

## Session WS02

*Monday, 4 September 2006 / Lundi, 4 Septembre 2006*

*Room 11.04, Faculty of Law, Lisbon University  
Salle 11.04, Faculté de Droit, Université de Lisbonne*

### **Megalithic quarrying Sourcing, extracting and manipulating the stones**

*organized by / organisé par*

**Chris SCARRE**

University of Cambridge, McDonald Institute for Archaeological  
Research, Cambridge, UK - [chris.scarre@durham.ac.uk](mailto:chris.scarre@durham.ac.uk)

#### **SESSION'S ABSTRACT**

In his famous 1872 volume "Rude Stone Monuments" architect James Fergusson commented on the inherently peculiar nature of megalithic architecture, which chose to employ large stone slabs that were frequently unmodified and unshaped. Subsequent studies of the megalithic slabs themselves have focused mainly on their geological origin and the distances over which they had been transported. The materiality of the slabs and the way that they were extracted from their source material has been only rarely addressed, although megalithic 'quarries' have occasionally been identified, and the deployment of glacial boulders in North European monuments is a well-known phenomenon. The session proposed here will study the two ends of the megalithic process: starting with the extraction of the stones, and ending with the precise manner in which they were incorporated in the monuments. How far did the character and availability of certain types of material constrain and direct monument form? The presence or absence of shaping and smoothing, along with other aspects of selection in the choice and placement of the individual slabs, will also be addressed. This aim is to identify what it was about the 'megalithic' quality of the slabs that inspired this kind of construction.

#### **RÉSUMÉ DE LA SESSION**

Dans son ouvrage bien connu de 1872 "Rude Stone Monuments" ('monuments mégalithiques brutes') l'architecte James Fergusson a remarqué le caractère fondamentalement particulière de l'architecture mégalithique, qui a voulu employé de gros blocs de pierres qui ne sont très souvent ni modifiés ni façonnés. Les études plus récentes sur les dalles mégalithiques se sont axées plus particulièrement sur leur origines géologiques et sur les distances sur lesquelles ces blocs ont été transportés. La matérialité des dalles elles-mêmes, et la façon dans laquelle on les a extraites de leur gisements d'origines sont parmi des questions qui ont attirées beaucoup moins d'attention scientifique, malgré la découverte de temps à autre de 'carrières' mégalithiques, et la circonstance bien connue de l'emploi des rochers d'origine erratique dans les monuments de l'Europe du nord. La séance proposée ici se portera sur les deux extrémités du processus mégalithique: en commençant par l'extraction des dalles, pour terminer avec la façon précise dans laquelle on les a incorporé dans les monuments. Dans quelle mesure le caractère et la disponibilité des matériaux particulier ont-ils contraints et dirigés la forme des monuments? La présence ou l'absence des évidences de façonnage ou de la régularisation des blocs, ainsi que d'autres aspects du sélectionnement et du placement des dalles individuelles, seront également abordées. L'objectif ultime est de déterminer ce qu'il y a avait dans le caractère mégalithique de ces blocs qui a inspiré ce genre de construction.

#### **SESSION PROGRAMME / PROGRAMME DE LA SESSION**

14:30            **Opening / Ouverture**

14:30-14:45    Ron L. ADAMS (Portland, OR, U.S.A.)

**WS02-01**

**Transforming Stone: Ethnoarchaeological Perspectives on Megalith Form in Eastern Indonesia.**

14:45-15:00    Jan Albert BAKKER (Baarn, The Netherlands)

**WS02-02**

**Hunebeds and Hünengräber. The construction of megalithic tombs west of the River Elbe.**

15:00-15:15    Gérard BENETEAU-DOUILLARD (La Bretonnière, France)

**WS02-03**

**Architectonique et esthétique des alignements de menhirs du sud de la Vendée (France).**

15:15-15:30    Rui BOAVENTURA

**WS02-04**

**Practical aesthetics and dolmen construction in Portugal: two case studies.**

15:30-15:45    Timothy DARVILL (Bournemouth, UK)

**WS02-05**

**Beyond Stonehenge: seeking the start of the bluestone trail.**

15:45-16:00    Torben DEHN  
Jørgen WESTPHAL

**WS02-06**

**The megalithic building site.**

16:00-16:15    Andrew FLEMING (Lampeter Ceredigion, UK)

**WS02-07**

**Searching for megalithic stone sources: the case of Wales.**

16:15-16:30    Eric GAUME

**WS02-08**

**Premières activités granitières et ardoisières dans l'ouest de la France néolithique: exemples de monuments mégalithiques sud-armoricains et angevins.**

16:30-16:45    Philine KALB

**WS02-09**

**Origin, extraction and transport of megalithic slabs and boulders in the Vale de Rodrigo region of southern Portugal.**

16:45-17:00    Michel LE GOFFIC (Quimper, France)

**WS02-10**

**Exploitation de la pierre et mise en œuvre des matériaux sur le site néolithique du Souc'h en Plouhinec (Finistère, France), première approche.**

17:00-17:15    Emmanuel MENS

**WS02-11**

**Technologie des mégalithes dans le Néolithique de l'Ouest de la France.**

17:15-17:30 Chris SCARRE (Cambridge, UK)

**WS02-12** Sourcing the stones: the deeper significance of megalithic architecture.

17:30-17:45 Kerstin SCHIERHOLD (Frankfurt, Germany)

**WS02-13** Gallery graves in Hesse and Westphalia: building materials, exploitation and building techniques.

17:45-18:30 Discussion

## ABSTRACTS / RÉSUMÉS

**WS02-01** Ron L. ADAMS (Portland, OR, U.S.A.)

**Transforming Stone: Ethnoarchaeological Perspectives on Megalith Form in Eastern Indonesia.**

**ABSTRACT:** The relatively recent and, in some cases, ongoing practice of erecting megalithic monuments in eastern Indonesia provides a unique case with which to examine the traditional practice of megalith building and its associated social and symbolic contexts. In this discussion, I focus on the issue of the shaping of megaliths used in the construction of large stone monuments. In particular, I examine how the social and symbolic contexts of megalithic monuments can influence their form. Large stone slabs are quarried, deliberately shaped, and often embellished with elaborate carvings in the construction of what can be very extravagant stone tombs in West Sumba, Indonesia. This practice is in sharp contrast to the erection of megalithic monuments elsewhere in eastern Indonesia, where the shaping of megaliths can be minimal or entirely absent. In this paper, I argue that the shaping of large stones and the designs that can be carved on their exterior can be highly tied to their emblematic significance and their importance in the contexts of competition between individuals and groups.

**WS02-02** Jan Albert BAKKER (Baarn, The Netherlands)

**Hunebeds and Hünengräber. The construction of megalithic tombs west of the River Elbe.**

**ABSTRACT:** The 55 extant megalithic tombs of the TRB or Funnel Beaker culture in the north-eastern Netherlands and those in north-western Germany, some 990, are made of glacial boulders and date from ca. 3350-3000 cal BC. Most of the tombs are passage graves and consist in principle of a row of trilithons – two uprights and one capstone – with an endstone at both ends and a short entrance passage in the middle of the southern or eastern long side. There may be a kerb of orthostats around the original foot of a barrow that covered the chamber. For the chambers, blocks with a flat inner side with dry walling of smaller stones between them aimed at forming smooth walls and ceilings. The capstones in the middle section usually are the largest, measuring 2-3 m transversely to the axis of the grave. If sufficiently large capstones were available, they were supported on two pairs of orthostats instead of one. Extremely large capstones led to modification of the tomb plan. The squarish plan of 810-Sieben Steinhäuser D is the most striking instance (there is no reason to derive it from the dolmens angevins). Other capstones allowed for a bay construction next to the entrance (D45-Emmerdennen, 846-Gross Stavern and probably 853-Klein Berssen 1). In 974-Visbek-Heidenopfertisch and 959-Molbergen-Teufelssteine, 5m- and 3.8m-long capstones cover a normal, 2.5m-wide chamber lengthwise.

The largest capstones weigh 20-30 tonnes, though sometimes much heavier glacial boulders occurred locally. (Estimating the weight of boulders is difficult and often results in divergent figures from different authors.) There are some indications reported that the larger blocks were shaped, but distinct traces of this are not recognisable on the stones, so this remains a point of discussion. A number of

the smaller erratic stones used for the dry walling, the sill stone and the floor pavement have however been cleft.

**WS02-03** Gérard BENETEAU-DOUILLARD (La Bretonnière, France)

**Architectonique et esthétique des alignements de menhirs du sud de la Vendée (France).**

**ABSTRACT:** Composante monumentale du mégalithisme de la façade atlantique de l'ouest de la France, les menhirs des alignements du sud de la Vendée montrent de nombreuses silhouettes anthropomorphes. La conception artistique de ces monoliths paraît être à l'origine d'un choix, d'une sélection pré-définie des formes des blocs naturels et leur extraction s'avère systématisée.

D'autre part, l'orientation des faces planes, ainsi que la disposition esthétique des menhirs dans les alignements, démontre que leurs déplacements et leurs levages ont été réalisés selon des concepts symboliques et architectoniques pré-déterminés.

Malgré un bouchardage terminal sommaire visant à adoucir les surfaces et les contours des silhouettes recherchés, les modalités techniques d'extractions restent parfaitement identifiables grâce à certains stigmates encore perceptibles.

Les menhirs anthropomorphes semblent même avoir donné lieu à une sexualisation de leurs formes qui peut sous-tendre la volonté d'une véritable architectonie sociale de la part des mégalithiques.

**WS02-04** Rui BOAVENTURA

**Practical aesthetics and dolmen construction in Portugal: two case studies.**

**ABSTRACT:** Using the cases of dolmens from two areas, Alto Alentejo and the Lisbon region (Lower Estremadura) some reflections will be made on the intentional use of certain rocks in the construction of these types of funerary structure. It is argued that such choices were conditioned generally by the availability and shape of the slabs needed, as much as by architectural considerations and the capacity of the human groups to undertake such a task. Alongside these practical reasons, however, it is possible to distinguish certain choices that can be interpreted as aesthetic.

**WS02-05** Timothy DARVILL (Bournemouth, UK)

**Beyond Stonehenge: seeking the start of the bluestone trail.**

**ABSTRACT:** It has long been known that Stonehenge in Wiltshire was built using stones from a number of different sources. These sources lie in two main areas: the chalk downlands of central southern England (sarsen stones), and the southwest Wales some 250km to the west of Stonehenge (the bluestones). Much effort has been devoted to looking at the geological aspects of the bluestone sources, but only recently has attention been directed to exploring the archaeological context. This paper reviews the nature and character of the bluestone blocks used in the construction of Stonehenge, their source on the Preseli Hills of southwest Wales, and the recorded archaeology of the area from which they came. It is argued that during the fourth and third millennia BC people viewed stone as part of the living cosmos and accordingly went to great lengths to move it around the landscape and integrate it within their monumental constructions.

**WS02-06** Torben DEHN  
Jørgen WESTPHAL

**The megalithic building site.**

**ABSTRACT:** One of the best opportunities for studying the manipulation of large stones by Neolithic societies is that provided by the megalithic graves which are the final result of the building process. By close examination of the architecture and constructional methods a better understanding can be gained both of that process of construction and of the ideas behind the monument as it appears today. The restoration and archaeological investigation of Danish listed megalithic graves together provide information about the constructional process and the changes that monuments underwent in antiquity. There are also traces of faults and mishaps during construction. The large number of investigated monuments (approximately 100) furnishes evidence of several different methods by which the

problems regularly encountered in megalithic construction could be solved. Key observations have been made both inside the chamber and outside in the surrounding mound where, for example, postholes connected with the handling of the capstones have been found. Other observations have been made during the process of restoration which in itself serves as a kind of experimental archaeology, helping us to understand better the problems faced by the megalith engineers and the solutions that they devised. These relate particularly to the methods of handling the large slabs and to the stability of the megalithic structures as a whole.

**WS02-07** Andrew FLEMING (Lampeter Ceredigion, UK)

**Searching for megalithic stone sources: the case of Wales.**

**ABSTRACT:** Traditionally, British prehistorians have displayed little interest in the sources of stone for megalithic tombs and related monuments, perhaps largely because the matter has seemed irrelevant in for students of typological history. But this question has become much more critical in recent years, as prehistorians have tried to relate the positioning of megalithic tombs to Neolithic notions of sacred geography, and have actively considered the possibility that stone itself may have had numinous properties. This paper discusses potential approaches to the question of megalithic stone sources in the Welsh landscape, and presents the results of some initial fieldwork.

**WS02-08** Eric GAUMÉ

**Premières activités granitières et ardoisières dans l'ouest de la France néolithique: exemples de monuments mégalithiques sud-armoricains et angevins.**

**ABSTRACT:** Dans le Golfe du Morbihan, le rôle du «pierreux» néolithique s'affirme particulièrement au Cerny, puis au Castelic dans l'érection de grandes stèles ornées et dans la construction généralisée au Néolithique moyen de tombes mégalithiques sous cairn de pierre sèche. Il suffit pour s'en convaincre d'observer attentivement par exemple l'ensemble granitique du Tumulus d'Er-Grah, du Grand-Menhir-Brisé et de la Table-des-Marchand à Locmariaquer, ainsi que le cairn en schiste ardoisier du Château d'Angers dans les Pays de Loire, et les nombreuses traces associées d'extraction de pierre à bâtir.

Ces moellons et ces mégalithes tirés de carrières ouvertes dans les pointements rocheux puis agencés en monuments, comme les différentes sortes de percuteurs non façonnés abandonnés en carrière ou remployés dans la maçonnerie, sont loin d'être des vestiges archéologiques insignifiants. Car suivant leur état de conservation et les qualités des pierres utilisées (ténacité, dureté, résistance, façonnabilité), les stigmates de percussion que l'on peut y discerner (points d'impacts, négatifs d'enlèvements, écrasement, gravures, etc.) peuvent tout aussi bien que la classique industrie lithique être révélateurs de la technologie des granitiers et ardoisiers de cette époque de la Préhistoire (trousse à outils diversifiés maniés en percussion lancée ou posée, processus techniques adaptés aux matériaux, etc.).

**WS02-09** Philine KALB

**Origin, extraction and transport of megalithic slabs and boulders in the Vale de Rodrigo region of southern Portugal.**

**ABSTRACT:** Since 1985 we have been investigating megaliths in the Vale de Rodrigo region of southern Portugal, paying special attention to the geological classification of slabs and boulders (uprights, capstones, standing stones, etc.) and the localization of their probable origin. We observe at about 50 monuments the use of different rocks at one and the same monument and we can argue that neither technical nor aesthetic considerations are the only reasons for the respective selections. Furthermore we note very few traces of the shaping of the slabs and boulders and we presume that Neolithic societies had profound knowledge of geology and the nature of rocks.

**WS02-10** Michel LE GOFFIC (Quimper, France)

**Exploitation de la pierre et mise en œuvre des matériaux sur le site néolithique du Souc'h en Plouhinec (Finistère, France), première approche.**

**ABSTRACT:** Connues depuis le début du XIXe siècle, les chambres des dolmens de la pointe du Souc'h ont été fouillées par A. Grenot en 1870 et 1871. Il s'agit en fait de deux cairns comportant chacun plusieurs sépultures, dont des dolmens à chambres compartimentées, à l'histoire complexe qui s'étale sur 2000 ans au moins. Les fouilles ont été reprises en 2000 par le Service départemental d'archéologie du Finistère et la dernière campagne de 2005 s'est plus particulièrement intéressée aux matériaux de construction et à leur étude.

La quasi totalité des grosses dalles servant d'orthostates pour la construction des parois des chambres et des couloirs des dolmens provient de l'estran proche. En effet, les surfaces et les arêtes des blocs sont très usées, polies et sont le résultat d'une érosion marine. Une prospection sur le littoral, à marée basse à l'équinoxe, a montré que toute la côte voisine recèle d'énormes galets d'orthogneiss identiques à ceux utilisés sur le site néolithique. La masse de ces blocs est de l'ordre de deux tonnes pour la plupart d'entre eux et ne pose donc pas de gros problèmes de manutention, le dénivelé étant à l'époque de 35 m à 40 m pour une distance de moins de 500 m.

Dans la lande rase qui se trouve à l'ouest des cairns et en limite de la rupture de pente du petit plateau du Souc'h, se voient deux dépressions contiguës dont l'une a été fouillé sur 28 m<sup>2</sup>. Il s'agit d'une carrière d'où a été extraite une grande partie des pierres et blocs ayant servi à l'édification des cairns. Le réseau de diaclases, fissures et failles est perpendiculaire à la foliation de l'orthogneiss coëillé, ce qui forme un débit naturel de la roche extrêmement facile à exploiter et ne nécessitant pas la mise en œuvre de matériel important ni de techniques particulières. (...)

**WS02-11** Emmanuel MENS

#### **Technologie des mégalithes dans le Néolithique de l'Ouest de la France.**

**ABSTRACT:** Une lecture originale des mégalithes de l'Ouest de la France est proposée en développant tous les outils d'analyse nécessaires à une étude technologique. Ce type d'étude, dont on connaît le succès sur l'outillage en silex des sociétés préhistoriques, permet de renouveler les problématiques de recherche liées au mégalithisme.

A travers le partage des affleurements pointant au-dessus du sol, on s'attache à reconnaître les processus d'acquisition, de transformation et d'utilisation des blocs destinés à la construction mégalithique. A l'aide de cette lecture technologique, suivre la gestion des blocs mégalithiques, depuis leur extraction jusqu'au travail de façonnage et de gravure, devrait permettre de recueillir des informations fiables sur le contexte économique et sociale ayant favorisé l'éclosion et le développement de l'architecture monumentale.

D'un point de vue méthodologique, la nouveauté consiste à resituer l'origine de chaque bloc mégalithique dans le déroulement du processus de partage de l'affleurement. Les blocs mégalithiques provenant des rochers à érosion sphéroïdale comme le granite ont une forme particulière, caractérisée par une face d'affleurement légèrement bombée opposée à une face d'arrachement plutôt plane. L'identification conjuguée des plans de débits et des anciennes faces d'affleurement permet de reconnaître l'emplacement du bloc dans le rocher avant son extraction. Les blocs mégalithiques peuvent ainsi être repositionnés dans les étages supérieurs ou inférieurs du rocher à la manière d'éclats de silex détachés de leur nucléus. Un remontage mental théorique de l'affleurement initial est donc possible et justifie le terme « d'affleurement nucléus » pour désigner le rocher ainsi reconstitué.

A partir du remontage mental des affleurements ayant été partagé en plusieurs blocs mégalithiques pour la construction des menhirs ou des tombes à couloir, un nouveau champ de recherche est ouvert sur la gestion du débitage du matériau de construction au Néolithique.

**WS02-12** Chris SCARRE (Cambridge, UK)

#### **Sourcing the stones: the deeper significance of megalithic architecture.**

**ABSTRACT:** Megalithic monuments are distinguished from other types of prehistoric structure by their incorporation of large (or as Childe put it "extravagantly large") slabs of stone. It is this that gave rise to the term 'megalithic' some 150 years ago. The tradition of megalithic architecture was far from opportunistic but is highly revealing of the attitudes of these societies to the materials that they were using: the large stones. Since these stones were not quarried from a depth but came from surface exposures or glacial erratics the source materials were visible in the landscape before construction was even contemplated. Thus the use of megalithic blocks played a key rôle in linking these

monuments to features of their local landscape. They drew on the landscape at two levels: for the materials themselves: the large stone slabs and other elements; and just as importantly, for the memories, powers and associations that those materials incorporated and symbolised. And it is at this second level that I believe the fundamental meaning of megalithic monuments must lie. The connection between landscape and monuments can be illustrated by several recent studies of megalithic structures in Britain and northern France. In all these cases, the sources of the stones can be shown to have been particularly important to the communities that built them.

**WS02-13**

Kerstin SCHIERHOLD (Frankfurt, Germany)

**Gallery graves in Hesse and Westphalia: building materials, exploitation and building techniques.**

**ABSTRACT:** Research on the Gallery Graves of Hesse and Westphalia has for the first time included geological analysis of the stones, focusing on five graves still preserved in the Altenautal, near Paderborn, and the well known grave from Züschen. The results allow a definition of the material and its provenance, and the transport distance. Few cases offer closer evidences for the extraction sites of the stones. The material itself shows the craftsmanship and geological knowledge of the builders in building these long lasting places for the dead. These aspects will be explained by the mentioned and further examples.

## Session WS04

Saturday, 9 September 2006 / Samedi, 9 Septembre 2006

Room 12.02, Faculty of Law, Lisbon University  
Saale 12.02, Faculté de Droit, Université de Lisbonne

**Men and volcanoes To live, survive and relive**

**Hommes et volcans Vivre, survivre et revivre**

*organized by / organisé par*

**ALBORE LIVADIE**

Napoli, Italy - [alborelivadie@libero.it](mailto:alborelivadie@libero.it)

**Jean-Paul RAYNAL**

Université de Bordeaux 1, IPGQ, UMR 5808, CNRS, Talence, France -  
[jpraynal@wanadoo.fr](mailto:jpraynal@wanadoo.fr)

### SESSION'S ABSTRACT

Volcanoes often had a devastating impact over civilizations and environment, revealed and documented by archaeological sites, in amore or less detailed way. Life in the immediate vicinity of active volcanoes was maintained or resumed whereas more distant civilizations were severely or completely affected by drastic modifications in the environment, governed by long distance phenomena. We wish to open a pluridisciplinary debate on the basis of resent research in this domain: volcanic eruptions have in fact affected Humankind since its African origins! Numerous questions may be raised: have eruptions favoured human inter-groups competition? The abandonment of affected territories is inevitable or a survival is organised on-site? Different eruption styles, with different impacts, lead to different responses, and the distance to the phenomenon has an influence in them? Past societies have been able to protect themselves from volcanic activity? Have they organised economic strategies to face the phenomenon? How to detect this stress and the societies' responses in the archaeological data? Actualism, is it a good tool to proceed to those identifications?

### SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00            **Opening / Ouverture**

09:00-09:20    Andrey SINITSYN (Saint-Pétersbourg, Russie)  
                  S. N. LISITSYN (Saint-Pétersbourg, Russie)  
                  John Frank HOFFECKER (Boulder, Colorado, U.S.A.)  
                  Biagio GIACCIO (Rome, Italie)

**WS04-01**    **L'horizon du téphra de Kostienki (Russie Centrale): la signification chronologique et culturelle.**

09:20-09:40    Maria SAÑA (Barcelona, Spain)  
                  Lidia COLOMINAS (Barcelona, Spain)  
                  Jordi GIBERT (Barcelona, Spain)  
                  Gabriel ALCALDE (Girona, Spain)  
                  Pau MARTIN (Girona, Spain)  
                  Emili BASSOLS (Garrotxas, Spain)



Llorenç PLANAGUMÀ (Garrotxas, Spain)

**WS04-02** **Volcanism and Prehistory. Archaeological analysis of the impact of volcanic activity on prehistoric societies.**

09:40-10:00 G. DI MAIO (Scalfati, Salerno, Italy)  
Claude ALBORE LIVADIE (Napoli, Italy)  
C. SCALA (Scalfati, Salerno, Italy)

**WS04-03** **Impact of Somma-Vesuvius' prehistoric activity (the Avellino-Pompeii period) on the human settlements of the River Sarno floodplain.**

10:00-10:20 G. M. BULGARELLI  
C. COLLINA  
R. GALLOTTI  
G. KIEFFER  
F.-X. Le BOURDONNEC  
M. PIPERNO  
J.-P. RAYNAL

**WS04-04** **Obsidian utilization at Melka Kunture (Middle Awash, Ethiopia)**

10:20-10:40 G. DI MAIO  
G. BALASSONE  
M.A. IANNELLI  
M. MARIOTTI  
E. RUSSO  
R. SARDELLA  
S. SCALA  
C. SCALA

**WS04-05** **Stratigraphic and geo-archaeological evidences of a possible Tsunami in the Early Bronze-Age: the prehistoric village of Oliva Torricella (Salerno - Italy).**

10:40-11:00 G. BALASSONE  
M. BONI  
G. DI MAIO

**WS04-06** **Analisi metallografiche e degli isotopi per la caratterizzazione delle tecniche e delle reti commerciali/approvvigionamento antiche – il caso delle culture dell'età del ferro della campania – Italia**

## ABSTRACTS / RÉSUMÉS

**WS04-01** Andrey SINITSYN (Saint-Pétersbourg, Russie)  
S. N. LISITSYN (Saint-Pétersbourg, Russie)  
John Frank HOFFECKER (Boulder, Colorado, U.S.A.)  
Biagio GIACCIO (Rome, Italie)

**L'horizon du téphra de Kostienki (Russie Centrale): la signification chronologique et culturelle.**

**ABSTRACT:** La région de Kostienki présente la majeure concentration de sites paléolithiques dans le moyen bassin du Don. 25 sites, la moitié desquels présente plusieurs niveaux culturels (jusqu'à 9 niveaux), sont localisés dans un territoire de 20 kmq.

La position taxonomique et chronologique de tous les sites du Paléolithique d'Europe de l'Est se confronte à deux séquences stratigraphiques distinctes: celle de Molodovo (bassin du Dniestr) et celle de Kostienki.

Le niveau de cendre volcanique identifié à Kostienki dans les années '50 du siècle dernier est devenu l'élément de référence qui sépare le groupe ancien (40-33 ka) du moyen (32-28 ka) dans le schéma chronologique de Kostienki. Aujourd'hui ce niveau est bien individualisé dans la stratigraphie de 9 sites.

Sur la base des études analytiques effectuées autour de 1980 (Melekestsev et al.), l'origine du téphra de Kostienki a été attribuée à l'éruption de l'ignimbrite Campanienne (IC) des Champs Phlégréens et à l'horizon Y5 reconnu au fond de l'Adriatique. Les recherches modernes (D. Pyle, Cambridge, UK; B. Giaccio, Roma, It.) qui confirment cette conclusion et l'âge de l'éruption (entre 39 et 41 ka) donnent un nouveau développement au problème.

En 2000, une couche culturelle fut identifiée à Markina Gora (Kostienki 14), dans la cendre volcanique entre les niveaux III et IVa, selon la nomenclature des années 1953/54. La littérature est si abondante sur ces sites qu'il n'a pas été possible d'en modifier la numérotation. Nous avons donc utilisé des termes descriptifs tels que "couche culturelle de cendre volcanique" à côté de la nomenclature traditionnelle numérique. Les premières fouilles avaient montré que la couche culturelle était protégée par la cendre volcanique, et que dans ces sites la vie avait été interrompue par un événement catastrophique. Les fouilles successives ont montré que la situation était plus complexe. Les couches culturelles in situ restaient identiques au-dessus des cendres volcaniques, comme si l'occupation s'était prolongée après la catastrophe au-dessus de la cendre sans changement. (...)

**WS04-02**

Maria SAÑA (Barcelona, Spain)  
Lidia COLOMINAS (Barcelona, Spain)  
Jordi GIBERT (Barcelona, Spain)  
Gabriel ALCALDE (Girona, Spain)  
Pau MARTIN (Girona, Spain)  
Emili BASSOLS (Garrotxas, Spain)  
Llorenç PLANAGUMÀ (Garrotxas, Spain)

**Volcanism and Prehistory. Archaeological analysis of the impact of volcanic activity on prehistoric societies**

**ABSTRACT:** The primary aim of this project is to study the impact that events such as the volcanic eruptions could have had on the dynamics of prehistoric societies. A detailed archaeological analysis will be carried out in the only area of the Iberian Peninsula where quaternary volcanism was been documented (the Natural Park of the Garrotxa Volcanic Zone and its immediate surroundings), covering a time period from 40,000 to 3,000 cal BC.

Achieving this goal requires an integrated interdisciplinary approach in which geoarchaeology, archeogeomorphology, paleoecology and archaeology are employed to reconstitute the specific relations between society and the environment before, during and after each volcanic eruption. To do this it will be necessary to establish and to correlate the following aspects and variables: prehistoric sites, chronology of the volcanic eruptions, topographic reconstruction of the volcanic relief and its products, climatic change and changes in biodiversity. At that point, it will be possible to explain the principal changes in the economy and in the social and political organization of the prehistoric communities that occupied and used this territory 40,000 years ago. This will allow us to evaluate the importance that volcanic phenomena had in the life of these communities and their perception of it a destructive agent or something advantageous in terms of biodiversity. In this sense, the particular characteristics of this zone during prehistory resulted in specific forms of occupation, management and exploitation which help explain the reactions of prehistoric societies and the answers they gave when faced with natural events such as volcanism.

On a methodological level, the volcanic phenomenon also had a direct influence on the formation and preservation of archaeological deposits and specific technical and analytical approaches are required to access them. The development and application of new methodological proposals in this field will contribute to progress and debate in archaeological and scientific investigation.

**WS04-03**

G. DI MAIO (Scalfati, Salerno, Italy)  
Claude ALBORE LIVADIE (Napoli, Italy)  
C. SCALA (Scalfati, Salerno, Italy)

**Impact of Somma-Vesuvius' prehistoric activity (the Avellino-Pompeii period) on the human settlements of the River Sarno floodplain.**

**ABSTRACT:** The "Pomici di Avellino" Plinian eruption (3,451±60 B.P.) was characterized by the deposition of thick layers of tephra that dramatically affected the sedimentation on part of the Campanian Plain, causing greater damage mainly to the areas on the north/northeast side of the volcano and hence also to settlements in this region. However, the event had only a minor destructive impact on the Sarno floodplain and its hydrographic regime.

The subsequent inter-Plinian events (generally defined as "proto-historic eruptions" in the volcanological literature), though, strongly modified the geological environment of the Sarno basin, also altering the direction of the Paleo-Sarno, as is shown by the position of several archaeological sites we have studied. Among them is the proto-urban settlement of Longola.

The explosive activity of the nearby Somma-Vesuvio volcano has strongly influenced the sediment supply to the Sarno plain, thus controlling the development of the different palaeoenvironments along the river. At the border of the plain, along the limestone slopes of the Lattari and Sarno mountains, explosive eruptions have produced a succession of volcanoclastic, as well as alluvial epiclastic, deposits. These deposits have always had a high destructive potential, often causing volcanoclastic and detrital flows involving the unconsolidated tephra initially deposited on the Apenninic slopes.

We describe here a series of analyses carried out in several archaeological sites on the Sarno floodplain and along its margins, between Vico Equense/Castellammare di Stabia to the west and Salerno to the east. Several stratigraphic sections, studied in areas both proximal and distal with respect to Vesuvius, reveal the continuing interaction through time between the deposition of eruptive products and human activities. The analysis of these sections has also yielded interesting information concerning varying environmental conditions and sediment deposition along the river valley. The proximal sites comprised Boscoreale, Boscotrecase and Pompeii to the south of the volcano, and Ottaviano to the east; the distal locations, Palma Campania and San Gennaro Vesuviano to the east, and Striano, San Valentino Torio and San Marzano on the River Sarno in the central part of the plain.

**WS04-04**

G. M. BULGARELLI  
C. COLLINA  
R. GALLOTTI  
G. KIEFFER  
F.-X. LE BOURDONNEC  
M. PIPERNO  
J.-P. RAYNAL

**Obsidian utilization at Melka Kunture (Middle Awash, Ethiopia)**

**ABSTRACT:** Melka Kunture is the only important East African prehistoric site to show a large exploitation and utilization of a raw material such as obsidian during Oldowan, Acheulian, Middle and Late Stone Age times.

Preliminary researches were carried out during 2002 and 2003, while a detailed geological study of the area of Balchit was undertaken on 2004 and several samples were collected for geochemical analysis which could indicate the patterns of diffusion of obsidian during prehistoric times.

With a few exceptions (as, for example, the Upper Acheulian site of Garba I, where other volcanic rocks played a dominant role in the production of large sized artifacts such as handaxes and cleavers) the exploitation of obsidian at Melka Kunture can be considered a leitmotiv lasting more than 1.5 million years, since its first utilization during Oldowan times at Gombore I and especially at Garba IV D, where it represents more than 40% of raw material.

In the locality of Simbiro, a few km far from Balchit, one of the Middle Acheulian level shows an exclusive and intensive use of obsidian, whose provenance still remains to be exactly determined. The extension and richness of this level seems to suggest the possibility that other still unknown outcrops could also have been exploited.

The utilization of obsidian is probably one of the main reasons for the technologically advanced features of many lithic products from Oldowan and Acheulian sites at Melka Kunture. This raw material is certainly more versatile than other volcanic rocks.

It seems evident that the utilization of obsidian represented a stimulus or, better, a technological facilitation, for the production of flakes. It still remains to be interpreted if the use of this raw material can be considered a "discovery" of such a great importance to influence the technological skill and to orient its results.

**WS04-05**

G. DI MAIO  
 G. BALASSONE  
 M.A. IANNELLI  
 M. MARIOTTI  
 E. RUSSO  
 R. SARDELLA  
 S. SCALA  
 C. SCALA

**Stratigraphic and geo-archaeological evidences of a possible Tsunami in the Early Bronze Age: the prehistoric village of Oliva Torricella (Salerno - Italy).**

**ABSTRACT:** Integrated geo-archaeological, stratigraphic/sedimentological, paleontological/palynological analyses and mineralogical investigations are in progress on a volcanoclastic and epiclastic deposit (here called STD) cropping out south of Salerno (Southern Italy). STD consists of poorly consolidated, yellowish sands and muds with subordinate levels of minute conglomerates. At Oliva Torricella, STD covers an Early Bronze Age archaeological site (here called OTEB), containing several huts and related working areas. This prehistoric village, located at the top of a marine terrace, was destroyed/abandoned after the STD catastrophic episode. The numerous archaeological findings (potteries, building materials and other processed products, bones etc.) have been mainly found in the sandy fraction; they are well preserved and show a clear evidence of transport and accumulation against obstacles (e.g. palings). The contact between SFD and the underlying anthropized paleosoil is sharp and locally erosive, pointing out to a sudden variation of the depositional environment. Human and animal tracks occur widely: filling structures (from trunks, mats, etc.) and internal casts (from pots, wells, ovens, etc.) have been frequently observed. In the area of San Leonardo, the SFD fills paleo-morphologies probably related to an ancient coastal marsh/lagoon environment, with a sort of "homogenite" layer up to one meter thick. The latter deposit covers black sediments (rich in organic matter, vegetables and woods) and two tephra levels fifteen centimetres thick. This might be the first stratigraphic-geoarchaeological evidence of a possible Tsunami, which occurred at the Early Bronze Age along the Thirrenian costs of Southern Italy.

**WS04-06**

G. BALASSONE  
 M. BONI  
 G. DI MAIO

**Analisi metallografiche e degli isotopi per la caratterizzazione delle tecniche e delle reti commerciali/approvvisionamento antiche – il caso delle culture dell'età del ferro della Campania – Italia**

**ABSTRACT:** Petrographic/mineralogic/metallographic analyses are currently under way on several metallic objects and slags sampled in several archaeological sites belonging to the Iron Age cultures in Campania (Southern Italy). The samples consist both of different types of slags and objects found in several tombs occurring in the necropolis of Caudium, from the Longola-Poggiomarino village and from the nearby necropolis of the Sarno River Plain. Other objects have been sampled in the necropolis of Monte Vetrano (Salerno), Pontecagnano and Sala Consilina. Pb-isotopic analyses carried out on several samples, show a prevailing provenance of the source materials from "Hercynian type" ore deposits in the Mediterranean area (Boni et al. 2000). The isotopic signatures can be referred so far to the old mining districts of southern Sardinia and southern Spain (with some hints to possible sources from northern Italy mines). The mentioned isotopic data, if compared with the "Alpine type" signatures (typical of Etruscan and Greek mines), commonly observed in the archaeological objects found in Campania between the VI and the III sec. B.C. point to a drastic change in the metal supply and/or in the commercial routes throughout these periods.

## Session WS06

*Saturday, 9 September 2006 / Samedi, 9 Septembre 2006*

*Anfiteatre 4, Faculty of Law, Lisbon University  
Amphithéâtre 4, Faculté de Droit, Université de Lisbonne*

### Quality management of prehistoric sites From research to dissemination

### Qualité de la gestion de sites préhistoriques De la recherche à la dissémination

*organized by / organisé par*

**Maurizio QUAGLIUOLO** DRI - Ente Interregionale, Roma, Italy - [gmauri@tiscali.it](mailto:gmauri@tiscali.it)  
**Luiz OOSTERBEEK** Instituto Politecnico de Tomar, Portugal - [loost@ipt.pt](mailto:loost@ipt.pt)

#### SESSION'S ABSTRACT

Our common Cultural Heritage, especially the prehistoric one, is subject to be rapidly deteriorated, needing to be preserved. On the other hand we have the responsibility to diffuse the knowledge of this Heritage to the public. Both of these activities have costs, sometimes expensive. The use of the Cultural heritage for tourism and other economic activities can help us to maintain it reducing costs and creating job opportunities. But there is a "break point" we have to study very well between "compatible development" (that take care of the context) and "sustainable development" (that is able to economically maintain itself). Our goal is to set an "equilibrium" between them. This session is aimed to discuss theoretical models and on-field experiences. The new HERITY International Registration for Quality Management of Cultural Heritage will also be introduced.

#### SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 09:00            **Oppening / Ouverture**
- 09:00-09:20    Dalton SALA (São Paulo, Brasil)  
**WS06-01**       **Jesuit mission settlements in South Americ: art history and archaeology.**
- 09:20-09:40    Fabio CARBONE (Aveiro, Portugal)  
**WS06-02**       **UISPP Workshop on Quality management of prehistoric sites: from research to dissemination.**
- 09:40-10:00    Inguelore SCHEUNEMANN DE SOUZA (Minas gerais, Brasil)  
**WS06-03**       **Education as part of cultural preservation.**

- 10:00-10:20 Alexander A. MALAFEEV (Samara, Russia)  
**WS06-04** **Cultural Heritage of Mid-Volga Region as the Object of Educational Management.**
- 10:20-10:40 Almudena CANAL MARTÍNEZ  
Jesús F. JORDÁ PARDO (Madrid, Spain)  
**WS06-05** **Vegetation management in archaeological and prehistoric sites.**
- 10:40-11:00 Mehmet OZDOGAN (Istanbul, Turkey)  
**WS06-06** **Cultural Heritage in Turkey: An Overview on the Current Threats and Management Policies.**
- 11:00-11:20 Niede GUIDON (Brasil)  
**WS06-07** **Discovery and rescue of archaeological sites in National Park Serra da Capivara region.**
- 11:20-11:40 Carlo PERETTO (Ferrara, Italy)  
Marta ARZARELLO (Ferrara, Italy)  
A. DI NUCCI (Ferrara, Italy)  
Giuseppe LEMBO (Isernia, Italy)  
Antonella MINELLI (Isernia, Italy)  
P. NUVOLI (Campobasso, Italy)  
B. PAGLIONE (Isernia, Italy)  
E. RUFO (Ferrara, Italy)  
Ursula THUN HOHENSTEIN (Ferrara, Italy)  
**WS06-08** **From research to dissemination: interventions for the valorization and dissemination of the prehistoric evidences in the Isernia province (Molise, Italy): the project LEADERPLUS-MOLI.G.A.L.**
- 11:40-12:00 Alice M. TRATEBAS (Newcastle, Wyoming, U.S.A.)  
**WS06-09** **Effects of Wildfire on Petroglyphs: Damage Assessment and Preservation Issues.**
- 12:00-12:20 Giuseppa TANDA (Cagliari, Italy)  
**WS06-10** **Progetto Goceano. Identità culturale, recupero e valorizzazione: per uno sviluppo compatibile e sostenibile.**
- 12:20-13:00 **Discussion**

## ABSTRACTS / RÉSUMÉS

- WS06-01** Dalton SALA (São Paulo, Brasil)  
**Jesuit mission settlements in South America: art history and archaeology.**

**ABSTRACT:** During the initial colonization period, the Portuguese sought to have natural borders (i.e. the Amazon, Paraguay, Paraná, and Prata rivers) prevail over the longitudinal line of demarcation stipulated by the Treaty of Tordesillas.

On the Spanish side, Jesuit-led mission settlements spearheaded political strategy for barring Portugal's military expansion.

This study shows how settlements in the Province of Paraguay in particular were devastated during three different periods: in the 17th century, on being attacked by bandeirantes (groups of roving explorers-cum-slave traders) from São Paulo; in the 18th century under frontier treaties; and in the 19th century by the wars of independence.

In the early 20th century, mission settlements were restored as national heritage and some are currently listed as Cultural Heritage of Humanity. Nevertheless, many are still awaiting the archeological work required for proper restoration and interpretation.

If the mission settlements are to be managed appropriately, there will have to be cross-disciplinary coordination between art historians and archeologists.

**WS06-02** Fabio CARBONE (Aveiro, Portugal)

**UISPP Workshop on Quality management of prehistoric sites: from research to dissemination.**

**ABSTRACT:** Cultural heritage valuation and promotion, as "root" that strengthens auto-esteem and local cultural identity, and the exploration of this heritage, as instrument of economical growth, are often discussed in the scope of the sustainable tourism development. One of the main benefits of this trend for Archaeology is that it can become a useful tool for sustainable development. But, to make it possible, it is necessary to reformulate the modalities of archaeological heritage management, even as primary tourist resource, by bringing it into a context that goes beyond the methodologies of conservation, musealization and spreading of the areas: archaeology has to become a tangible, integrated and dynamic instrument of economic, social and cultural development, especially at the local level. Within this context, the gradual touristification of archaeological heritage as a sustainable, integrated process has to be guaranteed. In this way, archaeological heritage exploration can represent a socio-economical benefit for the local population, and an added value in terms of tourist offer, not implying risks for the preservation of the archaeological sites.

For all the above, it is indispensable to create models (even flexible) of sustainable integrated management of archaeological areas. This paper proposes an innovative theoretical model for the sustainable management of archaeological heritage that includes the control of the quality of internal management and conservation of the sites (e.g. site preservation, content presentation and divulgation); the valorisation not only of the role of the Heritage Managers, but also of the archaeologists and technicians that operate at the sites; and the constant evaluation of the socio-economic and cultural relation between the activities developed in these areas and the local socio-economical growth.

Finally, we claim that it is possible to give archaeology a more important role in the economic, social and cultural sustainable development process through new ways of management. Moreover, the potential arising from a close relationship between archaeology and tourism is also viewed as a strong tool for the strengthening of both areas.

**WS06-03** Ingelore SCHEUNEMANN DE SOUZA (Brasil)

**Education as part of cultural preservation.**

**ABSTRACT:** The subject of science and society, at present, is one of the main topics in the agenda of international organizations. The main objective is to reach the public understanding that science is part of daily life, and may influence positively or negatively in the life pattern of each person and of the society in general. One of the most important concerns is to clarify to the public and to researchers that there is no clear limit between science and culture. As science, culture itself is an indissoluble component of daily life having an important role on the social and economic level of each society. Only if people understand it as part of their daily life will they take into account the role of each one of these components at any moment in the preservation of the cultural heritage as a whole. Measures to have

an equilibrium between visits, diffusion of the cultural heritage, and costs is not sufficient to guarantee the preservation. Education is the tool to reach that objective, but is not going to happen soon nor be a simple task. Therefore, some decisions are necessary, in all levels of education, to guarantee that the educational programs look to the people without disagreement in culture, science, history, technology, ethics, emotions, beliefs, sentiments, and physical appearance, like in the history and the identity of societies and territories where life is processed.

**WS06-04** Alexander A. MALAFEEV (Samara, Russia)

**Cultural Heritage of Mid-Volga Region as the Object of Educational Management.**

**ABSTRACT:** Cultural and historical heritage is great resource of educational activity and social-spiritual development. The historical monuments and any ancient traces are material manifestations of human creativity and cultural dialogue in time. The heritage is great information complex and we should know how we can to use its creative potential. Management of cultural heritage becomes one of urgent task of contemporary educational policy. The cultural-historical heritage is stages leading up us from past to future times. But we should not forget that heritage expressed the complicated configuration cultural and natural landscapes in human's environment.

Cultural mosaic of Samara region, its universalities and originalities, its past and present are the great resource of the development of tourism, poliethnic creativity and intercultural integration. Samara Povolzhie is situated within territory of Middle Basin of Volga river. Northern and western parts of this area lie in European forest-steppe zone, but southern and eastern parts stretch for Pre-Ural steppe province. Mid-Volga's region belongs to extremely active cross-contact ethnic-cultural areas of Euroasian continent.

The cultural heritage of Samara region is great and diverse. It is created by means of many generations and different nations. The ways of eastern and western, southern and northern cultures, ethnicities, religions were transcrossed here. This process of transcrossing had determined the complicated multiethnic population's structure of Samara region from prehistorical times. The settling of Samara Povolzhie had begun in palaeolithic time, but wide development of this land had taken place just in neolithic. In last years the series new Neolithic sites were discovered here. These monuments enable to show the originality of local cultures already in prehistorical time.

The Samarskaya Luka is a rich and original environmental museum, a unique part of the World Cultural and Natural Heritage. There are over 120 significant natural objects and over 100 historical and cultural monuments, over 100 species of animals and plants.

**WS06-05** Almudena CANAL MARTÍNEZ  
Jesús F. JORDÁ PARDO (Madrid, Spain)

**Vegetation management in archaeological and prehistoric sites.**

**ABSTRACT:** The purpose of this paper is to show the technologies used for control the vegetation raised on prehistoric sites and archaeological areas, emphasising particularly on the integral weed control, combining both the physical methods of control and eradication of the vegetation through chemical methods. Results obtained in the last years on some prehistoric and archaeological sites of Spain are included.

**WS06-07** Niede GUIDON (Brasil)

**Discovery and rescue of archaeological sites in National Park Serra da Capivara region.**

**ABSTRACT:** Thirty three years of research allow to discover and rescue 911 archaeological sites, 656 of them with rock art and 66 with engravings. When they were discovered some stayed untouched, others, used by the first settlers, showed white human presence marks: soot over the figures, graffiti, pieces of the stone wall broken. Since the years 80 the hunters exterminated the anteaters and "armadillos" natural enemies of termites and ants. The illegal trade reduced drastically the populations of parrots, macaws and parakeets, natural enemies of wasps and others insects. Over there the



shelters, included those placed far or in which the settlers never went, have their pictures recovered by termites and ants galleries and wasps nests.

The system we organized for the archaeological sites protection and for the rock art conservation gave us excellent results. Actually we have a program destined to develop archaeological tourism in order to increase the economic and social levels of the region, changing in this way traditional resources like nature exploitation, putting down vegetation, burnings and archaeological sites degradation.

**WS06-08**

Carlo PERETTO (Ferrara, Italy)  
Marta ARZARELLO (Ferrara, Italy)  
A. DI NUCCI (Ferrara, Italy)  
Giuseppe LEMBO (Isernia, Italy)  
Antonella MINELLI (Isernia, Italy)  
P. NUVOLI (Campobasso, Italy)  
B. PAGLIONE (Isernia, Italy)  
E. RUFO (Ferrara, Italy)  
Ursula THUN HOHENSTEIN (Ferrara, Italy)

**From research to dissemination: interventions for the valorization and dissemination of the prehistoric evidences in the Isernia province (Molise, Italy): the project LEADERPLUS-MOLI.G.A.L.**

**ABSTRACT:** The increasing requirement to improve the knowledge of the prehistoric evidences, located in the Molise region, has been developing during the last years by a strong interest of the local Institutions, that invested public financing, with the aim both to create a highly qualitative management system and to promote a wider exploitation and dissemination of the archaeological-prehistoric heritage of the Molise territory.

Considering the positive example of the paleolithic site of Isernia La Pineta, which is enjoyed by both the educational and scientific point of view, several interventions have been undertaken thanks to a common agreement among regional (Groups of Local Action) and national Institutions (Soprintendenza Archeologica del Molise, University of Ferrara, University of Molise) and have been finalized to locate, to explore, to study and to disseminate the prehistoric evidences coming from the Province of Isernia. These evidences were essentially known through the recommendation of the experts of the territory.

The Project Leaderplus started in 2004 and it is promoted by the Agency of Rural Development MOLI.G.A.L. (Molise GROUP Local Action), within the Community Program PIC Leader + Molise-PSL "Contado di Molisij-Parco Rurale d'Europa", Community Initiative in Rural Development (Axis 1, measure 1.3, action 1.3.1). This project represents a clear example of political wish to strengthen the quality of the interventions for the cultural heritage.

The realization of the project has allowed to verify the potentialities of a territory rich in archaeological evidences (i.e. Grotta Reali, Colle delle Api, Carovilli, San Lorenzo di Civitanova del Sannio), which have been explored, investigated, interpreted and inserted in a specific educational and scientific dissemination programme that is still in progress.

**WS06-09**

Alice M. TRATEBAS (Newcastle, Wyoming, U.S.A.)

**Effects of Wildfire on Petroglyphs: Damage Assessment and Preservation Issues.**

**ABSTRACT:** An extensive petroglyph site damaged by wildfire was used as a laboratory to investigate the nature and extent of fire damage. Because pre-fire varnish samples were available from earlier dating research, they could be paired with post-fire samples for controlled assessment of fire effects. Observed damage included fractured quartz grains in the substrate, spalled varnish, differential damage in zones of previous weathering, and ash deposits visible only microscopically. Paired samples were also used to test the fire effect on varnish dating. Dating experiments showed that varnish spalling and ash deposits may alter the results for several dating methods. The study generated several management recommendations for reducing wildfire damage to rock art.

**WS06-10**

Giuseppa TANDA (Cagliari, Italy)

**Progetto Goceano. Identità culturale, recupero e valorizzazione: per uno sviluppo compatibile e sostenibile.**

**ABSTRACT:** Il Goceano, denominazione d'origine medievale, oggi sede della VII Comunità Montana, è ubicato nella zona centro-settentrionale della Sardegna.

Presenta connotazioni geografico-morfologiche differenziate secondo quattro ambiti principali: la catena del Goceano, l'alta Valle del Tirso, la catena degli altipiani di Benetutti e Nule, il *plateau* basaltico di Pranu Mannu. Lo studio del paesaggio ha consentito di individuare un'apprezzabile varietà di attitudini o vocazioni di suoli: per l'agricoltura, per l'allevamento e per la selvicoltura.

Alcun fattori strutturali negativi quali la carenza di risorse idriche, la mancata elettrificazione delle campagne, l'assenza nei privati di spirito imprenditoriale hanno bloccato lo sviluppo della sub-regione che nel passato anche recente ha subito, a varie riprese, il fenomeno dell'emigrazione, con uno spopolamento continuo.

Le risorse offerte dal territorio sono, però, numerose e potrebbero essere sfruttate con esiti positivi se inserite in un sistema integrato che, potenziando i punti di forza e dando loro connotazioni identitarie anche con la creazione del Marchio Goceano sulle attività produttive, intervenga a correggere o superare, anche se parzialmente, i fattori di crisi.

In questo sistema il patrimonio culturale e, nella fattispecie, quello archeologico può essere il volano di pregio dello sviluppo. Allo stato attuale (ma il censimento dei Beni Archeologici non è ancora concluso) sono noti 340 siti attribuibili ad un arco culturale assai ampio, dal neolitico recente (3.500 ca) all'età romana.

La Comunità montana intende operare per il recupero e la valorizzazione di alcune emergenze archeologiche, in perfetta coerenza con le linee del piano di sviluppo socio-economico a suo tempo elaborato e seguendo la tematica progettuale degli itinerari turistico-culturali, in un quadro generale ed armonico, secondo criteri di opportunità geografica e di fruibilità sociale.

Il Progetto Goceano, elaborato da chi scrive, risponde a queste esigenze. E' un piano integrato che crea uno sviluppo sostenibile in quanto coniuga conoscenza, tutela e valorizzazione del patrimonio culturale ed ambientale con lo sviluppo economico, la ricerca con l'innovazione, il pubblico (Comunità Montana, Comuni, Dipartimenti universitari, Centri di Ricerca) con il privato (cooperative, PMI).

## Session WS07

Saturday, 9 September 2006 / Samedi, 9 Septembre 2006

Room 12.04, Faculty of Law, Lisbon University  
Saale 12.04, Faculté de Droit, Université de Lisbonne

### Public Archaeology

Participation of public power in managing memory generated through archaeological heritage, from the point of view of law and cultural policies

### Archéologie Publique

Participation du pouvoir public dans la gestion de la mémoire générée par le patrimoine archéologique, du point de vue de la loi et des politiques culturelles

*organized by / organisé par*

**Fábio VERGARA CERQUEIRA** Universidade de Pelotas, Pelotas, RS, Brasil -  
**fabiovergara@uol.com.br**

**Laurent CARON** Instituto Politécnico de Tomar, Departamento de Gestão do Território, Tomar, Portugal - **lcaron@ipt.pt**

### SESSION'S ABSTRACT

To debate archaeological research and heritage management within a wider cultural policy plan, managed by the public sphere. This includes both (1) the legal framework for regulations ruling archaeological activity (engaging the legislative action of modern democracies as well as the judicial action controlling the respect of such legislation by public and private social actors) and (2) the inclusion, by the public authorities, of a programmed action of memory generated by archaeological heritage, from the points of view of preservation methods and of education and tourist use. One will present and assess reports on experiences of relation between public archaeology and public framework for research and heritage management, in order to foresee an international public archaeology updating. (SAP)

### SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00 **Opening / Ouverture**

09:00-09:20 Carlos A. ETCHEVARNE (Bahia, Brasil)  
Claudia CUNHA KACHIMARECK (Feira de Santana, Bahia, Brasil)  
Jocimara SOUZA BRITTO LOBÃO (Bahia, Brasil)

**WS07-01** **Preliminary assessment and alternative management plan for rock art sites in the region of Morro do Chapeu, Bahia, Brasil.**

09:20-09:40 Katianne BRUHNS (Brasil)

**WS07-02** Educação Patrimonial e formas de inclusão social em Projetos de Arqueologia no Brasil

09:40-10:00 Pedro CURA (Tomar, Portugal)  
Sara CURA (Tomar, Portugal)  
Ana CRUZ (Tomar, Portugal)  
José GOMES (Tomar, Portugal)  
Luiz OOSTERBEEK (Tomar, Portugal)  
Lopes CARRAÇO (Tomar, Portugal)  
Luís SANTOS (Tomar, Portugal)  
Anabela PEREIRA (Tomar, Portugal)  
Tiago TOMÉ (Tomar, Portugal)  
Mónica GOMES (Tomar, Portugal)  
Carlos GOMES (Tomar, Portugal)

**WS07-03** Arqueojovem (youth association): archaeological and environmental research, preservation and divulgation after 15 years of voluntary service

10:00-10:20 Rogério José DIAS (Brasil)

**WS07-04** O IPHAN, Legislação e Publicação Arqueológica.

10:20-10:40 Rossano LOPES BASTOS (Brasil)

**WS07-05** Política de arqueologia preventiva no Brasil.

10:40-11:00 Discussion

## ABSTRACTS / RÉSUMÉS

**WS07-01** Carlos A. ETCHEVARNE (Bahia, Brasil)  
Claudia CUNHA KACHIMARECK (Feira de Santana, Bahia, Brasil)  
Jocimara SOUZA BRITTO LOBÃO (Bahia, Brasil)

**Preliminary assessment and alternative management plan for rock art sites in the region of Morro do Chapéu, Bahia, Brasil.**

**ABSTRACT:** A região de Morro do Chapéu, no centro do estado Bahia, Brasil, apresenta-se com um alto potencial de sítios arqueológicos, especialmente aqueles com pinturas rupestres. Em função de atividades empresariais de mineração ou de iniciativas agrícolas de micro proprietários, esses sítios, muitos dos quais ainda não registrados, correm sério risco de destruição, caso não se apresente um plano de manejo emergencial para toda a região. Neste artigo realizamos um diagnóstico e apresentam-se duas situações específicas referentes ao manejo dos sítios de arte rupestre se encontram localizados em duas áreas específicas: em terras ainda não desapropriadas do Parque Estadual de Morro do Chapéu e áreas de terras de propriedade privada. A proposta de manejo incide sobre os sítios de terras em mãos de particulares, posto que são essas estações arqueológicas as mais ameaçadas. No plano proposto se enfatizam os aspectos educativos e a inclusão da comunidade local como agente de preservação e fiscalização destas áreas, e a redefinição de atividades produtivas para a população rural.

**WS07-02** Katianne BRUHNS (Brasil)  
**Educação Patrimonial e formas de inclusão social em Projetos de Arqueologia no Brasil**

**ABSTRACT:** A Educação Patrimonial está se tornando imprescindível nos projetos de arqueologia, pois além de ser um processo educacional centrado no patrimônio cultural, tem assumido funções de

mediadora do relacionamento entre a comunidade afetada e os pesquisadores, acolhendo as expectativas e necessidades dos dois segmentos. Estabeleceremos um panorama das funções da Educação Patrimonial e de suas modificações ao longo do tempo, desde o lançamento da Portaria nº 230/02, do IPHAN.

Por estar intimamente ligada a cultura e por interagir com as comunidades afetadas de uma forma mais direta, a Educação Patrimonial trás em seu bojo a inclusão social via cultura, num processo de requalificar, reinserir, ressignificar os elementos constitutivos do patrimônio cultural pelas comunidades e pelo público em geral.

Portanto, trazemos a Educação Patrimonial como instrumento agregador de ações que objetivem uma transformação na maneira de tratar o patrimônio cultural, ou seja, a cidadania como ponto central em prol de atitudes inclusivas que visem a sustentabilidade das comunidades locais em sua interação com o patrimônio cultural.

**WS07-03**

Pedro CURA (Tomar, Portugal)  
Sara CURA (Tomar, Portugal)  
Ana CRUZ (Tomar, Portugal)  
José GOMES (Tomar, Portugal)  
Luiz OOSTERBEEK (Tomar, Portugal)  
Lopes CARRAÇO (Tomar, Portugal)  
Luís SANTOS (Tomar, Portugal)  
Anabela PEREIRA (Tomar, Portugal)  
Tiago TOMÉ (Tomar, Portugal)  
Mónica GOMES (Tomar, Portugal)  
Carlos GOMES (Tomar, Portugal)

**Arqueojovem (youth association): archaeological and environmental research, preservation and divulgation after 15 years of voluntary service.**

**ABSTRACT:** The youth association Arqueojovem (AJ) was created in 1991 after the experience of archaeological workcamps and other projects undertaken in the Middle Tagus region. Counting with the cooperation of more than 200 of volunteers this association has been promoting the research, preservation and divulgation of archaeological and environmental heritage of mentioned region. To reach its outputs AJ developed and organized, with the support of the National Youth Institute, Town Halls or European Community Programs, several activities like international workcamps and Workshops on archaeological and environmental themes. AJ also has a periodical Publication named TECNHE.

However in the WS07, more than to present AJ, we are more interested in raising questions and reflections about its actions and impact on the heritage, on the life of their volunteers and finally on the community of the region.

Questions like:

- How did AJ contribute for the research, preservation and dissemination of the archaeological and environmental heritage of the Middle Tagus region?
- How did AJ promoted scientific and cultural education among youngsters and others?
- How did AJ contribute for the internationalization of the Middle Tagus region?
- How far AJ influenced and helped the academic and civic education of its volunteers?
- Has AJ's voluntary service been permanent along these 15 years?
- AJ's dynamics depends on what?
  - Persons
  - Projects
  - Financial support

Keywords: Voluntary Service, Heritage Preservation, research and divulgation

**WS07-04**

Rogério JOSÉ DIAS (Brasil)

**O IPHAN, Legislação e Publicação Arqueológica.**

**ABSTRACT:** O IPHAN, Instituto do Patrimônio Histórico e Artístico Nacional, é no Brasil uma das instituições mais perenes da república, que vem cuidando e gerindo o patrimônio cultural brasileiro

desde 1937. Esta amparado num estatuto jurídico que remonta 70 anos, e vem ao longo do tempo prestando um relevante serviço a sociedade brasileira. Nossa legislação de proteção ao Patrimônio cultural tem um perfil social, pois aqui a propriedade privada encontra a única restrição, que é a sua função social que deve ser agregada a ela. Sendo assim, no Brasil podemos afirmar que o direito coletivo à memória suplanta o direito individual.

Na questão arqueológica a legislação é ainda mais restritiva, pois os sítios arqueológicos e os bens neles contidos são considerados bens da União federal, ou seja, bens de alcance social de usufruto de todo povo brasileiro.

Dentro dessa perspectiva, nosso desafio maior é tornar público aquilo que ao público pertence, num processo de publicização que recentemente tem ganhando normas específicas e apresentando resultados que será objeto deste trabalho.

**WS07-05** Rossano LOPES BASTOS (Brasil)

#### **Política de arqueologia preventiva no Brasil.**

**ABSTRACT:** O Brasil na última década, embalado pelo movimento ambientalista mundial e Nacional, tem experimentado um grande avanço nas questões ligadas aos projetos de infraestrutura desenvolvimentista e as suas relações com os procedimentos de avaliação de impactos ambientais.

Nessa perspectiva, o ambiente histórico cultural ganhou destaque com os novos instrumentos de gestão e avaliação, que foram introduzidos pelo IPHAN, Instituto do Patrimônio Histórico Nacional, órgão responsável constitucionalmente pelas ações de preservação, valorização e gestão em todo território nacional do patrimônio cultural reconhecido como de referência nacional no país.

Nessa oportunidade, enfatizaremos os avanços relativos por ocasião da implementação e aperfeiçoamento das normas infraconstitucionais que compõem a política preventiva patrimônio cultural arqueológico.

Desta forma, a proposição é mostrar a trajetória dos elementos constitutivos que formaram o escopo que hoje é referencial legal para os projetos de arqueologia preventiva no Brasil.

## Session WS11

*Thursday, 7 September 2006 / Jeudi, 7 Septembre 2006*

*Room 5.1, Faculty of Letters, Lisbon University  
Salle 5.1, Faculté de Lettres, Université de Lisbonne*

### Lithic technology in metal using societies

### Technologie lithique dans les sociétés à métaux

*organized by / organisé par*

**Berit Valentin ERIKSEN** Moesgaard Museum, Højbjerg, Denmark – [berit.eriksen@hum.au.dk](mailto:berit.eriksen@hum.au.dk)

#### SESSION'S ABSTRACT

During several hundred thousand years of human prehistory siliceous rocks such as flint and chert were the most important raw materials used for tool production. Already in the 5th millennium BC, however, the use of copper is documented in many neolithic tool assemblages and in the course of the 3rd millennium BC metal technology is introduced in prehistoric societies all over Europe. With a few exceptions metal is largely superior to flint when it comes to the production of tools, yet there are regions throughout the world where flint craftsmanship thrived long after metallurgy had been introduced. There are numerous examples of copper and bronze implements being copied with great skill in flint, and in some areas simple flint tools would seem to be in common use even in early Iron Age societies.

Contextual technological analyses of lithic inventories from the Stone Age document, how lithic exploitation patterns change characteristically through time. Evidently, different cultural traditions are not only characterized by the well known typological succession of artefact types, but also to a very high degree by different technological and socio-economic processes pertaining to raw material use and procurement strategies, as well as by the idiosyncratic, technical or functional mode of exploitation, i.e. knapping and further modification, of nodules and blanks. Obviously, these considerations also pertain to lithic inventories from later prehistory, but so far very little have been published on these issues.

The aim of this workshop is to congregate lithic researchers working on (pre)historic sites in which lithic technology were of apparent subordinate importance. Presenters are encouraged to share knowledge, data and analytical results on lithic inventories from a global range of societies in which tool-stone is being replaced by metal. Papers providing methodological and theoretical insight pertinent to these issues are also welcomed.

#### SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00            **Opening / Ouverture**

09:00-09:20    Deborah OLAUSSON (Lund, Sweden)

**WS11-01**        **Skeuomorphism in Scandinavian prehistory: Who's fooling whom?**

- 09:20-09:40 Jan APEL (Uppsala, Sweden)  
**WS11-02** **Flint Daggers and Bronze Axes - similarities and differences in the organization of skilful technologies in Early Bronze Age Scandinavia.**
- 09:40-10:00 Berit Valentin ERIKSEN (Højbjerg, Denmark)  
**WS11-03** **Flint tools in the Danish Bronze Age: cutting edge technology and left-over lithics.**
- 10:00-10:20 Anders HÖGBERG (Malmö, Sweden)  
**WS11-04** **Late Bronze Age Flint - Two Technologies, Two Traditions.**
- 10:20-10:40 Barbara R. ARMBRUSTER (Toulouse, France)  
**WS11-05** **Stone tools for Bronze Age metal working.**
- 10:40-11:00 Mechtild FREUDENBERG (Schleswig, Germany)  
**WS11-06** **Cushion Stones and other Stone Tools for early Metalworking in Schleswig-Holstein. Some new aspects on local Bronze Age Society.**
- 11:00-11:20 Annelou VAN GIJN (Leiden, The Netherlands)  
**WS11-07** **The use of flint in the Bronze Age of the Netherlands.**
- 11:20-11:40 Jaroslaw BRONOWICKI (Wroclaw, Poland)  
Miroslaw MASOJC (Wroclaw, Poland)  
Jolanta MALECKA-KUKAWKA (Wroclaw, Poland)  
**WS11-08** **The flint industry of the Lausitz Culture societies (SW Poland).**
- 11:40-12:00 Matthieu HONEGGER (Hauterive, Switzerland)  
Pauline de MONTMOLLIN (Hauterive, Switzerland)  
**WS11-09** **Flint daggers in the late Neolithic of the northern alpine area.**
- 12:00-12:20 Rajna ŠOŠIC (Zagreb, Croatia)  
**WS11-10** **Production of chipped stone artifacts on the late Neolithic and Copper Age site Slavca, Croatia.**
- 12:20-12:40 Evangelia KARIMALI (Rethymnon, Crete, Greece)  
**WS11-11** **Lithic production and use in the Bronze Age Aegean.**
- 12:40-13:00 Chloé DRUART  
**WS11-12** **Mycenaean stone arrowheads: production and function.**
- 13:00-14:30 **Lunch / Déjeuner**



- 14:30-14:50 Lasse SØRENSEN (Copenhagen, Denmark)  
**WS11-13** Exchange patterns and trading routes of obsidian artifacts during the Final Neolithic and Early Helladic in the Aegean region.
- 14:50-15:10 Isaac GILEAD (Ben-Gurion, Israel)  
**WS11-14** The Ghassulian Sickle blades Workshop of Beit Eshel, Beer Sheva, Israel.
- 15:10-15:30 Steven A. ROSEN (Beer Sheva, Israel)  
**WS11-15** Blood From Stone: Can We Really Do Ethnicity from Flint.
- 15:30-15:50 Teresa P. RACZEK (Pennsylvania, U.S.A.)  
**WS11-16** Stone Production of Farmers and Herders: Indian Lithic Technology in an Age of Copper.
- 15:50-16:10 Miriam N. HAIDLE (Tübingen, Germany)  
**WS11-17** Bifaces, shouldered adzes, and chert prisms: stone tool assemblages in later Cambodian prehistory.
- 16:10-18:30 Discussion

## ABSTRACTS / RÉSUMÉS

**WS11-01** Deborah OLAUSSON (Lund, Sweden)

### **Skeuomorphism in Scandinavian prehistory: Who's fooling whom?**

**ABSTRACT:** Skeuomorphism is defined by Vickers and Gill (1994) as the act of copying vessels in one material with the intention of evoking the appearance of vessels regularly made in another. Vickers and Gill were describing a situation in ancient Greece. However, skeuomorphism is a phenomenon which occurs in all human material culture, today as well as in the past. Given our evolutionary biases, we usually assume that copying metal objects using lithic or ceramic materials is an act of economic desperation or a sign of misplaced delusions of grandeur. In my paper I will describe a number of examples of skeuomorphism in Scandinavian prehistory. I wish to explore the reasons for the choice of alternative raw materials for making forms with otherwise identical morphology. Finally, I will question the a priori assumption that the metal object was always the original upon which the copy in another material was based.

**BIBLIOGRAPHY:** Vickers, M. & Gill, D. 1994. *Artful Crafts: Ancient Greek Silverware and Pottery*. Oxford.

**WS11-02** Jan APEL (Uppsala, Sweden)

### **Flint Daggers and Bronze Axes - similarities and differences in the organization of skilful technologies in Early Bronze Age Scandinavia.**

**ABSTRACT:** In this paper the production and consumption of flint daggers and bronze Axes in early Bronze Age Southern Scandinavia is compared and discussed in a chaîne opératoire perspective. These Crafts are regarded as prestige technologies that require a division of labour and access to quality raw materials in order to be executed. It is suggested that they, in markedly different ways,

played an important part in social strategies aimed to maintain or increase the symbolic capital of certain families.

**WS11-03** Berit Valentin ERIKSEN (Højbjerg, Denmark)

**Flint tools in the Danish Bronze Age: cutting edge technology and left-over lithics.**

**ABSTRACT:** A case study of the lithic inventories from five Bronze Age settlement sites, all situated at Bjerre in the province of Thy, Denmark, provides the basis for a discussion of the role of flint craftsmanship in a metal using society. The sites were settled for longer or shorter periods throughout a time span of approximately 700 years (ca. 1450-750 BC) and are well suited for revealing variations in lithic production strategies throughout time. The study focus on "individual" flint knappers and their technological skills and knowledge and not least the local and regional socio-economic tradition that they are part of. We find evidence of flint knapping "specialists" in the Early as well as in the Late Bronze Age inventories, but the degree of specialization as well as the tools produced is quite different. Thus, the study evidence the decline and fall of a master taught, state of the art craftsmanship, which slowly but surely degenerates into a do-it-yourself, ordinary, domestic industry. Nonetheless, flint remains an important raw material for the production of common tools throughout the period in question.

**WS11-04** Anders HÖGBERG (Malmö, Sweden)

**Late Bronze Age Flint - Two Technologies, Two Traditions.**

**ABSTRACT:** "If this rather unpleasant material cannot win our affection, it still needs our understanding" (Flint working in the Metal Age, Ford *et al.* 1984:167).

Flint from the Bronze Age and Iron Age is not an appealing material. Elusive and apparently without structure it captures the interest of few. I can not say that it has won my affection, but I have tried to understand it. A new circular road has been built around the town of Malmö. Due to this an archaeological excavation project related to the infrastructural development in the region, has been initiated. The investigated surface belongs to an area that has been one of the most densely populated regions in Scandinavia since the Mesolithic. Within this project a number of late Bronze Age settlements have been excavated. I have been working with the flint material from these sites. With a technological perspective, two different mental approaches in flint knapping, manifested in the technological expression, are examined. What I want to investigate are parts of the cultural forms, which makes the coexistence of two different crafts and technologies possible in the Late Bronze Age.

**WS11-05** Barbara R. ARMBRUSTER (Toulouse, France)

**Stone tools for Bronze Age metal working.**

**ABSTRACT:** Stone tools for metal working are rare objects in the archaeological record and often are not recognized in museum collections. This paper deals with stone implements of ancient goldsmiths and bronze casters. The principal functions of these artefacts are: hammer, anvil, abrasive or whetstone, touchstone and casting mould. The study is based on archaeological finds, traces indicating their usage and tool marks they left during the manufacture of metal objects. The technology of such kind of implement employed in metallurgical workshops of the Bronze Age will be discussed on the bases of an interdisciplinary approach. Depictions of artisans in Egyptian tombs illustrate tools and gestures of metal workers with detail. Ethno-archaeological research in traditional metal workshops in Africa supply analogies for explanatory models. Results from experimental archaeology provide technical knowledge on the practical use of stone implements. Finally archaeometry delivers analytical data for the identification of the composition of the materials such as stone and metal remains.

**WS11-06** Mechthild FREUDENBERG (Schleswig, Germany)

**Cushion Stones and other Stone Tools for early Metalworking in Schleswig-Holstein. Some new aspects on local Bronze Age Society.**

**ABSTRACT:** Stone tools in metal using societies are often thought as primitive relicts from the past. In my opinion this picture might be misleading. During at least the early and older Bronze Age in Schleswig-Holstein stone tools were frequently used, perhaps they even dominated the tools made of metal. Gold and bronze objects were mostly used for expressing status, for weapons and in religious contexts.

Some new cushion stones and other stone tools for metalworking were recently found in Schleswig-Holstein. Some were delivered fresh from the ground, others have been lying unnoticed in the storerooms for years. Schleswig-Holstein has always been thought of as a kind of remote region, there are only a few hints for early metalworking in comparison to Denmark or Central Europe. With the new finds the picture might change. It seems we were looking for the wrong objects. Tools for metalworking were often made of stone. At least in Schleswig-Holstein the variety of these tools is impressive. I will try to prove that stone tools are not necessarily signs of the past but they can be harbingers of new techniques and indicators for a new complex Bronze Age society.

**WS11-07** Annelou VAN GIJN (Leiden, The Netherlands)

**The use of flint in the Bronze Age of the Netherlands.**

**ABSTRACT:** Bronze Age settlement flint has long been the Cinderella of lithic research in the Netherlands. Attention was given to the beautifully shaped flint burial gifts and to the sickles made of Northern import flint. Lately several late Neolithic and Bronze Age settlements have been excavated. The flint assemblages and the material have been studied technologically and microwear analysis has been carried out. It has now become possible to compare the use of flint in settlements, burials and hoards. It turns out that flint is still important for various household tasks in the settlements, such as fire making. However, the need for specialized toolkits is no longer present, probably due to the completely sedentary existence of these communities. The flint is produced in an ad hoc fashion, frequently making use of a bipolar reduction technique. In contrast, the flint burial gifts often lack any traces of use. The sickles, frequently part of multiple hoards, are for the most part used for cutting sods, a task that may appear mundane, but is probably connected with the construction of houses and the erection of burial mounds. By comparing the production of implements and their use in these various depositional contexts, the role of flint in the technological system will be examined, and its significance for the prehistoric communities will be assessed.

**WS11-08** Miroslaw MASOJC (Wroclaw, Poland)  
Jaroslaw BRONOWICKI (Wroclaw, Poland)  
Jolanta MALECKA-KUKAWKA (Wroclaw, Poland)

**The flint industry of the Lausitz Culture societies (SW Poland).**

**ABSTRACT:** Results of the newest investigations considering the role of the chipped industry for the societies of the Lausitz Culture in the south-western Poland will be presented. Chronological range contains the entire period of existence of Lausitz Culture, namely from the III Bronze Age period III till Hallstatt D period.

Until recently the presence of the chipped industries in the metal using societies in Silesia (SW Poland) was totally imperceptible. Sometimes, especially as to the Lausitz Culture, the fact of using stone raw materials for tool production was denied. Moreover, the flint artifacts from both the settlements and the cemeteries, usually very rare and uncharacteristic, were interpreted as an admixture of older, stone-aged cultures. The excavations conducted in the recent years allowed appropriate observations and expressions of the first essential conclusions in that subject.

First of all it was stated that flint artifacts appear only on some sites of the Lausitz Culture, independently from their age. The differentiation of the quantity of discovering items on particular sites is observable, even on sites located very close to each other and staying in functional relationship. The flint artifacts appear both on cemeteries and on settlements. In the first case they appear both in skeleton graves and in cremated graves. The appearance of single artifacts outside the graves was also observable. Tools on the cemeteries are rather not very common, on the contrary, it happens that

flints from the graves conjoin each other which may points that flint knapping was of ritual meaning. Other interesting feature is a presence of unburned (in majority) artifacts in cremation graves.

On the settlements, the biggest differentiation with regard to the quantity of flint artifacts was observed, counted in relation to the number of excavated archaeological objects and also to the size of investigated area. There are known settlements where in several hundreds pits only a couple of flint artifacts were discovered, and, on the contrary sites where flint industry counts thousands items. (...)

**WS11-09** Matthieu HONEGGER (Hauterive, Switzerland)  
Pauline de MONTMOLLIN (Hauterive, Switzerland)

**Flint daggers in the late Neolithic of the northern alpine area.**

**ABSTRACT:** This study focuses on the flint daggers found in the late neolithic settlements of Switzerland, especially those of the lake of Neuchâtel. These daggers come from different areas of Europe : Grand Pressigny (FR), Forcalquier (FR), Monti Lessini (IT), etc. With the help of dendrochronology it is possible to reconstitute a precise chronology of the importations and to evaluate their numeric importance. The technological investment of the different productions will be examined in regard to the possible interactions with the increasing metal industry.

**WS11-10** Rajna ŠOŠIĆ (Zagreb, Croatia)

**Production of chipped stone artifacts on the late Neolithic and Copper Age site Slavca, Croatia.**

**ABSTRACT:** Little is known about the process of production and usage of the artifacts during the Neolithic and late prehistoric periods in Croatia. In the past few years, researches on the chipped stone artifacts began to step up. This paper presents the results of the technological and typological analysis of the chipped stone assemblage from the site of Slavca, in the Croatian region of Western Slavonia. The site was inhabited during the final stages of Neolithic (Sopot Culture), and throughout the Copper Age (Lasinja and Kostolac culture). There is resemblance in the techniques of production (in both periods indirect percussion was used for producing blades), as well as in the ways of the production of flakes and in tool typology. There are strong differences in the procurement of the raw material and the process of the production of blades between these two periods. This paper aims to elaborate the settlement and mobility patterns of populations that settled on Slavca throughout the analysis of the lithic assemblage.

**WS11-11** Evangelia KARIMALI (Rethymnon, Crete, Greece)

**Lithic production and use in the Bronze Age Aegean.**

**ABSTRACT:** Lithic raw material continued to be used continuously during the Bronze Age in the Aegean. Pressure, the main blade production technique, became more standardized in the Early Bronze Age, applied mainly on obsidian, and other fine-grained siliceous materials as well (e.g., chocolate flint). An indirect system of obsidian production was established in the Aegean, with many coastal sites of the mainland functioning as regional obsidian production centres, exporting prepared cores to inland, smaller sites and possibly to the coast of Asia Minor.

The use of stone (obsidian, flint but also green igneous rocks as well) continued down to the end of the Bronze Age, for making chipped-stone and ground stone tools, although specialized production was limited mostly to the islands (Cyclades, Crete). Metal did not replace stone at once, but in successive stages. The present discussion re-addresses the replacement issue by presenting some data from published BA Aegean sites in a comparative perspective. Moreover, it introduces a theoretical and methodological framework by which the parallel use of stone and metal in the Bronze Age can be placed and further understood.

**WS11-12** Chloé DRUART

**Mycenaean stone arrowheads: production and function.**

**ABSTRACT:** So far, the Mycenaean stone arrowheads had been the subject of no systematic study. We will thus try to better characterize this production by a techno-morphological and functional analysis, taking of account the raw materials (mainly flint or obsidian) as well as the methods and the techniques of flaking. According to their typology, these arrowheads appear as a characteristic of continental Greece at the Late Bronze Age, constituting a clearly Mycenaean cultural feature. In addition, diachronic and synchronic variations within this unit suggest differences in cultural and/or functional order, which are to be specified. Of a remarkable smoothness and often coming from prestigious funerary contexts, their function (utility and/or symbolic) in the Mycenaean society is also to define. For this reason, their frequent association with bronze arrowheads is an important aspect which can be lit by a trans-cultural reflexion in the role of the flaked stone in the using metal societies.

**WS11-13** Lasse SØRENSEN (Copenhagen, Denmark)

**Exchange patterns and trading routes of obsidian artifacts during the Final Neolithic and Early Helladic in the Aegean region.**

**ABSTRACT:** Obsidian is found on many settlements in the Aegean area and most of it comes from Melos. Few assessments have been made in order to evaluate the amount of obsidian exchanged in different periods, but it is a general assumption that the exchange of obsidian reached its peak during the Final Neolithic and the Early Helladic. During this particular transition the settlement pattern changes in the Aegean area and many sites moves closer to the sea and the different islands are colonized. This gives some possibilities of observing and testing different theories concerning exchange mechanisms and trading routes. The exchange of obsidian could have stimulated the development of some fixed transportation routes. Furthermore, the increasing exchange of obsidian during this transition lead to some established routes, which grew important when copper and other exotic good was traded during the following Helladic periods. These facts could be one of the main reasons, why some of these Final Neolithic sites developed into important Bronze Age cities.

**KEYWORDS:** Aegean, Final Neolithic, obsidian, exchange patterns, trading routes.

**WS11-14** Isaac GILEAD (Ben-Gurion, Israel)

**The Ghassulian Sickle blades Workshop of Beit Eshel, Beer Sheva, Israel.**

**ABSTRACT:** Craft specialization of the Ghassulian culture of the Southern Levant (fifth millennium B.C.) is one of the major keys for a better understanding of the social and economic organization of the Chalcolithic communities. Copper artifacts are the best known products of Ghassulian craftspeople and attract most attention. While every copper artifact is a product of specialists, it is difficult to know whether flint tools were produced by craft specialists. Raw flint is easily available and the products are found in every household, thus, tracing possible specialized production is complicated. The paper is based on the recently unearthed Ghassulian flint sickle blades workshop of Beit Eshel in Beer Sheva. These are unique assemblages that weight ca. 1500 kg, coming from limited surfaces of about 3.5x3.5 m. They include the entire range of flint processing products: flint pebbles, decortication pieces, blade cores, blades, snapped blades, retouched and sickle blades, as well as flint and limestone hammers and anvils. Aspects of copper-flint craft specialization and ritual will also be discussed.

**WS11-15** Steven A. ROSEN (Beer Sheva, Israel)

**Blood From Stone: Can We Really Do Ethnicity from Flint.**

**ABSTRACT:** A case study of the lithic industries in the southwestern corner of Israel-Palestine dating to the Early Bronze Age I-II (late 4th-early 3rd millennium BC) suggests that three distinct ethnicities are reflected in the stone tools. At a simple level, chipped stone industries attributable to Egyptian, Mediterranean Canaanite, and desert pastoralist societies respectively show technological and typological contrasts which can be assumed to correspond to ethnic distinctions defined geographically and on the basis of both texts and other elements of material culture. More significantly, beyond the passive reflection of ethnic distinction, examination of the cultural contexts, functions, and chronological trajectories of the different industries and sub-industries provides insights into how the different lithic industries functioned in their respective societies, strengthening the idea of ethnic distinction in the sense of 'doing things differently'. Furthermore, given the geographic proximity and overlap of the industries and sub-industries, the lithic industries also functioned within the general

interaction spheres of the societies, and thus reflect aspects of interaction such as trade, resistance, imitation, and continuity.

**WS11-16** Teresa P. RACZEK (Pennsylvania, U.S.A.)

**Stone Production of Farmers and Herders: Indian Lithic Technology in an Age of Copper.**

**ABSTRACT:** Throughout South Asia there is great variation in the production and use of lithics after the introduction of copper. This paper will compare the lithic technology of two nearby and contemporaneous sites in Rajasthan, India: Gilund, an agricultural settlement and Bagor, a temporary camp of pastoralists and hunter-gatherers. Shifts in the nature of lithic technology between 5000 BC and 1700 BC

at these two sites will be considered within broader economic and social contexts. Issues to be considered include access to copper and good quality stone, non-lithic craft production and exchange, complexity, subsistence strategies, and mobility.

**WS11-17** Miriam N. HAIDLE (Tübingen, Germany)

**Bifaces, shouldered adzes, and chert prisms: stone tool assemblages in later Cambodian prehistory.**

**ABSTRACT:** Mimotien circular earthworks in east Cambodia and southern Vietnam are dated to the end of the Neolithic and/or beginning of Metal Age ending in the second half of the first millennium BC. Fifty-one of these very homogeneous settlement sites with outer wall and inner ditch have been recorded so far, of which Krek 52/62, in Ponhea Krek district, Kampong Cham province, Cambodia is the most intensively examined. The lithic inventory of this and other Mimotien earthworks presents a diverse picture of raw materials, tool types and functions.

At least eight stone raw material groups have been identified. Local- and regional-occurring raw materials are most common, but lithic raw materials imported from further afield are also present. However, there is only minor evidence for modification of the latter at the site. High- and low-consumption raw materials with a short use period can be identified as well as low-consumption raw materials with a long use period. These groups do not perfectly align with the distances from primary raw material occurrence, but are clearly also influenced by functional considerations. Various sorts of stone artefacts can be found at Mimotien sites: as well as production debris, flakes, blades, bladelets and adze blanks, several typological forms can be identified such as borers, chisels, thin-butted and shouldered adzes, grinding stones, polishers and whetstones, bifaces, burnishing pebbles, bracelets with rectangular and triangular cross sections, beads, pendants, and fragments of a lithophone. The various raw materials were worked by unifacial and bifacial flaking, grinding, polishing, and core drilling. To perforate garnet and carnelian beads, specialized fine and imperishable tools for conical and biconical drilling can be assumed. The functions identified so far for the Mimotien stone tools include cutting, wood-working, chiseling/sculpting, drilling, grinding and polishing stone tools, whetting, burnishing pottery, and ornamentation, and sound/music instruments.

The variety of lithic raw materials, tool types, technologies, and functions as well as of the proposed increase over time of low-consumption raw materials with long use periods seems to characterize the stone tool inventory at the eve of the Metal Age, at least in the Mimotien complex.

## Session WS14

*Friday, 8 September 2006 / Vendredi, 8 Septembre 2006*

*Room 11.04, Faculty of Law, Lisbon University  
Salle 11.04, Faculté de Droit, Université de Lisbonne*

### **Humans, environment and chronology of the Late Glacial on the North European Plain**

### **Hommes, environnements et chronologie du tardiglaciaire dans les plaines Nord Européennes**

*organized by / organisé par*

- Martin STREET** Römisch-Germanisches Zentralmuseum Mainz, Schloss Monrepos, Neuwied, Germany – [street@rgzm.de](mailto:street@rgzm.de)
- Nick BARTON** Donald Baden-Powel Quaternary Research Centre, Institute of Archaeology, Oxford, UK – [nick.barton@arch.ox.ac.uk](mailto:nick.barton@arch.ox.ac.uk)
- Thomas TERBERGER** Historisches Institut - Ernst Moritz Arndt Universität Greifswald, Lehrstuhl für UR- und Frühgeschichte, Greifswald, Germany – [terberge@uni-greifswald.de](mailto:terberge@uni-greifswald.de)

#### **SESSION'S ABSTRACT**

The session of commission XXXII will provide new important information on research on the Late Glacial of the North European Plain. The papers will present for example new evidence on the Hamburgian, the transitional period to the Mesolithic and the colonization process of Scandinavia. Talks dealing with comparative aspects of more southern areas will also be given. A limited number of papers can still be accepted.

(If you are interested to participate, please directly contact Martin Street).

#### **SESSION PROGRAMME / PROGRAMME DE LA SESSION**

09:00 **Opening / Ouverture**

09:00-09:20 Nick BARTON (Oxford, UK)  
Martin STREET (Neuwied, Germany)  
Thomas TERBERGER (Greifswald, Germany)

**WS14-01** **Introduction: Humans, environment and chronology of the Late Glacial of the North European Plain: Recent progress and unsolved problems.**

- 09:20-09:40 Olaf JÖRIS (Neuwied, Germany)  
Bernie WENINGER (Köln, Germany)  
**WS14-02 Radiocarbon dating at Termination I.**
- 09:40-10:00 Roger M. JACOBI (London, UK)  
Tom HIGHAM (Oxford, UK)  
Chris BRONK RAMSEY (Oxford, UK)  
T. C. LORD  
**WS14-03 New radiocarbon determinations of bone from the British Late Glacial.**
- 10:00-10:20 Sonja GRIMM (Neuwied, Germany)  
**WS14-04 Cultural transition in a changing landscape.**
- 10:20-10:40 Becky MILLER (Liège, Belgium)  
Pierre NOIRET (Liège, Belgium)  
**WS14-05 Recent results for the Belgian Magdalenian.**
- 10:40-11:00 **Break / Pause**
- 11:00-11:20 Marc DE BIE (Heverlee, Belgium)  
Marijn VAN GILS (Heverlee, Belgium)  
**WS14-06 Human occupation in a Late Glacial landscape: The Federmesser site complex at Lommel (Belgium).**
- 11:20-11:40 Olivier BIGNON (Paris, France)  
**WS14-07 Regional populations and big game exploitation in the Paris Basin during the Late Glacial: In search of an integrated environmental model.**
- 11:40-12:00 Jacek KABACIŃSKI (Poznań, Poland)  
Iwona SOBKOWIAK-TABAKA (Poznań, Poland)  
**WS14-08 Big game versus small game hunting: Subsistence strategies of the Hamburgian Culture.**
- 12:00-12:20 Przemysław BOBROWSKI (Poznan, Poland)  
**WS14-09 The exploitation of local sources of flint on the Polish Plain during the Final Palaeolithic.**
- 12:20-12:40 Kristoffer BUCK PEDERSEN (Vordingborg, Denmark)  
Keld MØLLER HANSEN (Vordingborg, Denmark)  
**WS14-10 Final Palaeolithic / early Mesolithic in south Zealand, Denmark.**
- 12:40-13:00 **Discussion**
- 13:00-14:30 **Lunch / Déjeuner**



- 14:30-14:50 Kim AARIS SØRENSEN (København, Denmark)  
Erik BRINCH PETERSEN (København, Denmark)  
**WS14-11** South Scandinavian biota and the settling of early man 13,000 – 9,000 calBC.
- 14:50-15:10 Lars LARSSON (Lund, Sweden)  
**WS14-12** Horse hunters during the deglaciation of southern Scandinavia.
- 15:10-15:30 Mikkel SØRENSEN (København, Denmark)  
Farina STERNKE (Cork, Ireland)  
**WS14-13** Who made the Long Blade Industry? A view from the North.
- 15:30-15:50 Ilga ZAGORSKA (Riga, Latvia)  
**WS14-14** The River Daugava valley as the main route of postglacial colonization in the eastern Baltic.
- 15:50-16:10 Eva DAVID (Nanterre, France)  
**WS14-15** Retracing missing Late Glacial human occupations in the Baltic: The contribution of the bone industry with special emphasis on the Preboreal Zvejnieki site (Latvia).
- 16:10-16:30 **Break / Pause**
- 16:30-16:50 Michal KOBUSIEWICZ (Poznań, Poland)  
**WS14-16** The meaning of the Lyngby tanged point as a cultural marker.
- 16:50-17:10 Fotini KOFIDOU (Southampton, UK)  
**WS14-17** Identity and the distributed self in Late Glacial Northern Europe.
- 17:10-17:30 Stephan VEIL (Hannover, Germany)  
Klaus BREEST (Berlin, Germany)  
**WS14-18** Art of the Late Palaeolithic Federmesser groups on the Great North European Plain. State of research concerning the amber objects from Weitsche, Lower Saxony (Germany).
- 17:30-17:50 Tomasz PLONKA (Wrocław, Poland)  
**WS14-19** New ornamented artefacts from the Polish Lowland and Final Palaeolithic symbolism.
- 17:50-18:30 **Discussion, summary and conclusions**

## ABSTRACTS / RÉSUMÉS

**WS14-01** Nick BARTON (Oxford, UK)  
Martin STREET (Neuwied, Germany)  
Thomas TERBERGER (Greifswald, Germany)

**Introduction: Humans, environment and chronology of the Late Glacial of the North European Plain: Recent progress and unsolved problems.**

**ABSTRACT:** The past few years have seen major progress made in different research fields of the Final Palaeolithic. For example, much important new information has been presented for the late Palaeolithic at the southern edge of the North European Plain, new Magdalenian and Hamburgian sites have been detected in Poland, information has become available for the period transitional from the Late Palaeolithic to the Mesolithic in southern Scandinavia and new insights have been obtained for the colonisation of northern Scandinavia and the Baltic region.

The Lisbon workshop “Humans, environment and chronology of the Late Glacial of the North European Plain” will serve as a forum for contributions of new information extending from France to the eastern Baltic and from the later Magdalenian until the Mesolithic.

Thematically the contributions range from the methodological treatment of radiocarbon dating and calibration, to regional syntheses, site specific analyses and cases studies of faunal, lithic and categories of artefact assemblages.

**WS14-02** Olaf JÖRIS (Neuwied, Germany)  
Bernie WENINGER (Köln, Germany)

**Radiocarbon dating at Termination I.**

**ABSTRACT:** During recent years major advances have been achieved both in the extension of the Late Glacial and early Holocene tree-ring chronologies and in the construction of the corresponding Late Glacial radiocarbon-age calibration curve. The new Late Glacial 14C data sets are already now of the highest importance, notably, for modelling studies towards the underlying natural causes (geomagnetic, solar and oceanic) of the measured atmospheric and oceanic radiocarbon fluctuations. Archaeologists are also interested in this new data, which gives some much welcomed support for ongoing studies of the impact of highly abrupt climate changes on human behavioural patterns, as measured in terms of the rapidly evolving environmental and cultural background observed worldwide during Termination I.

Nevertheless, due to the high level of dating precision required in archaeological studies during this period, there still remain some problems in the construction of the Late Glacial 14C age calibration curve which are not satisfactorily solved in the recently published INTCAL04 data set. We will address these problems and make some alternative proposals concerning fine-tuning of the primary data allowing construction of a more satisfactory 14C age calibration curve for Termination I.

**WS14-03** Roger M. JACOBI (London, UK)  
Tom HIGHAM (Oxford, UK)  
Chris BRONK RAMSEY (Oxford, UK)  
T. C. LORD

**New radiocarbon determinations of bone from the British Late Glacial.**

**ABSTRACT:** We present new 14C determinations from humanly-modified bone and fauna from Late Glacial sites in Britain. We examine the emerging patterns that are beginning to become apparent in the data particularly those related to the presence and absence of human populations during the Younger Dryas. New results are presented from Sun Hole, Pixies Hole, Poulton-le-Fylde, Sproughton, Parc-le-Breos Cwm and Victoria Cave, amongst others. We discuss the chronology of horse (*Equus ferus*), elk (*Alces alces*), reindeer (*Rangifer tarandus*) and red deer (*Cervus elaphus*).

**WS14-04** Sonja GRIMM (Neuwied, Germany)

**Cultural transition in a changing landscape.**

**ABSTRACT:** From the Neuwied Basin there exists a range of well preserved evidence for human occupation from both before the onset of Greenland Interstadial 1 (GS-2a) and from the Middle to Late Interstadial itself (GI-1c to GI-1a). Between these two periods of occupation the environmental background changed considerably, leading to major shifts in human subsistence strategies. This development is accompanied by major changes in material technology and settlement systems, which show themselves e.g. in the altered pattern of raw material procurement and exploitation or in transformed site spatial organisation and, probably, duration of site occupation.

Based on high quality environmental evidence and 14C dates from north-western European archaeological sites, this paper intends to establish in detail the timing of changes in human adaptive patterns. A comparison of these results with high resolution records of climatic and ecological developments will examine whether ecological change functioned as a motor in forcing the observed cultural and behavioural differences.

**WS14-05** Becky MILLER (Liège, Belgium)  
Pierre NOIRET (Liège, Belgium)

**Recent results for the Belgian Magdalenian.**

**ABSTRACT:** This paper presents the Belgian Magdalenian from the perspective of recent results from the cave site of Trou Da Somme, placing it in relation to the other known Belgian Magdalenian sites, including caves in Middle Belgium (Chaleux, Bois Laiterie, Goyet, etc.) and open-air sites in Flanders (Orp, Kanne). Emphasis is placed on site function, chronology and lithic raw material procurement. Additionally, an engraved plaquette found at Trou Da Somme will be discussed.

**WS14-06** Marc DE BIE (Heverlee, Belgium)  
Marijn VAN GILS (Heverlee, Belgium)

**Human occupation in a Late Glacial landscape: The Federmesser site complex at Lommel (Belgium).**

**ABSTRACT:** The extensive *Federmessergruppen* site of Lommel Maatheide in northern Belgium has long been famous as a rich find spot of Final Palaeolithic artefacts. Polluting industrial activities on this spot, which destroyed the natural vegetation and instigated aeolian activity, caused tens of thousands of artefacts to be brought to the surface here in the first half of the 20th century. Since the 1930s, thousands of retouched tools were collected during field walking and by uncontrolled "excavations". Unfortunately, the context and location of these collections were never registered properly. In the 1970s, the area was used as dumping ground in order to stop the sand erosion. With the removal of this dump cover in 2003, the terrain finally became available for proper (geo-) archaeological research. Two years of new fieldwork have now provided excellent new insights into the location, extension, stratigraphy and preservation of this *Federmessergruppen* site complex, as well as into the geographical and palaeo-ecological context of the settlement, which appears to be located on a large Late Glacial sand ridge at the northern edge of a Late Glacial fen. More than 50 concentrations on a stretch of land some 100m in width and more than 1 km in length show that this area repeatedly attracted Final Palaeolithic residents.

Some artefact scatters are still well-preserved in a typical Usselo-soil. In the fen depression, this Allerød soil continues as a peat layer with excellent preservation of pollen, beetles and macrobotanical elements. This paper will present the results of interdisciplinary research which sheds new light on the natural context of the Allerød environment as well as on the land use system employed by Final Palaeolithic hunter-gatherer societies.

**WS14-07** Olivier BIGNON (Paris, France)

**Regional populations and big game exploitation in the Paris Basin during the Late Glacial: In search of an integrated environmental model.**

**ABSTRACT:** Numerous climatic oscillations are recognized during the Late Glacial, with pronounced regional contrasts of mean temperatures in Western Europe. The development of the Mammoth Steppe in northern regions is associated in the Paris Basin with recolonisation by Badegoulian human groups around 16,000 BP (Oisy, Nievre). The Mammoth Steppe ecosystem

already appears to be surprisingly well developed at this time to judge by the presence of the basic components of the animal community. The main game animals exploited by Badegoulian hunters were the two key species of the Eurasian Mammoth Steppe fauna: reindeer and horse. During the later Bølling chronozone Magdalenian faunal exploitation in Paris Basin is still focused on these same two species, even though hunting strategies seem to differ.

The diversified Mammoth Steppe communities occupied a heterogeneous landscape, as shown by the coexistence of a number of regional morphotypes for both horse and reindeer in Western Europe. This pattern of fragmented animal communities does not contradict the plaid (or mosaic) landscape model, and may imply a low level of genetic flux between regional populations. However, this does not mean that these ecological units should be seen as completely isolated, and habitat corridors may have allowed large herbivores to migrate. The main faunal components of the Mammoth Steppe, in particular horse and reindeer, probably formed populations large enough to resist demographic, genetic and environmental stochasticity. Magdalenian hunting strategies may have facilitated the coexistence of the large herbivores inside the regional ecological units. Taking account of the high diversity of animal communities and the mosaic landscape pattern, we make the assumption that the regional ecological units were regulated by self-organisation processes which probably occurred throughout the Mammoth Steppe biome. (...)

**WS14-08**

Jacek KABACIŃSKI (Poznań, Poland)  
Iwona SOBKOWIAK-TABAKA (Poznań, Poland)

**Big game versus small game hunting: Subsistence strategies of the Hamburgian Culture.**

**ABSTRACT:** Generally accepted ideas concerning the basis of subsistence strategies of the Hamburgian communities assume that they primarily hunted big mammals - reindeer and horses. In the following paper we discuss the results of recent studies on Hamburgian economy which show that another, independent economic strategy was also employed. This was based on the hunting of small mammals, fishing and fowling. At the same time the paper confirms ideas concerning the lack of settlement activity of Hamburgian groups in the freshly deglaciated areas, i.e. north of Late Vistulian terminal moraines. New data on the above subject are presented.

**WS14-09**

Przemysław BOBROWSKI (Poznan, Poland)

**The exploitation of local sources of flint on the Polish Plain during the Final Palaeolithic.**

**ABSTRACT:** Until quite recently, it was generally believed that the territory of the Polish Plain was almost completely lacking good quality flint raw material. This was explained by the fact that the Polish Plain was covered by very thick Quaternary sediments, mostly originating from the last two glaciations. Furthermore, natural outcrops of flint were destroyed by glaciers or covered by glacial or glacio-fluvial sediments. The main sources of raw material for Stone Age inhabitants were therefore fortuitously encountered erratics of Cretaceous Baltic flint or imported flint derived from open quarries situated in the region south of the Plain.

In the 1960s Michał Kobusiewicz noticed that some Stone Age sites in North-West Poland are strikingly rich in flint materials. Many of them have attributes typical for sites connected with flint procurement, such as flint mines, and for accompanying flint workshops such as those associated with quarries of good quality "chocolate" and Jurassic flint from Central and South Poland. On the Polish Plain these types of sites are linked to sporadic concentrations of erratic flint which are the result of specific geomorphological processes.

More recently, especially during past few years, dozens of new, very similar sites have been discovered across the entire area of the Polish Plain. Among them, between ten to more than a dozen are connected with Final Pleistocene hunter-gatherer societies. All of them show a specific configuration of flint assemblage, the presence of characteristic forms of tools designated as being of "mining-type", a specific geomorphological situation and a rich concentration of good quality erratic flint raw material. The discovery that sites of this type are concentrated within areas of limited extent permits us to put forward the hypothesis that we are dealing here with several "flint fields" exploited during the Final Pleistocene. These areas played an important role in providing raw material for the dwellers on the Polish Plain. (...)

**WS14-10** Kristoffer BUCK PEDERSEN (Vordingborg, Denmark)  
Keld MØLLER HANSEN (Vordingborg, Denmark)

**Final Palaeolithic / early Mesolithic in south Zealand, Denmark.**

**ABSTRACT:** Over the last ten years several sites from the terminal Palaeolithic / early Mesolithic have been discovered and excavated in South Zealand. Of these sites the Ahrensburgian site Eskebjerg and the early Mesolithic elk deposit site Lundby are of special interest. Situated high in the landscape, Eskebjerg is presumed to be a hunting site whereas Lundby is characterized by the occurrence of bones from more than one hunting episode deposited in a kettlehole located inland at the present day.

These sites could imply that the late Palaeolithic “way of life” survived into the Mesolithic, with an active use of the cultural landscape and a recurrent exploitation of the same hunting locations.

**WS14-11** Kim AARIS SØRENSEN (København, Denmark)  
Erik BRINCH PETERSEN (København, Denmark)

**South Scandinavian biota and the settling of early man 13,000 – 9,000 calBC.**

**ABSTRACT:** The model for animal dispersal into the deglaciated area of southern Scandinavia seems fairly simple, *i.e.* pioneer species moving into a formerly unoccupied area at the time when the vegetation becomes adequate for the species in question. Human immigration into the same area can also be seen in this way, in that a group of people fill up an empty, but promising area adjacent to one already occupied; a sort of movement from one area to the next while heading North and Northeast after the Late Glacial Maximum. However, following the initial arrival of human pioneers around 13,000 cal BC, the question remains open as to the nature of subsequent settlement. Are we moving rapidly from pioneers to residential, as has often been suggested, and do we have a replacement of one industry by the next, following an *in situ* development of the residential? This is the “Old Testament model”, where one culture begot the next, and so on.

Alternatively, do we have a situation where the first pioneers are being succeeded, after a time gap, by yet another group of pioneers with no obvious lineage with the first group? This could be a variation of the arctic pulsation” model. Finally, what about the coexistence of two or even three different industries, in which cultural interaction could be anything from friendly exchange of ideas and group members to a contest over resources? This is the competition model.

The present contribution deals with the faunal and cultural development of southern Scandinavia following the last deglaciation, and our topic thus includes both the Late Glacial and the early Holocene or, in archaeological terms, the Final Palaeolithic as well as the beginning of the Mesolithic. For better or worse, the combination of the subjects undergoing change - deglaciation, land / sea relationship, floral and faunal dispersion - has become a sort of a text book classic, characterized as environmental change followed by an adaptive response by early man. (...)

**WS14-12** Lars LARSSON (Lund, Sweden)

**Horse hunters during the deglaciation of southern Scandinavia.**

**ABSTRACT:** Several bones, some with cut marks, have been found in a complex of small bogs at Hässleberga in southwestern Scania, southernmost Sweden. Reindeer is the dominant species but horse is also represented. The horse bones have been dated to the late Allerød and Younger Dryas. This is the oldest known dated presence of horse in southern Scandinavia.

The epithets reindeer hunters and sometimes elk hunters have been given to the people of southern Scandinavia during the deglaciation. Now we have to take horse hunting into consideration. In what way did horse hunting affect Late Palaeolithic society? How does horse hunting influence our view of the Late Palaeolithic colonisation of southern Scandinavia?

**WS14-13** Mikkel SØRENSEN (København, Denmark)  
Farina STERNKE (Cork, Ireland)

**Who made the Long Blade Industry? A view from the North.**

**ABSTRACT:** This paper will discuss the Long Blade Industry (LBI) of northern Europe with a particular focus on its technology, chronology and spread. A suitable definition much more precise than one based on the metrical length of the blades is needed to understand and investigate the LBI.

Therefore the first problem to be dealt with is a definition based on careful studies of LBI technology. In addition, the relationship between the LBI and other European late Palaeolithic and Mesolithic traditions will be discussed. When considering lithic technology in combination with the scarce information available on typology and absolute chronology, it is possible to suggest that the LBI is contemporary with the Ahrensburgian. Further, it will be argued here that while the LBI is in fact an expression of the Ahrensburgian tradition, it is a task specific expression related to localities where large nodules of good quality flint were available. Concerning chronology, a view from the north represented by a study of the site Nørregård VI in Jutland, Denmark, suggests that the LBI continues through the Epi-Ahrensburgian and into the early Mesolithic. Our conclusion is that the LBI has to be considered as a manifestation of specific knowledge concerning different blade industries and the use of handheld axes, which derives from the Upper Palaeolithic, but is expressed throughout the Ahrensburgian and into the Mesolithic period.

**WS14-14** Ilga ZAGORSKA (Riga, Latvia)

**The River Daugava valley as the main route of postglacial colonization in the eastern Baltic.**

**ABSTRACT:** The location of sites along deep North-South oriented river valleys reveals ancient traditions observed by reindeer hunters in northern Europe during the Late Glacial period.

The first appearance of human settlement in the eastern Baltic was conditioned by the environmental situation. After the ice retreat one of the first regions to be occupied was the valley of the River Daugava. Several hundred sites of various ages are concentrated in the valley, many of them also including Late Palaeolithic finds. The flint collection is characterized by typological uniformity, belonging to the Masovian technocomplex found in Poland, Lithuania, Belarus and Ukraine (10,500 - 9,700 BC). Using the River Daugava as the main route, reindeer hunters reached the eastern Baltic, the northernmost boundary of these people.

The first radiocarbon dates on reindeer remains confirm that these animals and their hunters could have been present on the eastern coast of the Baltic Ice Lake even earlier than has been supposed.

**WS14-15** Eva DAVID (Nanterre, France)

**Retracing missing Late Glacial human occupations in the Baltic: The contribution of the bone industry with special emphasis on the Preboreal Zvejnieki site (Latvia).**

**ABSTRACT:** At the Zvejnieki settlement site (Latvia), the presence of harpoons is surprising considering that this type of tool hardly ever occurs in other contemporary North European assemblages (David 2003-a). Beside their morphological aspects which suggest their attribution to the earlier chrono-cultural stage of the Latvian Epipalaeolithic (Zagorska 2000), other interesting features which provide complementary data for further interpretation have also been observed on the industry from the lower horizon of the site dated to the Preboreal (Zagorska and Zagorski 1990). In fact, some tools have been manufactured on ancient tools, instead of being made, as it is usual for Mesolithic industry, on natural bones used as primary matrix. It is called a tool reshaped "in a second intention", because a long time may have passed between the use of the initial tool and its reappropriation for manufacture and use again. On the site, it involves items which evoke Epipalaeolithic-like types, such as some other harpoons and also two pieces, showing opposite zones with a scratched aspect, called retouchoirs (Malerba and Giacobini 2002). These have been reshaped, in second intention, into chisels (narrow and large) and gouge, which represent, besides hunting gear with an undetachable hafting, the most common manufactured items in the Early Mesolithic in the North European plains. From all possible interpretations which have been suggested about this (David 2003-b:110), one of our hypotheses has been recently supported by new geological and palynological investigations in the area which might indicate a rapid erosion of anthropogenic soils identified from the Late Dryas chronozone (Eberhards ; Kalnina, in print). (...)

**WS14-16** Michal KOBUSIEWICZ (Poznań, Poland)

**The meaning of the Lyngby tanged point as a cultural marker.**

**ABSTRACT:** The massive, so called Lyngby tanged point is known as the "fossile directeur" of the Bromme-Lyngby culture. This type of point, while obviously very typical for the classical Bromme-

Lyngby “territory”, is also often found in assemblages typologically quite different from Bromme-Lyngby and can be collected or excavated far to the East of the core area of this culture, e.g. in Lithuania or the Ukraine. The points usually occur in small numbers or as single pieces. Many scholars interpret their presence as proof of far reaching migrations or even raids by the Bromme-Lyngby cultural groups outside their native territory. Analysis of such finds leads to the conclusion that Lyngby tanged points happened to be intra-cultural goods, appreciated as a very useful and efficient invention by hunters belonging to different populations. The wide distribution of Lyngby points over a vast area, far from the Bromme-Lyngby homeland, demonstrates the cultural unification of the European Plain at the end of Pleistocene as a result of similar, unvaried natural conditions.

**WS14-17** Fotini KOFIDOU (Southampton, UK)

**Identity and the distributed self in Late Glacial Northern Europe.**

**ABSTRACT:** With this contribution I would like to explore some aspects of identity and personhood creation in Late Glacial hunter-gatherer communities. Material cultures in general and stone artefacts in particular have been considered as archaeological taxonomic units for too long. In an attempt to shift the focus from the “group” scale onto the single entity of the “individual” I will concentrate on elements of establishing personhood. Studying the case of the British Late Glacial site of Hengistbury Head, I will investigate the role of stone tools in creating social identity. This will be done through the framework of fragmentation theory (Chapman 2000) and the ethnographic concept of the distributed self.

Identity is not a stable, constant and universal concept; rather it is re-negotiated in specific places through social actions and practices. Networks of alienable and inalienable relationships are formed through the production, circulation and exchange of material objects. The Hengistbury Head lithics will be interpreted as a dynamic element of personhood creation in a local relational landscape. In an attempt to serve as an indicator of locally created identities, and reveal what / who these identities may be, the traditional tool classes can be considered through the lens of personal decisions, self-expression, and the production and reproduction of knowledge distributed through the landscape. The preliminary outcomes of such an interpretation can then be discussed against the more general background of relevant archaeological data from the Neuwied Basin and Belgium.

**WS14-18** Stephan VEIL (Hannover, Germany)  
Klaus BREEST (Berlin, Germany)

**Art of the Late Palaeolithic Federmesser groups on the Great North European Plain. State of research concerning the amber objects from Weitsche, Lower Saxony (Germany).**

**ABSTRACT:** During systematic investigations between 1986 and 2004 an elk figurine, a pendant displaying complex abstract representations, two beads and further fragments of amber have been discovered on the settlement area of the Late Palaeolithic Federmessergruppen at Weitsche. Their dating is based on analysis of the fluvial and limnic sediments in the Jeetzel valley and the study of the occupation structures, of the tool forms and their production as well as of the technological and stylistic attributes of the art objects.

On the comparison with other regions this evidence points to the existence of a hitherto unknown Late Palaeolithic art province in the northern parts of Central Europe whose abstract and figurative representations show many differences from the other backed point complexes spread over the continent (such as the Azilian s.s. or the Epigravettian) and questions the interpretation that hunter-gatherer groups had abandoned the production and use of art during the climatic transition because of changing ecology, subsistence and settlement patterns.

The amber finds of Weitsche follow the art of the Magdalenian and Hamburgian and precede similar artistic expressions of postglacial foraging cultures in the Scandinavian-Baltic area.

**WS14-19** Tomasz PLONKA (Wraclaw, Poland)

**New ornamented artefacts from the Polish Lowland and Final Palaeolithic symbolism.**

**ABSTRACT:** Ornamented objects are one of the rarest categories of find recovered from Final Palaeolithic sites of the European Lowland zone. Most of these symbolic objects lack a wider context and can only be dated on the basis of comparative studies.

In recent years, ornamented objects have also been recovered in the course of regular investigations (for example, Weitsche, Wustermark 22). One such find is a stone with a simple engraved geometric design discovered at Radgoszcz 15, in western Poland (close to the town Międzychód in Wielkopolska); another is a richly ornamented antler object found at Powalice, originating from a chalk quarry in Rusinowo near Swidwin in Pomerania (northern Poland). They correspond to two different types of symbolic behaviour: simple, elementary engravings on the one hand and sophisticated narrative compositions on the other.

Such discoveries are shedding new light on the symbolic culture of the hunters of the Final Palaeolithic of the European Lowland zone. They also offer a different perspective on the symbolic behaviour of Mesolithic societies of the northern zone at the onset of the Holocene.



## Session WS15

*Monday, 4 September 2006 / Lundi, 4 Septembre 2006*

*Room 6.1.47, Faculty of Sciences, Lisbon University  
Salle 6.1.47, Faculté de Sciences, Université de Lisbonne*

### Technological analysis on quartzite exploitation

### Analyse technologique de l'exploitation du quartzite

*organized by / organisé par*

**Sara CURA**

Museu de Arte Pré-Histórica e do Sagrado no Vale do Tejo; Mação,  
Portugal, [www.cm-macao.pt/~museu/indexws15.html](http://www.cm-macao.pt/~museu/indexws15.html) –  
[saracura@portugalmail.pt](mailto:saracura@portugalmail.pt)

**Stefano GRIMALDI**

Università di Trento, Dipartimento di Filosofia, Storia e Beni Culturali,  
Laboratorio di Paleontologia, Trento, Italy – [stefano.grimaldi@lett.unitn.it](mailto:stefano.grimaldi@lett.unitn.it)

### SESSION'S ABSTRACT

Quartzite was frequently knapped by prehistoric human groups in several Pleistocene and Holocene sites. Sometimes, it represents the only raw material exploited in a site/region.

Nevertheless scholars usually consider quartzite as an alternative raw material for prehistoric lithic production when «better quality» rocks (i.e. flint) are available in a given geographical area.

In this workshop we deal with all the aspects that involve technology and experimentation to discuss the adaptative implications for lithic industries made from quartzite.

### SESSION PROGRAMME / PROGRAMME DE LA SESSION

14:30-14:40 **Welcome to participants**

14:40-14:50 **Introducing the WS15**

14:50-15:10 Parth R.CHAUHAN (Bloomington, IN, U.S.A.)

**WS15-01**

**Palaeolithic exploitation of quartzite in the Indian subcontinent: some general observations.**

15:10-15:30 Stéphanie GUISLAIN (Grenoble, France)

**WS15-02**

**Modes d'exploitation des grès quartzites au paléolithique inférieur dans le Sud-Est marocain.**

- 15:30-15:50 Stefano GRIMALDI (Trento, Italy)  
Sara CURA (Mação, Portugal)
- WS15-03** The intensive quartzite exploitation in Middle Tagus Valley pleistocenic open air sites: the example of Ribeira da Ponte da Pedra.
- 15:50-16:10 David COLONGE (Le Vigan France)  
Vincent MOURRE (Ménerbes France)
- WS15-04** Quartzite et quartzites: aspects pétrographiques, économiques et technologiques des matériaux majoritaires du Paléolithique ancien et moyen du Sud-Ouest de la France.
- 16:10-16:30 Farina STERNKE (Southampton, UK)
- WS15-05** The Quartzite Palaeolithic of Germany: New Approaches to the Study of Late Middle Pleistocene Lithic Technology.
- 16:30-16:50 **Break / Pause**
- 16:50-17:10 Hélène Marie MONCEL (Paris, France)  
Arturo DE LOMBERA HERMIDA (Tarragona, Spain)  
Brigitte DENIAUX (Tautavel, France)
- WS15-06** Quartz et quartzite dans les niveaux d'occupation OIS 5 à 7 du site de Payre (France): un exemple de l'utilisation de ces roches pour une fonction spécifique et complémentaire.
- 17:10-17:30 Alain TUFFREAU (Villeneuve d'Ascq cedex, France)  
Vasile BORONEANT (Bucuresti, Romania)  
Emilie GOVAL (Villeneuve d'Ascq cedex, France)  
Adina BORONEANT (Bucuresti, Romania)  
Adrian DOBOS (Bucuresti, Romania)  
Bertrand LEFEVRE (Villeneuve d'Ascq cedex, France)  
Gabi POPESCU (Bucuresti, Romania)
- WS15-07** The use of the quartzite in the mousterian industry of Zabrani (Banat, Romania).
- 17:30-17:50 Kévin DI MODICA (Sclayn-Andenne, Belgium)  
Dominique BONJEAN (Sclayn-Andenne, Belgium)
- WS15-08** Exploitation du quartzite dans la couche moustérienne 5 de la grotte Scladina.
- 17:50-18:10 Zsolt MESTER (Miskolc-Egyetemvaros, Hungary)
- WS15-09** Exploitation du quartzite à la station d'Érd (Hongrie).
- 18:10-18:30 Francisco ALMEIDA (Lisboa, Portugal)  
João Pedro CUNHA RIBEIRO (Lisboa, Portugal)  
Joana CARRONDO (Vila Nova da Barquinha, Portugal)  
Sara CURA (Mação, Portugal)
- WS15-10** The Middle Paleolithic quartzite exploitation in the south interior of Portugal.

18:30-18:50 Solène BOURDIN-LAUNAY (Rennes, France)  
Nathalie MOLINES (Rennes, France)

**WS15-11** **Mousterian industries in western France : bifacial technique, producing sites and consumed tools.**

18:50-19:10 Luís RAPOSO (Seixal, Portugal)

**WS15-12** **O uso do Quartzito e de outras rochas locais nas indústrias paleolíticas e epipaleolíticas em Portugal: constrangimentos ou potencialidades?**

19:10-19:30 Telmo PEREIRA (Lisboa Portugal)  
Vera MOITINHO (Lisboa Portugal)

**WS15-13** **3D analysis on quartzite industries: a study case.**

## ABSTRACTS / RÉSUMÉS

**WS15-01** Parth R. CHAUHAN (Bloomington, IN, U.S.A.)

**Palaeolithic exploitation of quartzite in the Indian subcontinent: some general observations.**

**ABSTRACT:** In the Indian subcontinent, paleolithic assemblages are often produced on quartzite in varying environmental contexts. Both Acheulian and non-Acheulian assemblages as well as younger Middle and Upper Palaeolithic industries are results of different quarrying and reduction strategies. For example, biface production often relied on the acquisition of large clasts such as large cobbles and boulders to extract flakes or blanks large enough to allow considerable reduction to attain maximum symmetry and morphological preference. On the other hand, most non- and post-Acheulian assemblages relied on smaller cobbles and pebbles, rather than larger clasts, resulting in minimal cortex removal. Interestingly, most quartzite resources exploited in the Indian subcontinent during the Paleolithic were in the form of rounded, river-worn clasts. Very few sites exist where angular or tabular clasts were sought; some exceptions are specific Early Acheulian assemblages in central India. Depending on the palaeobiogeography, quartzite was the predominant raw material type preferred by and available to Pleistocene hunter-gatherer groups in South Asia and changes in preference are generally known to occur only during the later Pleistocene timeframe (e.g. Middle Palaeolithic and younger assemblages), but to variable degrees.

**WS15-02** Stéphanie GUISLAIN (Grenoble, France)

**Modes d'exploitation des grès quartzites au paléolithique inférieur dans le Sud-Est marocain.**

**RÉSUMÉ:** Dans le Sud-Est marocain, les formations sédimentaires à grès quartzites sont très nombreuses. Les dépôts sédimentaires ordoviens se présentent sous forme de massifs résiduels fortement déprimés ; les formations récentes du Crétacé constituent les hamadas. Les grès quartzites infra-cénomaniens sont présents à la base des dépôts hamadiens et sont présents sur toute la bordure des plateaux hamadiens crétacés. Les hommes préhistoriques du paléolithique inférieur ont presque exclusivement exploité cette roche abondante et d'excellente qualité. Plusieurs sites de surface de cette région ont fait l'objet d'études techno-typologiques. L'analyse a permis de mettre en évidence des modes d'acquisition des supports inhérents la morphologie des blocs à l'état naturel. Les deux systèmes de débitage sont le débitage Kombewa et le débitage Levallois. Ils sont orientés vers la production de bifaces et de hachereaux avec une forte prédétermination. En confrontant les résultats de cette région du Sahara nord-occidental à celles des régions limitrophes (Saoura, vallée du Draâ, et Mauritanie) et de l'ensemble du Sahara on note une grande homogénéité des comportements des tailleurs préhistoriques du Paléolithique inférieur.

**WS15-03** Stefano GRIMALDI (Trento, Italy)  
Sara CURA (Mação, Portugal)

**The intensive quartzite exploitation in Middle Tagus Valley pleistocenic open air sites: the example of Ribeira da Ponte da Pedra.**

**ABSTRACT:** The archaeological site of Ribeira da Ponte da Pedra is located in the slope of an ancient valley where tertiary deposits, quaternary fluvial terraces and coluvial deposits alternate. Since 1999 we have been excavating the middle terrace (lower Palaeolithic) and the lower terrace (Middle Palaeolithic). Recently, absolute datings have been obtained for the middle terrace (300 000 BP) and for the lower terrace (90 000 BP). The archaeological remains from both terraces are exclusively lithic artefacts and more than 95% of these are made from fluvial quartzite pebbles. Middle terrace lithic assemblages are morphologically similar to what is considered archaic or pre-acheulean, while as those from the lower terrace lack Levallois and typical Mousterian retouched implements. Authors, while stressing the weakness of typological studies, suggest more attention as to be given to the technology of quartzite pebbles exploitation considering features such as raw material constraints and/or advantages, variable volumetric shape and texture, their large availability in this region. Nevertheless, even if the use of quartzite pebbles influences both technological and economical behavioural patterns, the choice for this or that implement may be determined by contextual adaptative strategies adopted within a given time and place.

**WS15-04** David COLONGE (Le Vigan France)  
Vincent MOURRE (Mènerbes France)

**Quartzite et quartzites: aspects pétrographiques, économiques et technologiques des matériaux majoritaires du Paléolithique ancien et moyen du Sud-Ouest de la France.**

**RÉSUMÉ:** Le Sud-Ouest de la France est encadré par deux importants massifs montagneux, le Massif Central et les Pyrénées. Leur érosion a fourni d'énormes quantités de fraction grossière facilement accessible dans les formations détritiques et alluviales qui en sont issues. Ces dépôts ont constitué des sources de matières premières massivement mises à profit par les artisans du Paléolithique ancien et moyen, en premier lieu pour les quartzites. Sous ce terme unique sont en fait rassemblées des familles de matériaux aux caractéristiques pétrographiques et mécaniques diverses : les domaines liés aux Pyrénées ou au Massif Central en sont les deux principales. De plus, au-delà des différences intrinsèques, un même matériaux peut être disponible sous la forme de blocs ou galets aux qualités et contraintes propres. Ainsi, dans une apparente monotonie de nombreuses séries lithiques, des circulations et économies de matières premières ont pu être mises en évidence dans l'Acheuléen pyrénéen ou tarnais, le moustérien pyrénéen, ... par exemples. Ainsi, selon la nature et la morphologie des différents blocs disponibles ou transportés, des chaînes opératoires sont adaptées à ces paramètres de ce qui reste une même matière première.

**WS15-05** Farina STERNKE (Southampton, UK)

**The Quartzite Palaeolithic of Germany: New Approaches to the Study of Late Middle Pleistocene Lithic Technology.**

**ABSTRACT:** The study of raw material is now a central concern in Palaeolithic archaeology. Such studies have provided information on transportation patterns as well as manufacturing choices. Attention has focused almost exclusively on flint. However, in many European countries the Palaeolithic use of quartzite in the absence of good quality flint is well documented. But, how are we to interpret the choice of non-flint raw materials such as quartzite as the dominant raw materials for lithic production in terms of the technological and social behaviour of Middle Pleistocene hominids? The Quartzite Palaeolithic of Germany serves as a regional case study for the exploration of the relationship between hominids and their choice of lithic raw materials. The use of quartzite at four Middle Palaeolithic sites in two regions, which are divided by a differential distribution of flint as a result of glacial conditions, are examined. The focus is on the study of quartzite through time and within geographical and social space to demonstrate that quartzite was differentially exploited throughout prehistory in the two study regions and to explore the reasons for the absence of flint at these sites. The issue of preference versus necessity in terms of Middle Palaeolithic raw material use

and mobility is central to the discussion. This results in a new interpretation of Middle Pleistocene hominid behaviour in relation to mobility and lithic raw material procurement. Further, it will be shown how this study has benefited from the use of comparative experimental replication to resolve questions associated with the technological aspects of the assemblages in the case study.

**WS15-06** Helène Marie MONCEL (Paris, France)  
Arturo DE LOMBERA HERMIDA (Tarragona, Spain)  
Brigitte DENIAUX (Tautavel, France)

**Quartz et quartzite dans les niveaux d'occupation OIS 5 à 7 du site de Payre (France): un exemple de l'utilisation de ces roches pour une fonction spécifique et complémentaire.**

**RÉSUMÉ:** Le site de Payre livre plusieurs niveaux d'occupation sur un promontoir en bordure de la vallée du Rhône. Le silex est la roche la plus utilisée pour le débitage dans toutes les phases d'occupation, disponible en abondance dans un périmètre peu éloigné du site. Le basalte vient en seconde position, prélevé dans la rivière au pied du site. Il est destiné à un gros outillage sur galet, brut ou aménagé. Le quartz (2 à 12%) et le quartzite (0,5 à 4%) ne représentent qu'une petite partie des artefacts mais leur traitement indique un choix, non pas pour des raisons de manque de matériaux dans l'environnement, mais pour des fonctions spécifiques. Le quartz fournit des éclats épais laissés souvent bruts. Ils sont débités en grande partie sur place. La quartzite arrive avant tout sous forme de grands éclats bruts ou retouchés. Ces éclats sont des entames extraites de volumineux galets que l'on peut trouver en bordure de la vallée du Rhône toute proche. Les tranchants, très écrasés, indiquent un usage intense de ces outils. Quelques petits éclats en quartzite témoignent d'un possible ravivage d'outils qui n'ont pas été découverts dans l'habitat. Le matériel sur quartzite serait un outillage mobile de grande dimension et de module aplati. Le matériel en quartz serait complémentaire au silex en fournissant des produits épais et de dureté différente. L'association du quartz et du quartzite au silex et au basalte montre une gestion du territoire dans différentes directions et un traitement différentiel de matériaux variés pour des fonctions spécifiques.

**WS15-07** Alain TUFFREAU (Villeneuve d'Ascq cedex, France)  
Vasile BORONEANT (Bucuresti, Romania)  
Emilie GOVAL (Villeneuve d'Ascq cedex, France)  
Adina BORONEANT (Bucuresti, Romania)  
Adrian DOBOS (Bucuresti, Romania)  
Bertrand LEFEVRE (Villeneuve d'Ascq cedex, France)  
Gabi POPESCU (Bucuresti, Romania)

**The use of the quartzite in the mousterian industry of Zabrani (Banat, Romania).**

**ABSTRACT:** More than the half of the raw material knapped in the open air site of Zabrani dated in the Last Early Glacial is represented by the quartzite in spite the presence of other raw materials. The majority of the flake-tools are in quartzite. The analysis of the reducing sequences according to the different raw materials gives informations concerning the use of the quartzite (debitage, blanks, end-products).

**WS15-08** Kévin DI MODICA (Sclayn-Andenne, Belgium)  
Dominique BONJEAN (Sclayn-Andenne, Belgium)

**Exploitation du quartzite dans la couche moustérienne 5 de la grotte Scladina.**

**RÉSUMÉ:** La couche 5 de la grotte Scladina (Wallonie, Belgique) livre depuis 1978 une industrie lithique moustérienne de plus de 10.000 artefacts, caractérisée par la coexistence de quatre chaînes opératoires sur neuf matières premières d'origines et de natures diverses. Cette étude concerne la gestion des galets de quartzite qui ont été récoltés à proximité du site et exploités intégralement dans le gisement. Une cinquantaine de remontages, dont certains quasi complets, permettent de reconstituer la morphologie du bloc de départ et de décrypter le traitement technologique qui lui fut appliqué. La série se caractérise par un débitage centré sur l'obtention de supports courts et peu élaborés qui tirent avantageusement parti de la morphologie naturelle du galet. Les éclats, souvent corticaux et asymétriques, présentent un dos et/ou un talon large qui facilitent la préhension. De plus,

l'aspect grenu de la matière confère au tranchant une micro-denticulation naturelle propice à une action de sciage. La collection de Scladina est particulièrement intéressante car le quartzite fait l'objet d'un traitement spécifique, non seulement en fonction de la nature de la matière première et de critères ergonomiques, mais aussi de contraintes économiques. Celles-ci, liées à l'absence de silex dans l'environnement local, ont généré un système original de gestion des ressources lithiques régionales.

**WS15-09** Zsolt MESTER (Miskolc-Egyetemvaros, Hungary)

**Exploitation du quartzite à la station d'Érd (Hongrie).**

**RÉSUMÉ:** La station d'Érd, fouillée par Veronika Gábori-Csánk en 1963 et 1964, est un site particulier du Paléolithique moyen de la Hongrie. Deux zones d'habitat ont été mises au jour et six niveaux d'occupation ont été identifiés dont le matériel archéologique représentait la même industrie lithique. L'étude de la faune prédominée par l'ours des cavernes a fourni nombreuses observations paléolithiques concernant la chasse des habitants préhistoriques. Les résultats des études pluridisciplinaires ont été publiés en 1968 dans une monographie à renommé international. L'industrie de la station a été attribuée au Charentien d'Europe sud-orientale. L'utilisation dominante des galets de quartzite pour la confection des outils donne le caractéristique le plus important du faciès moustérien installé à Érd. V. Gábori-Csánk a comparé la technologie appliquée à celle du Pontinien en Italie. L'étude technologique de l'industrie d'Érd a révélé que les hommes ont appliqué plusieurs méthodes de débitage pour l'exploitation des galets de quartzite. Les méthodes ont été choisies en fonction de formes de galets et de paramètres souhaités des produits recherchés.

**WS15-10** Francisco ALMEIDA (Lisboa, Portugal)  
João Pedro CUNHA RIBEIRO (Lisboa, Portugal)  
Joana CARRONDO (Vila Nova da Barquinha, Portugal)  
Sara CURA (Mação, Portugal)

**The Middle Paleolithic quartzite exploitation in the south interior of Portugal.**

**ABSTRACT:** Due to the construction of the Alqueva dam in the south interior of Portugal emergence archeological works were carried out and two Middle Palaeolithic open air sites – Porto Meirinho e Sapateiros 2, were excavated and studied. This was an area where almost none evidences of this chronology were so far found. These two sites, situated along the Guadiana river terraces, present some similarities and differences that we find quite interesting. We aim to discuss some issues related to the methodology applied to the study of quartzite industries coming from fluvial terraces, i.e. secondary contexts, with none or rare refittings and no faunal remains. According to the characteristics of these two archaeological sites and their lithic industries, we also aspire to raise some questions related to the use of quartzite pebbles, their availability and their variable morfology and granulometry.

**WS15-11** Solène Bourdin-Launay (Rennes, France)  
Nathalie MOLINES (Rennes, France)

**Mousterian industries in western France : bifacial technique, producing sites and consumed tools.**

**ABSTRACT:** Several surface sites shared out in Western France provide lithic industries revealing numerous bifacial tools, they characterize regional Mousterian dating from Upper Pleistocene. These open sites providing abundant lithic artefacts always deal with local raw material disposability (glossy sandstone or flint). This study enter a large problematic of technological analysis about industries within bifacial treatment of blanks is a fundamental characteristic. Remains attest that all the producing system, from acquisition to abandonment, takes place in the site. Numerous tools, including handaxes, enter a reducing process combining resharpening, refitting, and technical status changing. These transformations indicate tools consumption, sign of their use near the site. Recycled artefacts give evidence of a will of expanding consumption cycle. The association of production and using of tools suggests a shared gestion of space during the settlement, between organisation of specific activities, still unknown, and flaking areas. Technical strategy of producing numerous handaxes needs a more important technological investment towards others tools, but these shaped supports integrate

long-term gestion with more important recycling capacities. Glossy sandstone (or “quartzite”) exploitation answers here a choice, and can not be considered as a palliative strategy dealing with the flint deficit of large module, specific of this region.

The study finds an outward-looking with comparaison possibilities with same ‘facies’ industries, known form occidental to oriental Europe. These new datas obtained from Western France contribute to the vaste debate about filiations of industries including bifacial component.

**WS15-13**

Telmo PEREIRA (Lisboa Portugal)

Vera MOITINHO (Lisboa Portugal)

**3D analysis on quartzite industries: a study case.**

**ABSTRACT:** Quartzite industries collections are macro-like. The volume and weight of each artefact makes the transportation of collections difficult. In one hand, this situation directly affects the study, mainly when it occurs outside the research centres and universities. On the other hand, this transport increases the deterioration of crucial stigma analysis. In this session we will show how the use of 3D technologies can assist on Virtual Archaeology. 3D Reconstruction may help the study, analysis, interpretation and preservation of artefacts, complementing the traditional archaeological alpha-numeric data and illustrations, with new digital forms of visual registration and virtual manipulation. Here we will present a first application test of these technologies in some Palaeolithic cobbles from Granho-Vale Coelheiro.

## Session WS16

*Monday, 4 September 2006 / Lundi, 4 Septembre 2006*

*Room 6.1.36, Faculty of Sciences, Lisbon University  
Salle 6.1.36, Faculté de Sciences, Université de Lisbonne*

### Sharing Taphonomic approaches

### Mise en commun des approches en Taphonomie

*organized by / organisé par*

|                             |   |
|-----------------------------|---|
| <b>Marie-Pierre COUMONT</b> | ESEP UMR 6636, MMSH/ESEP, Aix-en-Provence, France - <b>marie-pierre.coumont@caramail.com</b>                    |
| <b>Céline THIEBAUT</b>      | MMSH ESEP, Aix-en-Provence, France - <b>celine.thiebaut@wanadoo.fr</b>  |
| <b>Aline AVERBOUH</b>       | UMR 7041 CNRS, Maison de l'Archéologie et de l'Ethnologie, Nanterre, France - <b>averbouh@mmsch.univ-aix.fr</b> |

### SESSION'S ABSTRACT

In prehistoric archaeology, the reconstruction of human behaviour is in large part based on the study of material culture remains. This type of analysis must take into account the natural or accidental events that participate in the formation of archaeological assemblages. The study of these events developed punctually until it was finally established as a true discipline called Taphonomy. First conceived in the field of palaeontology, the field of Taphonomy now integrates the ensemble of analytical methods employed to identify the phenomena responsible for the modifications observed on remains.

Though these phenomena have been known for several years, the modifications they induce are, with rare exception (Texier et al. 1998, Bertran et al.), studied separately for each type of material (faunal remains, remains of lithic, bone and ceramic industries, etc.). Furthermore, the absence of common experimental protocols precludes comparison between different observations, thus preventing the promising possibility of sharing Taphonomic approaches.

Does a given phenomenon produce the same type of alteration regardless of the initial surface condition or material? Can the results of taphonomic studies of bone materials contribute to our knowledge of the taphonomic history of lithic materials? Does one type of trace always correspond to the same agent?

The aim of this Workshop is to promote discussion on this topic and to suggest guidelines for further work, particularly on : Trampling, Rain wash, Weathering, Solifluction, Geliturbation, Compaction, Bioturbation, Dissolution.

### SESSION PROGRAMME – PROGRAMME DE LA SESSION

14:30            **Opening / Ouverture**

14:30-14:50    Emilie CLAUD (Bordeaux, France)



- WS16-01** Understanding solifluction effects on lithic tools use wear traces: experimentations "in vivo" at Gavarnie (France).
- 14:50-15:10 Céline THIEBAUT (Aix-en-Provence, France)  
Vincent MOURRE (Toulouse, France)  
Marie-Pierre COUMONT (Aix-en-Provence, France)  
Sandrine COSTAMAGNO (Toulouse, France)  
Noëlle Provenzano (Dijon, France)
- WS16-02** Experimental approach of the consequences of large herbivores trampling on the archaeological remains.
- 15:10-15:30 Vincent LHOMME (Nanterre, France)  
C. CHAUSSE (Meudon, France)  
Aude COUDENNEAU (Aix-en-Provence, France)  
Elisa NICOUD (Aix-en-Provence, France)
- WS16-03** Assesment of the coherence degree of a recent Middle Palaeolithic archaeological unit in fluvial context. The example of the level D2 of the settlement of le Fond des Blanchards at Gron (Yonne - France).
- 15:30-15:50 Luc VALLIN (Villeneuve d'Ascq, France)  
Bertrand MASSON (Villeneuve d'Ascq, France)
- WS16-04** Deterioration of the paleolithic grounds by the formation of grounds illustrated under periglacial climate: archaeological illustrations and experimental approach.
- 15:50-16:10 A. GALLIN (Aix-en-Provence, France)
- WS16-05** Taphonomic deteriorations and ceramic sets : a presentation of the weathering phenomena in Saharan context.
- 16:10-16:30 Stephen WEINER (Rehovot, Israel)  
Liliane MEIGNEN (Sophia-Antipolis, France)  
Ofer BAR-YOSEF (Cambridge, U.S.A.)  
Mary C. STINER (Tucson, Arizona, U.S.A.)  
Steven KUHN (Tucson, Arizona, U.S.A.)  
Paul GOLDBERG (Boston, U.S.A.)
- WS16-06** Contribution of on-site FTIR (Fourier Transform Infrared Spectrometry) to the interpretation of bone concentrations in the Middle Palaeolithic caves of Kebara and Hayonim (Israel).
- 16:30-16:50 D. CH PROST (Rouen, France)
- WS16-07** Flake's mechanisms on prehistoric stone tools: methodology.
- 16:50-17:10 Avelin AVERBOUH A. (Aix-en-Provence, France)  
Marianne CHRISTENSEN (Nanterre, France)  
CL. LETOURNEUX (Nanterre, France)
- WS16-08** Taphonomical alterations and bone industry: which appraisal(s)? For which aim(s)? The dissolution case and its action on bone material worked remains.

17:10-17:30 V. FERUGLIO (Nanterre, France)

**WS16-09** Streaming, walls and parietal art: taphonomic approach applied to the study of rock art.

17:30-17:50 A. LENOBLE (Bordeaux, France)  
B. WIESNIESKI (Bordeaux, France)  
C. BEAUVAL (Bordeaux, France)  
David COCHARD (Bordeaux, France)  
Jean-Pierre TEXIER (Bordeaux, France)

**WS16-10** Terminology and concepts: tools of the interdisciplinarity.

17:50-18:10 P. BERTRAN (Bordeaux, France)  
A. LENOBLE (Bordeaux, France)

**WS16-11** Composition granulométrique des assemblages lithiques, application à l'étude taphonomique des sites paléolithiques.

18:10-18:30 Discussion

## ABSTRACTS / RÉSUMÉS

**WS16-01** Emilie CLAUD (Bordeaux, France)

**Understanding solifluction effects on lithic tools use wear traces: experimentations "in vivo" at Gavarnie (France).**

**ABSTRACT:** The alteration of flint, and more particularly of use-wear traces on tools, is one of the main problems for functional studies of Palaeolithic industries, as it reduces sample size and induces numerous distortions. Experimentation is critical for understanding the relationships between types of alterations and their formation processes. The results of such experiments provide models of alteration patterns which help researchers to evaluate the effects of such distortions on archaeological tools.

The "Gavarnie experimental project" in the French Pyrenees, directed by P. Bertran since 2002, aims at understanding the alteration processes of archaeological remains in periglacial environments, particularly solifluction. This project further describes the effects of solifluction on macro and microscopic use-wear traces.

This paper presents this experimental project and its methodological steps, including tool selection, tool use, casts and replicas, photography and description of use-wear traces, and experimental deposition.

**WS16-02** Céline THIEBAUT (Aix-en-Provence, France)  
Vincent MOURRE (Toulouse, France)  
Marie-Pierre COUMONT (Aix-en-Provence, France)  
Sandrine COSTAMAGNO (Toulouse, France)  
Noëlle PROVENZANO (Dijon, France)

**Experimental approach of the consequences of large herbivores trampling on the archaeological remains.**

**ABSTRACT:** The trampling of archaeological remains by large herbivores can involve a redistribution of the material, even its disappearance, but also many deteriorations which are sometimes difficult to distinguish from the voluntary anthropic actions (retouch of the edges, break). The experimentation concerning human trampling developed since the beginning of the 50's whereas the trampling experiments involving animals are just few.

An experimental program of trampling of lithics and bones clusters by bisons was carried out in order to evaluate the effects of this phenomenon on various raw materials. Four locus were set up; the first comprises a set of lithic pieces, the second contains only bovid's bone flakes and the last two are clusters of burned bones, one including complete epiphysis and the other only splinters. We propose to draw up an assessment of movements, the losses and the various types of deterioration (fracturing, removals, scratches) observed for each kind of materials and for the different locus.

**WS16-03**

Vincent LHOMME (Nanterre, France)  
C. CHAUSSE (Meudon, France)  
Aude COUDENNEAU (Aix-en-Provence, France)  
Elisa NICOUUD (Aix-en-Provence, France)

**Assesment of the coherence degree of a recent Middle Palaeolithic archaeological unit in fluvial context. The example of the level D2 of the settlement of le Fond des Blanchards at Gron (Yonne - France).**

**ABSTRACT:** The Middle Paleolithic settlement of *le Fond des Blanchards* has been discovered in 1996 in a gravel quarry of the Yonne valley (Paris Basin, France). It was included in an alluvial sequence, the Gron formation, which overlies the  $3 \pm m$  incision floor.

The settlement has yielded several prehistoric levels (levels DB, D4, D3, D2, Da, D1) attributed to the Lower or Middle Pleniglacial substages. The lower levels are interstratified in a sandy bank deposit belonging to a braided channel. A loamy sand representing floodplain deposits contains the upper levels.

According to the morphostratigraphical analysis, the D2 level results of a collapse bank process. Some of taphonomic data and particularly use-wear analysis confirm this hypothesis.

On the other hand, the analysis of the spatial distribution of remains and dynamic relations suggested by the lithic refitting do not indicate a major disturbance of the archeological level.

What degree of confidence is it possible to give to this archaeological assemblage and which role must be attributed to the taphonomic approach for the study of technical behaviours in this level ?

**WS16-04**

Luc VALLIN (Villeneuve d'Ascq, France)  
Bertrand MASSON (Villeneuve d'Ascq, France)

**Deterioration of the paleolithic grounds by the formation of grounds illustrated under periglacial climate: archaeological illustrations and experimental approach.**

**ABSTRACT:** A significant part of the paleolithic sites of the north of Eurasia are contemporary cold climates or knew, subsequently to their formation, a climatic degradation going until the establishment of a periglacial environment. These cold paleoclimates were marked, like the current climates of the high latitudes and of high mountain, by modifications of the landscape ordered mainly by alternations gel/dégel. Among the mechanisms post-dépositionnels started by the cold, the solifluction was often evoked to account for the deformations undergone by the archaeological levels. The role of the networks of ice-wedges in the redistribution of the artifacts lithic was less often described. However the observations carried out by the geomorphologists on the evolution of the polygonal grounds in active periglacial medium show the migration, in the surface part of the ground, the coarse elements towards the partitions of the polygons. We noted, on several sites of full air of the Paleolithic means, a spatial distribution of the vestiges lithic which could be explained by the constitution, subsequently to the occupation, of a polygonal network of ice-wedges. We will expose the experimentation which we carry out in active periglacial medium to check this assumption and to characterize the mechanisms of redistribution of the vestiges.

**WS16-05**

A. GALLIN (Aix-en-Provence, France)

**Taphonomic deteriorations and ceramic sets : a presentation of the weathering phenomena in Saharan context.**

**ABSTRACT:** The archaeological sites in the Sahara are mainly surface sites, which provide us sets of artefacts whose chronology is to be defined. Concerning ceramics, there are few taphonomic studies though they are necessary for understanding the constitution of these sets. We propose to devote such a study to the prehistoric ceramics of the basin of Taoudenni, hyper-arid area of the Malian Sahara. The climatic conditions, which have worsened for 5000 years, considerably deteriorated the potteries. We will first present the recording modes of surface qualities and the degrees of fossilization carried out jointly to the technical and stylistic analysis of ceramics. Then we will expose the first results of the comparison of these data concerning the chronology of the deposits on the scale of the site and the area.

**WS16-06**

Stephen WEINER (Rehovot, Israel)  
Liliane MEIGNEN (Sophia-Antipolis, France)  
Ofer BAR-YOSEF (Cambridge, U.S.A.)  
Mary C. STINER (Tucson, Arizona, U.S.A.)  
Steven KUHN (Tucson, Arizona, U.S.A.)  
Paul GOLDBERG (Boston, U.S.A.)

**Contribution of on-site FTIR (Fourier Transform Infrared Spectrometry) to the interpretation of bone concentrations in the Middle Palaeolithic caves of Kebara and Hayonim (Israel).**

**ABSTRACT:** Remains of bones and lithic tools constitute one of the most informative aspects of human activities taking place within Paleolithic sites. In particular, concentrations of bones resulting from various activities of animal processing play a principal part in the understanding of the spatial organization of such activities. However a number of post-depositional processes, including mechanical (trampling, displacement by runoff) and chemical (dissolution, recrystallization) disturbances can lead to the partial or complete disappearance of these bones. Before any conclusions or interpretations can be made about human behavior, it is important to check first the integrity of these bone distributions.

In this paper, we are particularly interested in the degree of diagenesis of the bone remains, which can be especially prominent in certain environmental contexts. Within the framework of an interdisciplinary program of research on the caves of Kebara and Hayonim (Israel), we carried out in the field systematic mineralogical analyses of the sediments associated with the bones and the bones themselves using FTIR (Fourier Transform Infrared Spectrometry). These analyses permitted us to evaluate whether the concentrations of bones observed in the field resulted from sedimentary diagenesis and bone preservation, and/or from human behavior. In order to understand the mechanisms involved we also studied diagenesis in recent and sub-recent cave guano deposits. An initial brief discussion of the principles of the approaches used will be followed by the presentation of two examples of occupations from the Middle Paleolithic cave sites of Kebara and of Hayonim, Israel. At Kebara, the presence of particular bone concentrations in a calcite/apatite-rich zone can be ascribed directly to human activities while at Hayonim, diagenetic factors were mainly responsible for the observed pattern. This conceptual and methodological approach thus constitutes a robust tool for the identification of anthropic structures.

**WS16-07**

D. CH PROST (Rouen, France)

**Flake's mechanisms on prehistoric stone tools: methodology.**

**ABSTRACT:** We study the methodology of flake's mechanisms on prehistoric tools, products in hard, fragile and elastic stones (flint, obsidian, basalt, ...). This method is applied to use microflakes, accidental damages and deliberate retouches.

The flakes are submitted to fragile fracture laws, established by physicians (Hertz, Boussinesq, ...). Types of fractures and morphology are dependent on specific mechanical parameters. In fact, in archaeology, the one and only fashion to study them, is not empiric experimentations, but based on experimental methods which can control mechanical parameters like Speth's method.

The main aim is to link cause to effect so as to identify flakes in accordance with mechanical origins.

The methodological principle for experimentation, in first time, is to produce flakes with punctual or limited contacts so as to identify them more easily. Exact archaeological and experimental examples can illustrate this principle.

**WS16-08**

Avelin AVERBOUH A. (Aix-en-Provence, France)  
Marianne CHRISTENSEN (Nanterre, France)  
CL. LETOURNEUX (Nanterre, France)

**Taphonomical alterations and bone industry: which appraisal(s)? For which aim(s)? The dissolution case and its action on bone material worked remains.**

**ABSTRACT:** The majority of the taphonomical phenomena now identified affects the bone, ivory and antler material. The alterations to which they draw have been for historical reasons recognized at first on faunal remains. They can be read also on handcrafted remains (scraps, support, rough pieces and finished objects) but it seems that some technical or functional actions modifies enough the states of the worked pieces surface that they modifies also the stigmas of this phenomena. That is what we wanted to evoke through the case of the dissolution. But, it's also towards a wider consideration that we want to open up our subject because the nowadays technological and functional analysis development of the bone industries yields taking into account in a systematic way (and not only for rare isolated cases) those phenomena in the analysis protocols.

**WS16-09**

V. FERUGLIO (Nanterre, France)

**Streaming, walls and parietal art: taphonomic approach applied to the study of rock art.**

**ABSTRACT:** In the same capacity as other remains of the material cultures of the prehistoric populations, painted or engraved representations on caves or shelters walls suffer from some taphonomical phenomena action. Among these, the action of water can be one of the most destructive. If it was taken into account for a long time in performed observations, it has not been considered, on the other hand, in the perspective of a taphonomical approach such as it has been developed in archaeozoology and even less, by crossing observations performed on the effects of this phenomenon on other categories of remains, including those accomplished on a similar support (engraved blocks, plaquettes, etc). Answering the themes of Workshop, we offer to think about this question by illustrating it, between other one, by ongoing job in the Chauvet-Pont d'Arc cave (Ardèche, France).

**WS16-10**

A. LENOBLE (Bordeaux, France)  
B. WIESNIESKI (Bordeaux, France)  
C. BEAUVAL (Bordeaux, France)  
David COCHARD (Bordeaux, France)  
Jean-Pierre TEXIER (Bordeaux, France)

**Terminology and concepts: tools of the interdisciplinarity.**

**ABSTRACT:** The meanings of the terms used to describe site formation stages and their associated processes are not universally understood by archaeologists. This confusion can be result of various factors : poor translation, an author's paradigm and so on. We note that one of the reasons is the inaccurate use of a term adopted from a sister discipline. The resulting confusion makes multi-disciplinary collaboration (taphonomy, geoarchaeology, assemblage studies) for identifying site formation processes difficult and oftentimes ineffective.

It is for this reason that we propose a terminology for successive phases of site formation processes. Selected stages are discussed based on their ability to be documented by the different disciplinary approaches. Finally, the ways these different approaches may be combined will be discussed.

**WS16-11**

P. BERTRAN (Bordeaux, France)  
A. LENOBLE (Bordeaux, France)

**Composition granulométrique des assemblages lithiques, application à l'étude taphonomique des sites paléolithiques.**

**ABSTRACT:** Une fois abandonnés sur le sol par les hommes préhistoriques, les débris provenant de la taille du silex et les outils usagés peuvent être assimilés à des simples particules sédimentaires, qui sont susceptibles de subir l'action des processus géomorphologiques jusqu'à leur enfouissement complet dans le sol. Ces vestiges peuvent être utilisés pour déterminer si les processus sédimentaires ont joué un rôle important dans la constitution d'un niveau archéologique. Plusieurs mécanismes ont la capacité de transporter sélectivement les particules en fonction de leur taille et/ou de leur forme. Ce tri granulométrique ou morphométrique est une signature qui peut être aisément mise en évidence par l'analyse de la composition des vestiges. La reconnaissance d'un tel tri dans une série lithique a d'importantes implications sur la signification que l'on peut donner à sa distribution spatiale, mais aussi dans certains cas, à sa composition techno-typologique. Les principales applications de l'analyse granulométrique aux assemblages lithiques sont décrites ici et un bilan des connaissances issues d'expériences ou de l'étude de sites paléolithiques est proposé, dans la perspective de constituer un outil fiable au service de l'analyse taphonomique des sites paléolithiques.

## Session WS19

*Thursday , 7 September 2006 / Jeudi, 7 Septembre 2006,*

*Room 12.04, Faculty of Law, Lisbon University  
Salle 12.04, Faculté de Droit, Université de Lisbonne*

### Rock Art and Museum

### Art Rupestre et Musée

*organized by / organisé par*

- Dario SEGLIE** Centro Studi e Museo d'Arte Preistorica (CeSMAP), Pinerolo, Torino, Italy – [CeSMAP@cesmap.it](mailto:CeSMAP@cesmap.it)
- Guillermo MUÑOZ** Grupo de Investigación de Arte Rupestre Indígena (GIPRI), Bogotá, D. C., Colombia – [gipri@telecom.com.co](mailto:gipri@telecom.com.co)
- Giorgio DIMITRIADIS** Director of the Hellenic Rock Art Centre, Rovato, Italy – [giorgio.dimitriadis@cheapnet.it](mailto:giorgio.dimitriadis@cheapnet.it)

### SESSION'S ABSTRACT

The name rock art is traditionally attributed to all non-utilitarian anthropic markings on rock surfaces; the term "art" is utilized *latu sensu*, without aesthetic implications, according to the Latin etymology that defines the human activity of producing artefacts, hence the derivation of the words artisan, artificer, artist.

Rock art is today only the "residue" of ancient cultural complexes, conserved over time, while songs, prayers, dances, gestures, votive offerings etc. are unrecoverable, but it displays the spiritual abundance of our oldest ancestors.

The keen interest in rock art derives from its relative rarity, as sites that testify the cognitive dimension of man; the main problem facing us now is conservation, protection and communication.

To identify the best procedures for a valid protection it is necessary to plan monitoring with instruments recording the variability in the environmental parameters and the impact on the rock monuments, in view of the primary conservational necessity.

The symposium will critically consider the propriety and feasibility of treating rock art of the past as a source of knowledge for the contemporary interpreter, examine the possibility that such knowledge may be distorted by subjective ethnocentric perceptions, and explore the necessity of evolving museological models, which can present and conserve rock art without reflecting current prejudices and predilections.

The symposium will also focus attention on the existing and pristine relation of the rock art landscapes with adjacent landscapes, humanized by local communities. An attempt will be made to assess the possibility of restoring the custodial interest, if any, of such communities in the rock art landscapes; and, to recognize the constructive, constitutive and creative role of rock art and the associated folklore in the conservation and replenishment of such landscapes.

The contributors may like to address themselves to the question of inter institutional cooperation across the globe for a quest into appropriate ways of documenting and presenting rock art within a

museum, for inciting aesthetic, technical, ecological, cultural and touristic interest of visitors, and, for fulfilling convergent objectives of conservation, education, research or appreciation.

Rock art museums, projects or institutions, in open air or indoor, as cultural interpretation of reality, is a form of cultural heritage conservation technique.

Museology and museography of rock art should be sciences devoted to the survival of this spiritual legacy of humanity. (GSA)

## SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00            **Opening / Ouverture**

09:00-09:15    Dario SEGLIE (Pinerolo, Italy)

**WS19-01**       **New perspective in rock art museology: the Rocca of Cavour and the prehistoric paintings ecomuseum in the Western Alps.**

09:15-09:25    Raffaella POGGIANI KELLER (Milan, Italy)

**WS19-02**       **Archaeological Rock Art Parks in Lombardy, Italy: Organization, Conservation and Recording Methods**

09:25-09:35    Gabriella DODERO (Genoa, Italy) - Patrizia GARIBALDI (Genoa, Italy)  
Irene MOLINARI (Genoa, Italy) - Paola SIGNORINI (Genoa, Italy)  
Antonella TRAVERSO (Genoa, Italy)

**WS19-03**       **Visual impairments and archaeology: an experience with a Talking Book**

09:35-09:45    George DIMITRIADIS (Philippi, Greece)

**WS19-04**       **Planning an Open Air rock art Museum: The case of Philippi, Greece.**

09:45-09:55    Aldo Renato Daniele ACCARDI (Palermo, Italy)

**WS19-05**       **La "communication" de l'art préhistorique: de la pratique didactique à la redécouverte de l'invisible.**

10:00-10:10    Miguel Angel ALBADÁN (GIPRI, Colombia)

**WS19-06**       **How to visualize the process and the complexity of rock art investigations?**

10:10-10:20    Guillermo Muñoz C. (GIPRI, Colombia)

**WS19-07**       **The cultural complexity and the conservation of the rock art.**

10:20-10:30    Judith TRUJILLO TELLEZ (GIPRI, Colombia)

**WS19-08**       **The rock art of the Bochica Route. Possible connections between oral tradition and sense and function of rock art.**

10:30-10:40    Luiz OOSTERBEEK (Tomar, Portugal)  
Sara CURA (Tomar, Portugal)



Anabela PEREIRA (Mação, Portugal)

**WS19-09** Prehistoric Art Museum of Mação - scientific research and social dynamization.

10.40-10:50 Barbara PROVINCIALI (Roma, Italy)  
Anna Maria MARINELLI (Roma, Italy)  
Domenico POGGI

**WS19-10** Stratifying of spiritual significances in the artock sites. Can matter's conservation takes part in the survival of its own meaning?

10:50-11:00 Discussion

## ABSTRACTS / RÉSUMÉS

**WS19-01** Dario SEGLIE (Pinerolo, Italy)

**New perspective in rock art museology: the Rocca of Cavour and the prehistoric paintings ecomuseum in the Western Alps.**

**ABSTRACT:** The rock art of Cavour Rock (a geologic *inselberg* in the Po plane) is characterized by petroglyphs and prehistoric paintings (Neolithic, VBQ Culture), as the outermost Eastern area of the "Mediterranean Province".

The keen interest in this rock art derives from its relative rarity in the Western Alps, as sites that testify the cognitive dimension of man, in connection with prehistoric human settlements; the main problem facing us now is conservation, protection and communication. The Cavour Rock is protected as integral reserve within the Mountain Po River Park.

The Cavour Rock Art and the others prehistoric paintings in the Western Alps constitute the Prehistoric Paintings Ecomuseum Project that is the pioneer experiment in the Piemonte Region.

To identify the best procedures for a valid protection, the Polytechnic of Torino, Dept. of Museography, works on the plan of monitoring, with instruments recording the variability in the environmental parameters and the impact on the rock monuments, in view of the primary conservational necessity.

Rock art museums, in open air or indoor, as cultural interpretation of reality, is also a form of cultural heritage conservation technique.

**WS19-02** Raffaella POGGIANI KELLER (Milan, Italy)

Archaeological Rock Art Parks in Lombardy, Italy: Organization, Conservation and Recording Methods

**ABSTRACT:** The widespread occurrence of rock art in Lombardy, where the most important European UNESCO site (entitled "Rock Drawings in Valcamonica") is situated, has stimulated great interest in the phenomenon, over the years, and led to the creation of a series of Archaeological Parks. The first of these, the Capo di Ponte National Rock Engraving Park, was also the first Archaeological Park in Italy: here (especially recently) a fine balance between nature, rock art and archaeological context has been achieved, combining visitor appreciation and conservation requirements. Measures for the protection and conservation of this important heritage have been implemented by the authority responsible for tutelage – the Lombardy Archaeological Superintendency – in collaboration with major national research institutes. In recent years conservation methods have been refined and modern recording procedures (using photogrammetry and laser scanning) developed, together with a combined rock art cataloguing and monitoring system ("IRWeb-CIMAR"), which is being applied to an extensive trial area. The UNESCO Site Management Plan was launched in 2005 and stipulates the uniform and coordinated use of these methods throughout the area, on the part of all managing bodies and research organizations, in a form compatible with other European systems.

**Keywords:** IRWeb-CIMAR, Rock Drawings in Valcamonica, UNESCO Site Management Plan.

**WS19-03** Gabriella DODERO (Genoa, Italy)-Patrizia GARIBALDI (Genoa, Italy)  
Irene MOLINARI (Genoa, Italy)-Paola SIGNORINI (Genoa, Italy)  
Antonella TRAVERSO (Genoa, Italy)

**Visual impairments and archaeology: an experience with a Talking Book**

**ABSTRACT:** We present the efforts being undertaken to make people with visual impairments (both blind and people with low residual vision) enjoy a visit to the Archaeological Museum of Genova Pegli. The experience is centered around the development of a Talking Book, especially designed for people with low vision, yet available (and enjoyable) for all visitors. This Talking Book describes the well-known grave of the so-called “Principe” from the Arene Candide Cavern, who lived approx. 24,000 years ago in Liguria. He was buried with an exceptionally rich set of finds, which allows to have an insight on the Gravetian culture in Northern Thyrrenum regions. Such a Talking Book was developed without requiring expensive hardware, nor specialized computer expertise. The paper details the methodology used in the development of the Talking Book, so that similar experiences could be developed by other Museums to help visually impaired people in enjoying visits to archaeological assets.

**Keywords:** museum accessibility, talking book, Visual impairment.

**WS19-04** George DIMITRIADIS (Philippi, Greece)

**Planning an Open Air rock art Museum: The case of Philippi, Greece.**

**ABSTRACT:** Last years rock art specialists, museum managers and archaeologist start working in a new approach on rock art open air sites. The problems which are calling to solve are several and most of them linked with the new culture and tourism industry. Specially the eco-compatible approach is review as rock art heritage is integral part of natural landscape. The present paper exam a new culture convergence management based principally in the experience collected during the constructive design actions planned and actuated in the rock art eco-museum of Philippi, Greece.

**Keywords:** Culture convergence Management, Open Air rock art Museum, Philippi, Hellenic Rock Art Center

**WS19-05** Aldo Renato Daniele ACCARDI (Palermo, Italy)

**La “communication” de l’art préhistorique: de la pratique didactique à la redécouverte de l’invisible.**

**RÉSUMÉ:** es sites préhistoriques peuvent devenir instruments pour la reconnaissance de l’identité d’une communauté en rapport à son territoire, en combien traces des relations entre eux et les hommes, c’est-à-dire spectateurs du lien existant entre facteurs *visibles* et *invisibles* dans leurs intrinsèques. Aujourd’hui, revisiter le passé, son héritage, les différentes formes d’art produites signifient ne se pas limiter plus à la seule protection des témoignages préhistoriques, mais se consacrer plutôt à la création de stratégies de communication qu’elles ont comme mission primaire l’interprétation des témoignages mêmes. L’interprétation est une didactique pratique et communicative qui va au-delà le simple offert de renseignements matériels. En discutent des découvertes préhistoriques on il a conscience que la plus grande valence testimoniale vient exprimée principalement des formes primordiales d’art, surtout cette pariétale; tel art constitue une des expressions qu’en grande mesure documentent le contexte de l’homme préhistorique, de son système de vie. De fréquent, à cause de l’impuissance de jouir librement des endroits originaux, il est d’oblige la création de solutions dans les quelles la technique vient mise au service de la préhistoire pour rendre accessible au public l’art, le style de vie et le milieu naturel des hommes primitifs, à travers la réalisation d’un pôle museale qui, créé pour évoquer réalités lointaines dans le temps, il se sert de stratégies museologique mixtes entre *living archaeology* et *archéologie expérimentale*, au but de remplir l’absence de cette comparaison immédiate, spatial et temporel, avec les réalités originaires. Spécialement avec les laboratoires didactiques dédiés à l’art rupestre il est possible de proposer au public une immersion totale dans la préhistoire en “le contraignant” à *penser* et *créer* à la manière des artistes préhistoriques en retrouvant les anciens gestes, les techniques et les valeurs symboliques.

**WS19-06** Miguel Angel ALBADÁN (GIPRI, Colombia)

**How to visualize the process and the complexity of rock art investigations?**

**ABSTRACT:** The project arises as answer to an initiative of the Group of Investigation of Indigenous Rock Art (GIPRI-Colombia), which decides to elaborate a museum of rock art in digital media with the purpose of offering a tool of international popularization to the public specialized in this topic. This museum looks for to concentrate on oneself system, diverse data relating to the history of the investigation, to the archaeological discoveries, the aesthetic and the ethnohistoric studies. In this way, a great database is built, these data could be fused and visualized in screen, then it allows the user to make thematic connections, specialized searches, relate space, and possibly, to determine conservation plans for each zone with rock art.

The technological development has been concentrated on two big areas: visualization of data and graphic synthesis. A programming atmosphere *Open Source* called *Processing* was used [www.processing.org], with which specialized software was developed which visualizes the information stored in charts *XML*, in a graph 3D way with which one can interacts in real time through Internet. The graphic plan recovered part of the outlines and conventions elaborated in the *Methodological Model for Documentation and Registration of the Rock Art* (GIPRI-1970-2005), and new elements were created that simplify the appearance in screen of each item, searching a purely geometric atmosphere that makes more efficient its reading.

**WS19-07** Guillermo MUÑOZ C. (GIPRI, Colombia)

**The cultural complexity and the conservation of the rock art.**

**ABSTRACT:** In the last years the processes of rock art study have come making more and more demanding and refined toward a synthesis that includes a complex group of points of view. In this sense, the team of Gipri has developed some experiences in the registration works and documentation of paintings and engravings but the group has also dedicated its work to the reconstruction of the language, the aesthetics of the thoughts and present representations in the rupestrian motifs. The refinement of the registration systems is parallely accompanied by a discussion on the before Columbus aesthetics, the national culture and the presence of oral traditions that they very surely keep some relationship with the systems of representation of the ethnics that produced these languages.

To unify this complexity of sources, to perceive the historical processes, to articulate the forgetfulness, to determine their historical interactions, they are roads that allow to establish some bonds among these seemingly archaic events with the current rural culture. All these elements (technicians and cultural) that configure a conservation proposal and patrimonial cultural appropriation, they were shown like a first synthesis of the diverse thing, in a problematic unit of historical determinations.

**WS19-08** Judith TRUJILLO TELLEZ. (GIPRI, Colombia)

**The rock art of the Bochica Route. Possible connections between oral tradition and sense and function of rock art.**

**ABSTRACT:** Inside the indigenous oral traditions, the well-known in Colombia, is the myth of Bochica, god civilizer. This deity of the Muisca Pantheon, in the highland of Cundinamarca and Boyaca, according to the legend, left to its step many of its teachings on the rocks, as the chroniclers reported (XVI century). Although the reasons for which this myth prevailed to the arrival of the Spanish, still are not very clear (what didn't happen with other myths), it is important to point out that the towns visited by Bochica have rupestrian locations, and many places associated to the myth exist (Hill of Bochica, Tequendama Waterfall, rupestrian murals with textile representations).

The rocks with paintings and engravings can be linked (for analogy) to the teachings of Bochica. The current activities, rural customs and places of the landscape can end up offering a new level of information of the rock art sense and function for the antique executioners. The connections that today are made are quite problematic, because we can not be sure about the straight relationship between Bochica myth and the places with rock art of his route. But these connections configure possibilities to project cultural forms of conservation of the places, a road to meditate about relationship between the indigenous past and the current rural traditions.

**WS19-09** Luiz OOSTERBEEK (Tomar, Portugal)  
Sara CURA (Tomar, Portugal)  
Anabela PEREIRA (Mação, Portugal)

**Prehistoric Art Museum of Mação - scientific research and social dynamization.**

**ABSTRACT:** The 2000 year rock art rediscover in the Ocreza river valley along with the previous intention of Mação's Town Hall of protecting and promoting the archaeological heritage of this region, launched an overall intervention project centred on the reorganization of the town Museum. Renewed as The Tagus Valley Prehistoric Art and Sacred Museum this institution is presently a regional centre committed to the study of the prehistoric population identities and their symbolic behaviours.

In the last five years the Museum became a strategic pole of a scientific network together with the CEIPHAR, CPH and CIAAR. Presently it is engaged in the coordination of several relevant European projects about the natural risks affecting the archaeological heritage (ArtRisk) and the relation between Prehistoric Art and contemporaneous art (ArtSigns). Within the scope of a protocol established with the IFRAO the museum is the European Head of the international rock art bibliographic registration. Together with the IPT and the UTAD the Museum harbours the Master Erasmus Mundus in Prehistoric Archaeology and Rock Art.

Besides this more scientific output the Museum of Mação, with its entertainment and pedagogic activities, is devoted to promote a more active communication and fruition of the exhibition thematic and the archaeological sites, booth for scholar publics, adults and elderly visitors. On this level the Museum also works with the Middle Tagus Archaeological and Environmental Park aiming the protection and promotion of the archaeological and environmental heritage through a museographic net and the establishment of several circuits.

**WS19-10** Barbara PROVINCIALI (Roma, Italy)  
Anna Maria MARINELLI (Roma, Italy)  
Domenico POGGI

**Stratifying of spiritual significances in the artrock sites. Can matter's conservation takes part in the survival of its own meaning?**

**ABSTRACT:** Artrock sites which preserve a continuity in their use connected at their own spiritual meanings and which, at the same time, are integrated in the urban and social contemporary texture, induce some reflexions about their conservation.

How to apply the principles of the Cesare Brandi "Teoria del Restauro"?

A methodological critical reflexion also connected with the praxis seems to be opportune through the exam of some particular cases in the Tuscia interland: Santa Fortunata and Santa Maria del Parto in Sutri.

Environment's conservation and conservation of the surfaces: studying about materials and the executive techniques.

## Session WS20

*Monday, 4 September 2006 / Lundi, 4 Septembre 2006*

*Room 6.1.48, Faculty of Sciences, Lisbon University  
Salle 6.1.48, Faculté de Sciences, Université de Lisbonne*

### **Rock Art Data Base New Methods and Guidelines In Archiviatiion and Catalogue**

### **Base de données en art rupestre Nouvelles méthodes et lignes guide en archivage et catalogage**

*organized by / organisé par*

|                                  |   |
|----------------------------------|---|
| <b>Raffaella POGGIANI-KELLER</b> | Ministry of Culture, Archaeological Superintendency, Milano, Italy – <a href="mailto:sop.arch.lomb@inwind.it">sop.arch.lomb@inwind.it</a>   |
| <b>George DIMITRIADIS</b>        | Herac, Philippi, Greece & University Of Lecce, Italy - <a href="mailto:giorgio.dimitriadis@cheapnet.it">giorgio.dimitriadis@cheapnet.it</a> |
| <b>Fernando COIMBRA</b>          | University of Salamanca, Salamanca, Spain & HERAC, Philipp, Greece - <a href="mailto:fac Coimbra@yahoo.com">fac Coimbra@yahoo.com</a>       |
| <b>Carlo LIBORIO</b>             | Archaeological Society, Milano, Italy Archaeological Society, Milano, Italy   |
| <b>Maria GIUSEPPINA RUGGIERO</b> | Archaeological Society, Milano, Italy - <a href="mailto:mg.ruggiero@libero.it">mg.ruggiero@libero.it</a>                                    |

### **SESSION'S ABSTRACT**

The workshop's aim is to analyze the new methods for cataloguing rock art, by the use of modern technologies: typology of the data-collection (d-base), digital photos, photogrammetry, laser scanner, etc. Particularly attention will be also dedicated to the conservation aspects for rock art's preservation, throughout special Art Risk Schedules (ARS) and sharing data by Internet. This last topic will be discussed in order to preserve the Intellectual Property Right (IPR), most of all for the public administration.

(GSA)

### **SESSION PROGRAMME / PROGRAMME DE LA SESSION**

|                |                                   |
|----------------|-----------------------------------|
| 14:30          | <b>Opening / Ouverture</b>        |
| 14:30-14:50    | A. M. FERRONI (Napoli, Italy)     |
| <b>WS20-01</b> | <b>The Risk Map and rock art.</b> |

14:50-15:10 Raffaela POGGIANI KELLER (Milano, Italy)  
T. PACCHIENI (Milano, Italy)  
Carlo LIBORIO (Milano, Italy)  
Maria Giuseppina RUGGIERO (Milano, Italy)

**WS20-02** **Valle Camonica (Italy). The rock art database by the Ministry of Cultural Heritage and Activities-Soprintendenza for Archaeological Heritage of Lombardia: from IR Project to IRWeb.**

15:10-15:30 D. VITALI (Milano, Italy)

**WS20-03** **The digital cataloguing of rock art on Web: server-client architecture and partnership on-line.**

15:30-15:50 Dario SEGLIE (Torino, Italy)

**WS20-04** **The EuroPreArt Project - European Prehistoric Art, Past Signs and Present Memories.**

15:50-16:10 Fernando Augusto COIMBRA (Salamanca, Spain)  
Giorgio DIMITRIADIS (Philippi, Greece)  
I. MAILLAND (Milano, Italy)  
Carmelo PRESTIPINO (Savona, Italy)

**WS20-05** **Philippi Rock Art. Guidelines for a Methodological Recovery and Preventive Action.**

16:10-16:30 J. MITCHAM (York, UK)

**WS20-06** **Archiving big datasets: a case study in rock art research.**

16:30-16:50 Guillermo MUÑOZ  
Judith TRUJILLO (Colombia)

**WS20-07** **Inventarios gráficos y geográficos: un proyecto de registro y conservación del arte rupestre en Colombia**

16:50-17:10 E. COLOMBO-ZEFINETTI  
P. PEVERELLI

**WS20-08** **New technology for rock art documentation by the Soprintendenza for Archaeological Heritage of Lombardia: laser scanner in Valle Camonica (Italy).**

17:10-17:30 D. VITALI (Milano, Italy)  
L. VISMARA (Milano, Italy)

**WS20-09** **Digital rights management for archived pictures in web contexts.**

17:30-17:50 FRANCESCO G. (Roma, Italy)

**WS20-10** **Web sites and Intellectual Property Rights.**

17:50-18:30 **Discussion**

M. TENCONI (Padova, Italy)

**Poster**

**Study and computerized cataloguing of rock art with IRWeb system: the Rock n.9 in the Parco Nazionale delle Incisioni Rupestri di Capo di Ponte (BS), loc. Naquane.**

**ABSTRACTS / RÉSUMÉS**

**WS20-01**

A. M. FERRONI (Napoli, Italy)

**The Risk Map and rock art.**

**ABSTRACT:** In 1997 the Central Institute for Restoration Works (ICR) and the Central Institute for Cataloguing and Documentation (ICCD) of the Italian Ministry for Cultural Affairs and Heritage performed in the framework of the Map on the Risk of the Italian Cultural Heritage some experimental cataloguing on rocks engraved in Valle Camonica and in Valtellina. This initiative, targeted at analysing conservative aspects, has highlighted how the biological, physical and mechanical degradation of rocks are closely related to the anthropic one (trampling, vandalism and rock cleaning performed by non specialist personnel). The analysis disclosed that rocks in better states of conservation are doubtless those situated in protected areas, where ordinary maintenance is constantly performed. Hence the crucial relevance of accurate and regular maintenance, failing which even the most rigorous restoration works run the risk of losing effectiveness.

Keywords: rock art, risk map, Valle Camonica, Valtellina, conservative aspects.

**WS20-02**

Raffaella POGGIANI KELLER (Milano, Italy)

T. PACCHIENI (Milano, Italy)

Carlo LIBORIO (Milano, Italy)

Maria Giuseppina RUGGIERO (Milano, Italy)

**Valle Camonica (Italy). The rock art database by the Ministry of Cultural Heritage and Activities-Soprintendenza for Archaeological Heritage of Lombardia: from IR Project to IRWeb.**

**ABSTRACT:** The rock art heritage of the Unesco site n. 94 "Rock Drawings of Valle Camonica" is safeguarded by the Italian Ministry for Cultural Activities and Heritage through the Soprintendenza for Archaeological Heritage of Lombardia. In 1997 the Soprintendenza has started a computerized cataloguing project ("IR", *Incisioni Rupestri*) which, as well as covering technical, scientific and administrative aspects, places particular emphasis on monitoring the state of preservation. On 2003 the application was improved, so that it can be used on Internet, with the possibility of de-localised data insertion ("IRWeb", *Incisioni Rupestri sul Web*). Within the archive, careful and specific attention is dedicated to the systematic review of rock preservation states, which is considered fundamental for a medium and long-term heritage management strategy. The terminology adopted for conservation aspects derives from the Risk Map realized by the Central Institute for Restoration Works (ICR) and the Central Institute for Cataloguing and Documentation (ICCD) of the Italian Ministry for Cultural Affairs and Heritage.

Keywords: rock art, Valle Camonica, IRWeb Project, preservation, management.

**WS20-03**

D. VITALI (Milano, Italy)

**The digital cataloguing of rock art on Web: server-client architecture and partnership on-line.**

**ABSTRACT:** The paper describes the architecture of IRWeb's application, based on a distributed client/server structure, which is able to function in a high-velocity internal network (Intranet) or in a remote web server (Internet) context. The system propose a solution to common problems in

cooperative online cataloguing systems such as multi-user security levels, data validation and publication procedures, grouped access to sets of data. All data is accessible via a standard webservice that enables IRWeb to be fully eligible for integration in external systems such as international public catalogues.

Keywords: rock art, Valle Camonica, IRWeb Project, Internet, web service.

**WS20-04** Dario SEGLIE (Torino, Italy)

**The EuroPreArt Project - European Prehistoric Art, Past Signs and Present Memories.**

**ABSTRACT:** This UE Project is focused on inventory, contextualisation, preservation and accessibility. The main aim of the project was to promote close international co-operation between the project partners and all other institution in Europe and around the world, devoted to Prehistoric Art. The broad range of Rock Art issued has necessitated the involvement of many important international organizations (IFRAO, UNESCO, UISPP). There is a growing understanding that we need to approach Rock Art management planning in as broadly based a way as possible: that is the way of principles of sustainable development in the field of Cultural Heritage preservation. We are now at the stage where we should re-assess each of our action, from the field work to the responsibility to disseminate knowledge through teaching and general educational programmes.

Keywords: rock art, UE Project, inventory, preservation, accessibility.

**WS20-05** Fernando Augusto COIMBRA (Salamanca, Spain)  
Giorgio DIMITRIADIS (Philippi, Greece)  
I. MAILLAND (Milano, Italy)  
Carmelo PRESTIPINO (Savona, Italy)

**Philippi Rock Art. Guidelines for a Methodological Recovery and Preventive Action.**

**ABSTRACT:** Last year HERAC starts a new document campaign nearby the village/parish Philippi, Municipality Philippi, focus its attention especially at the post-excavation and record process. In particular way we asked about finding destiny and which was the best temporary recovery action to undertake in order to protect properly the new archaeological data as came out from the rocky surface cleaning and cliffs safeguard from vandalisms and malign curious intentions. Indeed, by an immediate and generous effort of the Municipality Court we proceed to the rock cover by special membranes and smooth special sand mix respecting three basic conservation criteria: 1. to avoid humidity; 2. keep constant the temperature; 3. prohibit sunlight exposition. In fact all these parameters are mainly responsible for lichens and parasites affect and exfoliation, caused by the temperature variation between day and night, of the rocky surface.

Keywords: Philippi rock art, Preventive Action, Archivation and Data Management.

**WS20-06** J. MITCHAM (York, UK)

**Archiving big datasets: a case study in rock art research.**

**ABSTRACT:** The Big Data Project aimed to look at issues of preservation, reuse and dissemination for exceptionally large digital data files generated by archaeologists. Archaeologists are increasingly adopting data collection techniques that generate exceptionally large digital datasets, 3D laser scanning being just one of these technologies. Through the Big Data Project we have had an opportunity to assess how best to archive these types of data and make them available for future researchers. The case study discussed here is a project called 'Breaking Through Rock Art Recording'. This project was carried out by researchers at Durham University and funded by the Arts and Humanities Research Board. 3D laser scanning was carried out on Castlerigg stone circle in Cumbria, England, to try to locate and record carvings on the stones which were no longer visible to the human eye. The project produced large quantities of digital data which were deposited with the Archaeology Data Service for archiving. Recommendations on how data sets such as this one should be preserved and made available to future researchers will be shared during this session.



Keywords: Big Data Project, 3D laser scanning, Castlerigg stone circle, Cumbria, UK.

**WS20-08** E. COLOMBO-ZEFINETTI  
P. PEVERELLI

**New technology for rock art documentation by the Soprintendenza for Archaeological Heritage of Lombardia: laser scanner in Valle Camonica (Italy).**

**ABSTRACT:** Laser scanner applied to cultural heritage allows to obtain, in rapid time, detailed monuments' plans useful to elaborate 3D models. For rock art this is really important because it allows to know the rock morphology and the rock surface conservation state. The paper shows the preliminary results about the use of laser scanner on a rock placed in Bedolina (Capo di Ponte, Brescia, Italy). The work was realized on 2005 by the Superintendence for Archaeological Heritage of Lombardy, that has the responsibility for preservation and conservation. It was structured in four steps: 1) topographic plan to define the targets; 2) series of photographs to obtain the final representation (scale 1:20); 3) representation in orthophoto and 4) 3D model elaboration.

Keywords: rock art, laser scanner, topographic plan, orthophoto, 3D model.

**WS20-09** D. VITALI (Milano, Italy)  
L. VISMARA (Milano, Italy)

**Digital rights management for archived pictures in web contexts.**

**ABSTRACT:** Archives that offer a web-based access often publish images. Those images are used for different purposes (i.e. didactic, personal, etc.) and such availability requires to protect the cultural heritage in order to avoid commercial use of published images and to protect intellectual property. The paper describes an innovative method which uses advanced watermarking techniques in conjunction with a Digital Rights Management system based on strong digital signatures, in order to enable web archives to publish protected images and have a legal proof of ownership of them.

Keywords: watermarking, digital image, digital signature, web archives, rock art.

**WS20-10** G. DE FRANCESCO G. (Roma, Italy)

**Web sites and Intellectual Property Rights.**

**ABSTRACT:** È ormai chiaro che il Web soggiace all'ordinamento giuridico al pari del mondo analogico: i diritti esistono sul Web come al di fuori e le azioni che pregiudichino tali diritti sono parimenti perseguibili e sanzionabili. Prima di procedere alla progettazione e pubblicazione di un sito web occorre pertanto una consapevolezza dei diritti, e anzitutto dei diritti di proprietà intellettuale, che sussistono sui contenuti da inserire, e di quelli che si verranno ad acquisire sull'opera una volta conclusa. L'espressione "diritti di proprietà intellettuale" (intellectual property rights), coniata in ambito anglosassone, accomuna la industrial property e la copyright law; essa indica quindi, da una parte, i diritti relativi a marchi e segni distintivi in genere e ai brevetti per invenzione e per modelli, da noi disciplinati nell'ambito del diritto industriale, e dall'altra il diritto d'autore, ovvero l'insieme delle tutele cui sono sottoposte le opere dell'ingegno di carattere creativo. Tali tutele si organizzano in differenti sistemi nei diversi paesi; i due sistemi più diffusi sono quello di matrice latino-germanica del diritto d'autore e quello del copyright, proprio dei paesi di common law. A fronte della recente intensificazione della protezione accordata dalla legge alla proprietà intellettuale, il panorama è arricchito e innovato rapidamente dagli esiti di varie iniziative che si vanno sviluppando per offrire alternative che favoriscano la circolazione e il libero accesso alle opere.

Keywords: Copyright Law, Industrial Property, Intellectual Property Rights, Web.

**POSTER** M. TENCONI (Padova, Italy)

**Study and computerized cataloguing of rock art with IRWeb system: the Rock n.9 in the Parco Nazionale delle Incisioni Rupestri di Capo di Ponte (BS), loc. Naquane.**

**ABSTRACT:** The present study is part of the IRWeb, a db project commissioned by Superintendence of Archaeological Affaires of Lombardy (Italy) to manage a Web archive. The analysis of the rock has been carried out through topographical and photographic surveys and the study of its engravings. The photographic survey consists of many different photographs that document single sections where parts of the rock achieved dividing it into squares of 50 cm, the representations and the scenes on it. The following files have been compiled for Rock Nr 9: rock file, file with extra information, section files, scene files, representations files, preservation status file and historical status file. Through iconographical comparison, different types of representation have been discovered and documented. The ones that have been dated accurately are to the Iron Age.

Keywords: Computerized Cataloguing, Capo di Ponte (IT), IRWeb system, National Rock Art Parc.

## Session WS21

*Monday, 4 September 2006 / Lundi, 4 Septembre 2006*

*Amphitheatre 5, Faculty of Law, Lisbon University  
Amphithéâtre 5, Faculté de Droit, Université de Lisbonne*

### **Use of combustibles and site functions during the Palaeolithic and Mesolithic period: new tools, new interpretations**

*organized by / organisé par*

**Théry-Parisot ISABELLE**

**they@cepam.cnrs.fr**

**Sandrine COSTAMAGNO**

Université de Toulouse 2 - Le Mirail, Maison de la Recherche,  
Toulouse, France - **scostamagno@free.fr**

### **SESSION'S ABSTRACT**

Fire played a crucial part in the everyday life of Palaeolithic societies in relation with the varied function of fireplaces as well as the large number of activities closely related to them. The study of fires and their role was for a long time limited to typology. Over the last few years new studies have focused on the recognition of all kinds of burnt remains (phytoliths, charcoal, coal from bones, coke) and characterisation of combustibles properties, micromorphological studies, taphonomic analyses focusing on combustion processes and the differential conservation of burnt remains and ethnoarcheological studies. These approaches have considerably renewed our vision of the use of combustibles, the roles and the function of campsites during the Palaeolithic period. This workshop will enable us to find out and discuss the most recent researches on these topics.

### **SESSION PROGRAMME / PROGRAMME DE LA SESSION**

16:30 **Opening / Ouverture**

16:30-16:40 D. RHODE  
Lionel SIMS (London, UK)

#### **WS21-01**

**Prehistoric dung fuel use on the Tibetan plateau : archaeological and actualistic studies. Emploi des fumiers comme combustible sur le plateau Tibétain : études archéologiques et ethnographique.**

- 16:40-16:50 A. HENRY  
I. THÉRY-PARISOT (France)  
**WS21-02** Fuel management under a boreal climate: archaeological issues and ethnographical case study (Amour Region, south-eastern Siberia).
- 16:50-17:00 U. ODGAARD  
**WS21-03** Arctic hearths.
- 17:00-17:10 D. BOSQUET (Bruxelles, Belgique)  
F. DAMBLON (Bruxelles, Belgique)  
**WS21-04** Mise en évidence de l'utilisation d'un combustible osseux au Paléolithique moyen : le cas du gisement de Remicourt « En Bia Flo » I (province de Liège, Belgique).
- 17:10-17:20 C. DELHON (Nanterre, France)  
S. THIEBAULT  
**WS21-05** Fuel management during the Palaeolithic and Mesolithic in the South of France and the middle Rhone valley. New data from archaeological and “ off-site ” charcoal and phytolith analyses.
- 17:20-17:30 Rivka RABINOVICH  
Ruth SHAHACK-GROSS  
Erella HOVERS  
**WS21-06** Bones, Hearths and Ashes at the Neandertal site of Amud Cave
- 17:30-17:40 L. MEIGNEN (Valbonne, France)  
P. GOLDBERG (Boston, USA)  
R.M.ALBERT  
O. BAR-YOSEF (Cambridge, MA, USA)  
**WS21-07** Structures of combustion, choice of fuel and degree of mobility of groups in the Near Eastern Middle Paleolithic: examples from the caves of Kebara and of Hayonim (Israel)
- 17:40-17:50 C. DELHON (Nanterre, France)  
S. THIEBAULT  
**WS21-08** Complémentarité des analyses phytolithiques et anthracologiques dans la restitution des paléoenvironnements et la caractérisation des sites au Tardiglaciaire et au début de l'Holocène.
- 17:50-18:00 Henry AURÉADE  
**WS21-09** Fuel management in a cold arid desert (Kamchatka, Sibérie), an ethnoarchaeological study.
- 18:00-18:10 Susan MENTZER  
**WS21-10** Bone as a Fuel Source: The Effects of Initial Fragment Size Distribution
- 18:10-18:20 D. JOLY (Rennes, France)

R. MARCH (Rennes, France)  
D. MARGUERIE  
H. YACCOBACCIO

**WS21-11** Gestion des combustibles dans un site de chasseurs-cueilleurs d'altitude : l'exemple d'Hornillos 2 (Puna argentine)

18:20-18:30 Isabelle THERY-PARISOT (France)  
Sandrine COSTAMAGNO (Toulouse, France)

**WS21-12** Studying burned bones : a statistical model.

## ABSTRACTS / RÉSUMÉS

**WS21-01** D. RHODE  
Lionel SIMS (London, UK)

**Prehistoric dung fuel use on the Tibetan plateau : archaeological and actualistic studies. Emploi des fumiers comme combustible sur le plateau Tibétain : études archéologiques et ethnographique.**

**ABSTRACT:** The Tibetan Plateau, the world's largest continuous alpine zone, is largely barren of wood from trees or shrubs, it is very cold for much of the year, and its atmosphere is oxygen-poor. Peoples' fuel needs in this harsh environment are great, but the available supply is quite limited. Native Tibetans, typically pastoralists and monks, have long relied on dung from domestic yaks and sheep. Prehistoric foragers must have relied on dung fuel as well. Recent studies of early peopling of the Tibetan Plateau have focused on the use of dung as fuel from both archaeological and actualistic perspectives.

**WS21-02** A. HENRY  
I. THÉRY-PARISOT

**Fuel management under a boreal climate: archaeological issues and ethnographical case study (Amour Region, south-eastern Siberia).**

**ABSTRACT:** Investigating on Palaeolithic fuel management means integrating the whole parameters that determine the energetic needs of the human groups, as well as their capacity to satisfy them inside a well-defined gathering territory. Archaeological remains do not provide all clues to the integral knowledge of these parameters, interconnected in a complex manner and interacting permanently at several levels. Presented here as an example, a first ethnographical study has been undertaken in order to collect contemporary data on fuel management of nomad groups living under climatic conditions similar to the cold climate of the Palaeolithic period. This work leads to a broader approach concerning the palaeoecological reliability of anthracological diagrams, as well as the validity of the palaeo-economical hypotheses presented for Palaeolithic settlements.

**WS21-03** U. ODGAARD  
**Arctic hearths.**

**ABSTRACT:** Extreme cold, ice and a scarcity of firewood! These were the options for the first people to enter the arctic areas of Canada and Greenland around 2500 BC, when the ice from the last ice age finally had let go of these areas. However a study of the archaeological evidence shows that the Palaeo-Eskimos brought with them a sophisticated pyro-technology making use of different kinds of heat transmission processes. Traces of the dwellings can, when linked to ethnographic studies, form the basis for theoretical reconstructions of the architecture. The combination of the study of the hearths and the study of the architecture can provide us with information on indoor climate and indoor

life around the hearths.

**WS21-04** D. BOSQUET (Bruxelles, Belgique)  
F. DAMBLON (Bruxelles, Belgique)

**Mise en évidence de l'utilisation d'un combustible osseux au Paléolithique moyen : le cas du gisement de Remicourt « En Bia Flo » I (province de Liège, Belgique).**

**ABSTRACT:** Le site de Remicourt (province de Liège, Belgique) a été mis au jour en 1997, à l'occasion de prospections systématiques menées par la Direction de l'Archéologie de la Région wallonne sur le tracé du TGV, en collaboration avec l'Institut royal des Sciences naturelles de Belgique. L'occupation paléolithique en milieu loessique est située dans la chronostratigraphie au niveau du stade St Germain I, à la fin du stade isotopique 5c, vers 90.000 BP (Bosquet et Haesaerts, à paraître). La fouille, qui a couvert 628 m<sup>2</sup>, a livré une série lithique répartie entre deux entités spatiales distinctes, appelées ensembles 1 et 2, qui se distinguent aussi de façon très nette sur base des matières premières siliceuses exploitées et des techniques de débitage mises en oeuvre. L'ensemble 1 est caractérisé par un débitage laminaire sur silex à grain fin, tandis que l'ensemble 2 rassemble un matériel nettement plus massif, constitué d'éclats obtenus à partir de deux variétés de silex grenu (Bosquet *et al.*, 2004).

(...)

Les données exposées ci-dessus permettent de formuler l'hypothèse selon laquelle l'aire correspondant à l'ensemble 2 pourrait être, entre autres, une zone de traitement des carcasses de grands herbivores, comprenant une étape de démembrement et/ou de fragmentation des os faisant intervenir les « ciseaux », dans le but de sélectionner les parties spongieuses des ossements, plus propices à la combustion. Notons à ce titre qu'une association spatiale entre des restes de faune brûlés et un outillage spécifique, dans ce cas des éclats à dos, a déjà été mise en évidence sur le site paléolithique moyen de Beauvais « La Justice » (Locht et Patou-Mathis, 1998).

Obtenus sur un site qui n'a livré aucun reste de faune identifiable à la fouille, ces résultats illustrent de façon remarquable l'importance que revêt le prélèvement systématique de sédiments en milieu loessique réputé peu favorable à la conservation des matières organiques. Ils démontrent aussi de façon évidente la nécessité de mener à bien l'étude détaillée de ces échantillons, en étroite collaboration avec les autres spécialistes impliqués dans l'étude et dans le cadre de problématiques archéologiques communes.

**WS21-05** C. DELHON (Nanterre, France)  
S. THIEBAULT

**Fuel management during the Palaeolithic and Mesolithic in the South of France and the middle Rhone valley. New data from archaeological and “ off-site ” charcoal and phytolith analyses.**

**ABSTRACT:** In the middle Rhone valley, various research programs, associated notably with rescue excavations, have profitably increased the amount of available data concerning the palaeovegetation and its use by prehistoric societies.

Anthracological analyses of prehistoric settlements provide information about the wood used as domestic fuel. Pedo-anthracological analyses of wood charcoal recovered in fire layers “off archaeological site” give information about the woody vegetation growing next to these settlements. Thanks to phytolith analyses of the same “off-site” layers, we are able to take into account the importance of grasses in the vegetation and to estimate the density of the ligneous cover.

The comparison between archaeobotanical data and contemporaneous palaeobotanical data allows us to advance hypotheses concerning fuel management in the middle Rhone valley during the late Palaeolithic and the Mesolithic, in relation with the available biomass. New interpretations about the status of the archaeological sites and about the possible impact of climatic changes are presented.

**WS21-07** L. MEIGNEN (Valbonne, France)  
P. GOLDBERG (Boston, USA)  
R.M. ALBERT  
O. BAR-YOSEF (Cambridge, MA, USA)

**Structures of combustion, choice of fuel and degree of mobility of groups in the Near Eastern Middle Paleolithic: examples from the caves of Kebara and of Hayonim (Israel)**

**ABSTRACT:** In long archaeological sequences of the caves of Kebara and Hayonim (Israel), the Middle Paleolithic human occupations are characterized by many well preserved combustion features. Profiting from these favorable conditions, our research was thus focused on the role played by these “hearths” in human occupations. Initial detailed and systematic observations in the field, as well as later analyses in the laboratory (micromorphology, anthracology, phytolith analysis) have enabled us to identify the various types of structures related to combustion (*in situ* hearths, rake outs and cleaning), their degree of repetition/frequency of use, their duration, as well as the fuels employed. These data were then compared to the results obtained from the other fields of research, including lithic technology, exploitation of animal and vegetal resources, and seasonality. It is the integration of the entirety of these results that enables us to comprehend the types of occupation, function of the sites, as well as the degree of mobility of the groups within territory. In the case of the two chronologically distinct sites presented here, (Hayonim - Early Middle Paleolithic, and Kebara - Late Middle Paleolithic), these elements seem different, and the structures of combustion, as well as the choice of fuels, seem to reflect different patterns of occupation in these two caves.

**WS21-10**

Susan MENTZER

**Bone as a Fuel Source: The Effects of Initial Fragment Size Distribution**

**ABSTRACT:** Burned bones in association with Paleolithic hearths are often shorter in length than unburned bones. This size difference is generally considered to be a result of increased susceptibility to fragmentation following burning. The following study investigates whether the treatment of bone prior to burning affects 1) the final size distribution of burned bone fragments, and 2) the length of time that fires burn. The results of a series of experimental bone fires support the observations of Théry-Parisot (2002): fires containing bones burn longer than their respective wood-only control fires. In addition, there is a slight positive correlation between the initial mean bone size and the length of time that a fire burns; however the initial size distribution of the bone fragments has no effect on the final size distribution of the burned bones. Statistical comparisons of the final bone size distributions indicate that in several cases there are no significant differences. This size difference is generally considered to result from breakage during the combustion process as well as from increased susceptibility to post-depositional fragmentation. Fourier transform infrared (FTIR) analyses of the calcined bones and ashes reveal distinct mineralogical differences that may be applied to future studies of burned bone and ash mixtures.

**WS21-11**

D. JOLY (Rennes, France)  
R. MARCH (Rennes, France)  
D. MARGUERIE  
H. YACCOBACCIO

**Gestion des combustibles dans un site de chasseurs-cueilleurs d'altitude : l'exemple d'Hornillos 2 (Puna argentine)**

**ABSTRACT:** Hornillos 2 is a hunter-gatherer site, situated at an altitude of 4200 m, in argentinian dry Puna. Dated between 9710 BP and 6130 BP, many very rich hearths and charcoal levels were recovered. An other particularity is to be located in an arid zone where principal fuelwood is composed of bush. That's why, we carry out an anthracological study and a survey concerning actual use and management of fuelwood, completed with an experimental approach. So we had been able to understand the fuel management and its evolution in this particular environment.

## Session WS22

*Thursday, 7 September 2006 / Jeudi, 7 Septembre 2006,*

*Friday, 8 September 2006 / Vendredi, 8 Septembre 2006*

*And/ Et*

*Saturday, 9 September 2006 / Samedi, 9 Septembre 2006*

*Room 6.1.36, Faculty of Sciences, Lisbon University  
Salle 6.1.36, Faculté de Sciences, Université de Lisbonne*

### **Theoretical and Methodological Issues In Evolutionary Archaeology Toward an Unified Darwinian Paradigm.**

### **Questions théorétiques et méthodologiques en archéologie évolutive Vers un paradigme darwinien unifié**

*organized by / organisé par*

**Hernán Juan MUSCIO**

Grupo de Investigación Cultura, Comportamiento y Evolución Humana (GICCEH), Sección Arqueología, Universidad de Buenos Aires. CONICET, Buenos Aires, Argentine – [w22\\_archaeoevolu@yahoo.com.ar](mailto:w22_archaeoevolu@yahoo.com.ar)

**Gabriel Eduardo José LÓPEZ**

Sección Arqueología, UBA, Caba, Argentina – [gabelope@yahoo.com](mailto:gabelope@yahoo.com)

#### **SESSION'S ABSTRACT**

Asserting that artifacts and behaviors are part of the human phenotypes Evolutionary Archaeology explains the archaeological record in terms of the Darwinian theory of evolution. Sharing this common ground a great diversity of scopes has arisen, mainly from the approaches of the Human Behavioural Ecology, Sociobiology, and Cultural Transmission Theory. All these selectionist lines of reasoning expand the explanatory domain of the evolutionary research in a variety of topics, including social, technological, and biological evolution. However, a complete unified paradigm in Evolutionary Archaeology has not emerged. This demands the discussion of diverse epistemological, theoretical and methodological issues. At the core of the debate come out questions such as the units of selection, the role of the cultural transmission, the construction of cultural lineages, the documentation of neutral variation, the linkages between adaptive ecological behaviour and the broad time scale processes from which emerge archaeological patterns, between others. This workshop will bring together researchers working in a wide range of time periods and geographic areas, in order to generate a rich discussion ambience regarding the theoretical and methodological issues that could lead to an unified Evolutionary Archaeology paradigm.

#### **RÉSUMÉ DE LA SESSION**

Affirmant que les artefacts et les comportements font partie des phénotypes humains l'archéologie évolutionnaire explique le registre archéologique par la théorie darwinienne d'évolution. Partageant ce but commun une grande diversité des portées a résulté, principalement des rapprochements de

l'Ecologie du Comportement Humain, du Sociobiology, et de la Théorie la Transmission Culturelle. Toutes ces lignes de selectionist augmentent le domaine explicatif de la recherche évolutionnaire dans une variété de matières, y compris l'évolution sociale, technologique, et biologique. Au lieu de cela un paradigme unifié complet dans l'archéologie évolutionnaire n'a pas émergé. Ceci exige la discussion des aspects epistemological, théoriques et méthodologiques divers. Dans le centre de la discussion sont les custiones telles que les unités du selection, le rôle de la transmission culturelle, la construction des lignées culturelles, la documentation de la variation neutre, et le je lie entre le comportement adaptatif écologique, et les patrons du registre archéologique qui sont d'une plus grande échelle temporaire, entre d'autres. Cette volonté d'atelier rassemble des chercheurs travaillant dans un éventail de périodes de temps et de secteurs géographiques, afin de produire d'une ambiance riche de discussion concernant les aspects théoriques et méthodologiques qui pourraient mener à un paradigme évolutionnaire unifié d'archéologie.

## SESSION PROGRAMME / PROGRAMME DE LA SESSION

7<sup>th</sup> September 2006 / 7<sup>ème</sup> Septembre 2006

09:00            **Opening / Ouverture**

09:00-09:30    Albert F.H. NACCACHE (Beirut, Lebanon)

**WS22-01**        **The framework of models of evolution and the integration of human history within natural history.**

09:30-10:00    Tekahiko MATSUGI (Okayama, Japan)

**WS22-02**        **Evolutionary process of warfare and material culture in prehistoric Japan.**

10:00-10:30    Hector NEFF (Los Angeles, California, U.S.A.)

**WS22-03**        **Zahavi's handicap principle an the origins of Mesoamerican civilization.**

10:30-11:00    R. A. GUICHÓN (Mar del Plata, Argentina)  
M.H. FUGASSA (Mar del Plata, Argentina)  
J.A SUBY (Mar del Plata, Argentina)  
R.CASALI (Mar del Plata, Argentina)

**WS22-04**        **Health of native human populations in austral Patagonia, an evolutionary ecological perspective.**

11:00-11:30    Gabriel LÓPEZ (Buenos Aires, Argentina)

**WS22-05**        **The Study of the archaeological record of Santa Rosa de Los Pastos Grandes, Puna de Salta, Argentina, from an inclusive evolutionary perspective.**

11:30-12:00    Alex MESOUDI (St Andrews, Scotland, UK)

**WS22-06**        **The experimental simulation of archaeological patterns: a contribution to a unified science of cultural evolution.**

12:00-12:30    Marcelo CARDILLO (Buenos Aires, Argentina)



- WS22-07** Temporal trends in the morphometric variation of the lithic projectile points during the middle Holocene of Southern Andes (Puna region). A coevolutionary approach.
- 12:30-13:00 Michael W. GRAVES (Hawaii, U.S.A.)
- WS22-08** Cultural transmission, lineages, and the evolution of social units: an example from the Hawaiian islands.
- 13:00-14:30 Lunch / Déjeuner
- 14:30-15:00 Michael J. O'BRIEN (Columbia, Missouri, U.S.A.)
- WS22-09** What is cultural phylogeny, and how do we recognize it?
- 15:00-15:30 Hernán J. MUSCIO (Buenos Aires, Argentina)
- WS22-10** Artefacts behaviours an multilevel selection: a synthetic Darwinian paradigm in evolutionary archaeology is possible and convenient. Lessons from the archaeology of the Andean Puna of Argentina.
- 15:30-16:00 José Luis ESCACENA CARRASCO (Sevilla, Spain)  
Daniel GARCIA RIVERO (Sevilla, Spain)
- WS22-11** Evolutive cladogram of the "Bull skin motive" and its imitations in the archaic Mediterranean.
- 16:00-16:30 Monica TAMARIZ
- WS22-12** Darwinian dynamics in cultural skills and cultural forms.
- 16:30-17:00 Agner FOG (Copenhagen, Denmark)
- WS22-13** A group selection model of territorial war, xenophobia and altruism in humans and other primates.
- 17:00-17:30 José Luis ESCACENA CARRASCO (Sevilla, Spain)
- WS22-14** Interdemic selection and Phoenician priesthood. Darwinian reflections from the southern Hispanic archaeoastronomy.
- 17:30-18:00 John ODLING-SMEE (Oxford, UK)
- WS22-15** Niche construction and gene-culture co-evolution.
- 18:00-18:30 Diego RIVERO (Córdoba, Argentina)  
Matías E. MEDINA (Córdoba, Argentina)
- WS22-16** Environmental change, human predation and foraging efficiency in the Central Hills of Argentina.

8<sup>th</sup> September 2006 / 8<sup>ème</sup> Septembre 2006

- 09:00-09:30 Ceri SHIPTON (Cambridge, UK)  
**WS22-17** **Cognition and communication in the Acheulean of the Hunsgi-Baichbal Basin, Karnataka, India.**
- 09:30-10:00 José Luis LANATA (Buenos Aires, Argentina)  
**WS22-18** **The last frontier. The peopling of South America from na invasive species perspective.**
- 10:00-10:30 Jamshid TEHRANI (London, UK)  
Mark COLLARD ( Canada)  
**WS22-19** **Cladistic and ethnographic analyses of craft transmission in rural iran: towards na integrated study of cultural diversity and change.**
- 10:30-11:00 Herbert D. G. MASCHNER (Pocatello, Idaho, U.S.A.)  
Bem MARLER (Pocatello, Idaho, U.S.A.)  
**WS22-20** **Extended phenotypes, evolutionary psychology, complex systems and cultural transmission: why a unified Darwinian archaeology is not only difficult, but undesirable as well.**
- 11:00-11:30 Ethan E. COCHRANE  
**WS2-21** **From Clovis to Bantu peoples: What do different cultural phylogenies measure?**
- 11:30-12:00 Stephen J. LYCETT (Cambridge, UK)  
**WS22-22** **From Linnaean taxonomy to a Darwinian phylogeny of Palaeolithic technologies: implications for the evolutionary analysis of culture.**
- 12:00-12:30 Felix RIEDE (Cambridge, UK)  
**WS22-23** **Niche construction applied: triple-inheritance insights into the post-glacial re-colonization of southern Scandinavia.**
- 12:30-13:00 Kristen J. GREMILLION (Ohio State, U.S.A.)  
**WS22-24** **Two faces of Darwin: the complementarity of evolutionary archaeology and human behavioural ecology.**
- 13:00-14:30 **Lunch / Déjeuner**
- 14:30-15:00 Aimée PLOURDE (London, UK)  
**WS22-25** **Exploring the relationship between individual and group selection: na example from the study of prestige goods.**
- 15:00-15:30 Daniel O. LARSON  
**WS22-26** **Multidimensional selection and evolution: towards the scientific study of dual-heritage, transmission of information, modularity and complexity among humans.**

- 15:30-16:00 John DARWENT  
**WS22-27** Phylogenies of thule harpoon components from the north American high arctic.
- 16:00-16:30 Alex BENTLEY  
**WS22-28** Archaeological theory as an evolutionary process: distinguishing fad from theory, and why any unified paradigm is impossible.
- 16:30-17:00 Sibel KUSIMBA (Illinois, U.S.A.)  
**WS22-29** The archaeology of ethnic boundaries and mosaics: an ecological and evolutionary perspective.
- 17:00-17:30 Hernán J. MUSCIO (Buenos Aires, Argentina)  
Gabriel LÓPEZ (Caba, Argentina)  
**WS22-30** Unifying Darwinism in Evolutionary Archaeology.
- 17:30-18:00 Karen JOHNSON (Michigan, U.S.A.)  
**WS22-31** The cognitive domain of artefacts: ontogeny, phylogeny and human cultural learning strategies.
- 18:00-18:30 Mark COLLARD (Canada)  
Briggs BUCHANAN (Vancouver, Canada)  
**WS22-32** Testing models of early paleoindian adaptation using biological phylogenetic techniques.

*9<sup>th</sup> September 2006 / 9<sup>ème</sup> Septembre 2006*

- 09:00-09:30 David BULBECK  
**WS22-33** Darwinian evolutionary insights into pottery as an ethnic marker.
- 09:30-10:00 Mark ALDENDERFER (Tucson, Arizona, U.S.A.)  
**WS22-34** The trading zone in evolutionary archaeology: na alternative to a unified darwinian paradigm.
- 10:00-10:30 Mike CANNON  
**WS22-35** Explaining variability in the importance of agriculture, while working toward a unified Darwinian paradigm.
- 10:30-11:00 John DUDGEON (Long Beach, California, U.S.A.)  
**WS22-36** Cultural and biological phylogenetics within populations: what can one profitably teach the other?
- 11:00-11:30 Carl P. LIPO (Long Beach, California, U.S.A.)

Terry L. HUNT (Long Beach, California, U.S.A.)

**WS22-37** Investment, Competition, Bet-hedging and Signaling in the Evolution of Easter Island Prehistory.

11:30-12:00 Carl P. LIPO (Long Beach, California, U.S.A.)  
Terry L. HUNT (Long Beach, California, U.S.A.)

**WS22-38** The Cultural Phylogeny of Monumental Statues on Easter Island.

12:00-12:30 Marcelo CARDILLO (Buenos Aires, Argentina)

**WS22-39** Theoretical and Methodological Issues In Evolutionary Archaeology: Toward an Unified Darwinian Paradigm

12:30-13:00 Discussion

## ABSTRACTS / RÉSUMÉS

**WS22-01** Albert F.H. NACCACHE (Beirut, Lebanon)

**The framework of models of evolution and the integration of human history within natural history.**

**ABSTRACT:** In this brief presentation I will try to show how the theoretical foundation of the framework of Modes of Evolution (Naccache 1999) allows it to be used to analyze and organize archaeological data from the Lower Paleolithic till the Historical period, and this in a non-reductionist way integrating Human History along the chain of emergences—from atoms to populations—that characterizes our modern scientific worldview. I will emphasize two aspects:

- How the approach followed in the framework of Modes of Evolution (MoE), contrary to many of the “*isomorphic*” approaches of Evolutionary Archaeology, captures the “*emergent*” character of Culture within the realm of Life. This will be done through the identification of the MoE as major stages in the development of the mechanisms of transmission and reproduction of behaviors and artifacts in the overall lineage leading to *H. sapiens*.
- How the framework of MoE expands on the basic intuition of Maturana & Varela’s Autopoiesis (or today’s fashionable “Niche Construction”), by organizing archaeological data into a fine socio-cultural grid that helps us describe and comprehend the emergence and development of specific human behaviors.

Bibliography:

Naccache, A. F. H., 1999, “A brief history of evolution,” *History & Theory*, 38:4, 10-32.

**WS22-02** Tekahiko MATSUGI (Okayama, Japan)

**Evolutionary process of warfare and material culture in prehistoric Japan.**

**ABSTRACT:** We have plenty of archaeological evidences related to warfare from the Yayoi period prehistoric Japan(10c.b.c-A.D.2c). These material representations of dominance, the cardinal contents of agricultural ‘package’, are thought to have been brought by the immigrants from the continent around 10c.b.c. They functioned as ‘anchor’ to transmit the dominant cultural complex both vertically and horizontally to extend social stratification through the Yayoi era.

In the former and the middle phase of the Yayoi period(10-1c.b.c.), this transmission operated vertically in main so that the material representations became more and more intensive and locally

particularized. This process is considered to have led to the regionally specialized forms of social stratification based on relatively stable population patterns.

To the contrary, the last phase of the Yayoi period (A.D. 1-2c), with the increasing fluidity of population owing to over-exploitation of the local lands and dependence on external resources such as iron, saw the intensification of horizontal transmission of a violent cultural complex. This resulted in the unification of material representations for dominance, marking the emerging similarity of styles in stratified societies all over the mainland Japan.

The author concludes that the sequence of local intensification and universal extension of social stratification observed throughout the Yayoi period were generated by temporal change of population pattern dependent on environmental condition.

**WS22-03** Hector NEFF (Los Angeles, California, U.S.A.)

**Zahavi's handicap principle and the origins of Mesoamerican civilization.**

**ABSTRACT:** Fraser Neiman introduced the evolutionary theory of signaling, originated by Zahavi, to Mesoamerican Archaeology in the mid-1990s, arguing that Maya monuments could be understood as "wasteful advertisements" and defining the Maya collapse as a shrinkage in the range of ability to send costly (and thus reliable) signals. Independently, and apparently without any cross-fertilization from evolutionary theorists, John Clark and his colleagues have argued that status competition involving altruistic acts drove the emergence of ranked societies in eastern Mesoamerica during the Early Formative period.

In this paper, the Mesoamerican "mother culture" itself (i.e., the Gulf Coast Olmec) is explained as a set of costly signals intended for different kinds of audiences. Signals intended for local Gulf Coast people were borne on the famous "colossal heads" and other stone sculpture of that region. Signals intended for foreign audiences were borne initially on widely traded ceramic serving vessels, but, when the distinctive iconographic system began to be copied, more-difficult-to-falsify jade became the preferred medium for long-distance signaling. As a general principle for understanding communication between competing organisms, costly signaling would seem particularly useful for archaeologists studying the elaborate monuments, architecture, and rare items of long-distance exchange that constitute the trappings of "complex society."

**WS22-04** R. A. GUICHÓN (Mar del Plata, Argentina)  
M.H. FUGASSA (Mar del Plata, Argentina)  
J.A. SUBY (Mar del Plata, Argentina)  
R. CASALI (Mar del Plata, Argentina)

**Health of native human populations in austral patagonia, an evolutionary ecological perspective.**

**ABSTRACT:** The ecologic-evolutionary approach turns health information into an indicator of very diverse aspects referred to human societies. The presence of illnesses is, in general, the product of unbalances between individuals and numerous environmental components. In this context, we started working two years ago in the formulation of an investigation program, which has the evaluation of the biological impact of Native-European contact in Southern Patagonia as its main concern. One of the objectives of this project is the search for a space for transversal discussion of the biological, historical, archaeological and anthropological approaches. Therefore, from a paleoepidemiological perspective, we are generating paleoparasitological, nutritional paleopathologies and lifestyles information from human remains, which come from diverse archaeological contexts and historical documentation. The aim of this presentation is to discuss the possibilities and limitations that we have found when we approached the study of health in Southern Patagonia in the context of an ecological-evolutionary frame.

**WS22-05** Gabriel LÓPEZ (Buenos Aires, Argentina)

**The Study of the archaeological record of Santa Rosa de Ls Pastos Grandes, Puna de Salta, Argentina, from an inclusive evolutionary perspective.**

**ABSTRACT:** Darwinian evolutionism presents different theoretical perspectives that can be applied to the study of the archaeological record. In this work, particularly, the *evolutionary ecology* is emphasized, for being a theoretical frame that allows to analyze human behavior from formal models, applicable to the interpretation of the archaeological evidence. The case of study corresponds to an area of the high lands of the Northwest of Argentina, Puna of Salta, Pastos Grandes, which average altitude is superior to 4000 m.snm. and the risk of unpredictable droughts is very high. The archaeological record is represented by evidence of high and low density, so much in surface as in layer. From models of *human behavioral ecology*, hypotheses of optimization and risk management are proposed for the study of archaeological materials, in special archaeofaunas and lithics. Nevertheless, the social aspects that articulate human behaviors are not left of side. These are considered from hypotheses derived from the mechanisms of the *Theory of the Cultural Transmission*. In this sense is emphasized the importance of including different darwinian perspectives that allow to understand the variability of human behavior from the archaeological record and different lines of evidence for the empirical application of this theoretical frame.

**WS22-06**

Alex MESOUDI (St Andrews, Scotland, UK)

**The experimental simulation of archaeological patterns: a contribution to a unified science of cultural evolution.**

**ABSTRACT:** In the last few years a number of evolutionary archaeologists (e.g. Lipo *et al.*, 1997; O'Brien & Lyman, 2000, 2003) have argued that certain archaeological patterns can be seen as the result of the *cultural transmission* of information and artifacts from individual to individual within populations and across successive generations. This has coincided with the development of experimental simulations of small-scale cultural transmission by certain evolutionarily-minded anthropologists and psychologists (e.g. Baum *et al.*, 2004; McElreath *et al.*, 2005; Mesoudi & Whiten, 2004). I shall argue that experimental methods such as these can potentially reveal important insights into the large-scale patterns observed in the archaeological record. Experimental simulations offer a number of advantages not available to archaeologists, such as the ability to 're-run' history more than once, the ability to isolate and control single variables, and the generation of complete data-sets. Used in conjunction with archaeological methods and computer simulations, such simulations can be used, for example, to support inferences regarding the precise cultural transmission mechanisms originally responsible for generating different archaeological patterns. Finally, cross-disciplinary work such as this is facilitated by the adoption of a unified Darwinian evolutionary approach to human culture (Mesoudi *et al.*, 2004, submitted).

**WS22-07**

Marcelo CARDILLO (Buenos Aires, Argentina)

**Temporal trends in the morphometric variation of the lithic projectile points during the middle Holocene of Southern Andes (Puna region). A coevolutionary approach.**

**ABSTRACT:** The focus of this paper is to discuss theoretical and methodological issues regarding the study of artifact's morphometric variation, which to some extent can be considered as an outcome of the cultural transmission process and replication error in the archaeological temporal and spatial scales. The methodology proposed here, is based on the application of metrical and non metrical techniques, as geometric morphometrics. The last one, allows us to perform shape and form analysis, treating these two variables independently one from the other. This procedure is almost impossible with traditional morphometric methods. Even when these two elements of artifact's design are highly related, it is analytically possible to discriminate each one, in order to search variation patterns related with cultural learning. This approach could be very useful to expose the traits that were more controlled by learning rules. From the analysis of an small sample of projectile points of the middle Holocene in the South Andes (Puna), we discuss here the potentials and limitations of both methods: the traditional and the geometric morphometrics. Under the later, the performed analysis suggest that

while some basic traits of the form and shape have changed in different ways through time, other have tended to endure. This pattern suggest a phylogenetic signal.

**WS22-08** Michael W. GRAVES (Hawaii, U.S.A.)

**Cultural transmission, lineages, and the evolution of social units: an example from the Hawaiian islands.**

**ABSTRACT:** Americanist archaeologists have adapted the seriation method to an evolutionary paradigm as a means to track cultural transmission. Cladistic analysis has been proposed for detailing cultural lineages. How do we join these two approaches in an evolutionary archaeology? Differential transmission of stylistic traits in space may lead to the evolution of distinct social groups; transmission of these same traits through time may result in related cultural lineages. As a consequence, archaeologists can now describe the evolutionary history of artifact sets in terms of the humans responsible for their creation. I describe an example from Hawai'i illustrating these methods with monumentally-scale ceremonial sites (or *heiau*) and associated with chiefs within traditional Hawaiian society. It is now possible to identify a cultural lineage linking chiefs who commissioned the construction of *heiau* at different monumental scales. At the same time, *heiau* similarity can be used to measure the geographic scale of chiefly interaction through time. When both lineage and interaction data are combined, the differential persistence of *heiau* and their associated leadership groups can be assessed in terms of how widely they spread at the expense of others, the range of natural and social environments in which they came to occupy, and how much labor could be garnered to support them.

**WS22-09** Michael J. O'BRIEN (Columbia, Missouri, U.S.A.)

**What is cultural phylogeny, and how do we recognize it?**

**ABSTRACT:** Phylogeny refers to the genealogical history of any group of things, be they organisms, manuscripts, languages, or anything else that changes over time by means of an ancestor passing on material to an offspring. Phylogeny should be an important issue in both anthropology and archaeology because of their focus on history, that is, on questions about how and why people and their cultural trappings change in certain ways over time. These are evolutionary questions, just as in biology questions about organismal change over time are evolutionary. Not surprisingly, some of the methods that have been devised to examine historical (evolutionary) questions in biology have significant value for the study of cultural phenomena. The transference of methods from biology to anthropology is based on a growing recognition that artifacts, language, and other aspects of culture are phenotypic features in the same way that shells, nests, and bones are phenotypic in the organismal world.

**WS22-10** Hernán J. MUSCIO (Buenos Aires, Argentina)

**Artifacts behaviours an multilevel selection: a synthetic darwinian paradigm in evolutionary archaeology is possible and convenient. Lessons from the archaeology of the Andean Puna of Argentina.**

**ABSTRACT:** Evolutionists always argued that artifacts and behaviors, in a non metaphorical sense, are extensions of human phenotypes. Accordingly, evolutionary archeologists always considered individual selection as one of many mechanisms to explain behavioral and technological evolution. But the dispersion of the several lines of Darwinian research debilitates the emergence of a mature program in Evolutionary Archaeology. If archaeology takes as a goal to contribute seriously in the empirical and theoretical domains to the scientific evolutionary research (as paleobiology does), then a programmatic unification is required. Indeed, Evolutionary Archaeology is ready for that.

Because Darwinian evolution requires heritability, the evolutionary research mandates the exposure of cultural phylogenies and transmission. The explanation of these phylogenies is a second step. At this instance, an unified Darwinian paradigm inclusive of the major selectionist approaches to human culture and behavior is a promising source for hypothesis building and modeling, but only if these lines

are subordinated to the broader temporal and spatial scales of the archaeological phenomena. In the core of the synthetic paradigm should stay the recognition of the theoretical nature of the evolutionary units. Indeed, artifacts -at whatever scale of definition- can be sorted in evolutionary units, such as species and clades are, in order to study their *macroevolutionary* dynamics. Also, is critical the recognition that human decision making processes, biased by genetic or cultural evolved algorithms are selective in nature, and produce population level patterns, including the emergence of new selective environments. Therefore, for the evolutionary archaeologists it is strategically convenient to abandon any unilevel reductionist framework, in favor of a multilevel selectionist one. This should be oriented to explain the phylogenetic and the mechanist sides of any evolutionary change archaeologically documented. This paradigm must be sensitive to the genetic and cultural biases controlling human selective behavior at infraindividual levels, and to the ecological basis of the selective processes at several scales, such as artifacts, individuals and groups. Also possible nested processes between different focal levels require theoretical and empirical research. The synthetic paradigm in Evolutionary Archaeology should be one in which history, as well as ecology, matters at properly archaeological scales. I exemplify this proposal discussing the ceramic evolution of the early human food production niches from the Puna of Argentina.

**WS22-11**

José Luis ESCACENA CARRASCO (Sevilla, Spain)  
Daniel GARCIA RIVERO (Sevilla, Spain)

**Evolutive cladogram of the "Bull skin motive" and its imitations in the archaic Mediterranean.**

**ABSTRACT:** Archaeology works reconstructing ancient histories and processes, in many cases on the basis of a much reduced range of material culture. Nevertheless, sometimes a bigger investment in research studies, which in many cases lead to an increase of data, is not correlated with a better explanation of the archaeological problem. In part, this could be due to the insufficiency of the methods being applied, specifically those which deal with the classification of archaeological materials. These and the chronological sequences that archaeologists construct on the basis of these materials are very important in interpretative studies. That is why the introduction of new methodological frameworks such as cladistics potentially allows us to open new perspectives and can help us to tackle some of the common problems of the traditional classification systems. In this paper this method is applied to some testimonies of the ancient Mediterranean –some of them with a ritual character- which seem to imitate the bull skin motive. Thus, the first object is the assessment of the method itself, and the second, an exploration of the phyletic relationships between these archaeological elements.

**WS22-13**

Agner FOG (Copenhagen, Denmark)

**A group selection model of territorial war, xenophobia and altruism in humans and other primates.**

**ABSTRACT:** A theoretical model of wars over group territories shows that behavioral traits like cooperative warfare, justice, altruism and outsider exclusion may have coevolved in higher primates and prehistoric man. The conditions for territorial war to be an effective mechanism of group selection are discussed. These conditions may have been present in tribal societies in prehistoric times but not in modern times. The geographic evolution of territories is illustrated with a computer simulation.

**WS22-14**

José Luis ESCACENA CARRASCO (Sevilla, Spain)

**Interdemic selection and Phoenician priesthood. Darwinian reflections from the southern Hispanic archaeoastronomy.**

**ABSTRACT:** The most widespread interpretation sees in the religion a mechanism of reproduction of the society and of its internal inequalities. The Marxist positions have reinforced this vision. But the above mentioned approach does not explain why a conduct that only would benefit to the elites is



present in all cultures. Also, for the general scorn of the historians towards the biology as instrument for his investigations, the study of religion has not known the evolutionary mechanisms linking faith and the reproduction of individuals and populations.

From the Darwinism I push back that the beneficiaries of the religious credence are alone the highest classes, because the hierarchical structuring of a community is related to the competition for the resources between groups, that is to say, for interdemic selection. I support, yet, that the Phoenicians used his priests to organize their own dispersion. This way, they raised the foundation of new enclaves from the astronomical knowledge of the clergy. Without its application, the emplacement of the colonies might have prevented from organizing the commerce of overseas. This explains the link between foundational acts and sacred oracles.

Such aspects are slightly studied, especially for not interpreting many archaeological documents as cosmic symbols or astronomical knowledge. But there has not been explained, especially, the interest of a community to nourish a subpopulation of memetic hipermutants (the priests) exempt from any other obligation.

**WS22-15** John ODLING-SMEE (Oxford, UK)

**Niche construction and gene-culture co-evolution.**

**ABSTRACT:** To varying extents all organisms choose, regulate, construct and destroy important components of their environments. In doing so they modify natural selection pressures in their environments, and thereby introduce feedback to evolution. My colleagues and I call these processes “niche construction”. In humans, cultural processes greatly amplify our species’ capacity for niche construction, and human cultural niche construction is largely responsible for human material culture. I use gene-culture co-evolutionary theory as a basis for exploring the contributions that cultural niche construction may have made to human evolution in the past, and may still be making today.

**WS22-16** Diego RIVERO (Córdoba, Argentina)  
Matias E. MEDINA (Córdoba, Argentina)

**Environmental change, human predation and foraging efficiency in the Central Hills of Argentina.**

**ABSTRACT:** The maintenance of subsistence system based on high ranking and gregarious artiodactyls but, delimited to upper mountain grassland range are evaluated in this paper. A simulation model with two significant prediction is presented: a) because of biogeographical isolation this resource are highly sensitive to human predation; and b) a narrow diet based on big game cannot be maintainable beyond Early Holocene (10000-6000 BP).

To test this hypothesis archaeofaunal evidence proceeding from four Holocene Central Hills (Argentina) archaeological sites is analyzed. Some of them have been excavated by the authors – Arroyo El Gaucho 1 (Pampa de Achala, Córdoba) and Puesto La Esquina 1 (Pampa de Olaen, Córdoba)-, but assemblages from classical archaeological sites of the region –Intihuasi (Sierras de San Luis, San Luis) and Ongamira (Sierras Chicas, Córdoba)- were reanalyzed too.

According to Diet Breath Model higher ranking resources will be exploited providing they are encounter. Consequently, it is assumed that its frequency in archaeological record reflects its abundance in local landscape. This way, the temporary variability in taxonomic abundance, richness, age profile and processing intensity marks along the Holocene are analyzed.

To finish, the results are related to other archaeological evidence indicating changes in mobility, technology, increase importance of gathering and the establishment of agricultural practices on the Late Holocene.

**WS22-17** Ceri SHIPTON (Cambridge, UK)

**Cognition and communication in the Acheulean of the Hunsgi-Baichbal Basin, Karnataka, India.**

**ABSTRACT:** Following the premise of the Social Brain Hypothesis, that there is a fundamental link between sociality and cognition in humans, it is proposed that the social interaction is the smallest unit of transmission for the evolution and ontogeny of cognition and culture. This study aims to identify aspects of Acheulean sociality and cognition and patterns therein.

Experimental, core flaking data and spatial patterning are used to demonstrate systematic reduction strategies at Isampur Quarry, indicative of the propensity of Acheulean hominins to imitate one another.

Using a microscribe digitizer, three-dimensional morphological data is collected on c. 500 bifaces from 10 sites in the Hunsgi-Baichbal Basin. Site-wise standardised forms of Biface morphology are used to determine degrees of relatedness among sites.

To determine biface refinement, variables relevant to the hominins and their goals in biface manufacture are identified. Site-wise differences in biface refinement and raw material transfer distances, illustrate differences in dexterity and planning capacity among hominins, which in turn have implications for linguistic abilities.

It is proposed that the homogeneity of the Acheulean masks great changes in communication and cognition among Pleistocene hominins, only subtly manifested in lithic technology.

**WS22-18**

José Luis LANATA (Buenos Aires, Argentina)

**The last frontier. The peopling of South America from an invasive species perspective.**

**ABSTRACT:** In the human dispersal process, South America is the last continental mass to which the Homo sapiens arrived. Anthropology, linguistics, paleoanthropology and archaeology have discussed it from their own data. In our case we adopt an invasive specie perspective to model tempo and mode of human dispersal using demographic models. South American peopling simulations are presented based on the ecoregions available until 10 kybp, by considering a fast invasive process and a slow one. The results show that the tempo of the dispersal would not be very different among both situations, producing the same metapopulations under both circumstances. Comparing with the available archaeological data seems not to belong together the tempo of the dispersion that is of the pattern, while the way of the same one agrees with the data paleontológicos. We discuss our proposal in connection with other available models

**WS22-19**

Jamshid TEHRANI (London, UK)  
Mark COLLARD (Canada)

**Cladistic and ethnographic analyses of craft transmission in rural Iran: towards an integrated study of cultural diversity and change.**

**ABSTRACT:** Anthropologists and archaeologists have a long-standing interest in the evolution of cultural diversity and how it relates to linguistic, genetic and geographical patterns. Current debates regarding these issues have focused on the extent to which cultural assemblages arise by ancestral populations splitting into new ones ("phylogenesis") or through borrowing and blending among neighbouring populations ("ethnogenesis"). Here, we aim to further advance empirical research in this field by reporting the results of our recent case study of craft transmission in rural Iran.

The case study investigated relationships among different tribal groups' craft traditions by employing a novel and experimental combination of research methods adopted from evolutionary biology and social anthropology. A cladistic analysis of textile-related craft traits indicated that both branching and blending influenced the evolution of Iranian tribal craft traditions. This mixed pattern conformed to the ethnographic data on craft learning gathered during fieldwork in rural Iran, which indicated that although weavers initially learn their skills from their mothers, many subsequently adopt traits from external sources through a variety of media. However, subsequent analyses demonstrated that the

latter do not have a uniform impact on the transmission of all Iranian craft traits, and vary in different regions and historical periods

**WS22-20**

Herbert D. G. MASCHNER (Pocatello, Idaho, U.S.A.)  
Bern MARLER (Pocatello, Idaho, U.S.A.)

**Extended phenotypes, evolutionary psychology, complex systems and cultural transmission: why a unified darwinian archaeology is not only difficult, but undesirable as well.**

**ABSTRACT:** We find it odd that those who argue that artifacts are extensions of the human phenotype have never recognized that if this is true, then by default it must affect the fitness of the manufacturer, not the fitness of the artifact. We find it surprising that those who study the evolution of war have never recognized that the evolution of cooperation is the key evolutionary trait that made war possible, and evolutionary psychology is critical to its understanding. It is further interesting that complex systems, the most analytical and least humanistic of the potential Darwinian analyses, is now contributing more to our understanding of human behavior than studies of kin-selection and evolutionary ecology. These discrepancies are interesting for one fundamental reason: while Darwin's theory of evolution by natural selection is broad and encompassing, the use of that theory in archaeology has been myopic and particularistic. Using examples from the Aleutian Islands of Alaska, we will demonstrate that the reason there are so many different approaches to Darwinism in archaeology is not because we have different understandings of the concepts, but because it is being applied to a suite of different problems that require different approaches. Ten years since the publication of *Darwinian Archaeologies*, this is even truer than it was then

**WS22-22**

Stephen J. LYCETT (Cambridge, UK)

**From Linnaean taxonomy to a darwinian phylogeny of palaeolithic technologies: implications for the evolutionary analysis of culture.**

**ABSTRACT:** The roots of an evolutionary approach to the archaeological record can be traced to the 'culture historical' approaches of the early 20<sup>th</sup> century, despite the lack of a specific 'evolutionary' theoretical or analytical framework being employed by these scholars. The relatively recent introduction of an evolutionary theoretical framework for archaeological analysis explicitly transforms archaeological typologies from Linnaean taxonomies, where evolution is not automatically implied, to Darwinian phylogenies, where issues of ancestry, descent, inheritance, transmission, and the creation of lineages are brought to the fore. However, such shift in emphasis also creates a need for clear statements regarding units of analysis (what is being transmitted and inherited?), what is evolving, and how these relate to populations of artefact manufacturers. This paper will employ analysis of Palaeolithic technologies as a case study to examine these issues, and considers the implications of transforming typological taxonomies into explicit phylogenies for existing archaeological frameworks. The paper also reflects upon the implications of these analyses for issues relating to the patterns created by phylogenetic analysis of technological units, and questions of 'culture' more generally.

**WS22-23**

Felix RIEDE (Cambridge, UK)

**Niche construction applied: triple-inheritance insights into the post-glacial re-colonization of southern Scandinavia.**

**ABSTRACT:** Darwinian Archaeology today is in a difficult, but potentially rewarding situation: Strongly criticized by many archaeologists and ignored by most biologists, evolutionary-minded archaeologists have to juggle and reconcile two diametrically opposed views of the world. However, some biologists acknowledge that cultural behaviour can have significant long-term effect on the biological make-up of a species and the 'niche construction' or triple-inheritance model has been designed to integrate, on an even footing, the biological, ecological and cultural dynamics of human evolution.

The niche construction approach has inherent value to Darwinian archaeologists as it embraces not only technological but also ecological aspects of human evolution. Furthermore, it acknowledges the impact of the transmission of social knowledge on other levels of selection (i.e. the ecological and the genetic). The niche construction model has been applied to a case study of the pioneer post-glacial re-colonization of Southern Scandinavia (c. 15 – 13kya). I argue that while it is perhaps important to think about a 'unified paradigm' for Darwinian Archaeology it is as important if even more so to demonstrate to other archaeologists as well as to biologists that archaeology has much to say regarding the evolution of modern human biological and cultural diversity.

**WS22-24** Kristen J. GREMILLION (Ohio State, U.S.A.)

**Two faces of Darwin: the complementarity of evolutionary archaeology and human behavioral ecology.**

**ABSTRACT:** Divergent positions on the application of Darwinism lie at the heart of the divide between human behavioral ecology, with its focus on flexible responses to the environment, and evolutionary archaeology, which analyzes cultural transmission over multiple generations. Although both approaches address all four of Tinbergen's types of explanation to some degree, behavioral ecology targets functional-adaptive causes of behavior, whereas evolutionary archaeology emphasizes the evolutionary history of cultural traits. Evolutionary archaeology and archaeological behavioral ecology share a fundamentally Darwinian set of core assumptions and both must contend with the limitations of an incomplete evidential record. Both approaches have much to offer, and can coexist peacefully if their division of labor is accepted and understood.

**WS22-25** Aimée PLOURDE (London, UK)

**Exploring the relationship between individual and group selection: an example from the study of prestige goods.**

**ABSTRACT:** Great gains have been made in evolutionary archaeology through the employment of selectionist reasoning to examine behavior at the individual level, adopting insights from evolutionary psychology and human behavioral ecology, and to understand the transmission of cultural variants. The study of selection at the group level and the evolution of social institutions have also begun to benefit from adopting this perspective more rigorously. However, while selectionist reasoning underlies all of these pursuits, a unified paradigm has not emerged in part because it is often unclear how selection at each of these levels – the individual, the cultural variant, and the social group – impacts or interacts with the others. I suggest that a closer examination of the connections between differing levels of selection is needed. I will use the role of prestige goods in the formation of sociopolitical hierarchy as an example to illustrate this point. I theorize that prestige goods' value arose from their initial function as honest (costly) signals of individual skill or knowledge, in response to increasing levels of prestige competition in early human society. Prestige goods' function at the individual level then provided the mechanism for the role that they later played in group selection.

**WS22-27** John DARWENT

**Phylogenies of thule harpoon components from the north american high arctic.**

**ABSTRACT:** The use of cladistics for reconstructing phylogenies of archaeological phenomena is limited by scale. To demonstrate how scale, or the level of the units of analysis, can affect phylogenetic reconstruction I use late prehistoric- to historic-period Thule harpoons (ca. A.D. 1100–1900) from the High Arctic of Alaska, Canada and Greenland as an example. A harpoon is a multi-component hunting implement that typically consists of an endblade, harpoon head, foreshaft, socket, shaft, line, tension piece, and ice pick, and was used primarily for sealing but also to hunt walrus and whale. Although these components are assembled into one harpoon, and thus changes in one part might require changes in another, each component also can change separately from one another. In other words, the components can evolve independently. Using High Arctic harpoons, this analysis underscores the necessity of constructing phylogenies for the smaller-scale components of a composite artifact rather than at a whole-object level

**WS22-29** Sibel KUSIMBA (Illinois, U.S.A.)

**The archaeology of ethnic boundaries and mosaics: an ecological and evolutionary perspective.**

**ABSTRACT:** Archaeology and anthropology have approached the problem of ethnic identities, ethnic boundaries, and the relationship between ethnicity and material culture from a variety of perspectives. The work of Barth is an explicitly ecological perspective on the problem of ethnic interactions and boundaries. This paper will evaluate and critique the benefits and limits of ecological theory as an analog to understanding ethnic interactions, using archaeological examples from Tsavo, Kenya and Mount Elgon, Kenya, two areas where multiethnic societies are reflected in the archaeological and ethnographic records.

**WS22-31** Karen JOHNSON (Michigan, U.S.A.)

**The cognitive domain of artifacts: ontogeny, phylogeny and human cultural learning strategies.**

**ABSTRACT:** Two features that mark humans as a unique species are the creation of artifacts and processes of sociogenesis that sustain cultural knowledge over time. This paper considers the architecture of the human mind that affords such features by reviewing current research and theories in cognitive psychology. From here, this paper turns to a question of the relationship between ontogeny and phylogeny: can the development of artifact understanding in children help inform an archaeological account of the emergence of artifacts in hominid history? Though difficult, an appreciation of children's knowledge of artifacts may help in the attribution of particular cognitive capacities of hominid species as seen through artifact types. Additionally, an ontogenetic perspective provides insight into how human cultural processes—aided by the creation and organization of artifacts—operate on a time-scale that is categorically different from evolutionary processes.

**WS22-32** Mark COLLARD (Canada)  
Briggs BUCHANAN (Vancouver, Canada)

**Testing models of early paleoindian adaptation using biological phylogenetic techniques.**

**ABSTRACT:** We examine Early Paleoindian technological traditions using cladistic tree-building techniques from Biology to reconstruct a cultural phylogeny. Projectile point data collected from 26 Early Paleoindian (ca. 11,500-10,500 BP) assemblages recovered from sites located across North America are used in the construction of cladograms. Twelve quantitative, size-corrected characters are coded for cladistic analysis using the gap weighting coding technique. Outgroup selection uses the oldest minimum radiocarbon age associated with an assemblage in the analysis. The resulting cladograms are analyzed using permutation tail probability tests and goodness-of-fit statistics (consistency and retention indices) to examine the degree to which the evolution of point form was a branching process or was blurred through horizontal transmission. The results of this research, derived from a continental-scale database, allow questions concerning routes of migration into North America, subsequent population movements and interaction, and adaptation to regional environments to be addressed

**WS22-33** David BULBECK

**Darwinian evolutionary insights into pottery as an ethnic marker.**

**ABSTRACT:** In archaeology, the theoretical explanation of variation in pottery decorations has focused on Information Theory, combined more recently with Agency Theory (Bacus 2004). This paper considers whether the resulting insights can be cast within the framework of Darwinian cultural evolution, examining the specific case of protohistoric and early historical pottery in Luwu, South Sulawesi, Indonesia (Bulbeck and Caldwell 2000). A long-lived contrast between decorated pottery in

the north and generally plain pottery along the central coast correlates with different language stocks in these two areas. There are additional short-lived (c. 200 years) phenomena of: (a) the dissemination of “soft pottery”, associated with the establishment of a complex chiefdom in Luwu; and (b) idiosyncratic decorative repertoires linked to immigrant groups. The predictions derivable from the hypotheses of biased transmission based on similarity (Boyd and Richerson 2005: Chapter 6), and the niche-construction statements on cooperation and conflict (Odling-Smee *et al.* 2003:298-301, 359-62), are tested against the Luwu data.

References:

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- Boyd, R. and P.J. Richerson. 2005. *The Origin and Evolution of Cultures*. Oxford: Oxford University Press.
- Bulbeck, D. and I. Caldwell. 2000. *Land of Iron: The Historical Archaeology of Luwu and the Cenrana Valley. Results of the Origin of Complex Society in South Sulawesi Project (OXIS)*. Hull: University of Hull Centre for South-East Asian Studies.

**WS22-34**

Mark ALDENDERFER (Tucson, Arizona, U.S.A.)

**The trading zone in evolutionary archaeology: na alternative to a unified darwinian paradigm.**

**ABSTRACT:** Scientific knowledge of the past not only develops from unity, but also grows through diversity and challenge. What appear to be incommensurate paradigms may at times be able to share data, concept, and method in creative and useful ways. The “trading zone,” a concept developed by philosopher of science Peter Galison, is the intellectual locus in which competing paradigms may profitably benefit from one another. In this paper, I outline two domains of evolutionary archaeology which may benefit from seeking partners in the trading zone: 1) learning processes and changes in attribute frequency; and 2) parental investment and the locus of selection.

## Session WS23

*Friday, 8 September 2006 / Vendredi, 8 Septembre 2006*

*Anfiteatre 4, Faculty of Law, Lisbon University  
Amphithéâtre 4, Faculté de Droit, Université de Lisbonne*

### **Raw material supply areas and food supply areas Integrated approach of the behaviours**

### **Aires d'approvisionnement en matières premières et aires d'approvisionnement en ressources alimentaires Approche intégrée des comportements**

*organized by / organisé par*

- Marie-Hélène MONCEL** Institut de Paléontologie Humaine, Paris, France – [moncel@mnhn.fr](mailto:moncel@mnhn.fr)  
**Anne-Marie MOIGNE** Centre Européen de Recherches Préhistoriques, Tautavel, France – [Anne-Marie.Moigne@tautavel.univ-perp.fr](mailto:Anne-Marie.Moigne@tautavel.univ-perp.fr)  
**Marta ARZARELLO** Università di Ferrara, Dipartimento di Scienze Geologiche e Paleontologiche, Ferrara, Italy – [paleomarta@hotmail.com](mailto:paleomarta@hotmail.com)  
**Carlo PERETTO** Università di Ferrara, Dipartimento delle Risorse Naturali e Culturali, Ferrara, Italy – [me4@unife.it](mailto:me4@unife.it)

### **SESSION'S ABSTRACT**

Multidisciplinary analyses of the Palaeolithic sites provide more and more information on the origin of resources exploited by the occupants of a site and the sweep of land they move on in order to meet their needs of both food and raw materials. The overlapping of these two types of supply areas may greatly differ according to the situations.

In this workshop we would like first to draw up the state of knowledge in this field and then look at the evidences in their settings, in considering, for instance, the climate or season, the topography, the availability and quality of the raw materials, the wealth in big or small game (and in potential vegetal food), the site function, etc. Discussions shall aim at working out what specifically concerns the human behaviour, among the range of possible responses to the immediate vital requirements, given the environmental constraints.

Signs of inconsistency, in the course of time, between shifting environmental conditions and stable behaviours or inversely between changing behaviours and apparently stable conditions, may feed the debates regarding the traditions, the knowledge or ability exchanges, the people movements. Well documented studies may introduce socio-cultural notions, allowing to eventually making out particular behaviours that refer to the idea of feat (hunting) or masterpiece (implement) and that involve, among the human group, much wider interests than just the matter of day to day requirements.

### **RÉSUMÉ DE LA SESSION**

Les analyses pluridisciplinaires des gisements paléolithiques apportent de plus en plus d'informations sur l'origine des ressources exploitées par les occupants d'un site et sur l'amplitude des déplacements effectués pour subvenir tant aux besoins alimentaires qu'aux besoins en matériaux. Le recoupement des aires d'approvisionnement répondant à ces deux types de besoins peut varier fortement en fonction des situations.

Dans ce workshop nous souhaitons tout d'abord établir l'état des connaissances en ce domaine, puis envisager les différents cas de figure dans leur contexte, en considérant, par exemple, le climat ou la saison, la topographie, la disponibilité et la qualité des matières premières, la richesse en gros ou petit gibier (et en aliments végétaux potentiels), la fonction du site, etc. Les discussions tenteront de dégager ce qui, dans l'éventail des réponses possibles aux besoins vitaux immédiats, en fonction des contraintes environnementales, relève plus spécifiquement du comportement humain.

Les indices de décalage, au cours du temps, entre conditions environnementales variables et comportements stables, ou à l'inverse entre comportements différents dans des conditions apparemment stables, contribueront à enrichir la réflexion relative aux traditions, aux échanges de savoirs ou d'objets, aux mouvements de populations. Les études les mieux documentées pourront déboucher sur des notions d'ordre socioculturel, en permettant de discerner éventuellement des comportements qui relèvent de l'exploit (gibier) ou de l'exception (outil) et dont les implications, au sein du groupe humain, dépassent largement la question de subsistance au quotidien.

## SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00            **Opening / Ouverture**

09:00-09:20    Isidro TORO-MOYANO(Orce, Spain)  
Sophie GREGOIRE (Tautavel, France)  
Beatriz FAJARDO (Orce, Spain)  
Henry de LUMLEY (Paris, France)

**WS23-01**      **Origine des matières premières des industries lithiques du Pléistocène inférieur des sites de Barranco León et Fuente Nueva 3 à Orce (Bassin de Gaudix-Baza, Andalousie).**

09:20-09:40    Florent RIVALS (Tautavel, France)  
Anne-Marie MOIGNE (Tautavel, France)

**WS23-02**      **Saison d'occupation et stratégies de chasse au pléistocène moyen, l'exemple de la Caune de l'Arago (Tautavel, Pyrénées-Orientales).**

09:40-10:00    Sophie GREGOIRE (Tautavel, France)  
Anne-Marie MOIGNE (Tautavel, France)  
Deborah BARSKY (Tautavel, France)  
Henry DE LUMLEY (Paris, France)

**WS23-03**      **Gestion et sélection des ressources au sein d'un territoire. Un exemple de comportement économique au Paléolithique inférieur dans le sud de la France.**

10:00-10:20    Agnès LAMOTTE (Lille, France)  
Jacques FABRE (Amiens, France)

**WS23-04**      **La circulation du silex des sites du Paléolithique inférieur de Cagny-la-Garenne, Cagny-l'Épinette et de la Ferme de l'Épinette (Bassin de l'Avre, Somme, France).**

10:20-10:40    A. MGELADZE (Tbilissi, Georgia)



Marie Helène MONCEL (Paris, France)  
 N. TOUSHABRAMICHVILI (Tbilissi, Georgia)  
 A. VEKUA (Tbilissi, Georgia)  
 A. MOUSKELISHVILI (Tbilissi, Georgia)  
 J-CI MISKOVSKY  
 David LORDKIPANIDZE (Tbilissi, Georgia)

**WS23-05** **Une occupation spécialisée acheuléenne en haute montagne: le site de Tsona (sud du Caucase, Géorgie).**

10:40-11:00 Pascal DEPAEPE (Amiens, France)

**WS23-06** **Raw material supply during Middle Palaeolithic in south-east of the Bassin parisien (north France).**

11:00-11:20 Dominique CLIQUET (Caen, France)

**WS23-07** **Approvisionnement en matières premières et en ressources alimentaires en Normandie (France) entre le stade 7 et le stade 3.**

11:20-11:40 Nathalie MOLINES (Rennes, France)  
 Jean Laurent MONNIER (Rennes, France)

**WS23-08** **Paléogéographie, matières premières et territoires exploitables dans l'Ouest de la France au Pléistocène moyen.**

11:40-12:00 Gilles HUGUENIN (France)  
 Agnès LAMOTTE (Lille, France)

**WS23-09** **Approvisionnement et circulation des matières premières minérales au Paléolithique moyen en Haute-Saône : premiers résultats.**

12:00-12:20 L. BOURGUIGNON (Les Eyzies-de-Tayac, France)  
 P. BIDART (Les Eyzies-de-Tayac, France)  
 I. ORTEGA (Les Eyzies-de-Tayac, France)  
 Alain TURQ (Les Eyzies-de-Tayac, France)  
 Luc DETRAIN (Les Eyzies-de-Tayac, France)  
 André MORALA (Les Eyzies-de-Tayac, France)

**WS23-10** **Du territoire proche au territoire lointain : différences ou similitudes comportementales à partir des stratégies d'exploitations géologiques des matières premières lithiques au Paléolithique moyen (l'exemple de Combe Brune 1 et de l'Abri du Musée, Dordogne, France).**

12:20-12:40 Lilliane MEIGNEN (Valbonne, France)  
 Sandrine COSTAMAGNO (Toulouse, France)  
 C. BEAUVAL (Bordeaux, France)  
 L. BOURGUIGNON (Les Eyzies-de-Tayac, France)  
 B. VANDERMEERSCH (Bordeaux, France)  
 Bruno MAUREILLE (Talence, France)

**WS23-11** **Gestion des ressources lithiques au Paléolithique moyen dans une halte de chasse spécialisée sur le Renne: Les Pradelles (Marillac, Charente).**

12:40-13:00 Alain TURQ (Les Eyzies-de-Tayac, France)  
 L. BOURGUIGNON (Les Eyzies-de-Tayac, France)  
 J. Ph. FAIVRE (Les Eyzies-de-Tayac, France)

- WS23-12** L'apport de l'analyse des matières premières lithiques dans la compréhension du comportement humain a travers quelques exemples du nord-est aquitain.
- 13:00-14:30 **Lunch / Déjeuner**
- 14:30-14:50 Jean-Paul RAYNAL (Talence, France)  
Marie Hélène MONCEL (Paris, France)  
P. FERNANDES (Talence, France)  
Carmen SANTAGATA (Talence, France)  
Jean-Luc GUADELLI (Talence, France)  
P. FERNANDEZ (Lyon, France)  
Marylène PATOU-MATHIS (Paris, France)
- WS23-13** Espace minéral et espace de subsistance au Paléolithique moyen dans le Sud du Massif Central en France: les sites de Sainte-Anne I (Haute Loire) et de Payre (Ardèche).
- 14:50-15:10 Marta ARZARELLO (Ferrara, Italy)  
Stefano BERTOLA (Ferrara, Italy)  
Federica FONTANA (Ferrara, Italy)  
Antonio GUERRESCHI (Ferrara, Italy)  
Carlo PERETTO (Ferrara, Italy)  
Antonio ROCCI RIS (Torino, Italy)  
Ursula THUN HOHENSTEIN (Ferrara, Italy)
- WS23-14** Aires d'approvisionnement en matières lithiques et en ressources alimentaires dans les niveaux moustériens et épigravettiens de l'Abri Tagliente (Vérone, Italie): une dimension «locale».
- 15:10-15:30 M. D. GARCÍA-ANTÓN TRASSIERRA (Tarragona, Spain)  
M. MOSQUERA MARTINEZ (Tarragona, Spain)
- WS23-15** A preliminary approach to the selection and supply of lithic raw materials at the Middle Pleistocene occupations of Gran Dolina Level TD10-1 (Sierra de Atapuerca, Burgos, Spain).
- 15:30-15:50 Maria Gema CHACÓN NAVARRO (Tarragona, Spain)  
M. C. FERNÁNDEZ-LASO (Tarragona, Spain)  
M. D. GARCÍA-ANTÓN TRASSIERRA (Tarragona, Spain)
- WS23-16** Level K and L from Abric Romani (Barcelona, Spain): procurement resources and territory management in shorts occupations during the Middle Palaeolithic.
- 15:50-16:10 Leticia MENÉNDEZ GRANDA (Tarragona, Spain)  
Jordi ROSELL I ARDÈVOL (Tarragona, Spain)  
Marie Helène MONCEL (Paris, France)
- WS23-17** Comparative Analysis between Level G of Las Fuentes de San Cristóbal (Pre-pyrenees of Huesca, Spain) and Level Ga of Payre (Ardèche, France): a similar neanderthal territorial behavior in two different chronological contexts?
- 16:10-16:30 Harun TAŞKIRAN (Ankara, Turkey)
- WS23-18** Supply areas of Karain cave in southwest Anatolia.

16:30-16:50 Andrzej WIŚNIEWSKI (Wracow, Poland)

**WS23-19** Raw Material and Technology in Central European Early Middle Palaeolithic.

16:50-17:10 Marcel OTTE (Liège, Belgium)  
Fereidoun BIGLARI (Teheran, Iran)

**WS23-20** Aire d'approvisionnement du Zagros au Paléolithique moyen.

17:10-17:30 Moustapha SALL (Dakar, Senegal)

**WS23-21** Raw materials, agricultural techniques and harvest of molluscs in Diola zone (Senegal).

17:30-18:30 Discussion

## ABSTRACTS / RÉSUMÉS

**WS23-01** Isidro TORO-MOYANO(Orce, Spain)  
Sophie GREGOIRE (Tautavel, France)  
Beatriz FAJARDO (Orce, Spain)  
Henry de LUMLEY (Paris, France)

**Origine des matières premières des industries lithiques du Pléistocène inférieur des sites de Barranco León et Fuente Nueva 3 à Orce (Bassin de Gaudix-Baza, Andalousie).**

**RESUME:** Lors de l'étude pluridisciplinaire des sites de Barranco León et Fuente Nueva III à Orce, réalisée dans le cadre d'une collaboration Franco-espagnole, nous avons pu mettre en évidence les zones d'approvisionnement en matières premières exploitées pour la réalisation des industries.

L'assemblage lithique de Barranco León est composé de 27,5 % de calcaire et de 72,5 % de silex. Celui de Fuente Nueva 3 de 51 % de calcaire, de 48,8 % de silex et de 0,2 % de quartzite.

Les catégories pétrographiques de calcaire et de silex utilisés sur les deux sites, distants l'un de l'autre d'environ 2 km, sont sensiblement identifiés.

A Barranco León, trois catégories de calcaire et quatre de silex, distingués sur des critères macroscopiques ont été identifiés.

A Fuente Nueva 3, c'est cinq catégories de calcaire, six de silex et une de quartzite qui ont pu être individualisés.

Afin de déterminer la provenance éventuelle de ces matériaux, et notamment des silex, une étude de caractérisation pétrographique en lame mince a été entreprise sur le matériel lithique en procédant par micro-carottages de pièces représentatives de chacun des faciès reconnus.

En parallèle à ces travaux, des prospections des formations jurassiques au sud des sites ont permis d'identifier et d'échantillonner plusieurs gîtes à silex offrant des matériaux de bonne qualité, macroscopiquement semblables aux silex taillés par les hominidés. Ces gîtes sont situés par rapport aux sites, à des distances allant de 1 à 10 km. Plusieurs zones d'affleurement de ces mêmes roches, en dépôts secondaires d'alluvions et de colluvions, ont fait l'objet d'une attention toute particulière du fait de leur proximité encore plus importante avec les sites préhistoriques.

L'analyse des microfaciès siliceux en lame mince démontre une appartenance des silex archéologiques à des formations de calcaire marin formé en mer profonde, souvent oolithique, correspondant aux formations jurassiques échantillonnées. (...)

**WS23-02** Florent RIVALS (Tautavel, France)

Anne-Marie MOIGNE (Tautavel, France)

**Saison d'occupation et stratégies de chasse au pléistocène moyen, l'exemple de la Caune de l'Arago (Tautavel, Pyrénées-Orientales).**

**RÉSUMÉ:** Pour les gisements du Pléistocène moyen, les données archéozoologiques sur le type d'acquisition du gibier (charognage, chasse opportuniste, chasse sélective) sont peu nombreuses. Peu de gisements ont pu être étudiés selon une approche archéozoologique essentiellement pour deux raisons. Tout d'abord parce que l'étude du mode d'acquisition des herbivores par l'homme nécessite d'avoir un échantillon de taille importante. Ensuite, car il est primordial que la provenance stratigraphique des vestiges soit parfaitement définie et bénéficie d'unités archéostratigraphiques bien repérées.

Le site archéologique de la Caune de l'Arago remplit ces deux conditions. Les niveaux E, F et G, corrélés au stade isotopique 12, correspondent à des occupations humaines. Pour ces niveaux, l'étude de la structure des populations abattues (âge et sex-ratio) et de la saisonnalité de la capture a été réalisée pour l'argali (*Ovis ammon antiqua*) et le tahr (*Hemitragus bonali*). La saison de chasse a été déterminée par l'étude de l'éruption et de l'usure des dents mais aussi par l'analyse des micro-traces d'usure dentaire. L'abondance de certaines catégories de la population (mâles/femelles, jeunes/adultes) ne résulterait donc pas d'un choix de l'homme. Elle pourrait être liée à la saison à laquelle ces animaux ont été tués. Pour le sol F, par exemple, des hardes de femelles et de jeunes argalis ont été abattues au printemps et en été, au moment où les mâles vivent isolés et séparés de la harde. Dans ce cas la saison de chasse permet d'expliquer la faible proportion de mâles adultes dans l'échantillon.

L'étude combinée de la structure des populations et de la saison de chasse a permis de proposer une activité de chasse de type opportuniste sur l'argali (*Ovis ammon antiqua*) et le tahr (*Hemitragus bonali*) pour plusieurs occupations de la Caune de l'Arago.

L'environnement joue donc un rôle fondamental dans l'étude des stratégies de chasse et notamment la saison de capture du gibier qui est un paramètre à ne pas négliger dans les études archéozoologiques.

**WS23-03**

Sophie GREGOIRE (Tautavel, France)  
Anne-Marie MOIGNE (Tautavel, France)  
Deborah BARSKY (Tautavel, France)  
Henry DE LUMLEY (Paris, France)

**Gestion et sélection des ressources au sein d'un territoire. Un exemple de comportement économique au Paléolithique inférieur dans le sud de la France.**

**RESUME:** Le site de la Caune de l'Arago à Tautavel bénéficie depuis de nombreuses années d'études pluridisciplinaires appliquées à la succession des niveaux archéologiques dégagés au cours des fouilles.

La combinaison des résultats de ces études débouche sur des interprétations de plus en plus précises des comportements et des modes de vie à l'origine des accumulations anthropiques.

Les matières premières lithiques et les vestiges paléontologiques contribuent grandement, en association avec d'autres paramètres, à définir les zones d'approvisionnement directement liées aux activités quotidiennes ou aux déplacements saisonnier au sein d'un territoire des groupes anciens du Paléolithique.

La diversité des niveaux d'occupations identifiés sur ce site en grotte, exceptionnellement riche, donne accès à des informations très différentes, selon les niveaux, au préalable individualisés de manière stricte. Ces informations témoignent de plusieurs modalités d'occupation du site induites probablement par des activités diverses nécessitant globalement l'exploitation du même territoire mais de manière très variée.

Nous proposons de fournir plusieurs schémas de gestion des ressources naturelles identifiés à la Caune de l'Arago, et tenterons de comprendre quelles sont les raisons de ces variations de comportement au sein d'un territoire qui reste inchangé.

**WS23-04**

Agnès LAMOTTE (Lille, France)

Jacques FABRE (Amiens, France)

**La circulation du silex des sites du Paléolithique inférieur de Cagny-la-Garenne, Cagny-l'Épinette et de la Ferme de l'Épinette (Bassin de l'Avre, Somme, France)**

**RESUME:** L'achèvement d'un Projet Commun de Recherche sur la Géoarchéologie du silex du nord-ouest de la France, mené sur 4 ans, nous permet de renseigner de nombreux aspects comportementaux des hommes du Paléolithique inférieur vis à vis de la matière première minérale. Ainsi, les premières données ou suppositions concernant l'acquisition et l'approvisionnement du silex du crétacé supérieur, se clarifient depuis le début du projet. L'identification des faciès de silex étant bien établie, nous sommes en mesure de les comparer avec ceux présents dans les séries lithiques. Ils mettent entre autre, en évidence, la réalité d'un approvisionnement local. La présence rare, de faciès micro-régionaux et souvent de meilleur qualité que ceux existants sur place, contribuent à enrichir le débat concernant la motivation responsable de la circulation de la matière première : motivation qualitative ou quantitative des tailleurs, parcours occasionnel de chasseurs-cueilleurs, faits culturels....

**WS23-05**

A. MGELADZE (Tbilissi, Georgia)  
 Marie Helène MONCEL (Paris, France)  
 N. TOUSHABRAMICHVILI (Tbilissi, Georgia)  
 A. VEKUA (Tbilissi, Georgia)  
 A. MOUSKELISHVILI (Tbilissi, Georgia)  
 J-CI MISKOVSKY  
 David LORDKIPANIDZE (Tbilissi, Georgia)

**Une occupation spécialisée acheuléenne en haute montagne: le site de Tsona (sud du Caucase, Géorgie).**

**RESUME:** Le site de Tsona est localisée au pied du Grand Caucase, sur son versant sud, dans la région de Djava en Shida Kartli (Géorgie centrale). Cette grotte est située en haute altitude (2100m) et elle a livré deux niveaux rattachés à de l'Acheuléen dont l'âge précis n'a été estimé que sur des bases archéologiques (fin de l'acheuléen d'après A. Kalandadze, 1960, 1961 ; Acheuléen final d'après D. Toushabramishvili, 1984), ou par corrélation avec un des niveaux de la grotte de Koudaro I (environ 350 000 ans) qui est proche de Tsona.

Les deux niveaux ont livré en grande quantité des restes d'Ursidés mais quelques restes de Cervus elaphus, Capreolus capreolus, de Capra caucasica et de Bison semblent être des témoignages de l'activité anthropique. La localisation de la grotte en haute altitude et les caractères de l'assemblage lithique composé uniquement d'outillages apportés (bifaces, hachereaux, outils sur éclats) font penser à des traces d'occupations spécialisées, peut-être de courte durée dans le cadre d'une gestion locale de l'environnement. Les matières premières sont locales, représentées surtout par de l'argilite, du silex, du schiste et diverses roches volcaniques

**MOTS-CLES:** Achéuleen, Paléolithique inférieur, Grand Caucase, bifaces, hachereaux, occupation spécialisée.

**WS23-06**

Pascal DEPAEPE (Amiens, France)

**Raw material supply during Middle Palaeolithic in south-east of the Bassin parisien (north France).**

**ABSTRACT:** Northern France is rich in raw material, specially cretaceous flint. Till now, identification of flint origin was look as impossible because of the similarities of senonian flints (coniacian, santonian and campanian). A new method as been tested on several sites of the Bassin parisien. The economy of raw material seems like other regions, as south-western France : as far raw material is, less it is present in the tool kit and it' essentially tolls and Levallois flakes. However, distances of displacement are shortest than in SW France.

I will tackle some problems in this paper :

- Why choosing such and such flint in a very rich raw material environment ?
- Relations between sites functions and types of raw material.

- Duration of raw material supply source .

**WS23-07** Dominique CLIQUET (Caen, France)

**Approvisionnement en matières premières et en ressources alimentaires en Normandie (France) entre le stade 7 et le stade 3.**

**RESUME:** Les travaux récents effectués sur les sites normands et la reprise de gisements anciennement fouillés, soit une cinquantaine de stations, apportent quelques informations sur les stratégies d'approvisionnement durant la fin du Pléistocène moyen et le début du Pléistocène supérieur. Différents comportements vis à vis de la matière première ont pu être observés selon les espaces géographiques considérés et la structuration naturelle des aires d'occupation.

Dans l'espace littoral et les plaines côtières continentalisées, l'homme collecte presque exclusivement les matières premières minérales dans les cordons de galets littoraux, secondairement sur les gîtes de matières premières exondées. Le phénomène semble récurrent durant tout le stade 5, surtout illustré par les sites du nord Cotentin. Le recours aux matériaux de substitution est exceptionnel (Le Rozel, Iles Chausey).

Dans le domaine continental, l'homme s'implante sur les gîtes de matières premières, soit, les biefs à silex (Saint-Brice-sous-Rânes), les argiles à silex (Mont-Saint-Aignan) ou en bordure de dolines (Evreux « Long-Buisson », Grosseœuvre). Quelques exemples illustrent des apports de matières premières sous différentes formes (objets isolés, blocs épannelés), dont l'origine n'est pas toujours reconnue (Saint-Brice-sous-Rânes, Ranville, Grosseœuvre, Etoutteville). L'utilisation de matières premières autres que le silex reste aussi exceptionnelle (Radepont).

Les observations portant sur le milieu s'avèrent moins démonstratives, en raison de la non préservation des restes organiques dans la plupart des sites. Cependant, quelques gisements bien documentés (Le Rozel, Ranville) autorisent une approche comportementale.

Par ailleurs, l'analyse des structures de combustion du site de Saint-Germain-des-Vaux / Port-Racine, témoigne d'une sélection des essences végétales dans certaines aires où les foyers jouent un rôle prépondérant, et de l'utilisation d'algues pour l'alimentation de ces foyers. Cette sélection des combustibles ligneux a aussi été reconnue à Saint-Vaast-la-Hogue / Le Fort.

**WS23-08** Nathalie MOLINES (Rennes, France)  
Jean Laurent MONNIER (Rennes, France)

**Paléogéographie, matières premières et territoires exploitables dans l'Ouest de la France au Pléistocène moyen.**

**RESUME:** Les installations humaines dans l'Ouest de la France, durant tout le Pléistocène, vont se faire sous la pression de l'environnement et sont étroitement liées aux variations climatiques et paléogéographiques qui déterminent les possibilités d'accès aux matières premières, notamment le silex, celles de disposer de territoires favorables pour la chasse au gros gibier, également de trouver des abris en pied de falaise. Liés aux caractéristiques géologiques du Massif armoricain, les assemblages préhistoriques présentent une variété pétrographique très importante et reflètent des comportements différents dans la gestion des matériaux, voire des territoires, selon les populations considérées. Les études typologiques et technologiques classiques, corrélées systématiquement à des données pétrographiques et aux propriétés mécaniques des matériaux, nous permettent également d'aborder tous les aspects cognitifs et montrer les réponses apportées par les Préhistoriques aux conditions paléoenvironnementales. L'ouest de la France apparaît classiquement comme une région dans laquelle les vestiges fauniques mammaliens pléistocènes sont très rares, pour des raisons uniquement d'ordre taphonomique et liées à la nature des sédiments encaissants les dépôts archéologiques. Malgré cette relative perte d'informations, plusieurs gisements paléolithiques ont livré des restes osseux associés avec des industries lithiques permettant, grâce à des études récentes, une analyse assez exhaustive des modalités comportementales des Hommes préhistoriques.

La composante liée à la variation des niveaux marins est totalement indissociable de l'étude des premiers peuplements de l'ouest de la France, en effet, selon le contexte climatique de vastes territoires se trouvaient exondés et rendus accessibles vers les îles britanniques, ce qui modifie totalement la paléogéographie de cette partie de l'ouest de l'Europe. Des données obtenues par sismique réflexion (Géosciences, Rennes), ont ainsi pu être intégrées aux données archéologiques du littoral sud-armoricain et nous permettre de restituer une paléogéographie locale très différente de l'actuel, avec notamment le dégagement de vastes plaines littorales propices aux grands herbivores.

**WS23-09** Gilles HUGUENIN (France)  
Agnès LAMOTTE (Lille, France)

**Approvisionnement et circulation des matières premières minérales au Paléolithique moyen en Haute-Saône: premiers résultats**

**RESUME:** Conjointement à la reprise d'études de collections lithiques de surface ou de fouille du Paléolithique inférieur et moyen de la Haute-Saône, sont menées des études pétrographiques des séries lithiques. La région Nord de la Franche-Comté est une zone de contact entre la partie orientale du Bassin Parisien, le Sud des Vosges et le Nord du Jura. Les roches sédimentaires sont dominantes, mais existent aussi des roches métamorphiques et magmatiques provenant du massif des Vosges et du Morvan. Les matières premières minérales sont donc potentiellement variées. Même si les roches locales dominent le fond des séries lithiques (silex secondaire, silex tertiaire, chailles, calcaires silicifiés), quelques matières d'origine un peu plus lointaines figurent systématiquement, bien qu'en petite quantité, dans chaque gisement (grès, quartz, quartzites). La composition pétrographique de chaque série lithique sera décrite et renforcée du détail de la composition techno-typologique quand ce sera possible. Cette étude s'inscrit en complément d'un certain nombre de stations étudiées au préalable par C. Cupillard sur l'Ouest de la région. La provenance des matières premières saura être abordée à plusieurs échelles (locale, semi-locale et/ou régionale) de telle sorte qu'en terme de circulation, des axes privilégiés et des axes d'emprunts secondaires pourront être proposés pour le Paléolithique moyen nord Franc-comtois.

**WS23-10** L. BOURGUIGNON (Les Eysies-de-Tayac, France)  
P. BIDART (Les Eysies-de-Tayac, France)  
I. ORTEGA (Les Eysies-de-Tayac, France)  
Alain TURQ (Les Eysies-de-Tayac, France)  
Luc DETRAIN (Les Eysies-de-Tayac, France)  
André MORALA (Les Eyzies-de-Tayac, France)

**Du territoire proche au territoire lointain: différences ou similitudes comportementales à partir des stratégies d'exploitations gîtologiques des matières premières lithiques au Paléolithique moyen (l'exemple de Combe Brune 1 et de l'Abri du Musée, Dordogne, France).**

**RESUME:** A partir de deux sites moustériens de tradition acheuléenne implantés dans des territoires lithologiques riches et distincts (Bergeracois et Périgord noir), très certainement orientés vers des activités spécialisées (dans la consommation et/ou dans l'acquisition des biens), nous tenterons de mettre en évidence des comportements techno-économiques liés aux stratégies d'exploitation et de mobilité au sein d'un territoire local (voire intra-local). Celui-ci, sera comparé aux stratégies d'exploitation de milieux plus lointains et leurs relations seront également abordées. Au travers des analyses techno-économiques (évaluation des importations et des exportations) et la caractérisation des matières premières lithiques (essai de quantification de blocs exploités), des différences ou des similitudes seront mises en évidence entre le territoire « habité » et le territoire « parcouru ». Enfin, les schémas de mobilité résidentielle des groupes seront abordés à partir de ces nouvelles données (à la fois quantitatives et qualitatives).

**WS23-11** Lilliane MEIGNEN (Valbonne, France)  
Sandrine COSTAMAGNO (Toulouse, France)  
C. BEAUVAL (Bordeaux, France)  
L. BOURGUIGNON (Les Eysies-de-Tayac, France)  
B. VANDERMEERSCH (Bordeaux, France)  
Bruno MAUREILLE (Talence, France)

**Gestion des ressources lithiques au Paléolithique moyen dans une halte de chasse spécialisée sur le Renne: Les Pradelles (Marillac, Charente).**

**RESUME:** La composition techno-économique des assemblages lithiques reflète les activités menées sur le site et plus encore, elle nous informe sur le rôle du site dans l'organisation générale du territoire des chasseurs-cueilleurs du Paléolithique. Les niveaux inférieurs du gisement des Pradelles, en Charente, ont livré de faibles densités de matériel lithique qui contrastent avec

l'abondance en restes osseux, très majoritairement du Renne. Les études techno-économiques réalisées sur ces assemblages de type Quina ont mis en évidence des stratégies de gestion des matières premières, qui suggèrent des occupations de brèves durées en relation avec des expéditions répondant à des besoins spécifiques (task-specific location). Les différences observées dans le traitement des matériaux importés (silex du Crétacé) et celui des matériaux locaux, de moindre qualité (silex du Jurassique) soulignent les capacités d'anticipation des Neandertaliens. La confrontation de ces résultats avec les données archéozoologiques a confirmé et permis de préciser le fonctionnement de ce site au sein du territoire. En effet, les recherches effectuées sur les restes osseux, très abondants, ont permis de conclure à l'existence probable d'une chasse spécialisée sur le Renne, avec traitement de la viande pour consommation différée. Ce cas d'étude illustre parfaitement la nécessaire complémentarité des approches technologiques et archéozoologiques, entre autres, dans la définition des territoires, fonction des sites et schémas de mobilité des chasseurs-cueilleurs du Paléolithique.

**WS23-12** Alain TURQ (Les Eysies-de-Tayac, France)  
L. BOURGUIGNON (Les Eysies-de-Tayac, France)  
J. Ph. FAIVRE (Les Eysies-de-Tayac, France)

**L'apport de l'analyse des matières premières lithiques dans la compréhension du comportement humain à travers quelques exemples du nord-est aquitain.**

**RESUME:** Depuis déjà de nombreuses années les systèmes d'approvisionnement en matières premières lithiques des hommes du Paléolithique inférieur et moyen sont bien connus dans le nord-est du bassin aquitain. Outre l'immuable principe d'approvisionnement local quelque soit la qualité des ressources, l'approche prenant en compte la fonction de site permet de nuancer cette vision. Les nombreuses recherches menées récemment, l'émergence de la notion de ramification, l'étude systématiques des cortex, les essais sur le nombre minimum de bloc permettent d'aller encore plus loin.

Après avoir identifié et précisé les raisons du choix des matériaux transportés nous nous attacherons à deux de ces types de silex (celui dit de « Bergeracois » et celui dénommé « Belvés ») pour tenter une approche socio-économique. Celle-ci prendra en compte des gisements implantés sur ou à proximité des gîtes exploités, d'autres de grottes ou abris, de plein air, situés dans des écosystèmes spécifiques plus ou moins distants des sources de matières premières lithiques.

**WS23-13** Jean-Paul RAYNAL (Talence, France)  
Marie Hélène MONCEL (Paris, France)  
P. FERNANDES (Talence, France)  
Carmen SANTAGATA (Talence, France)  
Jean-Luc GUADELLI (Talence, France)  
P. FERNANDEZ (Lyon, France)  
Marylène PATOU-MATHIS (Paris, France)

**Espace minéral et espace de subsistance au Paléolithique moyen dans le Sud du Massif Central en France : les sites de Sainte-Anne I (Haute Loire) et de Payre (Ardèche).**

**RESUME:** Les niveaux d'occupation humaine de la grotte de Sainte-Anne I, située en moyenne montagne, sont datés des stades isotopiques 7 et 6. Ceux du site de Payre, grotte puis abri sous roche situé en bordure de la vallée du Rhône, sont datés des stades isotopiques 7 et 5. L'étude des matières premières à Sainte-Anne I permet de mettre en évidence des collectes majoritaires aux environs immédiats du site (matériaux volcaniques et certains silex) mais aussi un espace d'approvisionnement complémentaire (silex) relativement vaste alors que celui de Payre est plus restreint, en particulier pour le niveau Gb. Dans les deux cas, les collectes sont locales mais des sources éloignées sont également directement exploitées ponctuellement.

En ce qui concerne l'exploitation des grands mammifères, les hommes ont sans doute parcouru les biotopes locaux autour de Payre, plateau, versant et vallées de la Payre et du Rhône pour les cervidés, bovidés et équidés qui sont les espèces les plus abondantes. A Sainte-Anne, ce sont les équidés qui dominent les assemblages mais d'une façon générale, les espèces collectées reflètent une mosaïque de milieux qui corrobore l'image renvoyée par les matières premières.

Les secteurs parcourus par les occupants des deux sites ne montrent pas véritablement de différences significatives tant au niveau de l'approvisionnement en matières premières que dans la



chasse ou le charognage des mammifères. Les différences paraissent plus dépendre du contexte géologique et topographique. La manière d'exploiter un «territoire» obéirait donc sensiblement aux mêmes règles, en particulier lors des stades isotopiques 7 et 6.

**WS23-14** Marta ARZARELLO (Ferrara, Italy)  
Stefano BERTOLA (Ferrara, Italy)  
Federica FONTANA (Ferrara, Italy)  
Antonio GUERRESCHI (Ferrara, Italy)  
Carlo PERETTO (Ferrara, Italy)  
Antonio ROCCI RIS (Torino, Italy)  
Ursula THUN HOHENSTEIN (Ferrara, Italy)

**Aires d'approvisionnement en matières lithiques et en ressources alimentaires dans les niveaux moustériens et épigravettiens de l'Abri Tagliente (Vérone, Italie): une dimension «locale».**

**RESUME:** L'Abri Tagliente est situé dans les Monts Lessini, sur le flanc gauche de la Valpantena, dans le bourg de Stallavena sur la commune de Grezzana (Vérone, Italie).

L'abri s'ouvre à quelques mètres au-dessous des alluvions de fond de vallée, à la base du versant ouest du mont Tregnago et au pied d'une paroi rocheuse constitué de calcaires oolithiques de l'ère Jurassique.

Les fouilles systématiques ont mis en évidence une importante série stratigraphique de la quelle nous rappelons que la partie la plus profonde, mise ne place, d'après les données environnementales, pendant le stade isotopique 3, est caractérisé surtout par des industries Moustériennes, auxquelles se superposent des niveaux Aurignaciens. Cette première partie de la séquence est tronquée par une érosion d'origine fluviale, due au torrent Progno qui coule au fond de la vallée et surmontée par des dépôts contemporains à la partie finale du stade isotopique 2 avec des niveaux attribués à l'Épigravettien final (Bartolomei et alii 1982).

Les matières premières lithiques utilisés ont un âge compris entre le Jurassique supérieur et l'Eocène. Leur analyse démontre une origine limitée aux des Monts Lessini et ont été collectés dans un rayon de peu de kilomètres du site.

Les différents types de silex on été traité de façon différente au Paléolithique moyen et supérieur soit en termes de technologie que d'approvisionnement : dans les niveaux moustériens on observe une stratégie d'approvisionnement opportuniste à partir surtout de dépôts alluviaux, tandis que dans les niveaux épigravettiens une recherche plus miré a été mise en évidence, en relation avec les différents objectifs du débitage. (...)

**WS23-15** M. D. GARCÍA-ANTÓN TRASSIERRA (Tarragona, Spain)  
M. MOSQUERA MARTÍNEZ (Tarragona, Spain)

**A preliminary approach to the selection and supply of lithic raw materials at the Middle Pleistocene occupations of Gran Dolina Level TD10-1 (Sierra de Atapuerca, Burgos, Spain).**

**ABSTRACT:** Gran Dolina site is a cave into the karstic system of Sierra de Atapuerca, located at NE the city of Burgos, and at the NW border of the river Duero hydrographical basin. River Arlanzón belongs to this hydrographical basin and runs near the Sierra. Its proximity to the ridge may have played an important role regarding the occupational strategies of the Sierra de Atapuerca Palaeolithic peopling.

Level TD10-1 is 1 meter thickness, with a ponderated averaged date of  $372 \pm 33\text{ka}$  by RPE and U-Th (Falguères et al, 2001). This level has yielded different archaeo-paleontological sublevels, among which we select the oldest and richest one. This sublevel is situated at the bottom of TD10-1, and it has been interpreted as a base camp (Vergés, 1996; Mallol, 1997), where most of the usual Middle Pleistocene hominid activities have been performed.

Technologically, the starting point of the "operative chain" –that is, the selection of raw materials, is a marker of the knowledge and control degree that these communities had over their surrounding landscape.

In order to approach to the environmental exploitation and supply systems performed by these groups, it is important to cross data between present days availability, quantity and quality of raw materials in a 20 km<sup>2</sup> surrounding area, and the evidences offered by the archaeological excavations at this sublevel. This kind of study is performed through systematic analyses of all materials present at

secondary deposits (old fluvial terraces, deltaic deposits, coluvial and glacial deposits), and those located in primary position. The aim is to achieve elaborating a reliable map of the Pleistocene lithological richness of this territory, which consequently will reflect the mental map regarding subsistence and landscape strategies that these Gran Dolina Pleistocene communities developed.

**WS23-16** Maria Gema CHACÓN NAVARRO (Tarragona, Spain)  
M. C. FERNÁNDEZ-LASO (Tarragona, Spain)  
M. D. GARCÍA-ANTÓN TRASSIERRA (Tarragona, Spain)

**Level K and L from Abric Romaní (Barcelona, Spain): procurement resources and territory management in short occupations during the Middle Palaeolithic.**

**ABSTRACT:** The Abric Romaní site yielded one of the more important and complete stratigraphic sequences of Europe Middle Palaeolithic (14 archaeological levels dated between 70 and 40 ka BP). It is, consequently, a key site for human's behaviour studies among Neanderthals groups. The site is located in the northeast Iberian Peninsula, 50 km from Barcelona. The rock-shelter is situated over 317 m (above sea level) in a travertine cliff on the right margin of the Anoia river, which is a tributary of the Llobregat river. This river passes by the Capellades locality, excavating a narrow gorge known as the "Cinglera del Capelló". This corridor crosses the mountain range "Cordillera Prelitoral", and is considered as a natural passage between the inland and coastal Catalonia regions. This strategic location of the site provides to hominids the possibility to exploit a great variety of biotopes: river beds, plain and plateau, benefiting a very rich environment.

This paper presents the results of studies on resource procurements (lithics and animals) and on the territory use by Neanderthals groups, through two levels which show evidence of short occupations, K and L levels dated from about 52 ka BP.

The results of interdisciplinary analysis of lithic and faunal assemblages suggest that the resource procurement and management is focussed on a local and semi local exploitation in a geographic area of about 20 km.

**WS23-17** Leticia MENÉNDEZ GRANDA (Tarragona, Spain)  
Jordi ROSELL I ARDEVOL (Tarragona, Spain)  
Marie Helène MONCEL (Paris, France)

**Comparative Analysis between Level G of Las Fuentes de San Cristóbal (Pre-pyrenees of Huesca, Spain) and Level Ga of Payre (Ardèche, France): a similar neanderthal territorial behavior in two different chronological contexts?**

**ABSTRACT:** Level Ga of Payre (Ardèche, France) and level G of Las Fuentes de San Cristóbal (Pre-pyrenees of Huesca, Spain) belong to the same geographical context, southern Europe. Payre's Ga level is situated in OIS 7 by U/Th dates, while Las Fuentes de San Cristóbal G level, over a fluvial horizon of basal pebbles dated in 55.000 BP, must be assigned to OIS 3. Both levels correspond with the first human occupation of each archaeological site. Despite their chronological difference both industrial assemblages have been assigned to Mode 3 or Mousterian.

Have the first neanderthals a very different technological behavior from those of their successors of the 40.000 BP? Can we speak about two really different behaviors or these must be assigned to the different occupational and/or functionally site conditions? Could we apply, one more time, the concept of Mousterian Variability?

The study of the lithic assemblages, as well the faunal remains allow us to make a comparative analysis. It would point out if there exist important differences in subsistencial strategies according to the large chronological range considered.

In order to provide a new contribution in this topic, we have focused on the debitage methods and the raw material procurement as well as the faunal remains. In both sites raw material procurement are related to semilocal strategies. Differences regarding to configured tools must be related to site functionality. According to the biotops around the two sites, fauna procurement territory is smaller.

**WS23-18** Harun TAŞKIRAN (Ankara, Turkey)

**Supply areas of Karain cave in southwest Anatolia.**

**ABSTRACT:** The Karain cave is the most important palaeolithic cave site of Turkey where occupies on the crossroads between Africa, Asia and Europe. The archaeological sequences of Karain cave have provided evidences of a long-term human occupations from the earliest times (Lower

Palaeolithic) to the beginning of agriculture. Moreover, human remains have been discovered in the Karain E sequence, showing Neanderthal traits. The one of the most important reason of this long continuity is supply areas of Karain Cave. In pleistocene period, ecological conditions (fauna and flora), raw material sources and plentiful water springs are the primary factors for a long-term human occupations in the Karain Cave. During the presentations, it will show the cultural continuity, from ca 350 to 10 thousand years in Karain Cave with together special feature of supply areas of Karain.

**WS23-19** Andrzej WIŚNIEWSKI (Wracow, Poland)

**Raw Material and Technology in Central European Early Middle Palaeolithic.**

**ABSTRACT:** The paper reports on the results of technological analysis of selected “Early Middle Palaeolithic” lithic inventories from Central Europe. Its main focus is the model of working of lithic resources with key variables such as: raw material, methods+techniques of working stone, different types of activity and different palaeoecology. The discussed inventories all date from the “Saale complex”, originating from a wide region bounded by the valley of the Saale and of the western Bug. This area of lowlands, continental shields, Central European Middle Mountains and parts of the Carpathians harbours a variety of stone resources which were used for tool production during the Early Middle Palaeolithic. In Saxony-Anhalt and Thuringia, as well as in Lower Silesia, the main recourse was erratic flint (the only exception is the site Ehringsdorf, Weimar). In the Kraków-Częstochowa Highland zone local flint was used, mostly, Jurassic flint. Inventories from NW Bohemia and Moravia testify to the use of local quartzite and hornstone. In the “travertine zone” in Slovakia many tools were struck from quartz. From the point of view of technology the lithic inventories indicate that production was of “flake” or mixed variety (which included bifacial tools). Strategies of obtaining blanks varied, like in other regions of Europe, with a tendency to reduce the use of stable plane technology of Levallois type in areas poorer in lithic resources. (...)

**WS23-21** Moustapha SALL (Dakar, Senegal)

**Raw materials, agricultural techniques and harvest of molluscs in Diola zone (Senegal).**

**ABSTRACT:** The acceptance of the existence of ties between ceramics and identity shows that the various stages of the chaîne opératoire carry the cultural print of the group which produced this artefact. With regard to the first stage of this chain, namely the preparation of the pastes, studies carried out with Diola potters (Lower- Casamance, Senegal) showed that it is possible to go beyond a simple cultural justification and to analyze the various mechanisms which underlie the homogenisation of the behaviours, regarding the preparation of the pastes. These behaviours related on the use of rotten and desalted clay, and also crushed and burned shells as temper, are closely related to the techniques of desalting the rice plantations (polders) and the harvest of molluscs.

**Session WS24**

*Tuesday, 5 September 2006 / Mardi, 5 Septembre 2006*

*Room 6.1.53, Faculty of Sciences, Lisbon University  
Salle 6.1.53, Faculté de Sciences, Université de Lisbonne*

**Functional studies between East and West**

**Are we finally closer?**

**Études fonctionnels entre l'Est et l'Ouest**

**Est-on, finalement, rapprochés ?**

*organized by / organisé par*

**Natalia SKAKUN** Institut of History of Material Culture, St Petersburg, Russia –  
**vladza@peterlink.ru**

**Laura LONGO** Museo Civico di Storia Naturale di Verona, Sezione di Preistoria, Verona,  
Italy **Laura\_Longo@comune.verona.it**

## SESSION'S ABSTRACT

Theoretical context of early development and acknowledgement of the discipline, theoretical and methodological split between Eastern and Western approaches, subsequently created two distinct "traditions" or "schools" of thought and practice. Recently, since the beginning of the 3rd millennium, 3 international conferences opened the debate and exchange of ideas on the discipline: is it time to walk in the same direction broadening horizons?

## SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 09:00            **Opening / Overture**
- 09:00-09:30    Maria GUROVA (Sofia, Bulgaria)  
**WS24-01**      **Conformity and divergence in use-wear studies: where is the acceptable issue?**
- 09:30-10:00    RISCH  
                    PLISSON  
**WS24-02**      **Form and Function**
- 10:00-10:30    Clemente CONTE  
                    MANSUR  
**WS24-03**      **Ethnoanalogy from the Southern areas?**
- 10:30-11:00    ANDERSON  
                    Van GIJN  
                    Natalia SKAKUN  
**WS24-04**      **Functional analysis and the origin of Agriculture?**
- 11:00-11:30    Malewska-KUKAWKA  
**WS24-05**      **Functional approach in Eastern Europe?**
- 11:30-12:00    KOROBKOVA  
                    SHAROVSKAYA  
                    ESAKIA  
                    Natalia SKAKUN

ALEXASHENKO

**WS24-06** Functional analysis in modern time?

12:00-12:30 Schelinski  
Girya

**WS24-07** Functional analysis and its technological fall-up in tools reconstruction?

12:30-13:00 Sergey VASIL'EV  
COHEN

**WS24-08** Functional approaches in eastern and western schools?

13:00-14:30 Lunch / Déjeuner

14:30-15:00 LONGO  
SALA  
OLLE  
VERGES

**WS24-09** Functional approach to Lower Paleolithic cultural environment

15:00-15:30 KEELEY

**WS24-10**

15:30-16:00 ODELL

**WS24-11** Where is going Functional Analysis?

16:00-16:30 HAYDEN

**WS24-12** Functional analysis and the modelling of past economic systems?

16:30-17:00 FULLAGAR  
PROCOPIU

**WS24-13** The role of residues analysis and the new methodological approaches to functional studies

17:00-17:30 Myrian ALVAREZ

**WS24-14** Context of use and technological strategies of the hunter-gatherer societies of Tierra del Fuego (Argentina) through use-wear analysis

17:30-18:00 Natalia SKAKUN  
Natalia SOLOVYOVA  
Tamara SHAROVSKAYA

**WS24-15** Use-wear analysis of ceramic tools (on materials of Chalcolithic and Bronze Age sites in Turkmenistan)

18:00-18:30 Arazova ROZA

**WS24-16** Tools and the classification of housekeeping of earliest settlements in Azerbaijan

## ABSTRACTS / RÉSUMÉS

**WS24-01** Maria GUROVA (Sofia, Bulgaria)

### **Conformity and divergence in use-wear studies: where is the acceptable issue?**

**ABSTRACT:** Use-wear analysis of flint artefacts coming from different prehistoric contexts has its prominent role, which permits us to correlate a functional database on various (intra/inter-settlement) levels. This approach can go further to a reconstruction of the economic and social complexities of prehistoric communities. This is the purpose of functional studies focusing on the conformity and even uniformity of the scientific intentions of all specialists in this field. On the empirical level of flint assemblages' analysis and database completing, the East/West divergence could be still articulated as different level of technical equipment and device utilization. On the level of the reconstruction issues, the divergence is more complicated because of the formulation of common aims but different modus operandi and consequently, different generalization and application of the results.

**WS24-02** Myrian ALVAREZ (Ushuaia, Argentina)

### **Context of use and technological strategies of the hunter-gatherer societies of Tierra del Fuego (Argentina) through use-wear analysis.**

**ABSTRACT:** This paper addresses the context of use of lithic tools within hunter-gatherers of southernmost channels of South America. The purpose is to explain the relationships between the process of production and consumption of resources and to analyze variations in the frequencies of activities developed by these groups throughout the sequence of occupation of region. Since this particular case we intend to discuss the role of use-wear analysis to yield reliable interpretations about past societies and to fill the gap between the approaches that tackled the problem of stone tools usage.