

Session C78

Thursday, 7 September 2006 / Jeudi, 7 Septembre 2006

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

Modern Human dispersals, environments and cultural change in the Late Pleistocene of Northwest Africa and adjacent areas

Dispersion des Hommes modernes, environnements et changements culturels à la fin du Pléistocène en Afrique du Nord Ouest et les régions avoisinantes

organized by / organisé par

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- Fatima Zohra SBIHI-ALAOUI** fsbihialaoui@yahoo.fr

SESSION'S ABSTRACT

One of the most keenly debated issues in human evolutionary research concerns the African origins and dispersal of *Homo sapiens*. Until recently, Northwest Africa has been a much neglected region despite the occurrence of early *Homo sapiens* with the "Middle Palaeolithic" finds at Jebel Irhoud. In this region, several sites contain stratified sequences with exceptionally well-preserved organic remains offering rich sources of multi-proxy data for palaeoenvironmental and chronological studies.

The Northwest Africa is of key interest in the understanding of human evolution and behavioural development. A broader theme identified and could be discussed in the session concerns the nature, chronology and human associations with the cultural sub-division of the Aterian.

New radiometric data move the Late Upper Palaeolithic back in time to more than what it was known in North Africa. From calibrated record of AMS dates, the data of this region are compared with the global marine isotope record.

Amongst the key issues to be identified so far are: How early is the Upper Palaeolithic in this region, does its appearance signify the arrival of new populations, is there any relationship between the Upper Palaeolithic and Aterian, what is the environmental context of the Middle and Upper Palaeolithic. The aim of the session is not to answer all of these questions but to stimulate further discussion and to act as an introduction to other contributions that will cover the themes described above in more detail.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00 **Opening / Ouverture**

**Session 1: Chronology, Environments and Cultural change:
Morocco and Algeria**

Chair: Pr. Nick Barton

09:00-09:15 Abdeljalil BOUZOUGGAR (Rabat, Maroc)
Nick BARTON (Oxford, UK)
Fatima-Zohra SBIHI-ALAOUI

C78-01 Modern Human dispersals, environments and cultural change in the Late Pleistocene of Northwest Africa and adjacent areas: Introduction.

09:15-09:35 Abdeljalil BOUZOUGGAR (Rabat, Maroc)
Nick BARTON (Oxford, UK)
Cristopher BRONK-RAMSEY (Oxford, UK)
S. N. COLLCUTT (Oxford, UK)
Thomas F. G. HIGHAM (Oxford, UK)
L.T. HUMPHREY (London, UK)
S. PARFITT (London, UK)
Ed J. RHODES (Canberra, Australia)
J. L. SCHWENNINGER
Chris B. STRINGER (London, UK)
E. TURNER (London, UK)
S. WARD (Oxford, UK)

C78-02 The Middle and Upper Palaeolithic settlement in North West Africa : new evidence from Northern Morocco.

09:35-09:50 José RAMOS (Cadiz, Spain)
Darío BERNAL (Cadiz, Spain)
David CALADO (Faro, Portugal)
Salvador DOMÍNGUEZ-BELLA (Cadiz, Spain)
Juan José DURÁN (Madrid, Spain)
Blanca RUIZ (Alcalá de Henares, Spain)
María José GIL (Alcalá de Henares, Spain)
Eduardo VIJANDE (Cadiz, Spain)
Ramón JULIÁ (Barcelone, Spain)
Simón CHAMORRO (Ceuta, Spain)

C78-03 A sequence of the Middle, Upper Pleistocene and Holocene in the North of Africa. The Shelter and the Cave of Benu (Ceuta).

09:50-10:10 Merzoug SOUHILA (Alger, Algerie)
Sari LATIFA (Alger, Algerie)

C78-04 Réexamen de la zone I de l'abri de Tamar Hat (Nord Est algérien) à la lumière des nouvelles données archéozoologiques et technologiques.

10:10-10:30 David LUBELL (Waterloo, Canada)
M. JACKES (Waterloo, Canada)

C78-05 Environmental and cultural change in the early and mid Holocene: evidence from the Télijdjène Basin, eastern Algeria.

10:30-10:50 Discussion

10:50-11:00 Break / Pause

Session 2: Chronology, Environments and Cultural change :

Tunisia, Libya, Egypt and Mali

Chair: Dr. Abdeljalil Bouzougar

11:00-11:20 Nabiha AOUADI-ABDELJAOUAD (Tunis, Tunisie)
Lotfi BELHOUCHE (Tunis, Tunisie)

C78-06 **Nouvelles recherches préhistoriques en Tunisie Centrale : les occupations préhistoriques dans la région de Maknassy.**

11:20-11:40 Barbara E. BARICH (Roma, Italy)
Elena GARCEA (Cassino, Italy)

C78-07 **Ecological Models in the Late Pleistocene of Northern Libya-Chronology, Climate and Human Occupation in the Jebel Gharbi.**

11:40-12:00 Giuseppina MUTRI (Roma, Italy)
Giulio LUCARINI (Roma, Italy)

C78-08 *Some aspects of the late Pleistocene of Jebel Gharbi (Libya). New data from the Shakshuk area.*

12:00-12:20 Laurent CHIOTTI (Les Eyzies-de-Tayac, France)
Harold DIBBLE (Pennsylvania, U.S.A.)
Shannon MCPHERRON (Leipzig, Germany)
Deborah OLSZEWSKI (Philadelphia, Pennsylvania, U.S.A.)
Utsav SCHURMANS (Tempe, Arizona, U.S.A.)

C78-09 **Some Lithic Technologies from the Western High Desert of Egypt.**

12:20-12:40 Chantal TRIBOLO (Oxford, UK)
Stephen STOKES (Oxford, UK)
Michel RASSE (Rouen, France)
Sylvain SORIANO (Villeneuve-d'Ascq, France)
Eric HUYSECOM (Genève, Switzerland)

C78-10 **Optical dating of the long Pleistocene sequence of Ounjougou, Mali (West Africa).**

12:40-13:00 **Discussion**

13:00-14:30 **Lunch / Déjeuner**

Session 3: Human remains and behaviour

Chair: Pr. Barbara Barich

14:30-14:50 **Valentina MARIOTTI (Bologna, Italy)**
Benedetta BONFIGLIOLI (Bologna, Italy)
Silvana CONDEMI (Marseille, France)
Fiorenzo FACCHINI (Bologna, Italy)
Maria Giovanna BELCASTRO (Bologna, Italy)

C78-11 *The Epipaleolithic necropolis of Taforalt (Morocco): biocultural aspects inferred from the study of the skeletons.*

14:50-15:10 L. T. HUMPHREY (London, UK)
S. M. BELLO (London, UK)

C78-12 *New Late Upper Palaeolithic Ibéromaurusian burials from Eastern and Northern Morocco.*

15:10-15:20 Roland NESPOULET (Les Eyzies-de-Tayac, France)
Mohamed ABDELJELLIL EL HAJRAOUI (Maroc)
Avec la collaboration de
Amani FETHI
Ben-Ncer ABDELWAHED
Chennaoui KHADIJA
André DEBÉNATH
El Idrissi ABDELAZIZ
Jean-Paul LACOMBE
Patrick MICHEL
Sabah NIFTAH
Aïcha OUJAA
Emmanuelle STOETZEL

C78-13 *Les occupations paléolithiques de la région de Témara, près de Rabat, Maroc. Données récentes sur les milieux et les comportements humains.*

15:20-15:40 Stéphanie GUISLAIN (Grenoble, France)

C78-14 **Exploitation des gîtes de silex sur les hamada du Sud-Est marocain au paléolithique moyen et au paléolithique supérieur : l'exemple de deux ateliers de taille.**

15:40-16:00 Messili LAMIA (Paris, France)

C78-15 **Les figurines néolithiques en terre cuite de la grotte des Idoles : aspects techniques de la manipulation de l'argile (Cap Achakar, Maroc nordoccidental).**

16:00-16:20 **Discussion**

16:20-16:40 **Break / Pause**

Session 4: Regional overviews and perspectives

Chair : Pr. Jose Ramos Munoz

16:40-17:00 Mostapha BELHILALI (Rabat, Maroc)
Abdeljalil BOUZOUGGAR (Rabat, Maroc)
Abdellah LAOUINA (Rabat, Maroc)
Mohamed TAILASSANE (Rabat, Maroc)
Abderrahim WATFEH (Rabat, Maroc)

C78-16 **Occupation de l'espace et paléoenvironnements vers la fin du Pléistocène dans le bassin moyen de Bouregreg (Sud-est de Rabat, Maroc).**

17:00-17:20 Abderrahim WATFEH (Rabat, Maroc)
Mohamed TAILASSAN (Rabat, Maroc)
Abdellah LAOUINA (Rabat, Maroc)

Rachidra NAFAA (Rabat, Maroc)
Abdeljalil BOUZOUGGAR (Rabat, Maroc)
Farid MALEK (Rabat, Maroc)

C78-17 L'impact des changements morpho-dynamiques sur l'installation humaine dans la côte de la Meseta atlantique marocaine durant l'Holocène moyen.

17:20-17:40 Lotfi BELHOUCHE (Tunis, Tunisie)

C78-18 Nouvelles découvertes de sites préhistoriques dans le Sud Est tunisien.

17:40-18:00 Christophe FALGUÈRES (Paris, France)
Jean Jacques BAHAIN (Paris, France)
A. PEREZ GONZALES
M. SANTONJA
Norbert MERCIER (Gif-sur-Yvette, France)
J.M. DOLO (Gif-sur-Yvette, France)

C78-19 Datation par ESR/U-Th combinées de quelques sites acheuléens en Espagne.

18:00-18:20 Jorge MARTÍNEZ-MORENO (Cerdanyola del Valles, Spain)
Joel CASANOVA (Cerdanyola del Valles, Spain)
Rafael MORA (Cerdanyola del Valles, Spain)
Ignacio DE LA TORRE (London, UK)

C78-20 Technical answers of the South-eastern Pyrenees late Neanderthals.

18:20-18:40 Marcel OTTE (Liège, Belgium)

C-78-21 Relations entre Maghreb et Europe au Paléolithique.

18:40-19:00 General discussion and conclusions.

ABSTRACTS / RÉSUMÉS

Session 1: Chronology, Environments and Cultural change:

Morocco and Algeria

Chair: Pr. Nick Barton

C78-01 Abdeljalil BOUZOUGGAR (Rabat, Maroc)
Nick BARTON (Oxford, UK)
Fatima-Zohra SBIHI-ALAOUI

Modern Human dispersals, environments and cultural change in the Late Pleistocene of Northwest Africa and adjacent areas: Introduction.

ABSTRACT: One of the most keenly debated issues in human evolutionary research concerns the African origins and dispersal of Homo sapiens. Until recently, Northwest Africa has been a much neglected region despite the occurrence of early Homo sapiens with the "Middle Palaeolithic" finds. In this region, several sites contain stratified sequences with exceptionally well-preserved organic remains offering rich sources of multi-proxy data for palaeoenvironmental and chronological studies.

The Northwest Africa is of key interest in the understanding of human evolution and behavioural development. A broader theme identified and could be discussed in the session

concerns the nature, chronology and human associations with the cultural sub-division of the Aterian. New radiometric data move the Late Upper Palaeolithic back in time to more than what it was known in North Africa. From calibrated record of AMS dates, the data of this region are compared with the global marine isotope record.

Amongst the key issues to be identified so far are: How early is the Upper Palaeolithic in this region, does its appearance signify the arrival of new populations, is there any relationship between the Upper Palaeolithic and Aterian, what is the environmental context of the Middle and Upper Palaeolithic. The aim of the session is not to answer all of these questions but to stimulate further discussion and to act as an introduction to other contributions that will cover the themes described above in more detail.

C78-02

Abdeljalil BOUZOUGGAR (Rabat, Maroc)
 Nick BARTON (Oxford, UK)
 Christopher BRONK-RAMSEY (Oxford, UK)
 S. N. COLLCUTT (Oxford, UK)
 Thomas F. G. HIGHAM (Oxford, UK)
 L.T. HUMPHREY (London, UK)
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 Ed J. RHODES (Canberra, Australia)
 J. L. SCHWENNINGER
 Chris B. STRINGER (London, UK)
 E. TURNER (London, UK)
 S. WARD (Oxford, UK)

The Middle and Upper Palaeolithic settlement in North West Africa : new evidence from Northern Morocco.

ABSTRACT: The region of Northern Morocco is of key interest for the understanding of human evolution and behavioural development. Not only are its caves a prolific source of early human fossil and archaeological evidence but the area lies immediately adjacent to the Gibraltar Strait still considered by many as a likely if controversial- route for the dispersal of Homo sapiens out of Africa. Yet, for all of this obvious research potential, during critical periods of the Late Pleistocene when evidence would be expected for population replacement and dispersal, the record of human settlement patterns and cultural histories remains surprisingly vague and incomplete. This may be partly explained by a lack of modern fieldwork in the region and the fact that the number of sites with available dates is severely limited due to a combination of imprecise contextual information and an over reliance on bulked charcoal samples for radiocarbon dating. Also largely missing from the archaeological record until now is the detailed palaeoenvironmental evidence that would allow proper consideration of questions regarding the rates and scales of climatic and landscape change and how these might have impacted on human evolution and dispersal. Allied to these issues is a broader question of the major cultural sub-divisions and how they fit within any new chronological scheme. One such example is the Aterian which may have survived very late in Morocco but much information is lacking concerning its chronological development and fossil human associations. (...)

C78-03

José RAMOS (Cadiz, Spain)
 Darío BERNAL (Cadiz, Spain)
 David CALADO (Faro, Portugal)
 Salvador DOMÍNGUEZ-BELLA (Cadiz, Spain)
 Juan José DURÁN (Madrid, Spain)
 Blanca RUIZ (Alcalá de Henares, Spain)
 María José GIL (Alcalá de Henares, Spain)
 Eduardo VIJANDE (Cadiz, Spain)
 Ramón JULIÁ (Barcelone, Spain)
 Simón CHAMORRO (Ceuta, Spain)

A sequence of the Middle, Upper Pleistocene and Holocene in the North of Africa. The Shelter and the Cave of Benuz (Ceuta).

ABSTRACT: The Shelter of Benuz includes a stratigraphic sequence with ten levels, of which the lower ones (from one to seven) have human occupation. The speleothemes have been dated by U/Th and the sedimentary levels by OSL and TL.

In this paper, it is exposed a synthesis of the geomorphology, stratigraphic sequence and the excavation system, as well as the pollen, faunal and lithic remains. The settlement includes a sequence of hunter-gathered communities that belong to the Middle and Upper Pleistocene. The Cave of Benzu offers two levels with Neolithic attributions of tribal communities belonging to the VI millennium B.C.

Its situation in the area of the North of Africa in the Gibraltar Strait offers us interesting data to think about possible contacts and relationships among Prehistoric communities. These communities could have used the Strait as a bridge and not as a frontier.

C78-04 Merzoug SOUHILA (Alger, Algerie)

Sari LATIFA (Alger, Algerie)

Réexamen de la zone I de l'abri de Tamar Hat (Nord Est algérien) à la lumière des nouvelles données archéozoologiques et technologiques.

ABSTRACT: L'abri sous roche de Tamar Hat (Nord Est algérien) conserve une séquence complète de l'Ibéromaurusien (20600 ± 500 BP et 16100 ± 360 BP) et compte dans ses niveaux inférieurs la plus ancienne datation connue en Algérie.

Le réexamen des restes fauniques selon une méthodologie archéozoologique a démontré que les Ibéromaurusien de Tamar Hat présentent, tout au long des phases d'occupation du site, des comportements de subsistance analogues, tant dans leurs mode d'acquisition et de transport du gibier que dans le traitement des carcasses. La récurrence de techniques spécifiques de boucherie suggérant la présence de « traditions » communes à ces populations. Les travaux anciens basés sur la fluctuation des groupes d'outils lithiques avaient déjà, induit cette idée d'un long transfert des savoir faire.

Toutefois, la nécessité de la reprise de l'analyse de l'industrie lithique par le biais d'une approche techno-économique semble nécessaire pour confirmer ou infirmer ce postulat. De plus, l'association des résultats archéozoologiques et technologiques contribueront a donner une vision plus globale des techniques et savoir faire ibéromaurusien.

Cette optique de travail va être appliquée à la séquence stratigraphique supérieure de l'abri Tamar Hat (zone I).

C78-05 David LUBELL (Waterloo, Canada)

M. JACKES (Waterloo, Canada)

Environmental and cultural change in the early and mid Holocene: evidence from the Télijdène Basin, eastern Algeria.

ABSTRACT: Interdisciplinary investigations from 1973 to 1978 at Aïn Misteheyia and Kef Zoura D, two stratified Capsian sites in the Télijdène Basin, have shown that palaeoenvironmental changes centred around the 8200 BP cold event can be correlated with changes in subsistence and technology traditionally associated with the difference between Capsien typique and Capsien supérieur. This paper will use data from geoarchaeological investigations, invertebrate and vertebrate faunal assemblages, radiocarbon and stable isotope analyses to characterize the nature and extent of these changes.

Session 2: Chronology, Environments and Cultural change:

Tunisia, Libya, Egypt and Mali

Chair: Dr. Abdeljalil Bouzouggar

C78-06 Nabiha AOUADI-ABDELJAOUAD (Tunis, Tunisie)

Lotfi BELHOUCHE (Tunis, Tunisie)

Nouvelles recherches préhistoriques en Tunisie Centrale : les occupations

préhistoriques dans la région de Maknassy.

ABSTRACT: De récentes prospections dans la cuvette de Maknassy (Tunisie Centrale) ont révélé la présence de plusieurs sites préhistoriques allant du Moustérien jusqu'au Néolithique.

Ces sites font l'objet de plusieurs programmes de fouilles systématiques menés par une jeune équipe pluridisciplinaire de chercheurs préhistoriens de l'Institut National du Patrimoine (Tunisie). La fouille du site moustérien de Aïn El Guettar (dont la datation de la terrasse T3 indique un âge de $57\ 000 \pm 7\ 000$ et $47\ 000 \pm 4\ 000$ BP.) a révélé une faune abondante avec une dominance nette des équidés et des bovidés.

Les sondages du site de Aïn Henda 2 ont donné un grand nombre de pièces lithiques (dont plusieurs pièces pédonculées). Ce matériel montre un débitage de type Levallois.

Les sondages effectués dans la rammadyet El Oghrab ont livré quelques ossements d'Antilopes, beaucoup de fragments d'œuf d'autruche (dont une rondelle) et une quantité impressionnante de silex (outils et éclats). La malacofaune est formée essentiellement de trois espèces d'Helicidés qui sont : *Eobania vermiculata*, *Helix melanostoma*, *Rumina decollata* Linnée 1758. L'étude du matériel lithique le rapproche de deux faciès épipaléolithiques : l'Ibéromaurusien évolué et les industries à Lamelles du Sud Tunisien..

En dépit de la rareté des escargots dans la rammadyet de Jebel Bou Hedma 1 (seulement quelques coquilles d'*Helix melanostoma* et *Helix sp*) et l'absence totale des ossements, le site a livré une belle collection de silex. La présence d'une pointe de flèche en surface, nous permet d'attribuer ce site probablement au Néolithique.

C78-07

Barbara E. BARICH (Roma, Italy)
Elena GARCEA (Cassino, Italy)

Ecological Models in the Late Pleistocene of Northern Libya-Chronology, Climate and Human Occupation in the Jebel Gharbi.

ABSTRACT: The Jebel Gharbi, the plateau to the SW of the Sabratha coastal region, for long was one of the least known areas in the Libyan archaeological framework. A long lasting research programme by the Italian-Libyan Mission (based on the collaboration between the Libyan Antiquities Department and the Rome "La Sapienza" and Cassino Universities) currently allows us to reconstruct a well documented context of climatic events and related occupation phases. The Jebel Gharbi absolute chronology, built on a grid of more than 40 radiometric dates (C^{14} , AMS e U/Th,), permitted to recognise the main phases of local peopling which, on the whole, met the Haua Fteah sequence in Cyrenaica and, more generally, the Maghrebi late Pleistocene framework. The stratigraphic setting of the Aterian, until now very controversial despite the Haua situation, has been highlighted through new evidences which demonstrated that it lasted until ca. 40 ky bp. In fact, the palaeoclimatic reconstruction by Giraudi (2005), has pointed out the survival of a moderate moist climate, which allowed the Jebel to be inhabited even in elsewhere arid period. Therefore, the situation on the north African coast seems to have been quite different from that of Saharian territories which, at the same time, experimented a severe climatic crisis. On the basis of the most recent results, we can argue that, during the late Pleistocene, the Jebel Gharbi communities, as those in Jebel Akhdar, developed more efficient adaptation strategies, adopting new ways of stone manufacturing through the blade technique, and introducing some forms of food resource storing and manipulation. Such new economic and social patterns were afterwards continued by the late upper paleolithic (or epipaleolithic) hunter-gather groups, related to the Iberomaurusian and Capsian cultural spheres. Although the Jebel Gharbi radiometric datings, at least based on data currently available, show a hiatus between 40 and 30 ky bp, the continuity documented in the Jebel Akhdar – which the Dabban following directly the Aterian – allows us to be in favour of occupation continuity, without ceasing in the local population caused by the arrival of new groups. For this the Jebel Gharbi situation seems promising for contributing further data to the debate about the rise and dispersal of modern humans.

C78-08

Giuseppina MUTRI (Roma, Italy)
Giulio LUCARINI (Roma, Italy)

Some aspects of the late Pleistocene of Jebel Gharbi (Libya). New data from the Shakshuk area.

ABSTRACT: The research programme carried out by the Italo-Libyan Archaeological Mission in the Jebel Gharbi (Libya), since the beginning of nineties has highlighted the role played by hunter-

gatherers communities during the Late Pleistocene and Early Holocene. During the last field campaigns the foothills of the jebel and the Gefara plain were deeply investigated. Near the village of Shakshuk, close to a perennial water spring, the site SJ-00-56 was discovered. The site, characterized by a huge amount of lithic artefacts and faunal remains, was radiocarbon dated to 16.750 ± 60 bp, therefore to the wet phase identified in the paleoclimatic reconstruction of the region¹. The stone artefacts sample analyzed up to now, comprising the materials of the upper section of the deposit, gave already important information about the general tendencies of the lithic techno-complex., which is almost exclusively composed of debitage, chips, a few chunks and shows a very low percentage of retouched tools. The destination of the site is not completely understood, so far. The enormous concentration of materials and the highly fragmentary state of the faunal remains, initially brought to think that the area could represent a sort of waste dump. However, the good state of preservation of the largest part of debris recovered from the site, and the almost exclusive presence of debitage products, could indicate a specialized use as workshop.(...)

C78-09 Laurent CHIOTTI (Les Eyzies-de-Tayac, France)
Harold DIBBLE (Pennsylvania, U.S.A.)
Shannon MCPHERRON (Leipzig, Germany)
Deborah OLSZEWSKI (Philadelphia, Pennsylvania, U.S.A.)
Utsav SCHURMANS (Tempe, Arizona, U.S.A.)

Some Lithic Technologies from the Western High Desert of Egypt.

ABSTRACT: Recent work in the High Desert west of the historic site of Abydos has revealed a number of technologies dating from the Middle Paleolithic through later periods. The earliest of these include both Nubian 1, Nubian 2, and classical Levallois technologies, which are abundant and demonstrate virtually all stages of production. Presumed later technologies include both large unidirectional blade production technologies as well as more expedient reduction methods.

Although results are still preliminary, the lack of significant taphonomic disturbance, the abundance of refits (including many discrete flintknapping episodes), and the high visibility of the archaeological remains make this an ideal area to reconstruct the techniques of lithic production in use there. These results can be compared to existing models of Middle Paleolithic technological diversity and organization.

C78-10 Chantal TRIBOLO (Oxford, UK)
Stephen STOKES (Oxford, UK)
Michel RASSE (Rouen, France)
Sylvain SORIANO (Villeneuve-d'Ascq, France)
Eric HUYSECOM (Genève, Switzerland)

Optical dating of the long Pleistocene sequence of Ounjougou, Mali (West Africa).

ABSTRACT: Long sedimentological sequences are rare in West Africa and very few are suitable to provide chronological data. Ounjougou however, on the Yamé river (Dogon plateau, Mali), offers the opportunity to establish such chronological framework for the Upper Pleistocene. Indeed, despite the successive erosional processes, a thick sedimentological sequence has been conserved and has recorded at least 15 different stages of occupations and/or lithic complexes.

The Optically Stimulated Luminescence (OSL) method has been applied to >50 sediment samples. The aim of this paper is to describe the main steps of the methodology applied and discuss the results. In particular, the recently developed single grain technique has been applied for the determination of the equivalent dose to deal with either poor bleaching in the fluvial sequences or with bioturbation due to termite activities. The chronological succession of the techno-complexes set up by the OSL dates suggests a long history of population movements during stage 4, 3 and 2 at least, rather than a local evolution.

Session 3: Human remains and behaviour

Chair: Pr. Barbara Barich

C78-11 *Valentina MARIOTTI (Bologna, Italy)*
Benedetta BONFIGLIOLI (Bologna, Italy)
Silvana CONDEMI (Marseille, France)
Fiorenzo FACCHINI (Bologna, Italy)
Maria Giovanna BELCASTRO (Bologna, Italy)

The Epipaleolithic necropolis of Taforalt (Morocco): biocultural aspects inferred from the study of the skeletons.

ABSTRACT: The study of human skeletal remains allows to reconstruct past life conditions and to infer the adaptive strategies adopted by man in the past in relation to his environment. The skeleton, in fact, gives information about paleodemography (age, sex, infant mortality rate, etc.), paleonutrition (through the study of caries, tartar, dental wear, tooth fractures, etc.), paleopathology (infectious and metabolic diseases, articular degenerations, results of trauma, etc.) as well as behaviour (habitual physical activity, diet, cultural practices such as intentional tooth modification, interventions on the corpse, etc.).

The Epipaleolithic necropolis of Taforalt (Morocco, about 12-11000 BP) is one of the most important Iberomaurusian skeletal series. It consists of 28 multiple burials that give back the rests of about 180 individuals, 80 of which were adults (39 males, 31 females, 10 of unknown sex) (Ferembach 1962). From 1999, we have undertaken a broad anthropological investigation of the Taforalt skeletal collection. The aim of the present study is to give a picture of Taforalt complex society. The results of our bioarchaeological investigations have been interpreted in the light of other sources of information (archaeological, archaeozoological, paleobotanical).

C78-12 *L. T. HUMPHREY (London, UK)*
S. M. BELLO (London, UK)

New Late Upper Palaeolithic Ibéromaurusian burials from Eastern and Northern Morocco.

ABSTRACT: Evidence of human mortuary activity is well attested in the Northwest African Late Pleistocene archaeological record. Examples of multiple burials and grouped burials within cemeteries have been reported in eastern Morocco at Taforalt and at Ifri n'Ammar, and from sites in central and western Algeria, including a major cemetery at Afalou Bou Rhummel Cave.

At Grotte des Pigeons at Taforalt human osteological remains representing up to 180 partial human skeletons were recovered from a thick grey ashy layer in the upper sequence of the archaeological deposits during the last century. New work began at Grotte des Pigeons in 2003 allowing investigation of a long sequence of deposits spanning the Middle to Upper Palaeolithic. Excavations in 2005/6 recovered the partially articulated skeletons of at least 4 adults, from a small remaining area of grey silty deposit towards the back of the cave. The burials are found in close association and are surrounded by horn cores of various sizes, which are absent elsewhere in the deposit. No direct dating evidence is yet available for the burials but dates obtained in another part of the cave where up to 3 metres of the same grey ashy deposits are preserved show that these deposits accumulated very rapidly over period of not much more than 1800 radiocarbon years. The earliest date of (OxA-13477) 12,675±50 BP from the base of the sequence provides a likely maximum age for the new burials.

We will also report on a recently discovered undisturbed Late Upper Palaeolithic human burial from Hattab 2 Cave in northern Morocco, a region previously unknown for Ibéromaurusian graves. Unusually the burial represents a single inhumation, and is associated with grave goods including lithic artefacts, bone sagaies, a marine gastropod and a horn core. The skeleton is of a young adult and exhibits characteristic absence of the central upper incisors.

C78-13 Roland NESPOULET (Les Eyzies-de-Tayac, France)
 Mohamed ABDELJELLIL EL HAJRAOUI (Maroc)
 Avec la collaboration de
 Amani FETHI
 Ben-Ncer ABDELWAHED
 Chennaoui KHADIJA
 André DEBÉNATH
 El Idrissi ABDELAZIZ
 Jean-Paul LACOMBE

Patrick MICHEL
 Sabah NIFTAH
 Aïcha OUJAA
 Emmanuelle STOETZEL

Les occupations paléolithiques de la région de Témara, près de Rabat, Maroc. Données récentes sur les milieux et les comportements humains.

ABSTRACT: Dans les années 1970, les découvertes de restes humains paléolithiques à Dar-es-Soltane 2, El Harhoura 1 et aux Contrebandiers ont renforcé l'intérêt des sites de la région de Témara. Ces derniers, souvent cités en référence, ont fait l'objet de nombreuses recherches et ont apporté une contribution majeure à la Préhistoire du Maroc. Depuis 15 ans, les recherches effectuées dans deux sites clefs : El Mnasra et El Harhoura 2 ont considérablement enrichi les données disponibles pour cette région.

Les résultats préliminaires obtenus lors des fouilles menées depuis 2001 permettent de présenter le cadre paléoenvironnemental et de documenter les comportements techniques dans un contexte stratigraphique renouvelé. Les restes fauniques (microfaune et macrofaune) sont envisagés sous le triple aspect de la systématique, de la taphonomie et de la paléoécologie. Les industries lithiques et osseuses documentent les modalités d'acquisition et de transformation des matières premières.

Replacée dans l'histoire des recherches menées depuis plus de 60 ans dans la région de Témara, cette contribution permet d'aborder la question du peuplement paléolithique sur la base de données récentes, pour la plupart inédites.

C78-14

Stéphanie GUISLAIN (Grenoble, France)

Exploitation des gîtes de silex sur les hamada du Sud-Est marocain au paléolithique moyen et au paléolithique supérieur : l'exemple de deux ateliers de taille

ABSTRACT: Dans le Sud-Est marocain, les formations sédimentaires Crétacées sont localisées sur les hamadas. Les formations renfermant des silex, attribuées au Cénomanien-turonien, sont très bien représentées. Les prospections sur les massifs hamadiens, ont permis de mettre en évidence l'existence de nombreux gîtes de silex en position primaire ou secondaire autochtone.

La matière première se présente sous forme de rognons ou de plaquettes. On observe une exploitation continue de ces silex par les Hommes du Paléolithique moyen jusqu'à des périodes historiques pour la réalisation de pierres à feu.

L'étude de deux ateliers de taille attribués à des périodes préhistoriques différentes permet de mettre en évidence des modes d'acquisition et d'exploitation de ces silex différents.

C78-15

Messili LAMIA (Paris, France)

Les figurines néolithiques en terre cuite de la grotte des Idoles : aspects techniques de la manipulation de l'argile (Cap Achakar, Maroc nordoccidental).

ABSTRACT: Cette étude porte sur la technologie céramique à l'origine de la fabrication de petites figurines en terre cuite. Le corpus, d'une cinquantaine de pièces, a été découvert dans un contexte néolithique du secteur d'Achakar de Gibraltar, au Nord-ouest du Maroc. Le Cap d'Achakar a donné son nom au Néolithique local, dit « d'Achakar », dans les nombreux sites connus, particulièrement, depuis les travaux des équipes française et américaine du Peabody Muséum et l'Université de Harvard. L'étude porte sur les questions de provenance et les températures de cuisson. Une prospection sur le terrain en novembre 2004 a livré trois matières premières potentielles, trois argiles prélevées dans les périmètres proche et moyen du Cap. Ces trois candidats ont été testés à différentes cuissons et les transformations intervenues ont été enregistrées au fur et à mesure de la montée en température. La spectrométrie infrarouge à Transformée de Fourier s'est montrée très performante pour déterminer, sur les prélèvements archéologiques, les températures atteintes : environ 800°C pour l'ensemble des pièces du corpus. Les analyses IRTF ont attesté par ailleurs l'utilisation d'argiles très enrichies en sable ou sableuses, comme semble l'indiquer l'environnement géologique du Cap. Les premières données des céramiques utilitaires du site semblent confirmer que les mêmes critères de choix ont été concernés. Des différences évidentes apparaissent toutefois en ce qui concerne les paliers de cuisson.

Session 4: Regional overviews and perspectives**Chair : Pr. Jose Ramos Munoz**

C78-16 Mostapha BELHILALI (Rabat, Maroc)
 Abdeljalil BOUZOUGGAR (Rabat, Maroc)
 Abdellah LAOUINA (Rabat, Maroc)
 Mohamed TAILASSANE (Rabat, Maroc)
 Abderrahim WATFEH (Rabat, Maroc)

ABSTRACT: Le bassin moyen de Bouregreg (région de Maaziz) est rattaché à la zone nord du Plateau central marocain. Il relie le Palier inférieur vers le littoral et le Palier intermédiaire vers les causes du Moyen Atlas. C'est une région formée au nord par des plateaux calcaires homogènes et au sud par des plateaux schisteux très disséqués. Au milieu la région est formée par des fonds et des versants dans des roches tendres argilo-basaltiques.

Les terrasses des oueds et leurs affluents correspondent à des sources très riches en matières premières lithiques (quartzite, schiste et silex) et qui seraient exploitées par les groupes préhistoriques.

Des recherches menées sur le Quaternaire dans cette région par des chercheurs de la Faculté des Lettres et des Sciences Humaines de Rabat et de l'Institut National des Sciences de l'Archéologie et du Patrimoine à Rabat, ont permis la découverte de plusieurs sites archéologiques qui témoigneraient d'une occupation dense de la région au cours du Pléistocène supérieur. Le matériel archéologique est essentiellement composé d'objets lithiques abondants sur les surfaces des terrasses et des plateaux. Les premières identifications typo-technologiques les rattachent au Paléolithique moyen.

C78-17 Abderrahim WATFEH (Rabat, Maroc)
 Mohamed TAILASSAN (Rabat, Maroc)
 Abdellah LAOUINA (Rabat, Maroc)
 Rachidra NAFAA (Rabat, Maroc)
 Abdeljalil BOUZOUGGAR (Rabat, Maroc)
 Farid MALEK (Rabat, Maroc)

L'impact des changements morpho-dynamiques sur l'installation humaine dans la côte de la Meseta atlantique marocaine durant l'Holocène moyen.

ABSTRACT : Sur la côte atlantique de la Meseta, la période holocène se distingue par la présence des héritages sédimentologiques et archéologiques qui témoignent d'une diversité de dynamiques dès la transgression mellahienne et jusqu'à une période très récente.

Ces dynamiques constituent des indicateurs sur les oscillations marines holocènes d'une part et sur les mécanismes continentaux (éolisation, colluvionnement, pédogenèse) d'autre part.

Le littoral atlantique de la meseta constitue un site type pour l'étude des interférences entre les différentes dynamiques responsables de la morphogenèse côtière (Laouina et *al.* 1993, Laouina et *al.* 1994, Watfeh 1996, Nafaa 1998, Tailassane 1999).

De nouvelles études menées par une équipe pluridisciplinaire au sein du laboratoire de Géomorphologie à la Faculté des Lettres et sciences humaines de Rabat entre 2003 et 2005 et en collaboration avec l'Institut National des Sciences de l'Archéologie et du Patrimoine et le Laboratoire des Recherches, d'Analyses Techniques et Scientifiques de la Gendarmerie Royale ont abouti aux résultats suivants :

- La transgression mellahienne(holocène) se compose de deux phases :
 - Le Mellahien 1 présente un faciès de plage durcifié, à une hauteur de 1 m à 1.5 m par rapport au niveau actuel et un âge de 6000 ans BP, conforme aux précédentes études de Gigout 1952, Biberson 1961 et Weisrock 1991.
 - Le Mellahien 2 a un faciès transgressif biodétritique tendre ; il est daté de 4888 ans BP, suite à une remontée de la mer à 2 m par rapport au niveau actuel.
- Entre les deux transgressions, la dynamique éolienne s'est activée entre 5300 ans et 5111 ans et a formé des dunes biodétritiques peu endurcies. (...)

C78-18 Lotfi Belhouchet (Tunis, Tunisie)

Nouvelles découvertes de sites préhistoriques dans le Sud Est tunisien.

ABSTRACT: Lors d'un programme de prospections systématiques dans la région du Sud Est tunisien, une série de sites préhistoriques a été exhumée. Les sites de MED 0021 et de MED 0022 sur l'oued Chafter (gouvernorat de Mednine) sont deux sites néolithiques. Une datation au radiocarbone sur des fragments d'œuf d'autruche (venant du site de Med 0021) a fourni la date de 7125±45 BP. Des ramassages méthodiques de surface ont été pratiqués.

L'étude des deux gisements néolithiques a mis en évidence le caractère archaïque de leurs industries caractérisé par un fond capsien au sein de la structure industrielle.

La comparaison de la structure du stock industriel des deux sites (MED 0021 et MED 0022) avec les stocks de la région capsienne et du Bas Sahara montre que ces industries se rapprochent plutôt des industries du Sahara oriental et plus précisément de celle de Sebkhet El Maleh (Sud Tunisien).

Le processus de néolithisation semble intervenir dans le Sud Est tunisien dès le début du Vème millénaire. Cette phase s'exprimerait surtout par l'intervention des tête de flèches qui auront, désormais, un rôle de plus en plus important.

C78-19 Christophe FALGUÈRES (Paris, France)

Jean Jacques BAHAIN (Paris, France)

A. PEREZ GONZALES

M. SANTONJA

Norbert MERCIER (Gif-sur-Yvette, France)

J.M. DOLO (Gif-sur-Yvette, France)

Datation par ESR/U-Th combinées de quelques sites acheuléens en Espagne.

ABSTRACT: La péninsule ibérique est, de par sa position géographique et le nombre important de ses découvertes en terme de sites préhistoriques, une région-clé dans la compréhension et l'étude de la diffusion temporelle de la culture acheuléenne en Europe occidentale.

La « nouvelle » stratigraphie du site d'Ambrona (province de Soria) est composée par des dépôts fluvio-lacustres dans lesquels une faune abondante associée à des artefacts lithiques acheuléens dont des bifaces ont été trouvés.

Les datations obtenues sur dents de grands herbivores par ESR/U-Th combinées sont comparées à celles obtenues sur d'autres sites importants tels que la Cuesta de la Bajada (province de Teruel) et celles des couches de la Trinchera Galeria (province de Burgos).

C78-20 Jorge MARTÍNEZ-MORENO (Cerdanyola del Valles, Spain)

Joel CASANOVA (Cerdanyola del Valles, Spain)

Rafael MORA (Cerdanyola del Valles, Spain)

Ignacio DE LA TORRE (London, UK)

Technical answers of the South-eastern Pyrenees late Neanderthals.

ABSTRACT: In this presentation, the lithic reduction systems from the Middle Palaeolithic levels at Roca dels Bous, Trago and Cova Gran are presented. These three sites are located in the South Eastern Pyrenees in Catalunya (Spain), and yield some Mousterian levels which can be tentatively attributed to the end of MIS3.

At the three studied sites, there is coexistence between expedient knapping systems and more complex techniques such as the Levallois method. Furthermore, an extreme core reduction is documented in all sites, showing a pattern that cannot be explained by the absence or scarcity of raw material.

This technical pattern can be traced along older assemblages (MIS 4 and MIS 5) at the South-eastern Pyrenees, suggesting a techno-cognitive continuity in the Middle Palaeolithic during the Upper Pleistocene, in which changes in lithic reduction patterns are not evident. The implications of such observations deserve to be therefore contextualized within the general discussion on the behaviour of the Western Mediterranean Neanderthals.

C-78-21

Marcel OTTE (Liège, Belgium)

Relations entre Maghreb et Europe au Paléolithique.

ABSTRACT: Curieusement, les relations entre les deux continents se sont faites de façon sporadique : des épisodes de contact intense ont alterné avec une quasi-isolation des deux rives, sans que cela ne semble dû aux variations climatiques ou aux différents niveaux marins.

Le plus vaste phénomène concerne l'extension de l'Acheuléen, autant via Gibraltar que via la

Sicile. Très tardivement par rapport à l'Afrique, des populations entières ont traversé les détroits

brusquement : un décalage d'au moins 1 million d'années sépare les contextes africains des

premières traces européennes (Venosa, Ambrona). Ce phénomène est d'autant plus remarquable

qu'il s'arrête aussi brusquement en termes géographiques : aucune trace d'Acheuléen à l'Est du

Rhin, malgré d'abondants sites aussi anciens et aussi bien fouillés (Bilzingsleben, Korolevo,

Verteszöllös, Yarimbargas).

Tout le paléolithique moyen semble absent de contact, puis l'Atérien final (vers 20.000 BP)

traverse à nouveau Gibraltar pour abonder en région de Valence (Parpallo) puis dans le bassin du Rhône (« Solutréen Moyen ») où il fut acculturé avec les derniers Gravettiens (« Proto-Solutréen ») aux pointes à face plane.

Au cours du Magdalénien, aucune trace d'influence n'apparaît sûrement (un harpon à Ceuta, toutefois) mais "l'Epi-Gravettien" d'Italie semble nettement influencé par l'Ibéro-Maurusien du Maghreb qui, lui-même se rattache ultimement à la Cyrénaïque (Haua Fteah).

Session C80

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

*Anfiteatre 3, Faculty of Law, Lisbon University
Amphithéâtre 3, Faculté de Droit, Université de Lisbonne*

The Pleistocene palaeoart of the world

Le paléoart du Pleistocène dans le monde

organized by / organisé par

Robert G. BEDNARIK

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SESSION'S ABSTRACT

Recent advances in the study of human evolution have shown the need for greater attention to the cognitive and cultural development of humans. In the Pleistocene record, cognition and culture are primarily accessible through the study of palaeoart, which consists of rock art and portable art-like productions. Cognitive evolution, informed by recent advances in neuroscience and psychology, is increasingly becoming relevant to the understanding of Pleistocene palaeoart. The potential for gaining new insights into the significance of these items from the perspective of cognition is therefore immense. Correspondingly, archaeological finds from this period can provide evidence that may help substantiate particular models as to how human cognition may have eventuated. Collaboration between these disciplines can be viewed as mutually beneficial and sustaining. As research into cognition and brain functioning continues apace, the need to assimilate the various findings in relation to palaeoart becomes all the more imperative. Where Pleistocene artefacts are the subject of controversy, cognitive studies can supply useful suggestions as to interpretation, thereby providing the proper context for the determination of such items. It can also help to disentangle the complex ways by which culture and evolutionary factors interact so that a clearer understanding of their respective roles and influences can be gauged in relation to Pleistocene artefacts.

To render Pleistocene palaeoart scientifically useful, evidence needs to be studied as global rather than regional phenomena. Underlying principles and universals need to be identified, and the material of the Middle and Early Upper Pleistocene requires much more attention than has been evident in the 20th century. This symposium is intended to bring together much of the new evidence deriving from the archaeological record, cognitive studies and neuroscience to reflect the change from traditional preoccupations to new approaches. It will endeavour to place Pleistocene palaeoart into the context of cognitive evolution, explore its semiotic dimensions, consider implications for technology and culture during the Palaeolithic periods, present new empirical evidence of Pleistocene palaeoart from several continents, and review the methods of investigating this kind of evidence scientifically. Papers are invited on all aspects of Pleistocene palaeoart, including cognitive perspectives, and on palaeoart that has not been shown to be of such age but is considered likely to be so..

RÉSUMÉ DE LA SESSION

Les progrès récents dans le domaine de l'évolution humaine ont démontré combien des recherches poussées, en ce qui concerne le développement culturel et cognitif de notre espèce, étaient nécessaires. L'accès scientifique au concept de culture et à la cognition du pléistocène se fait à travers des témoignages archéologique qui consistent principalement en représentations mobilières, pariétales et rupestres. Les récentes recherches sur l'évolution de notre système cognitif, en particuliers dans les domaines de la neurologie et de la psychologie, deviennent de plus en plus à propos quand à la compréhension des mécanismes culturels et cognitifs impliqués dans la production des manifestations artistiques (paléart) du pléistocène. La possibilité de pouvoir accéder, par le biais de la cognition, à de nouvelles perspectives sur la signification de ces paléo objets représente un potentiel non négligeable, peut-être même immense. De la même façon, les découvertes archéologiques du pléistocène peuvent fournir des preuves suffisamment concrètes pour appuyer la plausibilité de certains modèles concernant l'émergence de la cognition humaine. La collaboration mutuelle entre ces différentes disciplines est d'ores et déjà bénéfique. Avec les progrès rapides dans les domaines de recherches cognitives et neuroscientifiques sur le fonctionnement du cerveau humain, le besoin d'assimiler et de replacer dans leurs contextes ces découvertes avec les recherches sur l'art rupestre et pariétal devient pressant, voire impératif. Par exemple, lorsque des objets du pléistocène deviennent des sujets de controverse, les recherches sur la cognition humaine peuvent fournir des suggestions utiles en ce qui concerne l'interprétation, et ainsi permettre l'élaboration de contextes appropriés pour l'élucidation de ces objets. Les recherches sur la cognition humaine peuvent aussi aider à démêler les mécanismes compliqués produits par les interactions entre culture et évolution, permettant ainsi une compréhension plus éclairée sur le rôle et l'influence de ces derniers sur les objets artistiques du pléistocène

SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 09:00 **Opening / Ouverture**
- 09:00-09:20 Yann-Pierre MONTELLE (New Zealand)
C80-01 **Paleoperformance: iconography and performance theory.**
- 09:20-09:40 Jean CLOTTES (Foix, France)
C80-02 **The emergence of Aurignacian cave art in Europe.**
- 09:40-10:00 Frederick L. COOLIDGE (Colorado, U.S.A.)
 Thomas WYNN (Colorado, U.S.A.)
C80-03 **The Role of Enhanced Working Memory in the Production of Therianthroic Art.**
- 10:00-10:20 Michael EASTHAM (U.K.)
C80-04 **In the beginning was the word – or was it?**
- 10:20-10:40 John Feliks (U.S.A.)
C80-05 **The graphics of Bilzingsleben: sophistication and subtlety in the mind of Homo erectus.**
- 10:40-11:00 John Feliks (U.S.A.)

C80-06 **Legends of the sea: Homo erectus people at the beginnings of navigation.**

11:00-11:20 Robert G. BEDNARIK (Caulfield South, Australia)
Giriraj KUMAR (Dayalbagh, India)

C80-07 **The Lower Palaeolithic rock art of India.**

11:20-11:40 Robert G. BEDNARIK (Caulfield South, Australia)

C80-08 **The origins of 'modern humans' and palaeoart reconsidered.**

11:40-12:00 Derek HODGSON (U.K.)

C80-09 **Neurovisual theory, the visuo-motor system and Pleistocene palaeoart.**

12:00-12:20 Dirk HUYGE (Bruxelles, Belgium)

C80-10 **Coa in Africa: the rock art of Qurta (Upper Egypt).**

12:20-13:00 **Discussion**

ABSTRACTS / RÉSUMÉS

C80-01 Yann-Pierre MONTELLE (New Zealand)

Paleoperformance: iconography and performance theory.

ABSTRACT: There seems to be a barely perceptible innovative breeze blowing gently in the forest of rock art research — a faint voice in the multi-vocal sphere of our nascent discipline. This feeble wind has crossed a few disciplines before finding a potential place in rock art research. It will be argued that the iconocentric attempts at deciphering the extant iconographic evidence from the Upper Palaeolithic has been 'missing' the most important area of research: behaviour. Performance theory is a discipline that provides sophisticated paradigms to investigate behaviour — and in the case of rock art, absent behaviour. By shifting the focus from the iconocentric approach to a more behavioural-based mode of investigations, the cave becomes the repository of a variety of behavioural evidence. This mosaic of evidence converge towards providing a suitable context to analyse the modes of production of Upper Palaeolithic iconography

C80-02 Jean CLOTTES (Foix, France)

The emergence of Aurignacian cave art in Europe.

ABSTRACT: Since the discovery of the sophisticated ivory figurines in the Vogelherd and then in other small caves in the Swabian Jura, the existence of a mature form of art in the Aurignacian has been a fact. Other indications, even if less obvious, existed from the presence of paint in some shelters in the Dordogne. It was not, however, until the discovery of Chauvet and its hundreds of images that we came to realise that there existed a fairly early Aurignacian cave art fully as developed as that of the statuettes. This entailed various consequences: a change of paradigms concerning the evolution of Palaeolithic art, the realisation that, if the motifs represented had evolved with time, this was not the case for the fundamental conceptual framework of the art, and finally a reappraisal of various caves (L'Audène, Baume-Latrone and others) that can now safely be attributed to the Aurignacian.

C80-03Frederick L. COOLIDGE (Colorado, U.S.A.)
Thomas WYNN (Colorado, U.S.A.)**The Role of Enhanced Working Memory in the Production of Therianthrope Art.**

ABSTRACT: Late Pleistocene palaeoart, such as the Hohlenstein-Stadel figurine, is thought to be a signature of modern brains if not modern minds. It has been proposed that inchoate palaeoart may have been consciously deployed camouflage to deceive the visual systems of hunted fauna. More controversial is the hypothesis that such art was the product of exogenously or endogenously caused trance states. We have already suggested (Coolidge & Wynn 2005a) that a much more prevalent and ubiquitous phenomenon, dreaming, may have led to the creation of palaeoart, particularly therianthrope figures. However, such art would also require highly advanced visual-spatial representational and motor skills abilities as is consistent with our hypothesis that an additive genetic neural mutation led to an enhancement of non-domain specific working memory capacity in the past 100 ky (Coolidge & Wynn, 2005b). We further propose that therianthrope art may reflect the effect enhanced working memory had upon language, specifically the subjunctive mode, which expresses wishes, hypotheticals, and ideas contrary to fact

C80-04

Michael EASTHAM (U.K.)

In the beginning was the word – or was it?

ABSTRACT: Thought through logical word usage is generally regarded as the distinctive differentiation between the behaviour of *Homo sapiens* and the behaviour of other animal species. This implies that we do more than vocalise emotions and plan sequences of actions to obtain intended objectives like animals do. We observe regularities, verify observations and communicate the results in a form accessible to others. Artefacts that are several hundred thousand years old are found associated with skeletal remains identical with those of modern *Homo sapiens* but they are no more than planned objects. The oldest artefacts providing evidence of observed regularities, verification, and communication are depictions of animals and composites such as those in Cosquer, Chauvet, Pair non Pair and Parpallo in western Europe and possibly Ubirr and Wangewangen in northern Australia.

C80-05

John FELIKS (U.S.A.)

The graphics of Bilzingsleben: sophistication and subtlety in the mind of *Homo erectus*.

ABSTRACT: In 1988, Dietrich and Ursula Mania published images of unmistakably deliberate engravings on bone artefacts dated to over 350,000 years BP, found near the village of Bilzingsleben in central Germany. Contrary to traditional notions of early peoples, Mania and Mania's and Robert Bednarik's (1995) preliminary interpretations suggested that these markings implied the existence of advanced human traits, which included abstract thinking, language and a 'concept of the world'. In this presentation, I will demonstrate that the Bilzingsleben markings go well beyond these already stunning assertions, and document a very large number of graphic innovations and 'highly' advanced intellectual traits in *Homo erectus*, innovations and traits that have long been regarded the exclusive domain of *Homo sapiens*. In fact, the artefacts contain so much information that, collectively, they constitute nothing less than a detailed and expansive map directly into the extraordinary mind of this early ancestor. I will demonstrate that the markings reflect graphic skills far more advanced than those of the average modern *Homo sapiens*. A new list of qualities, abilities and innovations which must now be credited to *Homo erectus*, and which are 'directly' indicated by the markings includes: abstract and numeric thinking; rhythmic thinking; ability to duplicate not only complex, but also, 'subtle' motifs; iconic and abstract representation; exactly duplicated 'subtle' angles; exactly duplicated 'measured' lines; innovative artistic variation of motifs including compound

construction, doubling, diminution and augmentation; understanding of radial and fractal symmetries; 'impeccably' referenced multiple adjacent angles; and 'absolute' graphic precision by high standard and, practically, without error. Each of these will be demonstrated visually. Hence, the following advanced cognitive qualities may be quite easily assumed for the species *Homo erectus* by way of geometric analogy: interrelationship sensitivity and complex organizational skill; language; use of metaphor and hidden meaning; philosophy; mysticism or other 'spiritual' perspectives; and a general ability to discern, appreciate, and create the most subtle nuance within any area of intellectual endeavour.

C80-06

John FELIKS (U.S.A.)

Legends of the sea: *Homo erectus* people at the beginnings of navigation.

ABSTRACT: Prerequisite: 'The graphics of Bilzingsleben: sophistication and subtlety in the mind of *Homo erectus*'. This abstract is primarily a justification for offering a blatantly emotional program in a scientific context. Nowadays, science is 'erroneously' associated with a very limited range of tools in order to make it appear completely rational. These publicly acknowledged tools include objective thinking, observation, testing, measurement, statistics, analogy, peer-review publication and debate. However, at its core, science is inextricably connected with subtler and less easily defined human qualities and pursuits such as intuition, art, music, mysticism, and the entire range of human emotions. Emotions are, and always have been, the driving force behind the work of every scientist (in every field) who is motivated by something other than money, being the kind of thing that everyone knows deep down to be true, yet tend not to admit on the surface (like sexual attraction, desire for love, acceptance, happiness, ad infinitum). A list of emotions (and despite any claims to the contrary, the following 'are' emotionally-dependent states) that typically drive the scientific person includes: inspiration, curiosity, a sense of mystery, intrigue, fascination, absorption, determination, exhilaration, satisfaction, competition, a sense of vindication, and the simple joys of discovery and self-expression. Emotions are just as necessary to science as are the resulting statistics, laws, general conclusions, or products. In fact, without the emotions to appreciate them, the results of 'any' scientific endeavour are absolutely useless to the human spirit. This presentation reflects the emotional explorations that inspired me in my quest to 'scientifically' understand the mind of *Homo erectus* people.

C80-07Robert G. BEDNARIK (Caulfield South, Australia)
Giriraj KUMAR (Dayalbagh, India)

The Lower Palaeolithic rock art of India.

ABSTRACT: Petroglyphs of Lower Palaeolithic age have been discovered in central India since 1990, when two motifs were found that had been covered by Acheulian strata in Auditorium Cave, Bhimbetka site complex. Since then, nine cupules occurring above ground in the same cave have been suggested to be of similar antiquity. A large corpus of cupules located in another quartzite cave, Daraki-Chattan, appeared to be of the same tradition. The presence of extensive exfoliation scars at the entrance to this site suggested that cupule-bearing wall fragments might occur within its floor sediments. Excavation of Daraki-Chattan since 2002 has yielded 28 cupules on exfoliated slabs, and one more cupule made in situ, all of which occurred either within or below the substantial Acheulian deposits. In addition, three engraved grooves were also found in this deposit. Hammerstones used to make the very numerous petroglyphs occur with the archaic, Oldowan-like cobble tool industry found below the Acheulian, and exfoliated slabs with cupules occur virtually down to the same level. In

addition to these two confirmed sites of Lower Palaeolithic rock art, a series of similar occurrences is also under investigation, as well as the possibility that pigment drawings were also made on rock in this period. The general implications of these new finds are discussed.

C80-08

Robert G. BEDNARIK (Caulfield South, Australia)

The origins of 'modern humans' and palaeoart reconsidered.

ABSTRACT: There is a widespread belief in archaeology that what are defined as modern humans and the cognition that led to palaeoart arose together about 35,000 years BP. This paper reviews the basis of this belief and examines both gracile human origins and the early evidence for symboling. It is shown that the favoured explanation of the rise of 'modern humans' is without adequate basis, that there is no evidence for a replacement of robust *Homo sapiens* in Europe or anywhere else, and that the development of human cognition is essentially not connected to skeletal evolution. Palaeoart was in widespread use by traditions of Middle and even Lower Palaeolithic technologies, in Australia, Asia, Africa and even in Europe.

C80-09

Derek HODGSON (U.K.)

Neurovisual theory, the visuo-motor system and Pleistocene palaeoart.

ABSTRACT: The structure and function of the early visual cortex has been shown to be relevant to the understanding of Pleistocene palaeoart. In order to obtain a more complete appreciation of how brain function may be relevant to this issue, it is necessary to take account of how the visual cortex of hominins may have been related to visuo-motor areas. The ability to translate the 'passively' experienced visual world into visuo-motor co-ordinates involving hand-eye co-ordination would have been vital before any purposely made Pleistocene palaeoart was possible. Delineating the probable course of this dynamic can provide clues as to the existence and timing of when particular kinds of palaeoart may have arisen and will constitute the main focus of this paper

C80-10

Dirk HUYGE (Bruxelles, Belgium)

Coa in Africa: the rock art of Qurta (Upper Egypt).

ABSTRACT: In March-April 2004, in the scope of rock art surveying at El-Hosh (Upper Egypt), about 30 km south of Edfu, on the west bank of the Nile, a new and intriguing petroglyph locality was discovered. This locality (Abu Tanqurah Bahari 11) shows, among other items, several images of bovids executed in a 'Franco-Cantabrian, Lascaux-like' style. They are quite different from the stylized cattle representations in 'classical' Predynastic iconography of the 4th millennium BC. On the basis of patination and weathering, these bovid representations are definitely extremely old. They are comparable to similar bovid images that had been discovered by a Canadian mission in 1962-1963 on the opposite bank of the Nile, about 10 km more to the south, in the Gebel Silsila area. In October-November 2005, we succeeded in relocating these previously found sites. They are part of a huge rock art complex along the northern edge of the Kom Ombo Plain, truly a 'Lascaux' along the Nile. Because of their proximity to the village of Qurta, we have called these sites Qurta I and II. The main theme are naturalistically drawn bovids. They vary greatly in size: many are 50 to 80 cm long (much taller than bovid images in 'classical' Predynastic iconography). In addition, there are also representations of gazelle, hippopotami, fish, some monstrous beings and several stylized human figures (of pure Palaeolithic, 'Magdalenian' type). All the arguments are circumstantial, but we are quite convinced this is Palaeolithic rock art indeed. Additional circumstantial evidence, the proximity of the rock art to Palaeolithic settlement at two different locations where this type of art occurs, leads us to believe that it predates the 'Wild Nile' geological stage, i.e. older than about 14,000 BP. This would definitely make Qurta Egypt's oldest art and one of the oldest graphic traditions thus far known from the African continent

Session C81

Friday, 8 September 2006 / Vendredi, 8 Septembre 2006

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

Spirals and Circular Forms

The most common rock art elements in the world?

Spirales et Formes Circulaires

Les éléments d'art rupestre les plus communs dans le monde?

organized by/organisé par

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SESSION'S ABSTRACT

Spirals and circular forms may be the most numerous non-representational rock art symbol in the world. They are found throughout the world. Interpretations for these images may be almost as numerous as there are examples of them. Some of these are fanciful and not based on scientific data. This session will explore the varied examples throughout the world and/or pose possibilities for their creation based ONLY on detailed research and substantiated studies.

RESUME DE LA SESSION

Quelques sujets choisis (preferablement concentre sur une seule forme): locations des spirales ou des formes circulaires dans le monde; comparaison et contraste de spirales ou cercles dans le monde; location des spirales ou des formes circulaires dans le paysage; l'histoire des interpretations de ces formes; les spirales ou les formes circulaires d'un pays specifique; les formes qui se trouvent a un site specifique qui en contient plusieurs; la signification de ces formes a certaines cultures.

SESSION PROGRAM / PROGRAMME DE LA SESSION

09:00-09:10 **Introduction.**

- 09:10-09:25 José Luis MAMANI (S. S. De Jujuy, Argentina)
Alicia FERNANDEZ DISTEL (S. S. De Jujuy, Argentina)
C81-01 **Spirals in Humahuaca and in the NW of Argentina (South America).**
- 09:30-09:45 Freddy BARNICHTA (Santo Domingo, Republica Dominicana)
C81-02 **Cuba: Rock Art and Aboriginal Myths Freddy Barnichta.**
- 09:50-10:05 Erika MORALES VIGIL (Mexico)
Katina VACKIMES SERRET
C81-03 **The Concentric Circle in Rock Art of Mesoamerican Cultures.**
- 10:10-10:25 César A. QUIJADA (Sonora, Mexico)
C81-04 **Spirals and concentric circles in Sonora, Mexico.**
- 10:30-10:50 Carlos VIRAMONTES ANZURES (Querétaro, Mexico)
C81-05 **Spirals in rock art traditions in Querétaro and Guanajuato, Mexico.**
- 10:50-11:10 **Break / Pause**
- 11:10-11:25 John CLEGG (Balmain, Australia)
C81-06 **Spirals at Sturts Meadows.**
- 11:30-11:45 Guilherme Albagli DE ALMEIDA (Bahia, Brasil)
C81-07 **Brief Considerations on Circular Pictographs in the Rock Art of the State of Bahia, Brasil.**
- 11:50-12:05 Evelyn BILLO (Flagstaff, Arizona, U.S.A.)
Robert MARK (Flagstaff, Arizona, U.S.A.)
C81-08 **Spirals of the Colorado Plateau, USA.**
- 12:10-12:25 David M. BROWNE (Ceredigion, UK)
C81-09 **Interpretations of the Pre-columbian Geoglyph spirals of the Nasca Region of Peru.**
- 12:30-12:45 Pratima KAMAT (Panaji, Goa, India)
C81-10 **Interpreting the Spiral at Pansaimol, Goa, India.**
- 12:45-14:30 **Lunch / Déjeuner**
- 14:30-14:45 Jane KOLBER (Bisbee, AZ, U.S.A.)
C81-11 **The Spirals of Chaco Canyon, U.S.A.**

14:50-15:05 Edi SHUKRIU (Prishtina, Kosova)

C81-12 Spirals of Prehistoric Open Rock Painting from Kosova.

15:10-15:25 Anita SPEARS (Lexington, KY, U.S.A.)
Paul PIRONTI (Lexington, KY, U.S.A.)

C81-13 A Niche in World Rock Art.

15:30-16:30 **Questions and discussion**

ABSTRACTS / RÉSUMÉS

C81-01 José Luis MAMANÍ (S. S. De Jujuy, Argentina)
Alicia FERNÁNDEZ DISTEL (S. S. de Jujuy, Argentina)

Spirals in Humahuaca and in the NW of Argentina (South America).

ABSTRACT: The spiral is studied for the first time in "About the Spirals" by Archimedes (Greece, 287-212 BC. This figure is introduced with the words "spire" for the single spin and "spiral" for the complete figure with more spins. In America, the design of spirals seems to have been used previous to Archimedes' time, although in the Northwest of Argentina the appearance of this figure is thought to date between the years 800 and 1,400 AD.

The spiral is found in the cave paintings, in pumpkin carvings and in ceramics, particularly those painted on the inside of plates (*pucos* in quichua language). There can be seen simple linear spirals, double spirals and spirals filled with squares, spirals in twos, facing each other and symmetric, as well as spirals joined to animals.

The number of spires detected in the largest spiral found in northwestern Argentina is 12, a number of evidently sacred characteristics. When there are several spirals in an earthenware vessel, it can be seen that all of them spin to the same side whether it is clockwise or not. This could have been caused by the predominance of the use of either one hand or the other by the ancient artist. What appears, is the spiral called "Archimedes'." For lack of precise calculus methods, the logarithmic spiral has not appeared yet.

This paper is produced with computer methods used to design spirals in the computer, either Archimedes's or the logarithmic ones. Finally, the wrong use in archaeology of the term "quadrangular spiral" is discussed, because in these cases we are either in front of: 1. Simple consecutive segments; 2. A linear spiral with tendencies to be triangular or quadrangular.

In this paper, arithmetic is complemented (with its specific field: geometry) with the archaeology of art.

C81-02 Freddy BARNICHTA (Santo Domingo, Republica Dominicana)

Cuba: Rock Art and Aboriginal Myths Freddy Barnichta.

ABSTRACT: The Amazon, Tibet and Africa fill bookstores full of catalogues, summaries of expeditions and collections of photographs, in all of which the desire to impress is so dominant that it almost makes it impossible for the reader to take in the value of the evidence put in front of him. The rock art of the American aborigine is intimately linked to the mythic, sociopolitical and cultural vicissitudes of the ethnic group that executes it. The aboriginal reality is a metaphor of their mythic history, and through this, one can approach these Cuban pictographs with a spiral (with a homologous in the Cueva del Cosmo in Brazil). We interpret it from the multidisciplinary optics of the arqueo-mythic-astronomy and the partial results that we are presenting are part of the original work that we wrote titled: "The Antilles Sky and the Good Luck of the Aborigine."

C81-03 Erika MORALES VIGIL (Mexico)
Katina VACKIMES SERRET

The Concentric Circle in Rock Art of Mesoamerican Cultures.

ABSTRACT: The concentric circle is a common sign presented in petroglyphs and paintings elaborated on rocks, associated with different kinds of settlements ubicated in the great cultural area of Mesoamerica. Although this settlements differ in time and space, actually we don't know the exactly date in which this signs were made. In this work we are going to present a general ubication of rock art sites with concentric circles in Mesoamerican territory, their associations – with other signs and archaeological elements – and an investigation about the cosmogonic importance for the different cultures in relation with this phenomena.

C81-04 César A. QUIJADA (Sonora, Mexico)

Spirals and concentric circles in Sonora, Mexico.

ABSTRACT: The state of Sonora is a region where a scarcity of water, over a period of centuries, has determined the location of various human activities. The geometric rock art of the northwestern state of Sonora, whether petroglyphs or pictographs, almost always includes spirals and concentric circles.

The present work will describe many of these elements in sites found in different natural environments--desert regions, valleys in the southern and central parts of the state, and the mountains of eastern Sonora--wherever there exists a supply of water, whether from a spring, a creek or a river.

C81-05 Carlos VIRAMONTES ANZURES (Querétaro, Mexico)

Rock art traditions in Querétaro and Guanajuato, Mexico.

ABSTRACT: During the pre-Hispanic time, the Mesoamerican agricultural societies that lived in the territories of the present states of Queretaro and Guanajuato (Mexico), were profoundly iconoclastic, and this was reflected in the rock art of the region. This work explores the possible meanings of the rock art of these societies, principally spirals of many types, scrolls, curved lines and architectonic representations on rock. The spatial disposition of these stone engravings, suggests that the pre-Hispanic societies marked the landscape, giving it the characteristics of a ritual landscape and revealed a sacred geography that was manifested in specific archeological sites of particular importance, in close relationship with the worship to the hills and the stone, the water and the fertility, to the dead and the ancestors, all of this in the framework of the Mesoamerican world view.

C81-06 John CLEGG (Balmain, Australia)

Spirals at Sturts Meadows.

ABSTRACT: Sturts Meadows is a large old Australian Aboriginal rock art site in western New South Wales, where we have counted 187000 engravings. There are areas we did not count. There are C14 dates on limestone deposits over engravings of 10,000 or so BP. There are reasons to believe that the engravings date to before the last ice-age maximum of 20-22000 BP.

The site has three different sorts of spirals. Those of one sort are carefully made and have been deepened by re-pecking. Others are experimental, art in the sense of activity that could foster discovery, and mathematical. Like Klees lines taken for a walk they sometimes reverse direction and joke. The third set are spirals only in that they were apparently made in one continuous line that loops round itself.

Such a large site has the advantage that the data-base is large enough for statistic playing. The spirals do not perform statistically in association and distribution like the concentric circles they so much resemble, but seem to belong to another analytical category, A complex non-figuratives that occur more commonly at Sturts Meadows than in the numerous comparable sites.

C81-07 Guilherme Albagli DE ALMEIDA (Bahia, Brasil)

Brief Considerations on Circular Pictographs in the Rock Art of the State of Bahia, Brazil.

ABSTRACT: The geographic position of the State of Bahia, in the middle of South America's eastern coast, makes it a convergence focus of different paleocultures, in different times. Although it is somehow difficult to differentiate these cultures by means of their lithic and ceramic evidence, their Rock Art can show well recognizable TRADITIONS which overlap in this area. Not all of them emphasize equally the production of round shaped figures. In fact, only in the "GEOMETRIC TRADITION", which is widespread on the Central Brazilian Highlands, can the round figures appear in expressive proportions. This article aims to analyse and present a personal synthesis on bibliographic data available in specialized literature.

C81-08 Evelyn BILLO (Flagstaff, Arizona, U.S.A.)
Robert MARK (Flagstaff, Arizona, U.S.A.)

Spirals of the Colorado Plateau, USA.

ABSTRACT: Not only are spirals common on the Colorado Plateau of the Southwestern United States, they have meaning to some indigenous people such as the Hopi who believe they depict migrations of their various clans. In some cases spirals have been studied in detail for light and shadow interactions that may indicate the rock art had calendrical significance to the people who created it. A large spiral on Fajada Butte in Chaco Canyon, first recorded by Jay Crotty in the late 1970s began the quest for rock art archaeoastronomy sites and increased the research into spirals in general.

C81-09 David M. BROWNE (Ceredigion, UK)

Interpretations of the Pre-columbian Geoglyph spirals of the Nasca Region of Peru.

ABSTRACT: The Nasca geoglyphs can be regarded as a special form of rock art; indeed, recent work by Reindel and Isla has indicated that the biomorph elements of them, at least, were inspired by Paracas culture petroglyphs. This paper classifies the various forms of spiral motifs occurring in the Nasca region. Explanations of their

possible meanings to their makers are advanced from contextual analysis of their relationship to other forms of geoglyph and to adjacent pre-Columbian settlements and civic-ceremonial sites. The study also makes use of contextual analysis of the occurrence of the spiral motif in other Paracas and Nasca culture artistic media, as well as ethnographic analogy.

C81-10 Pratima KAMAT (Panaji, Goa, India)

Interpreting the Spiral at Pansaimol, Goa, India.

ABSTRACT: As the early artists continually worked on an improved and accurate depiction of the animals they hunted and lived with, they simultaneously developed symbols that underwent A process of geometricisation. Various meanings have been attributed to this representational art. The discovery of the rock carvings at Pansaimol in South Goa, India, opened new vistas of archaeological interpretation of the symbolism associated with them, aspiring for a place of pride on the international map of proto-historic art. These petroglyphs constitute a veritable labyrinth on laterite for there is much controversy regarding their identification and dating. One of these petroglyphs, that attracts the attention of the visitor and the scholar, is an engraving that has been identified as the triskelion, *chakravyuha* or the labyrinth which is 1.5-1.7 metres in diameter and has been the subject of much discussion. In this paper an attempt has been made to critically examine the various interpretations of the geometric petroglyph of Pasaimol, referred to as the triskelion, described as a composition of seven concentric circles with three intercoiled snakes.

C81-11 Jane KOLBER (Bisbee, AZ, U.S.A.)

The Spirals of Chaco Canyon, U.S.A.

ABSTRACT: Spirals may be the most common nonrepresentational rock art element in the world. They most certainly are the most common in Chaco Canyon, a national park with the largest prehistoric ruins in the United States. Chacoan spirals are found in different shapes, styles and configurations. Some resemble those in other areas and some are unique. Placement in the landscape varies from small and hidden locations to large and prominent. Some adapt to the natural environment while others alter their surroundings. Interpretations of Chacoan spirals range from highly publicized sun watching stations to migration symbols. The study of these spirals may offer clues to understanding the most complex prehistoric civilization in the United States.

C31-12

Edi SHUKRIU (Prishtina, Kosova)

Spirals of Prehistoric Open Rock Painting from Kosova.

ABSTRACT: Spirals and deer compose the prehistoric open rock art found in southwest Kosova. Paintings done in red colour are placed on the two roofs and the wall. Roof 1 holds four spirals (zone A) and, two double spirals (Zone B). Roof 2 holds two double spirals. Wall has two levels: Horizon I start with the figure of the deer, followed by three spirals. Horizon II hold spirals and other signs.

Spirals are very present in Kosova. The close circle labyrinth dedicated to Dea Dardanica can be seen as the development of spirals as well as the continuity of the Sun worship by Dardanians.

C31-13

Anita SPEARS (Lexington, KY, U.S.A.)

Paul PIRONTI (Lexington, KY, U.S.A.)

A Niche in World Rock Art.

ABSTRACT: Every rock art site has its contextual niche in our world=s recognition of archaeological treasures. Site 15Lr77 is no exception to this statement. Explorations that began in 1995 led to a systematic survey of a small project area from 2002-2004. Numerous circular petroglyphs were documented on boulders and cliff walls in a permanent stream near a prominent landscape feature. Site 15Lr77 is located in a remote and rugged area on Pine Mountain in southeastern Kentucky in the United States of America. How could the data from this single isolated site be a contribution to the world study of rock art?

Session C83

Thursday , 7 September 2006 / Jeudi, 7 Septembre 2006

And/ Et

Friday , 8 September 2006 / Vendredi, 8 Septembre 2006

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

**Current issues on projectile tips studies, from the beginning
of the upper Palaeolithic to the end of the Neolithic.**

**État des recherches sur les armatures de projectile, du début
du Paléolithique supérieur à la fin du Néolithique.**

organized by / organisé par

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SESSION'S ABSTRACT

This Colloquium intends to bring together researchers concerned with the study of prehistoric weaponry. Most of our attention will be dedicated to projectile tips, our primary source of evidence about this topic. We wish this colloquium to be an opportunity for debate and exchange between specialists from different fields — lithic, bone and antler technology, archaeozoology, ethnoarchaeology, etc. The papers will be organized in four thematic sessions reflecting the main questions addressed by the current researches on prehistoric projectile tips:

- (1) Projectile tips: definition and identification;
- (2) What is the use of projectile tips?
- (3) "Technical investment": real topic or irrelevant question?
- (4) Can we find out why projectile tips change over time?

RESUME DE LA SESSION

Ce colloque vise à rassembler les chercheurs travaillant sur l'armement préhistorique, en se concentrant particulièrement sur ces témoins privilégiés que sont les armatures de projectile. Nous souhaitons qu'il soit un espace d'échange et de débat entre spécialistes d'horizons différents, croisant ainsi les approches de la technologie lithique et osseuse, de l'archéozoologie, de l'ethno-archéologie... Les communications seront organisées en quatre sessions thématiques, reflétant les principales problématiques qui structurent aujourd'hui les recherches portant sur les armatures préhistoriques :

- (1) Les armatures : définition et identification;
- (2) Des armatures pour quoi faire ?
- (3) L' "investissement technique": vraie ou fausse question ?
- (4) Peut-on dire pourquoi les armatures évoluent ?

SESSION PROGRAMME / PROGRAMME DE LA SESSION

7th September 2006 / 7^{ème} Septembre 2006

09:00-09:30 Introduction by the session organizers / Introduction des organisateurs de la session

09:30-10:00 Hugues PLISSON (Aix-en-Provence, France)

Méthodes et thèmes des recherches sur les armatures de projectiles.

Theme 1 : Projectile tips : definition and identification

Thème 1 : *Les armatures : définition et identification*

10:00-10:30 Christian NORMAND (Hasparren, France)
Magen O'FARRELL (Nanterre, France)
Joseba RIOS GARAIZAR (Santander, France)

C83-01 **Quelles fonction(s) pour les productions lamellaires de l'Aurignacien archaïque? Quelques réflexions à partir des exemplaires de la grotte d'Isturitz (France).**

10:30-11:00 Nejma GOUTAS (Nanterre, France)

C83-02 **Les pointes d'Isturitz: armatures de projectiles ou outils de transformation? Apport de l'étude technologique et fonctionnelle à la définition des pointes d'Isturitz.**

11:00-11:30 Valentina BORGIA (Siena, Italy)

C83-03 **Ancient Gravettian in the South of Italy: functional analysis of backed points.**

11:30-12:00 Sylvain DUCASSE (Toulouse, France)
Caroline RENARD (Nanterre, France)

C83-04 **Pointes à cran solutréennes et badegouliennes: première approche techno-économique comparative. L'exemple du Quercy (France).**

12:00-12:30 Pierre CATTELAINE (Treignes, France)

- C83-05** Des propulseurs dans le Magdalénien à navettes : pour quels projectiles ?
- 12:30-13:00 Jean-Marc PETILLON (Nanterre, France)
- C83-06** Des barbelures pour quoi faire? Réflexion sur la fonction des armatures barbelées magdaléniennes.
- 13:00-14:30 **Lunch / Déjeuner**
- Theme 2 continued:** What is the use of projectile tips ?
Thème 2, suite: Des armatures pour quoi faire ?
- 14:30-15:00 Hugues PLISSON (Aix-en-Provence, France)
Boris VALENTIN (Paris, France)
- C83-07** Fabrication et usage des pointes lithiques de l'Azilien ancien : l'exemple de la grotte du Bois Ragot à Goux (Vienne, France).
- 15:00-15:30 Stefano GRIMALDI (Trento, Italy)
- C83-08** Hunting, what? Early Mesolithic backed points in north-eastern Italy: an experimental approach.
- 15:30-16:00 Mara-Julia WEBER (Vienna, Autriche)
- C83-09** Au-delà de la typologie: fabrication et utilisation des pointes lithiques au Hambourgien.
- 16:00-16:30 Lorène CHESNAUX (Nanterre, France)
Sylvie PHILIBERT (Valbonne, France)
- C83-10** Des microlithes sauveterriens, témoins de l'armement des derniers chasseurs-cueilleurs des Alpes du Nord.
- 16:30-17:00 Annalisa PEDROTTI (Trento, Italy)
Fabio CAVULLI (Trento, Italy)
Stefano GRIMALDI (Trento, Italy)
- C83-11** The production of points for projectile weapons: the Neolithic arrowheads from La Vela and Isera La Torretta (northeastern Italy).
- 17:00-17:30 Vanessa LÉA (Valbonne, France)
Bernard GASSIN (Valbonne, France)
- C83-12** Quelles armatures de projectiles dans le Midi Méditerranéen et ses marges? Millieu V.ème - Millieu IV.ème millénaire.
- 17:30-18:00 Marie-Hélène DIAS-MEIRINHO (Toulouse, France)
- C83-13** La notion d'armes de guerre à la fin du Néolithique.
- 18:00-18:30 **General discussion on themes 1 and 2 / Discussion générale sur les thèmes 1 et 2**

8th September 2006 / 8^{ème} Septembre 2006

Theme 3 : "Technical investment" : real topic or irrelevant question ?
Thème 3 : L' "investissement technique" : vraie ou fausse question ?

09:00-09:30 Aurélien SIMONET (Toulouse, France)

C83-14

L'atelier de taille gravettien de Tercis (Landes) en relation avec l'occupation d'Isturitz: un cas probable d'apprentissage de la confection d'armatures lithiques.

09:30-10:00 Nicolas NAUDINOT (Rennes, France)

C83-15

L'investissement technique dans la conception des armatures: l'exemple des industries de la fin du tardiglaciaire de l'Ouest de la France.

10:00-10:30 Anne HAUZEUR (Bertrange, Luxembourg)
Hartwig LÖHR (Trier, Germany)

C83-16

Latéralisation des armatures rubanées: apport des données récentes de la Moselle dans le contexte culturel du Rubané du Nord-Ouest.

10:30-11:00 Caroline RENARD (Nanterre, France)

C83-17

Nouvelles données sur les armatures de la fin du Néolithique dans le bassin de la Seine.

11:00-12:00 General discussion on theme 3 / Discussion générale sur le thème 3

12:00-12:30 Matthieu LANGLAIS (Toulouse, France)

C83-18

Du Rhône à l'Ebre, l'identité magdalénienne au Tardiglaciaire à travers l'étude des armatures lithiques.

12:30-13:00 Eva DAVID (Nanterre, France)

C83-19

Les armatures de projectiles en matières dures d'origine animale de l'Holocène ancien en Europe du Nord: entre tradition technique et nécessité socio-économique.

13:00-14:30 **Lunch / Déjeuner**

Theme 4 continued : Can we find out why projectile tips change over time ?
Thème 4, suite : Peut-on dire pourquoi les armatures évoluent ?

14:30-15:00 Nicolas VALDEYRON (Toulouse, France)
Bruno BOS-ZANARDO (Toulouse, France)
Thomas BRIAND (Toulouse, France)

C83-20

Evolutions des armatures et dynamiques culturelles du Mésolithique au Néolithique ancien dans le sud-ouest de la France: l'exemple quercinois.

15:00-15:30 Georgia STRATOULI (Edessa, Greece)
Odysseas METAXAS (Athens, Greece)

C83-21 **Projectile points from Neolithic Layers of Drakaina Cave in Kefalonia, Ionian Islands, W. Greece: Technological Conservatism and Social Identity.**

15:30-16:00 Antoni PALOMO (Barcelona, Spain)
Javier FERNANDEZ (Tirig, Castellón, Spain)
Juan Francisco GIBAJA (Faro, Portugal)

C83-22 **Les microlithes géométriques utilisés comme pointes de projectile dans les sociétés néolithiques de l'Est de la Péninsule ibérique.**

16:00-16:30 Matthieu HONEGGER (Hauterive, Suisse)

C83-23 **Les segments de cercle de Nubie depuis le Mésolithique jusqu'au Chalcolithique: outils multifonctionnels, éléments de faucille ou armatures de flèches?**

16:30-17:00 Bruno BOSC-ZANARDO (Toulouse, France)
François BOM (Toulouse, France)
François-Xavier FAUVELLE (Johannesburg, Afrique du Sud)

C83-24 **L'armement Bushmen: regards croisés des sources historiques, ethnologiques et archéologiques.**

17:00-18:00 **General discussion on theme 4 / Discussion générale sur le thème 4**

18:00-18:30 **Outcomes and prospects / Bilan et perspectives**
Conclusion of the session / Conclusion du colloque

ABSTRACTS / RÉSUMÉ

C83-01 Christian NORMAND (Hasparren, France)
Magen O'FARRELL (Nanterre, France)
Joseba RIOS GARAIZAR (Santander, Spain)

Quelle(s) fonction(s) pour les productions lamellaires de l'Aurignacien archaïque? Quelques réflexions à partir des exemplaires de la grotte d'Isturitz (France).

RESUME: Depuis quelques années, de nouvelles recherches sont menées sur la riche séquence archéologique de la salle de Saint-Martin de la grotte d'Isturitz. Dans ce cadre, des fouilles programmées ont permis de recueillir de nombreuses séries couvrant la quasi-totalité du techno-complexe aurignacien. Parmi celles-ci, certaines, attribuables à l'Aurignacien archaïque, ont livré un matériel abondant et diversifié. Sa composante lithique est dominée par les lamelles, plusieurs milliers d'éléments bruts et plusieurs centaines retouchés, dont la production était à l'évidence prioritaire dans la grotte. Mise en parallèle avec l'absence de pointes en matière dure animale, cette place centrale, déjà observée dans d'autres sites, conduit à proposer une fonction d'armature de projectile pour les pièces utilisées.

L'objectif de cette communication sera de faire le bilan des travaux en cours qui visent à évaluer cette proposition à partir des exemplaires d'Isturitz.

Ainsi, nous présenterons tout d'abord les caractères distinctifs des lamelles découvertes, leur variabilité typologique et les modalités de leur obtention, puis les résultats des analyses tracéologiques dont elles ont fait l'objet, qu'elles aient été retouchées ou non. A partir de ces diverses données, nous aborderons les différentes hypothèses fonctionnelles qui peuvent être élaborées et nous insisterons en particulier sur les informations qui nous permettent de penser qu'une grande partie d'entre elles correspondaient effectivement à des armatures de projectiles. Toutefois, nous concluons sur les limites actuelles de ces travaux et les interrogations qui subsistent.

C83-02 Nejma GOUTAS (Nanterre, France)

Les pointes d'Isturitz: armatures de projectiles ou outils de transformation? Apport de l'étude technologique et fonctionnelle à la définition des pointes d'Isturitz.

RESUME: Dans le cadre de notre recherche doctorale portant sur la caractérisation des industries en matières dures animales du Gravettien en France, nous nous sommes particulièrement intéressée à la "pointe" d'Isturitz considérée comme le seul "fossile directeur osseux" du Gravettien et caractéristique de la phase moyenne à burins de Noailles. Le gisement d'Isturitz, dont elle porte le nom, a livré le plus important corpus de France (n = 179), avec plus de 70 % des pièces recensées. A l'exception de ce dernier site et, dans une moindre mesure, de l'abri Pataud, les pointes d'Isturitz ne sont généralement représentées que par quelques exemplaires, généralement fragmentaires.

Les auteurs se sont longtemps opposés sur la nature de ces pointes, afin de déterminer si la partie striée était la partie emmanchée ou la partie active de la pièce. Notre étude a permis de répondre à cette question en montrant que ces deux hypothèses sont justes. Nous avons ainsi proposé une première typologie et une nouvelle interprétation des pointes d'Isturitz. L'étude typologique, technologique et fonctionnelle que nous avons conduite, nous amène à remettre en cause l'interprétation systématique de ces pièces comme armatures de projectiles. Les macro-traces fonctionnelles présentes sur un certain nombre de ces pièces contredisent cette hypothèse. Nous avons ainsi fréquemment observé des stigmates de percussion bipolaire suggérant une utilisation en outils intermédiaires. Le terme de "pointe" d'Isturitz semble désormais impropre, c'est pourquoi il nous semble préférable d'utiliser une terminologie plus neutre, comme par exemple celle de "pièce d'Isturitz".

C83-03 Valentina BORGIA (Siena, Italy)

Ancient Gravettian in the South of Italy: functional analysis of backed points.

ABSTRACT: This study is concentrated on the modalities of use of the Gravettian backed tools, considering the Adriatic and Tyrrhenian sides of southern Italy.

A first part of the work has regarded the functional analysis of the backed instruments found in the layers of the ancient Gravettian of Grotta Paglicci (Foggia). The methodological proposal derived from this study, based on the association of the techno-typometric and typological analysis with use-wear analysis, has been extended for a comparison to the backed tools coming from a Gravettian site almost coeval, but situated on the opposite side of our peninsula: Grotta della Cala (Salerno).

C83-04 Sylvain DUCASSE (Toulouse, France)
Caroline RENARD (Nanterre, France)

Pointes à cran solutréennes et badegouliennes: première approche techno-économique comparative. L'exemple du Quercy (France).

RESUME: Le Quercy renferme un certain nombre de gisements stratifiés, fouillés à des époques assez diverses et étageant des industries attribuables au Solutrén supérieur et au Badegoulien; l'un ne se rencontrant que rarement sans l'autre. Les analyses en cours des ensembles lithiques issus des sites fouillés le plus récemment (Le Cuzoul de Vers, Les Peyrugues...) permettent d'ores et déjà d'effectuer une première comparaison des chaînes opératoires liées à la production d'armatures lithiques et, en l'occurrence, celle des pointes à cran. Ces dernières, bien que constitutives des industries rattachées aux dernières phases du Solutrén ne sont présentes au sein du Badegoulien qu'à titre très exceptionnel.

Les industries badegouliennes et solutréennes ont longtemps été strictement opposées, l'esthétisme des secondes contrastant vivement avec le style fruste des premières. L'apport des analyses techno-économiques via le prisme analytique constitué par l'appréhension des activités liées à la sphère cynégétique (industries lithiques, osseuses, archéozoologie...), laisse envisager la possibilité d'engager une réflexion sur l'évolution de cette dernière entre 20000 BP et 18000 BP en Quercy et d'éclairer autrement les relations existant (ou pas) entre ces deux techno-complexes.

C83-06 Jean-Marc PETILLON (Nanterre, France)

Des barbelures pour quoi faire? Réflexion sur la fonction des armatures barbelées magdaléniennes.

RESUME: Les éléments barbelés en bois de Cervidé interprétés comme des armatures de projectile se multiplient dans les sites magdaléniens à partir de la fin du Dryas ancien. Si ces objets ont tout d'abord été considérés comme témoignant du développement des activités de pêche, des réflexions plus récentes – dont la plus détaillée reste celle de M. Julien – tendent à nuancer cette idée et à faire des armatures barbelées une catégorie fonctionnellement hétéroclite, sans doute liée au milieu aquatique mais pas exclusivement à la pêche (chasse aux oiseaux aquatiques, piégeage d'ongulés dans des zones marécageuses...).

Force est cependant de constater que la ou les fonctions de ces objets restent aujourd'hui largement conjecturales. Tout se passe comme si le problème du classement typologique des éléments barbelés, et surtout de leur sériation chronoculturelle, avait en partie occulté la question de leur signification fonctionnelle. Il s'agit pourtant de l'un des seuls cas au Paléolithique supérieur où l'apparition d'un nouveau type de vestige nous renseigne directement sur l'introduction d'une nouvelle méthode de capture des proies. Il devient dès lors essentiel de comprendre comment, et dans quelle mesure, cette innovation a modifié le système de prédation des sociétés magdaléniennes.

De ce point de vue, les perspectives de recherche les plus prometteuses ne se situent pas forcément du côté de l'archéologie expérimentale. Peut-être faut-il plutôt s'attacher, d'une part, à des comparaisons précises entre la représentation des éléments barbelés et les données archéozoologiques de chaque gisement ; d'autre part, à une exploration aussi complète que possible des informations ethnographiques se rapportant aux modalités d'utilisation des armes et projectiles barbelés. Ces deux axes de recherche ne sont bien sûr pas nouveaux, mais c'est de leur application systématique, tendant à l'exhaustivité, que nous espérons voir émerger des tendances significatives.

C83-07 Hugues PLISSON (Aix-en-Provence, France)
Boris VALENTIN (Paris, France)

Fabrication et usage des pointes lithiques de l'Azilien ancien : l'exemple de la grotte du Bois Ragot à Gouex (Vienne, France).

RESUME: L'azilianisation, dont on perçoit mieux aujourd'hui les rythmes et les modalités de développement, s'est traduite, entre autres aspects, par une transformation importante de l'armement de chasse : sans doute dès le XIII^{ème} millénaire avant J.-C., l'usage des pointes osseuses diminua très nettement au profit d'un emploi presque exclusif des pointes lithiques.

Comment fonctionnèrent ces armatures, et notamment le modèle «bipointe» qui s'imposa pendant la phase ancienne des traditions aziliennes? C'est ce que nous commenterons à partir des résultats d'une analyse technologique – étude conjointe des méthodes de retouche et des traces d'usage – sur un ensemble de près de 400 pointes et fragments du niveau 4 du Bois-Ragot (Plisson, 2005; Valentin, 2005).

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VALENTIN B. avec la collaboration d'A. Hantai (2005) - *Transformations de l'industrie lithique pendant l'Azilien. Étude des niveaux 3 et 4 du Bois-Ragot*. In CHOLLET A., DUJARDIN V. (coord.), *La grotte du Bois-Ragot à Gouex (Vienne). Magdalénien et Azilien. Essais sur les hommes et leur environnement*, Paris, Société préhistorique française (Mémoire de la Société préhistorique française, 38): 89-182.

C83-08 Stefano GRIMALDI (Trento, Italy)

Hunting, what? Early Mesolithic backed points in north-eastern Italy: an experimental approach.

ABSTRACT: Extant literature considers the so called "Sauveterrian" early Mesolithic points, together with other microlithic forms such as geometrics, under the definition of projectiles. This definition is generally equated to that of throwing weapons, or more commonly, given their sizes, to arrow points or projectile components that were probably used with a bow mainly for hunting. The quest that we asked ourselves was the following: is it possible that such small arrow points could have been used to kill medium to large sized animals such as deer, ibex and wild boar, all characterised by heavy musculature and thick hard skin?. A sample of single- or double-backed lithic points coming from four archaeological "Sauveterrian" sites located in the Trentino Province (north-eastern Italian Alps) has been analysed. The sites are Pradestel rockshelter, Laghi delle Buse, Colbricon 6 and Colbricon 8 open air sites. All of the items have been made from flint. It is worth mentioning the clear relationship between thickness and weight. Experimental blanks have been produced. Several experimental points have been hafted and shot against animal target. Observed both experimental and archaeological data allow us to suggest a more available utilisation of the microlithic projectiles in hunting activities toward small/medium game - such as Roe deer, Marmot and other furred animals. At the same time, it remains quite difficult to relate these morphologies to big game - such as Red deer or Ibex - hunting practices. An alternative hypothesis related to big game is also suggested.

C83-09 Mara-Julia WEBER (Nanterre, France)

Au-delà de la typologie: fabrication et utilisation des pointes lithiques au Hambourgien.

RESUME: Un des éléments caractéristiques du Hambourgien sont les pointes à cran hambourgiennes. Suivant la chaîne opératoire de fabrication de ces pointes, une première question concernera la place qu'occupe le débitage des lames servant de supports de pointes dans le système de production lithique. La comparaison des pointes provenant de différents sites de la vallée d'Ahrensburg montre que leurs supports sont plus ou moins normalisés selon les inventaires et que, par conséquent, l'aménagement de la base des pointes varie également à des degrés divers. Par contre, la technique du micro-burin pour l'aménagement de l'apex semble être un phénomène général. Quant à l'utilisation, le type d'emmanchement adapté à la base de ces pointes serait l'insertion dans une rainure diagonale de la hampe, et les traces d'impact témoignent de la fonction cynégétique des pointes. Ces observations sont complétées par les résultats d'analyses archéozoologiques permettant de reconstituer la technique de chasse employée et d'intégrer ainsi les projectiles dans le système économique hambourgien.

C83-10 Lorène CHESNAUX (Nanterre, France)
Sylvie PHILIBERT (Valbonne, France)

Des microlithes sauveterriens, témoins de l'armement des derniers chasseurs-cueilleurs des Alpes du Nord.

RESUME: Cette étude consiste en l'interprétation des stigmates de fabrication (observation de la retouche) et d'utilisation (observation des cassures d'impact, de résidus de colle d'emmanchement...) de microlithes et hypermicrolithes (armatures de flèches) du Mésolithique moyen sauveterrien des Alpes du nord.

Le but de ce travail est donc la reconstitution des gestes de fabrication et d'utilisation de ces microlithes, témoignant directement des intentions de leurs utilisateurs. Ces intentions, procédant de choix culturels particuliers, nous éclairent sur l'identité des groupes de chasseurs-cueilleurs mésolithiques concernés.

Pour cela nous avons tenté de retracer la chaîne opératoire de ces armatures depuis l'obtention de leur support (lorsque cela était possible) jusqu'à leur abandon. Cette étude repose donc pour l'essentiel sur la mise en place de modèles, notamment ceux de l'emmanchement des divers types d'armatures que nous mettons en évidence.

C83-11 Annalisa PEDROTTI (Trento, Italy)
Fabio CAVULLI (Trento, Italy)
Stefano GRIMALDI (Trento, Italy)

The production of points for projectile weapons: the Neolithic arrowheads from La Vela and Isera La Torretta (northeastern Italy).

ABSTRACT: Several arrowheads have been found at La Vela site (early-middle Neolithic) and Isera la Torretta site (Neolithic and Copper Age); both sites are situated in the river Adige valley (Trentino region, northeastern Italian Alps). A typological and technological analyses has been carried on. Points have been knapped from blades, flakes or chips. Each blank is strictly related to specific point morphologies and technical constraints. Data allowed authors to identify several lithic types showing morphological evolutionary trends as well as different impact fractures and rejuvenation procedures. A functional hypothesis in order to explain the observed technical and chronological variability is also suggested.

C83-12 Vanessa LÉA (Toulouse, France)
Bernard GASSIN (Valbonne, France)

Quelles armatures de projectiles dans le Midi Méditerranéen et ses marges? Millieu V.ème - Millieu IV.ème millénaire.

RESUME: Du milieu du Vème millénaire au milieu du IVème, les industries lithiques du Midi méditerranéen, spécialisées ou peu investies, se caractérisent par une certaine diversité et variabilité récemment décrites par des études technologiques. Paradoxalement, les armatures de projectiles n'ont pour l'heure jamais fait l'objet d'une synthèse qui permette de les définir.

Dans un contexte dit de "plein Néolithique" pour lequel les études pluridisciplinaires montrent une baisse significative de l'activité de prédation, il semble intéressant de s'interroger sur la place des armatures dans les assemblages lithiques.

Afin de caractériser ces armatures et de voir dans quelle mesure elles peuvent constituer un révélateur social de ces communautés du Néolithique moyen, nous rendrons compte d'études technologique et tracéologique de plusieurs sites en déclinant notre réflexion selon les différents thèmes proposés par cette section.

L'identification et la définition des armatures de projectiles reposent sur des critères fonctionnels et technologiques. La place des armatures de projectiles dans le système technique lithique est abordée à partir du choix des matières premières, de la place des supports choisis pour le façonnage des armatures au sein des chaînes opératoires, des techniques mises en oeuvre, des modalités de circulation des armatures et/ou des supports, mais aussi de leurs stratégies de gestion. Corrélativement, l'existence de bitroncatures géométriques et de pièces bifaciales que leurs caractéristiques fonctionnelles et dimensionnelles ne permettent pas de considérer comme des armatures de projectiles sera discutée.

Les assemblages étudiés présentent une variabilité horizontale (faciès régionaux / statut du site) et verticale (chronologie) qui sera examinée et dont la corrélation avec d'autres éléments du système technique sera appréciée. La diversité et la variabilité des armatures seront décrites et évaluées : ont-elles une signification fonctionnelle? Résultent-elles d'échanges généralisés et multidirectionnels pour cette catégorie de produits? Traduisent-elles une faible normalisation des armatures?

Les contextes de dépôt des armatures de projectiles seront analysés, notamment sur le plan de la représentation des armatures au sein des assemblages lithiques, de la relation entre la fréquence des animaux chassés dans la faune et l'importance des armatures de projectiles dans les assemblages. Les interrogations concernent la place des armatures dans l'espace économiques des sociétés, mais aussi les relations avec l'univers symbolique, notamment en contexte sépulcral.

C83-13 Marie-Hélène DIAS-MEIRINHO (Toulouse, France)

La notion d'armes de guerre à la fin du Néolithique.

RESUME: Dans les sociétés de la fin du Néolithique en Europe occidentale, la chasse fait encore partie des comportements manifestement attestés. Parallèlement, parmi les témoignages des relations entre différents groupes humains, sont perceptibles des moments de violence ou de combat. Ce rapport nous mène directement sur le propos des armes et plus particulièrement sur l'utilisation de l'arc et des flèches.

L'approche choisie dans notre travail s'organisera autour de la conception et de l'utilisation des flèches dans les rapports conflictuels entre les hommes de cette fin du Néolithique. Aussi, pouvons-nous nous engager dans la seule opposition entre des flèches conçues pour les activités cynégétiques et celles conçues pour le combat ? Quels sont les arguments en faveur d'une distinction tangible de telles armes ?

Par l'étude des pointes restées fichées dans les ossements humains, nous tenterons de renseigner et de percevoir les limites du cadre informatif relatif à cette délicate question.

C83-14 Aurélien SIMONET (Toulouse, France)

L'atelier de taille gravettien de Tercis (Landes) en relation avec l'occupation d'Isturitz: un cas probable d'apprentissage de la confection d'armatures lithiques.

RESUME: La retranscription objective de différents degrés de savoir-faire est particulièrement délicate. L'expérimentation et l'observation empirique apporte ici de nombreux éléments de réponse. Cependant, les difficultés actuelles rencontrées lors de reconstitution ne sont, pour l'instant, que très peu observées au sein du matériel archéologique. En effet, les artefacts identifiés comme relevant de gestes d'apprentissage sont pour l'instant limités. Les armatures – qui exigent souvent un savoir-faire très important – sont notamment très souvent considérées sous leur forme «conceptuellement parfaite». Certaines d'entre elles pourraient, en réalité, correspondre à des gestes maladroits s'éloignant de l'idée intentionnel. L'étude approfondie d'industrie dites «atypiques», indices possibles d'apprentissage s'avère alors essentielle au sein des discussions sur l'investissement technique.

Malheureusement, ces artefacts sont noyés sous la masse de l'industrie lithique. Il devient alors très difficile de définir ce qui relève du manque de compétence. En effet, au sein d'un assemblage lithique, tous les degrés de compétence peuvent virtuellement s'amalgamer. Si l'on y rajoute les cas de débitage ponctuellement ratés par des tailleurs compétents, les débitages intentionnellement sommaires et les inexplicables, l'écheveau est alors complexe. Son démêlage est néanmoins envisageable et nécessaire grâce à l'apport des connaissances actuelles. Malgré tout, la détermination ne pourra être entièrement certaine mais relèvera du domaine du probable ce qui est, par ailleurs, le propre des sciences humaines.

Le site de Tercis offre l'avantage d'offrir des concentrations isolées les unes des autres, l'ensemble étant lui-même en relation avec une ou plusieurs aire(s) d'habitat distincte(s) (des relations sont démontrées avec Isturitz par les déterminations pétrographiques, d'autres sont envisageables avec Brassempouy,...). L'une de ces concentrations offrent une série d'armatures gravettiennes maladroites, associée à un débitage à la productivité très faible à inexistante. Cet exemple d'atelier, que l'on peut interpréter comme destiné (au moins partiellement) à l'apprentissage d'armatures lithiques, est pour l'instant unique. Ce site, replacé dans son cadre régional, est propice à une réflexion sur le savoir-faire nécessaire à la fabrication des armatures à dos gravettiennes. Une approche comparative entre, d'une part, une autre concentration de l'atelier de taille dévoilant un niveau de compétence différent, et, d'autre part, les armatures présentes sur un des lieux d'habitats envisageables (Isturitz) met l'accent sur l'intérêt de cette série au sein de questionnements relatifs à l'investissement technique et l'importance culturelle des armatures lithiques. Enfin, cette approche participe au débat sur la nécessité d'accepter les descriptions qualitatives ou plutôt de rendre objectif des notions aussi délicates que celles du degré de compétence.

C83-15 Nicolas NAUDINOT (Rennes, France)

L'investissement technique dans la conception des armatures: l'exemple des industries de la fin du tardiglaciaire de l'Ouest de la France.

RESUME: Cette communication a pour objectif de présenter plusieurs hypothèses concernant l'investissement technique consacré à la fabrication des armatures à travers l'exemple de

l'épépaléolithique de l'Ouest de la France. Nous verrons les différentes évolutions entre l'azilien ancien et une industrie méconnue que nous appellerons Techno-complexe des industries à pointes à dos rectiligne ou encore «Auvoursien». Ces industries récemment identifiées seraient à rapprocher des gisements épi-laboriens du Sud-ouest de la France ou encore du site des Blanchères à la Boissière-Ecole dans les Yvelines. Nous présenterons l'état de nos recherches en nous focalisant sur les armatures afin de répondre à plusieurs questions concernant l'investissement technique. Peut-on par exemple percevoir des variations dans les temps de travail ou la complexité des savoir-faire mis en œuvre dans leur conception entre l'azilien ancien et l'Auvoursien? Ces éléments nous permettent ils de déduire l'importance sociale des pointes de projectiles? S'agit t-il simplement de phénomènes liés aux schémas opératoires de débitage des groupes préhistoriques? Le discours s'articulera principalement autour de l'industrie du gisement du Camp d'Auvours à Saint-Mars-la-Brière dans la Sarthe (Fouille de Michel Allard) où plusieurs milliers d'armatures entières ou fragmentées ont été identifiées dans un assemblage de plus de 330.000 pièces lithiques. Nous proposons de rajourner cette occupation longtemps attribuée au Magdalénien terminal, puis à l'Azilien, en la plaçant à la fin du tardiglaciaire (période chrono-climatique du Dryas récent ou début du Préboréal) et d'en faire le site emblématique du Techno-complexe des industries à pointes à dos rectiligne.

C83-16 Anne HAUZEUR (Bertrange, Luxembourg)
Hartwig LÖHR (Trier, Trèves, Germany)

Latéralisation des armatures rubanées: apport des données récentes de la Moselle dans le contexte culturel du Rubané du Nord-Ouest.

RESUME: Les armatures de flèche figurent parmi les rares éléments de l'industrie lithique dont la charge identitaire permet de les inscrire dans les composantes traditionnelles des différents faciès régionaux des cultures néolithiques. Même en situation de pénurie de matières premières de qualité, comme l'est la moyenne vallée de la Moselle, la pointe de flèche reste a priori un artefact à forte connotation culturelle - ce qui a été démontré à travers leur latéralité morphologique (Löhr, 1994) - qui permet de situer la région dans le contexte plus vaste de la « province » stylistique du Rubané du Nord-Ouest (RNO) telle que définie par Chr. Jeunesse.

L'augmentation substantielle du nombre d'armatures dans la région de la moyenne Moselle, due à la fouille de plusieurs nouveaux sites en Allemagne (Schmidgen-Hager, 2003), au Grand-Duché de Luxembourg (Hauzeur, 2003) et en Lorraine comble un espace géographique, qui malgré sa position charnière apparaissait déficient dans le débat sur la latéralisation. La prise en considération des pièces asymétriques autant que les symétriques est un des éléments qui permettent d'affiner la position de la Moselle au sein du RNO et de confirmer sa proximité culturelle avec les régions du sud-est malgré un réseau d'approvisionnement en matières premières axé vers le nord.

Les pointes asymétriques aussi bien que les symétriques du Rubané nord-occidental auraient été générées par un substrat mésolithique purement local, par le fait que l'on trouve les deux formes typologiques dans les mêmes assemblages mésolithiques de ces régions. Par ailleurs, la latéralisation senestre des armatures rubanées – correspondant à la même latéralisation des trapèzes du Mésolithique final – fréquente voire abondante dans les régions méridionales du Rubané du Nord-Ouest et dans le Rubané du Neckar est mise en relation avec une influence de la Céramique de La Hoguette par différents auteurs (e. a. Löhr, 1994; Gronenborn, 1997; Jeunesse, 2002), alors que la latéralisation dextre serait plutôt liée à l'influence d'un substrat Limbourg. Dans cette discussion, la Moselle trouve une place intermédiaire entre les régions méridionales à majorité de type symétrique et les régions nord-ouest où l'asymétrie (droite) domine.

Enfin, la latéralisation pourrait aussi faire l'objet d'une interprétation technologique, à partir du moment où la technique du microburin est observée sur les pièces latéralisées tant à gauche qu'à droite. En effet, choisit-on le support et le travaille-t-on en fonction du type de latéralisation à obtenir, ou la latéralisation est-elle le résultat de l'aménagement du support en tenant compte des contraintes technologiques? Pour le Kraichgau, B. Heide évoque la transformation des pointes de flèche symétriques en type asymétrique sur la base d'une réduction dimensionnelle de ces dernières (Heide, 2001).

La latéralisation des armatures du Rubané de la moyenne Moselle, croisée avec les autres données typométriques de cette catégorie d'artefacts, s'accorde avec les analyses des différents éléments de la culture matérielle (architecture, céramique et outillage lithique) pour faire de la Moselle une région limitrophe du RNO, fortement empreinte des traditions culturelles plus méridionales. En démontant les

schématismes explicatifs, elle démontre aussi la complexité des relations interrégionales et/ou interculturelles au Néolithique ancien.

C83-17 Caroline RENARD (Nanterre, France)

Nouvelles données sur les armatures de la fin du Néolithique dans le bassin de la Seine.

RESUME: Une révision des données sur la fin du Néolithique dans le Centre-Nord de la France est actuellement en cours. Elle a permis d'entamer des travaux synthétiques, notamment sur les armatures de flèche du bassin de la Seine. Malgré le faible nombre d'occupations précisément attribuées chronologiquement, il est possible d'examiner les armatures sous l'angle de l'investissement technique et de leur signification sociale. Ces thèmes semblent en effet particulièrement importants à la fin du Néolithique. On dispose, pour traiter le premier, d'armatures à tranchant transversal qui demandent des compétences particulièrement limitées. Le second sera étudié par le biais des nombreuses sépultures collectives, qui contiennent un mobilier choisi et notamment divers types d'armatures. En nous appuyant sur les séries bien datées du bassin de la Seine, nous verrons enfin si la variabilité typologique constatée s'inscrit dans le cadre d'un contexte particulier (notamment domestique ou funéraire).

C83-18 Matthieu LANGLAIS (Toulouse, France)

Du Rhône à l'Ebre, l'identité magdalénienne au Tardiglaciaire à travers l'étude des armatures lithiques.

RESUME: Le renouveau des études menées sur les projectiles lithiques et osseux du Magdalénien permet d'établir des comparaisons sur de grands territoires et de fait, de confronter les synthèses typologiques régionales qui sont à la base de notre réflexion. Entre le Rhône et l'Ebre, l'examen comparé de plusieurs séries lithiques attribuées au Magdalénien permet de s'interroger sur l'identité magdalénienne au Tardiglaciaire dans une région au contact de l'Epigravettien à l'Est et de faciès originaux au Sud. A partir de la définition des normes techniques de fabrication des armatures lithiques, nous tenterons d'évaluer des choix culturels au sein des tendances évolutives générales du Tardiglaciaire.

C83-19 Eva DAVID (Nanterre, France)

Les armatures de projectiles en matières dures d'origine animale de l'Holocène ancien en Europe du Nord: entre tradition technique et nécessité socio-économique.

RESUME: En Europe du Nord, les sites attribués au Mésolithique ancien (IXe -VIIIe millénaire avant J.-C.) ont tous livré des armatures de projectiles à emmanchement fixe en matières dures d'origine animale ; elles y représentent l'essentiel de l'armement qui compose toujours plus de la moitié de l'industrie osseuse. Principalement façonnées sur métapodiens de cervidés (chevreuil, cerf, élan), la reconstitution de leur mode de fabrication (David, 2004) et la représentativité des produits qui en sont issus - pointes droites, à crans, à barbelures et à lamelles - révèlent, au VIIIe millénaire avant J.-C., une tripartition de l'Europe en entités chrono-culturelles distinctes. En outre, au sein d'une même tradition technique, en Europe septentrionale par exemple, et indépendamment de notre connaissance de la destination de ces armatures ou même de la fonction des sites (Leduc, étude en cours), on observe une variabilité intra- et inter-sites dans le façonnage de ces pointes de projectiles. Là, du Préboréal à la transition Boréal/Atlantique, on dénote aussi une évolution des armatures qui tend vers un délaissement des crans au profit des barbelures. La mise en évidence de traditions techniques, de variabilités stylistiques et de tendances évolutives dans l'étude de l'armement du Mésolithique ancien est à l'origine de la caractérisation des industries osseuses de l'Europe du Nord (David, 2003). Selon l'échelle d'observation choisie, la simple considération de l'armement par rapport à l'ensemble de la production osseuse et aux types de supports anatomiques exploités dans l'industrie est source d'informations importantes pour la compréhension des dynamismes industriels à l'Holocène ancien (Newell et al., 1990). Ainsi, pour ce qui concerne précisément les facteurs régissant l'évolution morphologique des armatures, on suppose qu'ils reflètent davantage une spéciation de

l'armement liée à des modifications structurelles, d'ordre socioéconomique, des sociétés qu'une adaptation aux changements environnementaux.

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C83-20

Nicolas VALDEYRON (Toulouse, France)
Bruno BOS-ZANARDO (Toulouse, France)
Thomas BRIAND (Toulouse, France)

Evolutions des armatures et dynamiques culturelles du Mésolithique au Néolithique ancien dans le sud-ouest de la France: l'exemple quercinois.

RESUME: Le Quercy, que sa position géographique place naturellement au carrefour d'influences multiples venues de la Méditerranée et/ou de l'Atlantique, constitue aujourd'hui une zone atelier particulièrement favorable à l'étude et à l'analyse des transformations à l'oeuvre, dans les sociétés mésolithiques, entre le début du Xe et la fin du VIème millénaires cal.BC. Ce secteur offre en effet une concentration rarement égalée en France de gisements plus ou moins importants, en abri naturel ou de plein air, fouillés pour la plupart récemment et offrant, de fait, de bonnes garanties de fiabilité des assemblages et des datations qui leur sont associées. Le statut particulier de la plupart de ces gisements, manifestement fréquentés pour l'essentiel dans le cadre de déplacements liés aux activités de chasse, explique par ailleurs la très forte représentation, dans les outillages de pierre, des armatures microlithiques, toujours présentes en très grand nombre : au total, c'est un corpus fort de plusieurs milliers de pièces qui est aujourd'hui accessible et en cours d'étude. Les variations (morphologiques, typo-technologiques et fonctionnelles) plus ou moins brutales reconnues au sein de ce corpus, en enregistrant les transformations du contenu des carquois, semblent surtout rythmer l'évolution culturelle de ces communautés, évolution marquée tout à la fois par la vivacité des substrats et leur perméabilité aux influences extérieures. Cette communication a pour objectif de présenter les méthodes d'étude élaborées dans le cadre de différents travaux, ainsi que les premiers résultats qui en découlent.

C83-21

Georgia STRATOULI (Edessa, Greece)
Odysseas METAXAS (Athens, Greece)

Projectile Points from Neolithic Layers of Drakaina Cave in Kefalonia, Ionian Islands, W. Greece: Technological Conservatism and Social Identity.

ABSTRACT: Drakaina Cave is situated on the SE coast of Kefalonia, an island off the west coast of Greece. Excavations in the neolithic deposits of the Cave have been carried out since 1992 and are still in progress.

Drakaina Cave has yielded, alongside other chipped stone artefacts, a distinctively large projectile points assemblage, which numbers nearly 190 specimens. However, it differs from other lithic assemblages from Greek LN cave sites not only in terms of size, but also in terms of morphofunctional characteristics and temporal distribution. A noticeable trend towards the persistence of MN elements, both morphological and technological, well into the LN is evident. The cave users' participation in a considerable range of exchange networks, strongly points that regional isolation does not have to be connected with morphological conservatism in this case.

The first aspect, namely the prolific deposition or discard of projectile points in Drakaina Cave, triggers a series of questions concerning the use of the cave and its special position in the subsistence or even cultural practices of the social groups which had access to it. The second allows the discussion of technological issues, as are the patterns of use and enhancement of projectile weaponry, the technical investment variability and the role of raw material type exploitation, but also the implications of the insular environment of Kefalonia. It has to be further discussed whether some unparalleled features of the assemblage are purely the result of technological choices, or this insular environment is to be connected with the formation of local cultural peculiarities, which had an imprint on both the technology of chipped stone and the status of projectile points.

C83-22

Antoni PALOMO (Barcelona, Spain)
 Javier FERNÁNDEZ (Castellón, Spain)
 Juan F. GIBAJA (Faro, Portugal)

Les microlithes géométriques utilisés comme pointes de projectile dans les sociétés néolithiques de l'Est de la péninsule ibérique

RESUME: Nous présentons ici les résultats de l'analyse morphologique, technologique et tracéologique des microlithes géométriques découverts dans les habitats et nécropoles néolithiques de l'Est de la péninsule ibérique (Catalogne et Valence).

Les microlithes du Néolithique récent témoignent d'un changement technologique et morphologique par rapport à ceux du Néolithique ancien. Durant le Néolithique moyen, nous assistons à plusieurs processus régionaux : en Valence, la technique du microburin est utilisée pour fabriquer des trapèzes employés comme armatures, tandis que la Catalogne se caractérise par un usage important des trapèzes comme tranchets, associé à une production lithique standardisée (silex blond, nucléus prismatiques, débitage à la pression). Des analyses statistiques récemment effectuées sur les nécropoles ont montré qu'ils sont l'un des éléments étroitement associés aux hommes adultes. Dans le Néolithique récent, on trouve un groupe de microlithes géométriques qui coexistent avec des pointes bifaciales.

La principale tendance observée dans le Néolithique méditerranéen de la péninsule ibérique suggère l'importance sociale croissante des microlithes en tant que composant de base de l'armement (arc et flèches). La culture des "Sepulcros de Fosa" et l'art levantin illustrent le domaine symbolique de ces produits lithiques dans les sociétés néolithiques méditerranéennes.

C83-23

Matthieu HONEGGER (Hauterive, Suisse)

Les segments de cercle de Nubie depuis le Mésolithique jusqu'au Chalcolithique : outils multifonctionnels, éléments de faucille ou armatures de flèches ?

RESUME: Depuis le Mésolithique jusqu'aux débuts des temps historiques, le principal outil en pierre taillée de Nubie est représenté par le segment de cercle. Cette armature, dont la longueur peut varier de quelques millimètres à quelques centimètres, remplit des fonctions diverses selon l'époque et selon ses dimensions. A l'aide d'exemples variés, provenant des fouilles de Kerma au nord du Soudan, on cherchera à cerner les relations entre les caractéristiques intrinsèques de l'outil, son contexte archéologique, ses traces liées à l'usage et sa (ses) fonction(s).

C83-24

Bruno BOSC-ZANARDO (Toulouse, France)
 François BON (Toulouse, France)
 François-Xavier FAUVELLE (Johannesburg, Afrique du Sud)

L'armement Bushmen: regards croisés des sources historiques, ethnologiques et archéologiques.

RESUME: Les armes des Bushmen ont très tôt été consacrées par l'ethnologie, la vision de ces chasseurs-cueilleurs nomades, s'éloignant dans le paysage désertique du Kalahari avec des arcs et des flèches se détachant en ombres chinoises sur leur dos, étant l'une des représentations les plus emblématiques de ce mode de vie en voie de disparition.

Outre les valeurs techniques mises en jeu dans la réalisation de cet équipement, dont l'usage de poisons est une signature importante, leur rôle en tant que vecteur de valeurs sociales a également été richement illustré. En particulier, il a été montré de quelle façon la flèche trace non seulement un lien entre le chasseur et sa proie, mais entre la possession de cette dernière et les réseaux d'alliances auxquels participent la chasse et celui qui la pratique.

Néanmoins, la plupart des référentiels sont fondés sur les équipements de populations actuelles et subactuelles, c'est à dire sur ceux utilisés par les groupes limités à l'occupation d'un territoire correspondant au désert du Kalahari, à cheval sur le Botswana et la Namibie. Or, il y a quelques décennies seulement, les Bushmen occupaient des aires beaucoup plus vastes, correspondant à une large moitié occidentale de l'Afrique australe. Cela signifiait aussi l'exploitation de territoires écologiquement plus contrastés qu'aujourd'hui. En outre, le statut socio-économique de ces ancêtres des Bushmen actuels était, semble-t-il, plus diversifié, des groupes de chasseurs-cueilleurs nomades voisinant avec des pasteurs, dont il est vraisemblable qu'ils aient peu ou prou appartenu à des sociétés étroitement liées entre elles.

Les travaux réalisés sur plusieurs collections de flèches et d'arcs conservés dans des musées sudafricains, confrontées aux sources historiques, qui adoptent principalement la forme de récits de voyage des XVI-XIXème siècles, mettent également en lumière une plus grande diversité. Cette dernière porte tant sur la panoplie d'armes elle-même (la lance, le casse-tête et le bâton de jet s'ajoutant aux seuls arcs et flèches) et sur la confection des flèches proprement dites, que sur leurs fonctions présumées, introduisant le thème de la guerre au côté de celui de la chasse. Derrière cette diversité, c'est toute la complexité de l'histoire récente des populations Bushmen que l'on peut tenter de retracer.

POSTER

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The shouldered and backed pieces of ancient Epigravettian from Paglicci Cave: typological analysis and hypothesis of use.

Abstract: The authors analyse the shouldered and backed pieces found in the layers 17-13 of Paglicci Cave, referred to ancient Epigravettian. This study has highlighted a different percentage of these tools in the layers and a typological and typometrical evolution in their morphology, such as graduated variations in the length, in the shape of the *cran*, in the type and the distribution of the complementary retouch. They have been moreover evidenced morphological and technological analogies between shouldered and backed pieces with pointed shape (points or bladelets) that present characteristics not found in not pointed ones. On the ground of these observations it has been assumed a different use of the two types of tools, verified by the use-wear analysis.

Session C84

Monday, 4 September 2006 / Lundi, 4 Septembre 2006

*Room 11.06, Faculty of Law, Lisbon University
Salle 11.06, Faculté de Droit, Université de Lisbonne*

Place Theory in Rock Art Studies

La théorie du lieu dans les études sur l'art pariétal

organized by / organisé par

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SESSION'S ABSTRACT

Space, place, center and boundary: rock art has been used to shape human-defined space, marking locations of memory or cultural inheritance, since time immemorial. Over the last decade, many new ideas have entered the scholarly literature on rock art, to include place theory (aka landscape theory). While individual papers have been presented at international conferences that employ place theory, there has been no focused discussion or criticism of these approaches. We invite international scholars whose research focuses on how rock art has been used to construct a cultural/ritual/aesthetic landscape, or those who critique this theoretical approach.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 16:30 **Opening / Ouverture**
- 16:30-16:45 Blaze VALESKA O'CONNOR
C84-01 **Inscribed Landscapes - prehistoric rock art in Ireland.**
- 16:45-17:00 Denise SMITH (Atlanta, GA, U.S.A.)
C84-02 **Leaving A Mark: Inscribed Landscapes of the American Southeast**
- 17:00-17:15 George NASH (Bristol, UK)
C84-03 **Light at the end of the passage: the way Megalithic art was viewed and experienced by George Nash.**
- 17:15-17:30 Gerard O'REGAN (Auckland, New Zealand)
C84-04 **An Intra-site spatial analysis of Maori Rock in the South Island of New Zealand.**

- 17:30-17:45 Reinaldo MORALES JR. (Conway, Arizona, U.S.A.)
C84-05 **Canyons, cosmologies and cognition: rock art and the reception of space.**
- 17:45-18:00 Stan PLUM
C84-06 **Petroglyphs, People, and Places.**
- 18:00-18:15 William BREEN MURRAY (Nuevo León, México)
C84-07 **Rock art landscape of Northeast Mexico.**
- 18:15-18:30 **Discussion**

ABSTRACTS / RÉSUMÉS

- C84-01** Blaze VALESKA O'CONNOR
Inscribed Landscapes - prehistoric rock art in Ireland.

ABSTRACT: This presentation focuses on three rock art landscapes in Ireland; the Inishowen Peninsula in County Donegal, the County Louth / County Monaghan rock art group, and the Dingle Peninsula, County Kerry. Recent research in these areas suggests that particular places in the prehistoric landscape may have served as carving sites that were visited by people from the wider surrounding region, whilst others may have been created by people living relatively close by. Drawing on anthropological studies, the possible reasons behind the selection of these significant places for embellishment through carving are explored. Different regional traditions are apparent in both the ways in which rock art panels are situated in the landscape, and the nature of the art itself, suggesting that carving practices may have been a means of expressing regional, as well as social and individual, identity.

- C84-02** Denise SMITH (Atlanta, GA, U.S.A.)
Leaving A Mark: Inscribed Landscapes of the American Southeast.

ABSTRACT: To consider how rock art shapes landscapes is to address the larger context of the art. Images inscribed or painted on stone were intended to convey meaning, which only makes sense in the syntax of the whole. This paper will consider rock art sites from Georgia, the largest state in the American Southeast, addressing issues in place theory, such as the identification of centers and places, boundaries and intersections. Rock art in Georgia is not dramatic, nor does it seem to be intended to be seen for a long distance. The messages are more subtle, perhaps more private. This paper will offer some suggestions for further thought and discussion.

- C84-03** George NASH (Bristol, UK)
Light at the end of the passage: the way Megalithic art was viewed and experienced by George Nash.

ABSTRACT: There is a limited but significant passage-grave art tradition in England and Wales which although restricted to two passage grave monuments in Anglesey and a destroyed megalithic structure located in a park in Liverpool, marks the eastern extent of megalithic art in Britain. The passage grave tradition is also the last megalithic architecture of the Neolithic. Outside these two areas there are a small number of sites that possess simple decoration, usually restricted to single and multiple cupmarks. However, these monuments are not classified as passage graves. Outside England and Wales, in Ireland and northern France, megalithic art and passage grave architecture is both numerous and complex in form.

The three definite passage graves in North Wales and Northern England possess complex carved artistic forms that are usually located within the inner section of the passage or form part of the chamber alignment. The Bryn Celli Ddu monument in Anglesey has a slightly more complex stone arrangement. Despite intense and comprehensive archaeological investigations on both Anglesey monuments and the near complete destruction of the Calderstones monument, one can make an assessment of the light intensity both within the chamber and passage areas, in particular the way natural and artificial light illuminates the art.

This paper will assess the light impact of the chamber and passage areas, focusing on the illumination of the rock-art. I suggest that megalithic art is deliberately placed in such a way to mark the point where natural light in the passage area fades and is, and has to be replaced by artificial light (i.e. fire). Based on two types of light intensity, two cognitive emotions are at play, one based on the visual knowledge and comfort of the façade and passage areas, the other based on the ignorance and anticipation of the chamber which is dark, foreboding and unknown.

C84-04 Gerard O'REGAN (Auckland, New Zealand)

An Intra-site spatial analysis of Maori Rock in the South Island of New Zealand.

ABSTRACT: This paper reports on current research exploring why New Zealand Maori artists positioned particular motifs in particular places. By demonstrating that spatial variability in *tapu* ('sacredness') is evident in the positioning of rock art, we hope to enhance our understanding of how past Maori interacted with artistic and sacred spaces, including how their conceptions of space changed with accumulated markings. This study explores the placement within a confined space of different motif types in relation to each other as well as in relation to other site features, including purposefully blank spaces. This aims to elucidate the spatial thinking exhibited by the artists rather than identifying their group, period or stage of development as is typical in other rock art studies in New Zealand. Utilising digital technology and detailed 3D field recording, the project also provides a methodological case study and testing of the efficacy of an intra-site landscape approach in the study of Southern Maori rock art.

C84-05 Reinaldo MORALES JR. (Conway, Arizona, U.S.A.)

Canyons, cosmologies and cognition: rock art and the reception of space.

ABSTRACT: For the indigenous inhabitants of the Brazilian highlands, the rockshelters that lie outside the villages are frequently referred to as the 'houses' of various spirits, including those of ancestors-transitional spaces between the present and the mytho-historic past. These rockshelters were also the locus of significant rock art production. Informed by the ethnographic record, this paper first examines how the landscape is conceived by the indigenous populations. This cognitive framework is then brought to bear on the rock art. Environmental exigencies likely led to a shift in the function and conception of rockshelters in the period between the end of the Climatic Optimum (c. 4500BP) and the advent of settled village life (c. 2500 BP). This was a period of transition in the use of the landscape. This transition, it is argued, was reflected functionally and aesthetically in the rock art.

C84-06 Stan PLUM

Petroglyphs, People, and Places.

ABSTRACT: The mountains forming the northern edge of the Salt River Valley of Arizona acted as a semi-permeable membrane through which people have passed for millennia. The river people who lived south of the mountains and the people who inhabited the uplands north of the mountains shared similar life-ways, fought and traded with each other, and marked this place with petroglyphs. The City of Phoenix has established a large portion of the North Mountains as a preserve and as such preserved not only the land, but also the remnants of the landscapes of previous inhabitants.

The pre 16th century landscape of these northern mountains was marked by small communities, walled hilltop compounds; flood irrigated fields, and petroglyphs. I will use Geographical Information Systems and Virtual Reality to examine the scattered petroglyphs and one of the compounds in order to study the relationship between the petroglyphs, the surrounding topography, and the people who made them. I believe that these relationships formed places that were represented metaphorically in oral histories and physically with petroglyphs.

C84-07

William BREEN MURRAY (Nuevo León, México)

Rock art landscape of Northeast Mexico.

ABSTRACT: Rock art manifestations were intentionally placed and permanently anchored in the landscape by their creators, but both the natural features and the cultural meanings of that landscape can change over time. Thus, landscapes –like individual images- can become super-imposed and acquire new spatial dimensions which are reflected in the rock art manifestations.

Northeast Mexico has both dramatic landscapes and abundant rock art. This paper will define and illustrate a regional typology for the rock art sites found in the semi-desert basin and range landscapes of the Sierra Madre Oriental, and will look in greater detail at the key site of Boca de Potrerillos (Nuevo León), where thousands of petroglyphs spread over a 6 km² area define super-imposed landscapes created over 7000 years of human occupation.

Session C85

Thursday, 7 September 2006 / Jeudi, 7 Septembre 2006

*Room 6.1.49, Faculty of Sciences, Lisbon University
Salle 6.1.49, Faculté de Sciences, Université de Lisbonne*

European Cave Art

organized by / organisé par

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SESSION'S ABSTRACT

Recent discoveries from the four quarters of Europe have fired the public and scholarly imagination. This symposium will focus on new findings, current research, emergent methodologies, controversies, related sciences such as dating and geomorphology, the archaeological context of rock art and insights into interpretations of art found in caves in Europe. The symposium's intention is to help current scholars in the field make new connections and to foster research.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 09:00 **Opening / Ouverture**
- 09:00-09:20 Alberto MINGO ÁLVAREZ (Madrid, Spain)
C85-01 **The Rock Signs of Cueva de El Castillo (Puente Viesgo, Cantabria, Spain) in the Context of the Cantabrian Palaeolithic Art.**
- 09:20-09:40 Robert G. BEDNARIK (Caulfield South, Australia)
C85-02 **To Be or Not to Be Palaeolithic, That is The Question.**
- 09:40-10:00 Jean CLOTTE (Foix, France)
 Jean COURTIN
 Luc VANRELL
C85-03 **Cosquer Revisited.**
- 10:00-10:20 Norbert MERCIER (Gif-sur-Yvette, France)
 Hélène VALLADAS (Gif-sur-Yvette, France)
 Thierry AUBRY (Vila Nova Foz Côa, Portugal)
 João ZILHÃO (Lisboa, Portugal)
 Jean-Louis JORON
 Jean-Louis REYSS
 Farid SELLAMI (Grignon, France)

- C85-04** La Roche N°1 de Fariseu, Vallée du Côa (Portugal): Confirmation par les Méthodes de la Luminescence de l'Âge Paléolithique des Gravures [The Fariseu Engraved Rock Panel No. 1, Côa Valley (Portugal): Confirmation of the Paleolithic Age of the Petroglyphs using Luminescence Dating Methods].
- 10:20-10:40 Yann-Pierre MONTELLE (Providence, RI, U.S.A.)
- C85-05** Shifting Focus: Attention to Details.
- 10:40-11:00 Terje NORSTED
- C85-06** Cave Paintings in Norway.
- 11:00-11:20 Arnaud NOURY
Jean-Michel CHAZINE (Buoux, France)
- C85-07** Sexual Identity Determination of Negative Hand Stencils on the Large Panel of the Gua Masri II's Cave (East-Kalimantan/Borneo - Indonesia).
- 11:20-11:40 Paul PETTITT (Sheffield, UK)
- C85-08** Discovery, Verification, Contextualisation and Interpretation of Britain's First Upper Palaeolithic Cave Art at Church Hole Cave and Robin Hood Cave, Creswell Crags.
- 11:40-12:00 Romain PIGEAUD (Paris, France)
Joël RODET
Thibaut DEVIESE
Jean-Pierre BETTON
Pascal BONIC
- C85-09** Palaeolithic Cave art in Northern Europe: An Exceptional Discovery.
- 12:00-12:15 Kevin SHARPE (Oxford, UK)
Leslie VAN GELDER (Oxford, UK)
- C85-10** Finger Flutings in Gargas Cave, France.
- 12:15-12:30 Hélène VALLADAS (Gif-sur-Yvette, France)
Hélène CACHIER
Nadine TISNÉRAT-LABORDE
Evelyne KALTNECKER
- C85-11** La Datation Directe de l'Art Pariétal par la Méthode du Carbone 14 en SMA [Direct AMS Radiocarbon Dating of Parietal Art].
- 12:30-12:45 Stefano RICCI (Siena, Italy)
Annamaria RONCHITELLI (Siena, Italy)
- C85-12** Grotta Paglicci: new reliefs and modern conservative technologies of paleolithic parietal paintings.
- 12:45-13:00 Discussion

ABSTRACTS / RÉSUMÉS

C85-01 Alberto MINGO ÁLVAREZ (Madrid, Spain)

The Rock Signs of Cueva de El Castillo (Puente Viesgo, Cantabria, Spain) in the Context of the Cantabrian Palaeolithic Art.

ABSTRACT: The rock art of Cueva de El Castillo is one of the most characteristic examples of diversity (regarding to the thematic, chronology and spatial organization of the representations that contains) in the Palaeolithic sanctuaries of the Cantabrian region. The complex signs in this cave have a great importance. Some of these images have a certain paralelism with other signs appeared in caves located in the same geographical context of El Castillo. The similarities among their shapes, structures, techniques, contexts, are studied in this work, as well as some possible and derived ethnic implications are posed.

C85-02 Robert G. BEDNARIK (Caulfield South, Australia)

To Be or Not to Be Palaeolithic, That is The Question.

ABSTRACT: The tendency of many European and some Asian archaeologists to pronounce rock art as being Palaeolithic in the absence of any evidence other than stylistic vibes is examined. Numerous examples are presented and discussed, especially from central Europe. It is shown, for instance, that there is currently no evidence of any Pleistocene rock art in the central regions of Europe. All claims from outside the traditional main corpus, essentially in France and Spain, are in fact tenuous and largely unsupported, and this applies to the entire region from Portugal to China. There are literally hundreds of false or very tenuous claims for Pleistocene rock art from Eurasia. This state is then compared with the situation in other continents, in an effort to understand the psychology of those making precipitate claims.

C85-03 Jean CLOTTE (Foix, France)
Jean COURTIN
Luc VANRELL

Cosquer Revisited.

ABSTRACT: The paintings of the Cosquer Cave were discovered near Marseille (France) in July 1991. Most of the chambers and galleries of the cave are flooded and the works of art are only preserved in the high-up chambers that remained above sea level. A first study was published in 1994. In 2002 and 2003, we pursued the work in the cave and made numerous discoveries. In all, we now know 187 animal figures, among which horses are dominant, a strange image of a killed man, several representations of genital organs, 65 hand stencils and more than 200 geometric signs. We could study and document the activities of the Palaeolithic visitors to the cave, in particular the fact that they scraped the walls to gather mondmilch and broke stalagmites to take away their fragments, probably to make medicines. The 27 radiocarbon dates obtained have shown that the cave was frequented during two periods, first around 27,000 before present, then around 19,000 BP.

C85-04 Norbert MERCIER (Gif-sur-Yvette, France)
Hélène VALLADAS (Gif-sur-Yvette, France)
Thierry AUBRY (Vila Nova Foz Côa, Portugal)
João ZILHÃO (Lisboa, Portugal)
Jean-Louis JORON
Jean-Louis REYSS
Farid SELLAMI (Grignon, France)

La Roche N°1 de Fariseu, Vallée du Côa (Portugal): Confirmation par les Méthodes de la Luminescence de l'Âge Paléolithique des Gravures [The Fariseu Engraved Rock Panel No. 1, Côa Valley (Portugal): Confirmation of the Paleolithic Age of the Petroglyphs using Luminescence Dating Methods].

ABSTRACT: La roche gravée n°1 de Fariseu située sur la rive gauche de la vallée du Côa est exceptionnelle dans la mesure où des niveaux archéologiques ont été trouvés au contact direct des

gravures. Lors des fouilles de 1999 dirigées par T. Aubry, des échantillons de quartzites chauffées ont été sélectionnés et des sédiments prélevés. Leur datation, réalisée respectivement par Thermoluminescence (TL) et Luminescence Stimulée Optiquement (OSL), a fourni des âges compris entre 10.8 ± 1.7 et 18.4 ± 1.6 ka. Ces données et les observations de terrain permettent de conclure que les gravures datent d'au moins 14.5 ka, et sont donc d'âge paléolithique. [The Fariseu engraved rock panel n°1, located on the left bank of the Côa Valley is exceptional as archaeological levels were discovered in direct contact of engravings. During the 1999 excavations directed by T. Aubry, heated quartzite samples were selected and sediments sampled. Their dating carried out respectively by Thermoluminescence (TL) and Optically Stimulated Luminescence (OSL), provided ages ranging between 10.8 ± 1.7 and 18.4 ± 1.6 ka. These data and the field observations lead to conclude that the engravings are at least 14.5 ka old, and are thus of Paleolithic age.]

C85-05

Yann-Pierre MONTELLE (Providence, RI, U.S.A.)

Shifting Focus: Attention to Details.

ABSTRACT: By looking at the recent evidence for human use of western European caves in the Upper Paleolithic, it has become undeniable that the *iconocentric* approach has been detrimental to a century of interpretations. The cave, as cultural reservoir, is quickly becoming a complex repository of anthropic traces that, until recently, have been excavated with antiquarian discriminations. The systematic destructions of the paleo-floors have resulted in a series of biased investigations focused mainly on one obvious evidential body – the so-called “cave art”. The recent efforts by Jean Clottes and others to preserve the floors and to pay attention to the “details” have already made major breakthroughs and projected the research beyond the limitations of the *iconocentric* approach. This, it is argued, will ultimately shift the focus from dated taken-for-granted a priori to new understandings about the socio-economic and cultural functions of the deep caves, as well as the motivations for the Upper Paleolithic hominids to use these deep caves for an unbroken 25,000 year span.

C85-06

Terje NORSTED

Cave Paintings in Norway.

ABSTRACT: As far as we know, Norway has the only occurrences in the northern half of Europe of paintings situated in deep, dark caves. Nine such caves have been recorded along the coastline in the central and northern part of the country.

The age of the paintings is unknown. Movable objects left by man in two of the caves have been dated to 1800-500 B.C., but this does not necessarily correlate with the painting activity.

The motifs of the paintings are mainly human figures, but animals and combinations of long lines also occur. A large part of the humans form groups which may be interpreted as ritual scenes. Today the caves and their paintings are usually associated with northern Eurasian shamanic world-view and practices.

These localities are extremely vulnerable, and the conservation problems are formidable. For the paper, I want to present some current thoughts on context, interpretation and conservation.

C85-07Arnaud NOURY
Jean-Michel CHAZINE (Buoux, France)**Sexual Identity Determination of Negative Hand Stencils on the Large Panel of the Gua Masri II's Cave (East-Kalimantan/Borneo - Indonesia).**

ABSTRACT: Paralleling Sharpe and Van Gelder studies in Rouffignac and using Manning's ratios for sexual differentiation, a test-software (*Kalimain 1.0*, Beta version) has been elaborated and experienced upon one of the numerous negative hand print surveyed in Indonesian East Borneo by a Franco-Indonesian archaeological team (<http://www.kalimanthrope.com>).

Applied upon the negative hands prints of Gua Masri II cave, sexual identities determination, have shown that this ornate cave was differently used by both men and women. Sexually differentiated hands' disposition in the main panel indicates that above a deliberate disposition of hand prints, there is a sexual differentiation corresponding to social or historical structures which provide an easier access to unexpected interpretations.

The further development of *Kalimain* software will provide numerous opportunities for studying occurrences and correlations linking motifs, locations, quantities, similarities and all other statistical

combinations observed in all various Rock Art expressions.

C85-08 Paul PETTITT (Sheffield, UK)

Discovery, Verification, Contextualisation and Interpretation of Britain's First Upper Palaeolithic Cave Art at Church Hole Cave and Robin Hood Cave, Creswell Crags.

ABSTRACT: In recent years a number of new discoveries and analyses have improved our understanding of the British Upper Palaeolithic. This has often been seen as impoverished in comparison to the continental record, due to long periods of human absence in the UK and the rather rushed excavations of the nineteenth century which emptied many potentially important sites of their materials. Now, new analyses of important sites, new dating programmes and new interpretative paradigms are combining to create a new understanding of the northwestern periphery of the Upper Palaeolithic world. Part of this was the discovery in 2003 of Britain's first examples of Upper Palaeolithic cave art, in two caves of Creswell Crags on the Derbyshire/Nottinghamshire border. This paper will present current understanding of the art in its broader late Upper Palaeolithic (Magdalenian) context. It follows that a number of clear parallels with continental Magdalenian art can be found, and the British hunter-gatherer societies of the earlier part of the Lateglacial Interstadial can be seen to have possessed strong cultural links to communities elsewhere in Europe.

C85-09 Romain PIGEAUD (Paris, France)

Joël RODET

Thibaut DEVIESE

Jean-Pierre BETTON

Pascal BONIC

Palaeolithic Cave art in Northern Europe: An Exceptional Discovery.

ABSTRACT: With sites such as Lascaux, Chauvet and Cosquer in the south of France (Perigord, Ardèche and Bouches-du-Rhône) and Altamira in Spain (Cantabria), cave art in the south of Europe is very well-known. For a long time, cave art was not so commonly known in the North. This situation has changed with a series of recent discoveries in England (Church Hole), in France (Grande grotte d'Arcy-sur-Cure) and in Germany (Hohle Fels). It has strengthened the group of the seven decorated caves already discovered in Normandy (Gouy, Orival), Central France (Boutigny, Croc-Marin, Trois Pignons) and in Mayenne (Mayenne-Sciences), to which we can include the fragments of rock painting from the cave of Geissenklösterle, in Germany. In this paper, we are presenting the discovery in July 2005 of Palaeolithic engravings and paintings in the Margot cave (Mayenne). This is the first decorated cave identified in Western France since 1967 and the 13th known in Northern Europe. The radiocarbon dating from some of these sites and the stylistic attributions of others authorize us to define a cultural group positioned at the end of the Upper Palaeolithic; this period corresponds to a time when climatic conditions facilitated the progression of prehistoric humans to the North.

C85-10 Kevin SHARPE (Oxford, UK)

Leslie VAN GELDER (Oxford, UK)

Finger Flutings in Gargas Cave, France.

ABSTRACT: The Paleolithic finger flutings in Gargas Cave, France, have been known for some time and two studies have previously been made of them. Many of the flutings are in poor condition but in all they are extensive, one panel stretching over 400 square meters. This paper reports on a considerably more thorough examination of them, using and extending methods that focus on the lines themselves and the gaining of forensic information from them. Results suggest that almost all, if not all the flutings in the cave were made by three people: a man, a woman, and a young child, perhaps a boy. To some extent, their behaviors in the cave can be elaborated and some of their individual physical characteristics (e.g., height, handedness) deciphered. They repeated particular movements and flutings in various parts of the cave and in different media. Some of the flutings are of animals (which previous researchers have highlighted); these appear to have been made by the man and may relate to some of the engraved animals in the small chambers at the end of the cave. Questions remain about the flutings, however, and one panel in particular is intriguing and beckons for further research.

C85-11

Hélène VALLADAS (Gif-sur-Yvette, France)
Hélène CACHIER
Nadine TISNÉRAT-LABORDE
Evelyne KALTNECKER

La Datation Directe de l'Art Pariétal par la Méthode du Carbone 14 en SMA [Direct AMS Radiocarbon Dating of Parietal Art].

ABSTRACT: La méthode du carbone 14 en SMA a apporté une contribution importante à l'étude de l'art pariétal, avec la datation des tracés réalisés avec du charbon de bois. Les résultats montrent la nécessité d'intégrer cette approche chronologique à un cadre pluridisciplinaire incluant l'étude détaillée des panneaux ornés, ainsi que l'analyse des pigments. Comme chaque grotte a connu sa propre histoire, les tracés pariétaux offrent des conditions de conservation variables et sont plus ou moins favorables à la datation. Il faut donc d'étudier, dans chaque cas, les sources possibles de contamination des pigments charbonneux par du carbone étranger. Quelques exemples illustreront les difficultés rencontrées lors de ces études chronologiques, du prélèvement du pigment à l'interprétation des résultats. [The AMS Radiocarbon method has made an important contribution to the study of parietal art by making it possible to date the drawings and paintings done in wood charcoal. The results confirm the importance of integrating this chronological approach into a pluridisciplinary program combining a detailed study of the decorated panel with an investigation of the pigments. As each cave has a different past, the drawings and paintings are in various states of conservation and some are more suitable for dating than others. Consequently, it is necessary to investigate in each case the possible sources of contamination of the pigment by extraneous carbon. Several examples will illustrate the difficulties encountered during this chronological study, from the pigments sampling to the interpretation of results.]

C85-12

Stefano RICCI (Siena, Italy)
Annamaria RONCHITELLI (Siena, Italy)

Grotta Paglicci: new reliefs and modern conservative technologies of paleolithic parietal paintings.

ABSTRACT: In 1961 F.Zorzi and F. Mezzena discovered, in an inner room of Grotta Paglicci - Puglia, Italy, some parietal paintings referable to the ancient horizon of the franco-cantabric art. During the new excavations (2002-2005) directed by Prof. A.Ronchitelli, the paintings have been reconsidered with new techniques of survey and a program of conservation with the employment of modern technologies has been started.

Session C86

Tuesday, 5 September 2006 / Mardi, 5 Septembre 2006

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

Middle and Upper Palaeolithic bladelet productions A diachronic perspective

Les productions lamellaires au Paléolithique moyen et supérieur Une perspective diachronique

organized by /organisé par

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SESSION'S ABSTRACT

The Upper Palaeolithic is conventionally characterized by the seemingly sudden proliferation of some of the more distinctive features of fully modern cultural behaviour. One of the most noteworthy changes in material culture is the trend towards a significant reduction in size of lithic tools, combined with their increasing standardization. It is an acknowledged fact that the Upper Palaeolithic fully expressed the global systematisation of bladelet production. However, similar productions have lately been documented for the Middle Palaeolithic of Eurasia, thus widening the temporal scope of this phenomenon. These findings thus give rise to a series of questions about the chronology of Eurasian bladelet productions and the circumstances that surround their appearance.

Typological studies have already described the main characters and the large variability of bladelet tools. More recently, technological studies based on the concept of chaîne opératoire have proved fruitful for discussing the technical processes implemented in their production, as well as their techno-typological diversity and their functional purpose. Upper Palaeolithic bladelet productions in particular are known to be very fine chrono-cultural markers. In the Aurignacian and the Gravettian for instance, such productions have been efficiently used to monitor the internal diachronic evolution of these techno-complexes (XIVth UISPP Congress, Liège 2001, symposium 6.7. organized by F. Le Brun-Ricalens).

The aim of this session is to investigate the significance of the wide diachronic range and highly varied facets of bladelet productions, through a series of European and Near-Eastern case studies drawn from Middle and Upper Palaeolithic archaeological contexts.

The following issues are considered particularly relevant:

- The specific technologies of bladelet productions
- The typo-technical characters of bladelets and their functional purposes
- The chronological variation of bladelet production systems
- The production of bladelets in an economic perspective: transport of both cores and end-products

We are confident that this session can result in an updated synthesis on Middle and Upper Palaeolithic bladelet productions, which clearly played a determining part in the vast changes that took place in Eurasia between 50 and 30 ka BP.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

09:00 **Opening / Ouverture**

09:00-09:15 Nicolas TEYSSANDIER (Toulouse, France)

C86-01 **De la valeur des productions lamellaires en termes de marqueur technologique et évolutif au Paléolithique moyen et supérieur.**

09:15-09:30 Stéphanie BONILAURI (Nanterre, France)
Eric BOËDA (Nanterre, France)

C86-02 **Le débitage lamellaire au Paléolithique intermédiaire dans le bassin d'El Kown (Syrie centrale).**

09:30-09:45 Ludovic SLIMAK (Aix-en-Provence, France)

C86-03 **Lamelles moustériennes de France méditerranéenne. Etat des connaissances autour d'un projet technique de la fin du Paléolithique moyen.**

09:45-10:00 Federico Bernaldo DE QUIROS (Leon, Spain)
Granada SANCHEZ (Madrid, Spain)
José Manuel MAILLO-FERNANDEZ (Madrid, Spain)

C86-04 **Bladelets, Dufour and Neanderthals: the bladelet production in the Cantabrian's Late Mousterian.**

10:00-10:15 François BACHELLERIE (Bordeaux, France)
Jean-Guillaume BORDES (Bordeaux, France)
André MORALA (Les Eyzies-de-Tayac, France)
Jacques PELEGRIN (Nanterre, France)

C86-05 **Existe-t-il une production lamellaire au Châtelperronien?**

10:15-10:30 **Discussion** (discutants: Ofer BAR-YOSEF et Janusz K. KOZLOWSKI)

10:30-10:45 **Break / Pause**

10:45-11:00 Tsenka TSANOVA (Bordeaux, France)

- C86-06** **Entre l'Europe et le Proche-Orient, le début de la production lamellaire dans les Balkans de l'Est: l'exemple du niveau VII de la grotte Kozarnika en Bulgarie.**
- 11:00-11:15 Ofer BAR-YOSEF (Cambridge, MA, U.S.A.)
Anna BELFER-COHEN (Jerusalem, Israel)
- C86-07** **Bladelet productions during the Initial Upper Paleolithic in the Levant.**
- 11:15-11:30 François BON (Toulouse, France)
Jean-Guillaume BORDES (Bordeaux, France)
Foni Le BRUN-RICALES (Luxembourg, Luxembourg)
Nicolas TEYSSANDIER (Toulouse, France)
- C86-08** **L'évolution des productions lamellaires à l'Aurignacien et leur signification.**
- 11:30-11:45 Illuminada ORTEGA (Bergerac, France)
J. RIOS (,Spain)
- C86-09** **Variabilité techno-fonctionnelle des productions lamellaires à l'Aurignacien ancien. Quatre occupations de plein air en Bergeracois (Dordogne, France).**
- 11:50-12:05 Alvaro ARRIZABALAGA (Vitoria, Spain)
- C86-10** **L'évolution de la laminarité au début du Paléolithique supérieur dans la partie orientale des Cantabres (Cantabria et Pays Basque).**
- 12:10-12:25 Janusz K. KOZLOWSKI (Krakow, Poland)
- C86-11** **La production lamellaire dans les occupations aurignaciennes de la grotte n°1 de Klisoura (Argolide, Grèce).**
- 12:30-12:45 Alexandre MICHEL (Bordeaux, France)
Jean-Guillaume BORDES (Bordeaux, France)
- C86-12** **Normes et variations dans l'Aurignacien « post I » du sud-ouest de la France.**
- 12:45-13:00 Pierre NOIRET (Liège, Belgium)
Vasile CHIRICA (Iasi, Romania)
- C86-13** **Production lamellaire aurignacienne à Mitoc-Malu-Galben (Roumanie).**
- Discussion** (discutants : Federico Bernaldo DE QUIROS & Pierre BODU)
- 13:00-14:30 **Lunch / Déjeuner**
- 14:30-14:45 Marcel OTTE (Liège, Belgium)
Janusz K. KOZLOWSKI (Krakow, Poland)
- C86-14** **Lames et lamelles à Kara Kamar (Afghanistan).**
- 14:45-15:00 György LENGYEL (Mikolc, Hungary)

- C86-15** Bladelet debitage in the Upper Palaeolithic-Epipalaeolithic sequence of Raqefet cave, Mount Carmel, Israel.
- 15:00-15:15 Luc MOREAU (Tübingen, Germany)
- C86-16** The early Gravettian assemblage of the Geissenklösterle: the bladelet production and its place in a regional diachronic perspective.
- 15:15-15:30 Laurent KLARIC (Nanterre, France)
Thierry AUBRY (Vila Nova Foz Côa, Portugal)
- C86-17** Des armatures variées, des modes de production variables... et quoi d'autres? Réflexion sur la portée des études technologiques à partir de quelques exemples issus des phases moyenne et récente du Gravettien d'Europe occidentale (France, Portugal).
- 15:30-15:45 Patricia GUILLERMIN (Toulouse, France)
- C86-18** Les productions lamellaires au sein des ensembles dits Protomagdalénien dans le sud-ouest de la France.
- 15:45-16:00 **Discussion** (discutants François BON, Ludovic SLIMAK)
- 16:00-16:15 **Break / Pause**
- 16:15-16:30 Carmine COLLINA (Aix-Marseille I, France and Roma, Italy)
R. GALLOTI (Roma, Italy)
Marcello PIPERNO (Roma, Italy)
- C86-19** Les microgravettes du site Gravettien de Roccia San Sebastiano (Mondragone, Italie). Comportements techniques et chaînes opératoires.
- 16:30-16:45 Lucie CHEHMANA (Issy-Les-Moulienaux, France)
- C86-20** Des productions lamellaire sur tranche d'éclat: un phénomène commun à tout le Paléolithique supérieur! Quelques éléments de distinction culturelle pour le Badegoulien à partir des données recueillies sur le gisement d'Oisy (Nièvre, France).
- 16:45-17:00 Mathieu LANGLAIS (Toulouse, France)
- C86-21** La diversité des productions lamellaires et microlamellaires au Magdalénien inférieur dans le sud de la France et le Nord-Est de la Péninsule Ibérique.
- 17:00-17:15 Jérôme PRIMAULT (Nanterre, France)
- C86-22** La production des lamelles à dos vers 17.000 BP: le Magdalénien ancien de la grotte du Taillis des Coteaux à Antigny (Vienne, France).
- 17:15-17:30 Eric BOËDA (Nanterre, France)
- C86-23** La production des lamelles dans la séquence Paléolithique moyen récent/Paléolithique supérieure initial d'Umm el Tiel (Syrie)

17:30-17:45 Jean-Philippe FAIVRE (Les Eyzies-de-Tayac, France)

C86-24

Production lamellaire au Moustérien dans le Sud-ouest de la France : l'exemple du site de Combe-Grenal.

17:45-18:00 **Discussion (discutants : Marie-Isabelle CATTIN et Laurent KLARIC)**

18:00-18:30 **General discussion / Discussion générale.**

ABSTRACTS / RÉSUMÉS

C86-01

Nicolas TEYSSANDIER (Toulouse, France)

De la valeur des productions lamellaires en termes de marqueur technologique et évolutif au Paléolithique moyen et supérieur.

RESUME: Le Paléolithique supérieur se caractérise par une large série de transformations qui touchent tant les productions matérielles que les sphères symboliques et artistiques. Parmi les phénomènes les plus notables, et les plus durables dans le temps, s'amorcent une réduction de la taille et une normalisation accrue des outillages. En effet, et d'une manière très générale, le Paléolithique supérieur marque le plein développement et la systématisation de la production des lamelles. Récemment, de telles productions ont été documentées au Paléolithique moyen, venant ainsi élargir dans le temps la portée de ce phénomène. Si les études typologiques ont déjà bien mis en avant les caractères particuliers des outils sur lamelles, la généralisation des études technologiques permet désormais de s'interroger de manière plus fine sur la variété des procédés mis en œuvre pour leur production, sur leur variabilité morpho-typologique ainsi que sur leur destination fonctionnelle. Il apparaît, en particulier pour le Paléolithique supérieur, que ces productions possèdent un statut privilégié en tant que marqueur chrono-culturel. A l'Aurignacien ou au Gravettien par exemple, ce sont les lamelles et leurs chaînes de production qui permettent au mieux d'identifier les stades évolutifs de développement de ces techno-complexes.

Cette communication servant d'introduction générale au colloque se propose de rendre compte de l'ampleur diachronique et de la grande variété du phénomène lamellaire à travers le temps et l'espace.

C86-04

Federico Bernaldo DE QUIRÓS (Leon, Spain)

Granada SÁNCHEZ (Madrid, Spain)

José Manuel MAILLO-FERNÁNDEZ (Madrid, Spain)

Bladelets, Dufour and Neanderthals: the bladelet production in the Cantabrian's Late Mousterian.

ABSTRACT: The bladelet productions is documented during the Final Mousterian in several sites of Cantabrian region. We have identified a series of bladelet schemes opératoires prismatic and Levallois recurrent type in sites like El Castillo or Cueva Morín. The new point relies on the fact that some of these bladelets show an inverse and semiabrupt retouch (Dufour bladelets). The implications of these pieces lead us to reconsider some of the diagnostic features concerning the Upper Paleolithic and the modern behaviour.

C86-06

Tsenka TSANOVA (Bordeaux, France)

Entre l'Europe et le Proche-Orient, le début de la production lamellaire dans les Balkans de l'Est: l'exemple du niveau VII de la grotte Kozarnika en Bulgarie.

RESUME: Après les sites déjà connus de Bacho Kiro et Temnata, la grotte de Kozarnika a livré la troisième grande séquence pléistocène récemment établie dans la région de l'Est des Balkans.

Datée entre 39 et 11 Ky BP, la séquence du Paléolithique supérieur présente à la base une industrie lithique (niveau VII) qui est inédite à l'échelle régionale. Cette industrie est constituée d'un débitage et outillage lamellaire dont la plus grande partie est constituée de pointes à retouche fine et de pièces à dos mince. Cette industrie lithique est associée à une pauvre industrie osseuse sans sagaies à base fendu et à de la parure. Le niveau VII, daté entre 39 et 36 Ky BP est dénommé «Kozarnikien» en attente d'études plus complètes. L'industrie recueillie présente des analogies dans sa composante lamellaire tant avec l'Ahmarien ancien du Levant qu'avec certains ensembles du Proto-Aurignacien du sud de l'Europe.

C86-08

François BON (Toulouse, France)
Jean-Guillaume BORDES (Bordeaux, France)
Foni Le BRUN-RICALES (Luxembourg, Luxembourg)
Nicolas TEYSSANDIER (Toulouse, France)

L'évolution des productions lamellaires à l'Aurignacien et leur signification.

RESUME: Cette communication dressera un bilan à l'échelle de l'Europe sur la valeur des productions lamellaires en termes de sériation chrono-culturelle et évolutive de l'Aurignacien.

C86-13

Pierre NOIRET (Liège, Belgium)
Vasile CHIRICA (Iasi, Romania)

Production lamellaire aurignacienne à Mitoc-Malu-Galben (Roumanie).

RESUME: Bien que n'ayant jamais livré de lamelles retouchées (Dufour ou autres), les ensembles aurignaciens de Mitoc-Malu Galben (Roumanie) relèvent probablement de l'Aurignacien de type Krems-Dufour. Dans le matériel lithique récolté par V. Chirica dans les années 1980, plusieurs indices permettaient de supposer une production lamellaire, à partir de nucléus-outils carénés. Un petit ensemble lithique, non encore publié, provenant des fouilles des années 1990 et associé à un foyer, atteste une telle production. Les modes de débitage seront décrits et comparés à ceux connus dans le monde aurignacien occidental et oriental.

C86-14

Marcel OTTE (Liège, Belgium)
Janusz K. KOZLOWSKI (Krakow, Poland)

Lames et lamelles à Kara Kamar (Afghanistan).

RESUME: Un important ensemble industriel déplace la limite aurignacienne, loin en Asie Centrale. L'étude détaillée de cette documentation manifeste les modes de formation lamellaires selon deux voies, au moins: rectilignes sur bord d'éclats et par extraction courbe sur front de grattoirs. La position extrême-orientale et les premières dates disponibles (32.000 BP) en font un des sites significatifs pour cette méthodologie.

C86-15

György LENGYEL (Mikolc, Hungary)

Bladelet debitage in the Upper Palaeolithic-Epipalaeolithic sequence of Raqefet cave, Mount Carmel, Israel.

ABSTRACT: Raqefet Cave is located in the east Mount Carmel, in Wadi Raqefet. Its stratigraphy contains layers with Mousterian, indeterminate early Upper Palaeolithic, Levantine Aurignacian, Late Kebaran, Geometric Kebaran and Late Natufian lithic assemblages. Present discussion demonstrates variability in bladelet productions from the early Upper Palaeolithic (indeterminate early UP and Levantine Aurignacian; ca. 33-30 ka BP) throughout the Epipalaeolithic (Late Kebaran, Geometric Kebaran and Late Natufian; ca. 16,5-10,5 ka BP). Uniform features of bladelet productions in the studied sequence are the use of soft hammer technique and the prevalently unidirectional core exploitation. Significant differences can be observed in the exploitation of raw material, selection of blanks for cores, core configuration and core rejuvenation. Raw materials in the indeterminate early UP, Levantine Aurignacian and Late Kebaran assemblages are of mediocre quality, while those in the Geometric Kebaran and Late Natufian are of good quality. The core blanks in the indeterminate early UP and the Epipalaeolithic industries are small nodules and prior blade cores, while in the Levantine

Aurignacian those are often thick cortical flakes. In the core configuration, the Late Natufian used most likely heat treatment. Signs of heat treatment do not occur in any other industry of the sequence. Core maintenance with striking platform rejuvenation and neo-cresting was most frequently performed in the Late Kebaran, while in other industries the appliance of those are rarer, and almost absent in the Aurignacian. The Geometric Kebaran instead of rejuvenation rather turned unused surfaces of the cores into debitage at the end of the core exploitation. Summarizing all available data it can be argued that although there is a tendency for using better quality raw materials and flint heat treatment appears in the course of the Epipalaeolithic, most changes in the studied sequence are not evolutionary. Changes are rather due to the appearance of distinct technical behaviors stem from culture specific mindset.

C36-16 Luc MOREAU (Tübingen, Germany)

The early Gravettian assemblage of the Geissenklösterle: the bladelet production and its place in a regional diachronic perspective.

ABSTRACT: The Gravettian of the Swabian Jura developed roughly 30,000 years ago, and no clear stratigraphic break separates the lowest Gravettian from the uppermost Aurignacian deposits which also date to roughly 30,000 years ago. Unlike the Aurignacian that is well documented in both the Lone and Ach Valleys, the Gravettian is found almost exclusively in the Ach Valley, where particularly rich assemblages are known from sites including Brillenhöhle, Hohle Fels and Geißenklösterle.

After 27,000 bp. evidence for Gravettian occupations in the region decrease and only scant traces of occupation are visible during the Last Glacial Maximum.

The Geissenklösterle was excavated from 1973 to 2002 by the University of Tübingen with modern standards, including systematic waterscreening and three dimensional recording of the finds, and presents a well documented chronostratigraphy. The study of the Gravettian assemblage was mainly oriented towards the production of small blades and bladelets that were transformed into blunted-back armatures. Next to an integrated production of blades and bladelets on prismatic cores, the presence of polyedric and flat faced burins on high quality material raises the question of their role in the assemblage.

This paper aims to present the typo-technological study of the Geissenklösterle Gravettian with focus on the bladelet production sequence and compares it with the underlying Aurignacian assemblage.

C36-17 Laurent KLARIC (Nanterre, France)
Thierry AUBRY (Vila Nova Foz Côa, Portugal)

Des armatures variées, des modes de production variables... et quoi d'autres? Réflexion sur la portée des études technologiques à partir de quelques exemples issus des phases moyenne et récente du Gravettien d'Europe occidentale (France, Portugal).

RESUME: Depuis quelques années maintenant, certaines phases du Gravettien connaissent un regain d'intérêt s'accompagnant d'un développement croissant des études technologiques, en France et ailleurs en Europe. Ces travaux ont surtout concernés les modalités de production des supports d'armatures retouchées (plus que les seules productions lamellaires) des phases moyennes, récentes et finales. Si les résultats obtenus contribuèrent à améliorer nos connaissances et notre compréhension des systèmes techniques de ces différents moments du Gravettien, rares ont été les occasions où l'on a pu tenter de comparer ces données pour en tirer une réflexion diachronique plus large. Certes l'état des connaissances s'avère encore très disparate d'une région et/ou d'une phase à l'autre, mais de tels hiatus ne sauraient justifier que nous poursuivions seulement un objectif documentaire visant à «caractériser les modes de productions lamellaires». Si cette étape descriptive constitue une pré requis indispensable, chacun s'accordera à reconnaître le risque d'une dérive conduisant à une «typologie classificatoire de systèmes techniques». Pour tenter d'aller plus loin qu'un simple constat de variabilité, analogies et différences, cette communication propose de lancer quelques pistes de réflexion fondées sur nos travaux sur certaines entités gravettiennes de France et du Portugal. La comparaison des grands traits des modes de productions d'armatures de différents sites (La Picardie, Arcy-sur-Cure, Brassempouy, Le Cirque de la Patrie, Mainz-Linsenberg, Olga Grande 4, Cardina 1, Vale dos Covoos, Terra do Manual) issus de phases chronologique distinctes et

de milieux écologiques radicalement différents permettra alors d'alimenter la réflexion sur les contraintes et les choix techniques et économiques mais aussi culturels de ces groupes gravettiens. Il s'agira de mettre en lueur comment ces différents facteurs ont pu peser sur les choix techniques des hommes conditionnant de manière variable l'ensemble du système technique lithique dont la composante lamellaire peut finalement n'être qu'une partie assez restreinte.

C86-21 Mathieu LANGLAIS (Toulouse, France)

La diversité des productions lamellaires et microlamellaires au Magdalénien inférieur dans le sud de la France et le Nord-Est de la Péninsule Ibérique.

RÉSUMÉ: Lors de la transition Pléniglaciaire-Tardiglaciaire en Europe de l'Ouest, différents complexes industriels post-solutréens sont identifiés. Dans le sud de la France et le nord-est de l'Espagne, les premières phases du Magdalénien sont caractérisées par une riche composante lamellaire et microlamellaire. L'étude comparée de séries provenant de fouilles récentes a permis de mettre en évidence une grande diversité des modalités de productions qui témoignent également d'une importante exploitation des matériaux locaux. Ainsi, la production d'éclats supports de nucléus est essentielle dans ces industries qui portent pourtant probablement en elles les racines de la norme laminaire du Magdalénien moyen.

Session C87

Friday, 8 September 2006 / Vendredi, 8 Septembre 2006

Room 5.2, Faculty of Letters, Lisbon University
Salle 5.2, Faculté de Lettres, Université de Lisbonne

Climatic Change and Social Evolution in the Arid Lands during the Holocene

organized by / organisé par

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SESSION'S ABSTRACT

The Holocene is characterized by environmental fluctuations at both local and global scales. The human populations living in arid lands develop specific strategies to face this typical environmental risk and uncertainty of deserts. Furthermore, many archaeologists agree that economic and social modifications were correlated with those climatic changes. For that reason, it is absolutely necessary to study the environmental evolution as one of the main keys for understanding social and economic change, such as animal and plant domestication and social complexity. Our goal is to discuss new paleoenvironmental data in parallel with archaeological information to get an integrated panorama about resource use, land management, and technological responses that human societies devised during this time-period.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

- 14:30 **Opening / Ouverture**
- 14:30-14:50 Aixa S. VIDAL (Madrid, Spain)
C87-01 **An insight into the integral analysis of formative pottery in Southern Argentine Puna.**
- 14:50-15:10 Fabio CAVULLI (TRENTO, ITALY)
C87-02 **Problems of stratigraphy relating to the excavation of loose sediment in dry environments: a case study of KHB-1, Ra's al Khabba, Sultanate of Oman.**
- 15:10-15:30 Hernán Juan MUSCIO (Buenos Aires, Argentina)
C87-03 **Why the modal description of past environments is unfortunate in archaeology? Niche, predominant strategies and optimizing selection during the early agropastoral evolution of the Andean puna of Salta, Argentina.**
- 15:30-15:50 Daniel E. OLIVERA (Buenos Aires, Argentina)
 Pablo TCHILINGUIRIAN
C87-04 **Agriculture and soil management in meridional Puna, Antofagasta de la Sierra, Argentina.**

15:50-16:10 J. M. SAYAGO (Argentina)
M. M. SAMPIETRO VATTUONE (Argentina)
M. A. CARIA (Argentina)
M. M. COLLANTES (Argentina)

C87-05 **Dryness and social disruption in dry intermountaneous Valleys of North West Argentina, during the Medieval warm epoch.**

16:10-16:30 Alejandro TERRAZAS MATA
Martha Elena BENAVENTE SANVICENTE

C87-06 **Environmental changes and bio-social evolution of the early Holocene human populations in the Desert of Sonora, Mexico.**

16:30-16:50 Hugo D. YACOBACCIO

C87-07 **Global and local Holocene climate change: are they isomorphic?**

16:50-17:10 D. JOLY (Rennes, France)
R. MARCH (Rennes, France)
D. MARGUERIE (Rennes, France)
H. YACOBACCIO (Buenos Aires, Argentina)

C87-08 **Gestion des combustibles dans un site de chasseurs-cueilleurs d'altitude. L'Exemple d'Hornillon 2 (Puna, Argentina).**

17:10-17:30 Norma RATTO (Buenos Aires, Argentina)
Blas Valero GARCÉS (Zaragoza, Spain)

C87-09 **Cultural and climatic change in Catamarca's Southwest (Argentina).**

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

ABSTRACTS / RÉSUMÉS

C87-01 Aixa S. VIDAL (Madrid, Spain)

An insight into the integral analysis of formative pottery in Southern Argentine Puna.

ABSTRACT: This paper presents an insight into the use of ceramic materials in three sites in Southern Argentinian Puna: Casa Chávez Montículos, Real Grande 6 and Cueva Cacao 1A. Chronological and culturally they correspond to the local Formative. Their features, however, are quite different: a village, a hilltop site, and a ritual and rock art cave; though their ceramic assemblages are comparable from a technological and formal perspective. The analysis presented here aims at studying the potential functions of these vessels, particularly in what we would call a domestic context.

C87-02 Fabio Cavulli (Trento, Italy)

Problems of stratigraphy relating to the excavation of loose sediment in dry environments: a case study of KHB-1, Ra's al Khabba, Sultanate of Oman.

ABSTRACT: The excavation of KHB-1 archaeological site is part of the Joint Hadd Project and carried out by the *Istituto Italiano per l'Africa e l'Oriente di Roma* and the Universities of Bologna and Trento. This multi-stratified deposit can be attributed to a community of gatherer-fishers of the fourth millennium; who to a lesser extent also practiced animal breeding. The loose, coarse sandy deposits

(granular, loose archaeological sediments), are of aeolian origin, which have been disturbed by anthropic action and mixed with food remains, artefacts and features. The material culture and the settlement features recovered from this excavation are important as they fill a gap in the archaeological studies of the region. During the fieldwork, it became apparent that there were methodological problems related to the excavation of loose sediments and the formation processes of the archaeological stratigraphy. This paper aims to discuss the principle problems encountered and the way they were resolved and to embark on a more general discussion regarding the documentation and interpretation of this type of deposit. This is not intended to be an exhaustive discussion, but an attempt to discuss some issues that have been neglected in the literature and hopefully to bring together the study of stratigraphy in archaeology and geology.

C87-03

Hernán Juan MUSCIO (Buenos Aires, Argentina)

Why the modal description of past environments IS unfortunate in archaeology? Niche, predominant strategies and optimizing selection during the early agropastoral evolution of the Andean puna of Salta, Argentina.

ABSTRACT: Evolution is descent with modification. Darwinian evolution is a theory about the population level effects of the inheritance of variation in particular selective environments. In order to build evolutionary explanations in archaeology we need to conceive environment as a selective context, assessing its variation at several scales potentially affecting human adaptedness. Hence, modal descriptions of past environments in evolutionary archaeology are neither satisfactory nor useful.

Niche and *predominant strategies* are theoretical notions that help us constructing evolutionary narratives based on selection and environmental variation. Hierarchically conceiving the functional organization of human niches, a predominant strategy is the economic strategy that subordinates other adaptive strategies structuring the niche, and affording the inclusion of a hominid population into local and more inclusive trophic chains. Niches and predominate strategies are contingent with the selective properties of local environments and culture history. Humans, as all organisms, regulate, destroy and build major components of their environments, producing new selective pressures and hereditary selective environments by a process known as niche construction. By controlling the production of variation and cultural transmission, a predominant strategy can also affect the evolvability of a population and the strengths of niche construction. Here, I show the potential of this Darwinian perspective to past environments, discussing the optimizing selection processes in the evolution of the earliest agropastoral populations of the arid highlands of the Andean Puna of Salta, Argentina.

C87-04Daniel E. OLIVERA (Buenos Aires, Argentina)
Pablo TCHILINGUIRIAN

Agriculture and soil management in meridional Puna, Antofagasta de la Sierra, Argentina.

ABSTRACT: This paper contributes to research on prehispanic agricultural system with irrigation in the Puna environment of Antofagasta de la Sierra, province of Catamarca, Argentina. We set up interdisciplinary work, in which studies of archeological agricultural sites included topographical, hydrological and soils analyses.

When in 1.650-1.700 years BP the conditions were less humid, there seems to be a new and radical change in archaeological settlement patterns at South Argentine Puna. The driest point in 1.000 years BP seems to coincide with the incorporation of new technological criteria for agriculture by the use of artificial watering in lands with more slope. It seems that, before moving to more apt environments or diminishing their number, the populations choose to incorporate better yielding thanks to new technology.

In archeological Belen and Inca sites at Antofagasta de la Sierra there are 5 km² of agriculture evidence. Soil and water management transformed the desert landscape of Plesitocene alluvial coarse sediment over artificial channels, anthropic terraces and system with irrigation

Analysis confirmed the technological rationality of the prehispanic system, as well as a favorable evaluation on feasibility form reactivation, keeping in mind the need for an adequate organization of the presently availed water resources.

This research produced important new record which contributed to increment the basic scientific knowledge about the environment and the archeology of arid zones, but also would help to the present agropastoralist regional economy of the people in the Puna.

C87-05

J. M. SAYAGO (Argentina)
M.M. SAMPIETRO VATTUONE (Argentina)
M.A. CARIA (Argentina)
M.M. COLLANTES (Argentina)

Dryness and social disruption in dry intermountaneous Valleys of North West Argentina, during the Medieval warm epoch.

ABSTRACT: During the Medieval Warm Epoch in Greenland, Iceland and portions of northern Europe temperatures began to rise around AD 800 until AD 1300 with a cool interlude between AD 1050 and 1150 (Lamb 1965, 1977). Authors as Stine 1998, Hodel et al. 1995, Abbot et al. 1997 and Binford et al. 1997 demonstrate the influence of highly dryness in social disruption of human occupations, in Yucatan Peninsula, South-tropical Andes and Patagonia, during the medieval times. This work describe the influences of extreme dry climatic conditions in the abandonment of long-occupied sites of agrarian cultures in the Tafi Valley -at the western side of the pre-Andean ridges- and it's possible migration to the more humid eastern regions during the Medieval Warm Epoch. The Tafi culture flourished from around 2500 AP up to 1500 AP when a progressive dryness would explain the abandonment of the occupations from the valley bottom with a migration toward the north and north-eastern that culminates around 800 AP. The palinological reconstruction (Garralla, 1999) points out the change from coverage similar to the present dry-wet sub-tropical forest to the typical xerophytic vegetation of "Espinal or Monte" around 1200 AD contemporary with the last Tafi occupations. In the Trancas valley at eastern side of pre-Andean ridges under wetter climatic conditions only pure remains of Candelaria (a typical culture of the dry-wet sub-tropical forest) are described before 900 AD. After that, Candelaria culture appears associated with Santa Maria handiworks (Berberian 1977, Caria 1999) which would suggest the migration of people from the arid western valleys (Valles Calchaquíes). Meggers (1994) suggested a relationship between Mega-Niños (ENSO) and dryness in several sites of Amazonia and Perú during the last two millennia. In addition, during the last century (Sayago et al. in press) demonstrated the relationship between El Niño face of ENSO and extreme dryness in northwest of Argentina. The weakness of the South Atlantic anticyclone (influencing the weakness of trade winds over the South Pacific), in parallel with a boreal migration of ITCZ, would explain the South Hemisphere dryness and cooling during the Medieval Epoch. Within a global perspective the contrast between temperature rise in northern Europe and Greenland and the dryness and cooling in the South would allow to speculate with a climatic scenario similar to the bipolar sea saw.

C87-06

Alejandro TERRAZAS MATA
Martha Elena BENAVENTE SANVICENTE

Environmental changes and bio-social evolution of the early Holocene human populations in the Desert of Sonora, Mexico.

ABSTRACT: The Desert of Sonora extends for the northwest of Mexico and the Southwest of the United States, the presence of human occupations has been documented from the Terminal Pleistocene, until the development of early farming societies at the time of the contact with the Spanish missionaries in the XVII century. The societies of hunter-gatherer of the Holocene have grouped, traditionally, based on their lithic industries, like part of the Archaic period of North America. The development of the societies of hunters-gatherers and marginal farmers of the region have been interpreted, for the North American orthodoxy, as the result of two main forces, on one hand the processes of climatic change, structured in periods of similar climate to the current one, and a very dry and warm period, denominated "Altithermal", determining the adaptations of the societies. On the other hand, the changes in the social complexity would associate to the introduction of new technologies, as the agriculture, coming from other areas like Mesoamérica and the Anazasi region. In recent times new information has been generated that reveals that the climatic changes along Holocene were much more complex that the simplistic models of the sixty's. It has been proposed that the changes on social organization of the Archaic period human groups are not associated directly with the climatic change periods or the introduction of foreign technologies.

On the other hand, it intends that, in great measure, these people have not "adapted" to the ecosystem, but rather they were "able" to promote a series of changes in the distribution of the local vegetation and fauna, along the establishment of systems of economic complementation that embraced the coast, Pleistocene dried lakes and interior flood plains. (...)

C87-07

Hugo D. YACOBACCIO

Global and local Holocene climate change: are they isomorphic?

ABSTRACT: The Holocene climate is characterized by frequent fluctuations on both global and local scales. Although not always these scales have isomorphic changes. In this paper I explore long-term global and local climate changes that could have affected the Puna de Atacama region (Argentina). My purpose is to examine the possible match between global and local scales, and the correlation of these changes with long-term cultural processes, such as camelid (*Lama* sp.) domestication and the origins of pastoralism and village life.

C87-08

D. JOLY (Rennes, France)
R. MARCH (Rennes, France)
D. MARGUERIE (Rennes, France)
H. YACOBACCIO (Buenos Aires, Argentina)

Gestion des combustibles dans un site de chasseurs-cueilleurs d'altitude. L'Exemple d'Hornillon 2 (Puna, Argentina).

RÉSUMÉ: Hornillos 2 est un site de chasseurs-cueilleurs, situé à 4200 m d'altitude, dans la puna sèche argentine. Daté entre 9710 BP et 6130 BP, il contient de nombreux foyers et couches charbonneuses très riches. Son autre particularité est d'être situé dans une zone aride où le bois, sous forme d'arbustes est encore le principal combustible. Le transport de bois un altitude joue un rôle encore importante aujourd'hui et conditionne d'un certain façon la fonctionnalité des sites dans le temps. C'est pourquoi nous avons mené une étude anthracologique du site, en parallèle à une enquête concernant l'utilisation et la gestion actuelles du bois comme combustible, auxquelles s'ajoute une démarche expérimentale. Nous avons ainsi pu comprendre la gestion du combustible et son évolution dans cet environnement particulier.

C87-09

Norma RATTO (Buenos Aires, Argentina)
Blas Valero GARCÉS (Zaragoza, Spain)

Cultural and climatic change in Catamarca's Southwest (Argentina).

ABSTRACT: Water availability has played a determinant role in the use of the space, the exploitation of the natural resources, and the political, economical and social structures of past societies in the Argentinean northwestern region. A number of archaeological sites in the Puna and the mesothermal valleys provide evidence of how the different cultures related to environmental changes since the Archaic (8000 yr B.P.) till the Inka period (500 yr B.P.). Paleohydrological reconstructions based on lacustrine record suggest significant fluctuations in water availability during that period. Lacustrine terraces in El Peinado indicate more humid conditions in the early Holocene and after 5000 yrs. Fluvial paleolakes in the Chaschuil River also developed at around 5 ka. A period of increased water balance in the San Francisco Basin ended at about 1600 yr BP and it would correlate with a humid phase between 3000 and 1800 yr B.P detected in other sites of the southern Altiplano. El Peinado Lake record indicates aridity prior to the 17th century, wetter conditions during the 17-19th centuries, and a change to modern conditions in the late 19th century. The increase in the frequency of extreme events may have played a role in the settlement and abandonment of archaeological sites in the Andean foothills

Session C88

Monday , 4 September 2006 / Jeudi, 4 Septembre 2006

And/ Et

Tuesday , 5 September 2006 / Mardi, 5 Septembre 2006

*Amphitheatre IV, Faculty of Letters, Lisbon University
Amphithéâtre IV, Faculté de Lettres, Université de Lisbonne*

Rhythms and causalities of anthropisation dynamic in Europe between 6500 and 500 BC Sociocultural and/or climatic assumptions

Rythmes et causalités des dynamiques de l'anthropisation en Europe entre 6500 et 500 BC Hypothèses socio-culturelles et/ou climatiques

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SESSION'S ABSTRACT

The period lasting between the early Neolithic and the emergence of the state and urban societies of the Iron Age was characterized by important social and environmental transformations. At the European scale, the dynamics of these changes affecting societies and their environment were synchronous.

In order to answer a number of questions concerning this period, it is necessary to better understand a broader problem: the interactive mechanisms existing between environmental systems and societies. These questions include the nature of the settlement, the development and environmental impact of the agro-pastoral practices, the evolution of the agrarian systems as that of the specialized exploitation of the natural resources. The socio-environmental interactions are of the greatest importance for the oldest periods, e.g. the beginning of the Neolithic, because they underlie the mechanisms leading to the construction of the territories. The objective of this conference is to present and analyze the evidence of the possible causal-links between sociocultural and environmental dynamics. If Western Europe constitutes the geographical surface of reference of this conference, the presentation of data obtained from other regions remains highly desired.

RÉSUMÉ DE LA SESSION

La période comprise entre le début du Néolithique et l'émergence des sociétés étatiques et urbaines de l'âge du Fer est le témoin de transformations sociales et environnementales majeures. Dans certaines régions d'Europe occidentale, des relations apparaissent entre les dynamiques de changement qui touchent les sociétés et celles qui affectent leur environnement. Les questions du peuplement, du développement et de l'impact environnemental des pratiques agro-pastorales, de l'évolution des systèmes agraires ainsi que celle de l'exploitation spécialisée des ressources naturelles sont autant de questions vives qui dépendent d'une problématique plus large : celle des

mécanismes interactifs existant entre systèmes environnementaux et sociétés. C'est en priorité pour les périodes les plus anciennes, du début du Néolithique à l'aube de notre ère, que se posent de telles questions, car elles sous-tendent la compréhension des mécanismes ayant conduit à la construction des territoires.

L'objectif de ce colloque est de présenter et d'analyser les évidences et manifestations des liens unissant dynamiques socio-culturelles et environnementales, en particulier climatiques.

Si l'Europe occidentale constitue l'aire géographique de référence de ce colloque, la présentation de résultats obtenus sur d'autres terrains reste néanmoins vivement souhaitée.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

4th September 2006 / 4^{ème} Septembre 2006

Chair: Klaus OEGGL (Innsbruck, Austria)

14:30 **Opening / Ouverture**

14:30-14:45 Didier GALOP (Besançon, France)
Laurent CAROZZA (Strasbourg, France)

14:45-15:05 Santiago RIERA (Barcelona, Spain)
Xavier ESTEVE (Barcelona, Spain)
Jordi NADAL (Barcelona, Spain)

C88-01 **Approche multidisciplinaire des systèmes d'exploitation et d'anthropisation du paysage méditerranéen pendant le Néolithique et l'Âge du bronze sur le littoral du nord-est de la péninsule ibérique.**

15:05-15:25 Jean-Michel CAROZZA (Toulouse, France)
Laurent CAROZZA (Dijon, France)
Thierry ODIOT CAROZZA (Montpellier, France)

C88-02 **Evolution du littoral méditerranéen et ses conséquences sur la répartition et la reconnaissance des sites Néolithique et Proto-historiques : exemple de la plaine du Roussillon.**

15:25-15:45 Guy JALUT (Toulouse, France)

C88-03 **Holocene climatic changes in the Mediterranean basin : regional comparisons, possible causes.**

15:45-16:05 Christine RENDU (Toulouse, France)
Pierre CAMPMAJO (Toulouse, France)
Denis CRABOL (Cerdagne, France)
Stéphanie BREHARD (Paris, France)

C88-04 **Dynamiques et formes d'exploitation d'un versant montagnard à l'Âge du Bronze : réflexions et nouvelles données à partir des fouilles du Pla de l'Orri (2100 m d'altitude - montagne d'Enveig - Pyrénées-Orientales - France).**

16:10-16:30 **Break / Pause**

Chair: Mauro CREMASCHI (Milano, Italy)

16:30-16:50 Ana EJARQUE (Tarragona, Spain)
Itxaso EUBA (Tarragona, Spain)
Yannick MIRAS (Barcelona, Spain)
Josep Maria PALET (Tarragona, Spain)
Santiago RIERA (Barcelona, Spain)

C88-05 **Systèmes d'exploitation et évolution des paysages culturels de haute montagne dans les Pyrénées orientales: la vallée de Madriu-Perafita (Andorre) et le secteur de La Vansa-Cadí (Alt Urgell, Catalogne).**

16:50-17:10 Claire DELHON (Nanterre, France)
Stéphanie THIEBAULT (Nanterre, France)

C88-06 **Gestion du milieu et de l'espace au Néolithique moyen dans le sud de la France : Mise en évidence de systèmes agro-sylvo-pastoraux en moyenne vallée du Rhône.**

17:10-17:30 Chantal LEROYER (Périgueux, France)
Giselle ALLENET (Périgueux, France)
Christine CHAUSSE (Meudon, France)
Jean-François PASTRE (Meudon, France)

C88-07 **Dynamique de l'anthropisation du paysage dans le Bassin parisien du début du Néolithique jusqu'à la période gauloise.**

17:30-17:50 Maria-José GAILLARD (Kalmar, Sweden)
G. LEMDAHL (Kalmar, Sweden)
A. GREISMAN (Kalmar, Sweden)
F. OLSSON (Kalmar, Sweden)

C88-08 **Human impact and climate in southern Sweden 6500-500 BC – the role of disturbances in forest and landscape dynamics.**

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

5th September 2006 / 5^{ème} Septembre 2006

Chair: Marie-José GAILLARD (Kalmar, Sweden)

09:00-09:20 Emilie GAUTHIER (Besançon, France)
Hervé RICHARD (Besançon, France)

C88-09 **Land-use phases and climatic changes during Bronze age and Iron age in north Alps and Jura: a climatic determinism?**

09:20-09:40 Klaus OEGGL (Innsbruck, Austria)

C88-10 **Sustainable vegetation changes in the central part of the Alps – anthropogenic or climatic triggered?**

09:40-10:00 Pierre-Jérôme REY (Gresy-sur-Aix, France)
Bernard MOULIN (Gigors et Lozeron, France)
Dominique SORDOILLET (Besançon, France)

C88-11

Approche de l'occupation humaine autour d'un grand col alpin de la Préhistoire à l'Antiquité ; données archéologiques et paléoenvironnementales sur les versants du Petit-Saint-Bernard (2188 m).

10:00-10:20 Mona COURT-PICON (Marseille, France)
Jean-Louis DE BEAULIEU (Marseille, France)
Philippe PONEL (Marseille, France)
Monika BADURA (Gdansk, Poland)
Josep Maria PALET (Tarragona, Spain)
Kevin WALSH (York, UK)
Florence MOCCI (Aix-en-Provence, France)
Philippe LEVEAU (Aix-en-Provence, France)

C88-12

Man/environment interactions in mountainous areas during the Holocene: an integrated research program for the reconstruction of patterns and chronologies of human occupations in the Champsaur valley (Southern French Alps).

10:20-10:40 **First poster session**

Amandine BORDON (Gif-sur-Yvette, France)
Odile PEYRON (Besançon, France)
A.-M. LEZINE (Gif-sur-Yvette, France)
M. DENÉFLE (Meudon, France)
EPD MEMBERS

Quantitative reconstruction of the Lateglacial to Holocene climate at lake Maliq, Albania, from pollen data.

José António LOPEZ-SAEZ (Madrid, Spain)
Pilar LÓPEZ-GARCIA (Madrid, Spain)
Lourdes LÓPEZ-MERINO (Madrid, Spain)

Synchronicous cultural and climatic changes in the Prehistory of Central Spain (Amblés Valley, Ávila, Spain) between 850 and 760 cal BC.

Florence MAZIER (Besançon, France)
Carole CUGNY (Toulouse, France)
Christine RENDU (Toulouse, France)
Didier GALOP (Besançon, France)

Modelling modern pollen assemblages, actual vegetation and pastoral activities relationships in order to validate pollen signature of the fossil records (Western Pyrenean mountains-France).

Anne LE FLAO (Toulouse, France)
Simon BREWER (Aix-en-Provence, France)
Guy JALUT (Toulouse, France)
Didier GALOP (Besançon, France)

The spread of *Fagus sylvatica* and Neolithic impact: a multi-scale spatial and multidisciplinary study.

10:40-11:00 **Break / Pause**

Chair : Antonio MARTINEZ CORTIZAS (Santiago de Compostela, Spain)

11:00-11:20 Neva CHIARENZA (Pisa, Italy)
Renata GRIFONI CREMONESI (Pisa, Italy)
Irene LAMBERTINI (Pisa, Italy)

C88-13 Settlements and routes : the effect of environment on settlement strategies and traffics in the Central-Northern of Italy during the Eneolithic.

11:20-11:40 Mauro CREMASCHI (Milano, Italy)
Maria BERNABÒ BREA (Parma, Italy)

C88-14 Over-exploitation of resources and a possible climatic co-factor in the collapse of the Terramare culture (Middle and Late Bronze age – Northern Italy).

11:40-12:00 Odile PEYRON (Besançon, France)
Emilie GAUTHIER (Besançon, France)
Michel MAGNY (Besançon, France)
Hervé RICHARD (Besançon, France)
Hervé ROUECHE (Besançon, France)
Amandine BORDON (Gif-sur-Yvette)

C88-15 Climatic changes during the Bronze Age in Eastern France from pollen and lake-levels data.

12:00-14:30 **Lunch / Déjeuner**

Chair: Guy JALUT (Toulouse, France)

14:30-14:50 Jean-François BERGER (Valbonne, France)
Jean GUILAINE (Toulouse, France)

C88-16 Néolithisation et environnement. Une perspective méditerranéenne.

14:50-15:10 Antonio MARTÍNEZ CORTIZAS (Santiago de Compostela, Spain)
M. COSTA CASAIS (Santiago de Compostela, Spain)

C88-17 Reconstructing environmental change in NW Iberia for the period 6500 to 500 BC.

15:10-15:40 **Second Poster session**

Marie-Claude BAL (Toulouse, France)
Laurent CAROZZA (Dijon, France)
Fabrice MAREMBERT
Christine RENDU (Toulouse, France)

Boris VANNIERE (Besançon, France)
Nicolas VALDEYRON (Toulouse, France)
Didier GALOP (Besançon, France)

Fire and human activities on the basque mountains (Western Pyrenees), inferred from pedoanthracological, palynological and archaeological data.

José António LOPEZ-SAEZ (Madrid, Spain)

Coprophilous fungi as a source of information of anthropic activities during the Prehistory in the Amblés Valley (Ávila, Spain): the archaeopalynological record.

José António LOPEZ-SAEZ (Madrid, Spain)
Pilar LÓPEZ-GARCIA (Madrid, Spain)
Lourdes LÓPEZ-MERINO (Madrid, Spain)

The neolithisation process in the Iberian Peninsula from a palaeopalynological point of view.

Mona COURT-PICON (Marseille, France)
Jean-Louis DE BEAULIEU (Marseille, France)
Alexandre BUTTLER (Besançon, France)

Relation pluie pollinique actuelle/vegetation/utilisation des terres dans la vallée du Champsaur (Alpes Françaises et leur potentiel dans l'interprétation des enregistrements polliniques fossiles.

15:30-16:00 **Break / Pause**

Chair : Santiago RIERA (Barcelona, Spain)

16:30-16:50 Maria José IRIARTE (Vitoria, Spain)

C88-18

Paysage végétal et anthropisation du milieu dans l'aire centrale du Nord de la Péninsule Ibérique (Pyrénées Occidentales, Cantabrique orientale et haute vallée de L'Ebre) : l'état de la question.

16:50-17:10 Angelo VINTALORO (Corleone, Italy)

C88-19

Anthropisation de la Sicile et relation avec la Méditerranée.

17:10-18:30 **Conclusion of the symposium.**

ABSTRACTS / RÉSUMÉS

C88-01

Santiago RIERA (Barcelona, Spain)
Xavier ESTEVE (Barcelona, Spain)
Jordi NADAL (Barcelona, Spain)

Approche multidisciplinaire des systèmes d'exploitation et d'anthropisation du paysage méditerranéen pendant le Néolithique et l'Âge du bronze sur le littoral du nord-est de la péninsule ibérique.

Résumé: La région du Penedès, localisée au Nord-Est de la Péninsule Ibérique, est un exemple illustrant les changements du peuplement et de l'économie préhistorique et historique qui ont conduit à l'anthropisation des milieux méditerranéens.

Les systèmes économiques préhistoriques complémentaires entre la plaine et la montagne littorale ont été mis au jour à partir de la confrontation des données de peuplement, archéozoologiques, anthracologiques, palynologiques et carpologiques. Sur la base d'un ensemble de 40 datations radiocarbones, a été reconstruite la succession des transformations paléoenvironnementales issues des systèmes d'exploitation des territoires.

Cette anthropisation débute à la fin du Mésolithique; les incendies et la présence des animaux sur la plaine littorale suggèrent une intervention humaine dans un but cynégétique. Le Néolithique Cardial se caractérise par une activité de production mixte itinérante impliquant une mobilité des troupeaux d'ovicaprinés entre l'intérieur et le littoral. Les activités productives fixes s'établissent dans les plaines à partir de la fin du Néolithique Ancien et durant le Néolithique Moyen, avec une rotation des zones exploitées et la dominance des bovins sur les ovicapridés. Pendant le Néolithique Final/Chalcolithique la déforestation devient plus extensive et l'expansion agricole en plaine continue tandis que des forêts pâturées occupent les versants. L'anthropisation du milieu s'intensifie durant le Bronze Initial parallèlement à un essor de l'élevage. Dans le même temps, les activités humaines se spécialisent et le paysage devient plus diversifié. Pendant le Bronze Final/1er Âge du Fer, l'expansion agricole, plutôt tournée vers l'élevage, contribue à homogénéiser le paysage. À cette époque, des déplacements de troupeaux entre les pâturages de l'intérieur et ceux du littoral sont démontrés.

C88-02

Jean-Michel CAROZZA (Toulouse, France)
Laurent CAROZZA (Dijon, France)
Thierry ODIOT (Montpellier, France)

Evolution du littoral méditerranéen et ses conséquences sur la répartition et la reconnaissance des sites Néolithique et Proto-historiques : exemple de la plaine du Roussillon.

Résumé: L'évolution de la position du trait de côte au cours de l'Holocène est un aspect majeur de la transformation des paysages littoraux méditerranéens. Cette évolution est commandée par trois facteurs principaux : 1) la variation du niveau marin eustatique 2) la variation des flux sédimentaires résultant de forçages climatiques et anthropiques 3) l'héritage morphologique pléni et tardi-glaciaire. Le premier paramètre est relativement bien contraint à l'échelle du bassin méditerranéen occidental, même si l'existence d'un niveau marin positif reste discutée. La question des flux sédimentaires a fait l'objet de travaux importants depuis le milieu des années 80, bien que les facteurs de contrôle – climatique ou anthropiques – reste débattue. Par contre, le rôle de l'héritage morphologique pléni- et tardi-glaciaire n'a été abordé que récemment. Il joue pourtant un rôle majeur dans la paléomorphologie du littoral pré- et proto-historique et des dynamiques sédimentaires, mais surtout sur la répartition des sites néolithiques et proto-historiques.

A partir des informations archéologiques et des reconstitutions paléo-géographiques, nous discutons la représentativité des sites néolithiques et les limitations induites par ces reconstitutions en terme d'analyse spatiale.

C88-03

Guy JALUT (Toulouse, France)

Holocene climatic changes in the Mediterranean basin : regional comparisons, possible causes.

Abstract: Various proxies concerning the Mediterranean basin show that the Holocene can be divided in two periods. During the first, the early Holocene, the vegetation cover dominated by deciduous trees suggests climatic conditions wetter than the present. During the second, evergreen trees, more characteristic of drier climate conditions became dominant. This vegetation change was frequently interpreted as the consequence of a strong human impact. However, some changes occurred before the beginning of this impact. Synchronism with palaeohydrological records, sea

surface temperatures, speleothems or sapropel phases rather suggests a climatically induced evolution. In the Mediterranean basin, aridification processes started since the early Holocene. In the mid-low latitude desert belt as well as in the east of the Mediterranean basin, an aridification trend began around 7 ka.. In the western and eastern parts of the basin, significant changes occurred around 4 ka and 3 ka cal BP. In the NW Mediterranean basin they corresponded to the final stages towards the Mediterranean climate. The more or less regular millennial-scale occurrence of these Holocene climatic events suggests that they were driven by interrelated forcings such as the North Atlantic's thermohaline circulation, the North Atlantic Oscillation and the displacements of the Atlantic westerlies jets. Submitted to these changes, human populations had to adapt, increasing the effects of the climatic changes on the vegetation.

Keywords: Mediterranean basin, Holocene, climatic changes, Mediterranean climate, Climate forcing, Human impact.

C88-04

Christine RENDU (Toulouse, France)
Pierre CAMPMAJO (Toulouse, France)
Denis CRABOL (Cerdagne, France)
Stéphanie BREHARD (Paris, France)

Dynamiques et formes d'exploitation d'un versant montagnard à l'Âge du Bronze : réflexions et nouvelles données à partir des fouilles du Pla de l'Orri (2100 m d'altitude - montagne d'Enveig – Pyrénées-Orientales – France).

Résumé: Entre 2002 et 2005, les fouilles consacrées à l'exploitation pastorale de la montagne d'Enveig dans la longue durée ont repris, avec l'objectif d'explorer de façon fine les occupations d'un plat pastoral intermédiaire, le Pla de L'Orri, située à 2100 m d'altitude. La présence d'une tourbière au centre de ce plat n'est pas étrangère à ce choix puisqu'il s'agissait en particulier de mieux cerner le sens des distorsions et des convergences entre les images archéologique et palynologique de l'activité pastorale, sur la séquence de temps la plus longue possible.

Les quatre campagnes de fouille ont permis d'éclairer les histoires de six sites répartis dans un rayon de 100 à 200 m autour de la tourbière. Si des phases chronologiques encore peu documentées apparaissent — l'importance du haut Moyen Âge et de l'Antiquité tardive est ainsi appelée à être réévaluée —, c'est surtout sur l'Âge du Bronze que les résultats attirent l'attention.

Sur un replat situé à 200 m de distance de la tourbière, les fouilles ont en effet mis au jour une série d'aménagements peu ordinaires pour des occupations d'altitude, au regard de ce que l'on connaît toutes périodes confondues. La structure principale, la « cabane » 88, est datée, dans son occupation la plus lisible, des XIV^e - XIII^e siècle avant notre ère. Ses dimensions (plus de 30 m² intérieurs) et son architecture (dalles de chant en parement interne, trou de poteau) ne l'apparentent pas à une cabane mais à une maison. Le caractère fortement aménagé du replat sur lequel elle se situe (mur de ceinture en amont et de terrasse en aval) appuie cette impression.

Comment comprendre cette installation, pastorale et peut-être agro-pastorale, à cette altitude ? Dans quel contexte se développe-t-elle et de quels systèmes est-elle susceptible de relever ? On examinera les différents scénarii possibles de relations à un environnement et à un climat supposés défavorables, et les formes de structuration et d'exploitation des ressources à l'échelle du versant, à partir d'une discussion interdisciplinaire et diachronique étendue à l'ensemble de la séquence (occupations du Néolithique final et du Bronze ancien incluses), en puisant aussi à la comparaison avec d'autres époques pour cerner et ouvrir le champ des possibles.

C88-05

Ana EJARQUE (Tarragona, Spain)
Itxaso EUBA (Tarragona, Spain)
Yannick MIRAS (Barcelona, Spain)
Josep Maria PALET (Tarragona, Spain)
Santiago RIERA (Barcelona, Spain)

Systèmes d'exploitation et évolution des paysages culturels de haute montagne dans les Pyrénées orientales: la vallée de Madriu-Perafita (Andorre) et le secteur de La Vansa-Cadí (Alt Urgell, Catalogne).

Résumé: La communication présente la démarche entreprise et les résultats préliminaires des recherches microrégionales sur deux cas d'étude localisés dans deux vallées pyrénéennes du haut bassin du Segre: la vallée du Madriu-Perafita (Andorre), dans les Pyrénées axiales, et le secteur de La Vansa-Cadí (Alt Urgell), situé sur sa bordure calcaire.

Le programme scientifique a débuté en 2004 sous la coordination de l'Institut Català d'Arqueologia Clàssica (ICAC). L'étude de la vallée Madriu-Perafita s'inscrit dans la déclaration de cette vallée comme Patrimoine de l'Humanité (UNESCO). Les recherches se fondent sur une approche d'archéologie du paysage, et elles proposent d'analyser, sur la longue durée, la dynamique des paysages montagnards considérés comme espaces culturels, présentant une dimension environnementale et humaine. C'est pourquoi ces recherches sont diachroniques et pluridisciplinaires avec pour objectif majeur d'étudier l'anthropisation des milieux de haute montagne et les rapports homme - milieu.

Les activités humaines qui ont modelé ces espaces sont, entre autres, le pastoralisme, la métallurgie, le charbonnage et l'aménagement de la forêt. La richesse et la potentialité patrimoniale de cette zone d'étude sont démontrées par les résultats des prospections archéologiques et par l'analyse paléocologique des tourbières et lacs s'étageant sur un transept altitudinal entre 2000 et 2600 m d'altitude.

Depuis 2004, dans la vallée de Madriu, près de 150 structures et 28 gisements ont été inventoriés dans le haut bassin de la vallée. Les résultats sont similaires dans le secteur de La Vansa et Serra del Cadí. La diversité des activités anthropiques est suggérée par la variété typologique des structures étudiées: cabanes de bergers et de charbonniers, enclos pastoraux, terrasses de charbonnières, fours métallurgiques, chemins creux, etc.). Les opérations de sondages couplées aux dates radiocarbone obtenues suggèrent, d'une part, un accroissement des activités au Moyen Âge et à la période moderne, et d'autre part, un démarrage précoce (âge des Métaux et Antiquité) d'une anthropisation de la haute montagne associée au pastoralisme et à la métallurgie.

En ce qui concerne la recherche paléocologique, l'analyse *multi-proxy* (pollen, microcharbons, spores fongiques, phytoplancton, indicateurs biochimiques et sédimentologiques) se fonde, dans la vallée du Madriu, sur l'étude de sédiments lacustres (étangs Blau -2470 m- et étang Forcat -2540 m) et tourbeux (Bosc dels Estanyons, 2180 m et Orris de Setut, 2300 m) enregistrant l'histoire paléoenvironnementale sur près de 12000 ans. Dans la vallée de La Vansa et Serra del Cadí, sur substrat calcaire, différentes analyses paléobotaniques sont en cours sur la tourbière de Pradell (1970 m). La mise en évidence d'une activité métallurgique et l'existence de charbonnières ont justifié le recours à des analyses anthracologiques.

L'étude anthracologique préliminaire des charbonnières et des niveaux archéologiques des structures pastorales de la vallée de Madriu montre l'existence d'une pinède xérophile de haute montagne au moyen âge et à l'époque moderne dominée par le pin sylvestre et le pin à crochet ainsi que la présence d'arbustes (genévrier, buis, etc.). À différence du Madriu, dans la chaîne du Cadí, des charbons de sapin ont été identifiés dans les charbonnières. En ce qui concerne l'utilisation du bois, la forêt aurait été exploitée de manière intensive et sélective pour la fabrication de charbons à destination d'une activité métallurgique et pour l'alimentation des troupeaux.

C88-06

Claire DELHON (Nanterre, France)
Stéphanie THIEBAULT (Nanterre, France)

Gestion du milieu et de l'espace au Néolithique moyen dans le sud de la France: Mise en évidence de systèmes agro-sylvo-pastoraux en moyenne vallée du Rhône.

Résumé: A l'occasion des travaux d'archéologie préventive préalables à la construction du TGV-Méditerranée en moyenne vallée du Rhône, des stratégies innovantes d'étude des paléoenvironnements ont été mises en place. Elles reposent sur le prélèvement et l'analyse de restes

botaniques parfois ténus (phytolithes, charbons) non seulement sur les sites archéologiques proprement dits, mais aussi dans de nombreuses séquences «hors-site». En donnant accès à de nouveaux contextes de dépôt, dans les zones de plaine alluviale jusqu'ici peu documentées, le recours aux analyses phytolithiques et pédo-anthracologiques s'est révélé un moyen efficace non seulement de tirer partie de séquences sédimentaires à première vue pauvres en restes botaniques, mais aussi d'accéder à des données «hors-site», pour lesquelles l'existence d'un biais culturel (choix d'espèces lors du ramassage) ne peut être avancé.

La confrontation des données obtenues en plaine et en hors-site avec celles, préexistantes, issues des analyses anthracologiques des grottes et abris karstiques de l'arrière pays met en lumière une organisation agro-sylvo-pastorale complexe du paysage au Néolithique moyen, supposant une spécialisation des unités de paysage et une pression anthropique forte et continue sur le couvert végétal. Toutefois, ces contraintes ne suffisent pas à expliquer le maintien d'un tel système pendant tout le Néolithique moyen. Le facteur climatique a sans doute été déterminant pour que perdurent des formations à la limite des équilibres écologiques.

Mots-clés: Néolithique moyen, Moyenne vallée du Rhône, système agro-sylvo-pastoral, pédo-anthracologie, analyse phytolithique, anthracologie.

C88-07

Chantal LEROYER (Périgueux, France)
Giselle ALLENET (Périgueux, France)
Christine CHAUSSE (Meudon, France)
Jean-François PASTRE (Meudon, France)

Dynamique de l'anthropisation du paysage dans le Bassin parisien du début du Néolithique jusqu'à la période gauloise.

Résumé: Dans les fonds de vallées du Bassin parisien, une synthèse palynologique a été effectuée sur l'évolution de l'anthropisation du milieu. Elle repose sur un très large corpus de séquences organiques, sélectionnées selon un protocole visant une hiérarchisation des informations, indispensable pour une bonne représentativité des enregistrements. A ce titre, les profils proviennent de plusieurs bassins alluviaux, sont plus ou moins dilatés et présentent un lien variable avec des occupations humaines. Cette démarche permet de retracer l'évolution globale de l'anthropisation en parallèle aux grandes étapes de l'histoire de la végétation régionale mais aussi de percevoir les variations de l'impact des sociétés humaines en fonction de l'occupation du sol. Ces données peuvent ensuite être confrontées aux principales modifications morpho-sédimentaires, reconnues dans les différentes vallées.

Il apparaît clairement que la nature et l'incidence de l'exploitation du milieu ne se manifestent pas de façon régulièrement ascendante depuis le VII^{ème} jusqu'au I^{er} millénaire. La perception de l'impact des hommes du Néolithique ancien et moyen apparaît largement tributaire de la proximité des occupations et de l'importance du peuplement local. Ainsi s'opposent deux secteurs : le bassin aval de la Marne et la Bassée qui connaissent respectivement une anthropisation manifeste durant le Néolithique ancien et le Néolithique moyen. Une intensification des activités agro-pastorales se marque durant les phases récentes et finales du Néolithique. En effet, malgré une liaison moins forte avec les occupations, la majorité des séquences relate alors une hausse de l'impact anthropique. A cette période sont décelés les premiers éléments révélateurs d'une dégradation significative des environnements et d'une augmentation de l'activité fluviale. Un léger déclin des activités humaines est ensuite perçu durant les phases ancienne et moyenne de l'Âge du Bronze. Il s'accorde avec la raréfaction des implantations archéologiques de ces périodes alors qu'une importante instabilité des écoulements est enregistrée dans les vallées. L'expansion régionale des occupations du Bronze final se marque par contre dans toutes les séquences polliniques par une hausse des marqueurs agro-pastoraux et une ouverture accrue du milieu forestier mais elle ne semble pas engendrer une nette augmentation de l'activité hydrodynamique. Durant l'Âge du Fer, la tendance est à une accentuation de l'impact anthropique, particulièrement marquée au cours de la période gauloise. Toutefois, cette évolution n'est pas aussi "linéaire" que ne le laissent penser les longues séquences de référence. Les analyses polliniques de profils très dilatés montrent qu'une même station peut connaître une pression humaine plus ou moins forte en fonction des occupations et que des zones forestières subsistent à cette époque. Durant ces périodes, on constate un certain ralentissement de l'activité fluviale mais une poursuite soutenue des apports limoneux.

Si les modalités de l'exploitation du milieu sont bien cernées au travers des données polliniques, leur confrontation aux événements morpho-sédimentaires ne permet pas de dégager de conclusions fermes sur les causalités climatiques et/ou anthropiques de la déstabilisation du milieu.

Mots-clés: palynologie, anthropisation, vallées, Bassin parisien, Néolithique, Âge du Fer.

C88-08

Maria-José GAILLARD (Kalmar, Sweden)
G. LEMDAHL (Kalmar, Sweden)
A. GREISMAN (Kalmar, Sweden)
F. OLSSON (Kalmar, Sweden)

Human impact and climate in southern Sweden 6500-500 BC – the role of disturbances in forest and landscape dynamics.

Abstract: Six sites along a E-W transect through the boreo-nemoral zone of southern Sweden is studied for pollen, plant macroremains, charcoal and insect in order to unravel the Holocene history of forest and cultural landscape dynamics during the last 11 500 yrs BP (Holocene). The relationships between climate, human impact, fire, forest dynamics and structure, and biodiversity (vascular plants and insects) are examined in order to understand the role of disturbances on biodiversity on various time scales.

The results obtained so far show that fires were very frequent during the period 6500-500 BC at all six sites. As a matter of fact, fire episodes are recorded from 8500 BC and until AD 1800. This shows that fire was a common disturbance in the forests of southern Sweden from the start of the Holocene and until recently. In most parts of the studied area, the forests were dominated by broad-leaved trees from 6000 BC to AD 1000, which demonstrates that deciduous trees may burn as frequently as conifers, which was not the common view in the south-Swedish context. Besides climate, weather and human impact, the amount of dead wood in these past forests was probably the major factor controlling the time and frequency of the fires. The fire episodes recorded in the area are assumed to have been mainly natural until ca 4 000 BC, whereas they are clearly connected to human impact from 500 BC. From that time onwards, landscape openness increased drastically as grazing land expanded very significantly in the region as a whole. It was also at that time that *Calluna* heaths became a common feature in the landscape. From ca. 3600BC (Neolithic time) until 500 BC, fire was probably both natural and human induced.

The data at hand so far suggest that there is some correspondence between periods of dry climate (as inferred from lake-level records) and times of frequent and important fires during Early and Middle Holocene, while such relationship cannot be demonstrated for Late Holocene. It is clear from the data that forest dynamics was highly influenced by fire, the history of hazel, linden, oak, pine and beech being clearly related to such fire events. However, the fire episodes registered until now are not always synchronous between sites, which would suggest a high variability in space and time and, therefore, high ecosystem dynamics in the area. The hypothesis that we intend to test is that environmental dynamics (i.e. disturbances due to climate, human impact and fire) in time and space is a prerequisite for the formation and long-term survival of biotope richness, and thus of biodiversity as a whole. The careful analysis of the relationship between climate, and cultural landscape history will also allow us to draw conclusions on the possible causal links between climate change and human societies.

Keywords: Holocene, human impact, climate, fire, forest dynamics, biodiversity.

C88-09

Emilie GAUTHIER (Besançon, France)
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Land-use phases and climatic changes during Bronze age and Iron age in north Alps and Jura: a climatic determinism?

Abstract: In the North-East of France, the second half of Subboreal period corresponds to the whole Bronze age whereas the first third of Subatlantique period corresponds to the Iron age. High resolution pollen analysis should give more informations about land-use phases. A comparison of

these phases with climatic fluctuations would show an eventual climatic dependence of agricultural activities during these two millennia.

Pollen diagrams in north of the Alps and the Jura Range show sometimes three parts in Bronze Age. A first part, which would cover the early Bronze age (about 1700-1400/1350 cal. BC), corresponds to an increase in agricultural activities. An intermediate phase, which would correspond to the middle Bronze age (1400/1350-800/750 cal. BC), is affected by a decrease of anthropogenic indicators expressing an agricultural decrease. The last part, including the late Bronze age (1400/1350-800/750 cal. BC), is characterised by important agricultural practices and local clearings. In fact, the late Bronze age can be split into two parts. According to certain sites, the first one is characterised by a important decline of agricultural activities or a weak human influence. The second is very sharply defined by a strong human impact only stopped during a short episode of decline towards the 9-10th centuries BC.

The Hallstatt period (800/750-450 cal. BC) is generally divided in two parts. The first is characterized by a sharp decrease of human impact following the expansion of late Bronze age. Second half of Hallstatt period and La Tène period (450-50 BC) are more complex but it rather corresponds to a global increase of human impact. The Gallo-Roman agricultural development takes place in partially populated and cultivated area. This period is characterised by a local clearance without important deforestation, and a regular increase of anthropogenic indicators.

These successive phases of high and weaker human impacts on vegetable cover appear to follow the climatic fluctuations of this period. Indeed, the paleoclimatic approaches suggest three climatic oscillations during the Bronze age. The beginning of the first Iron age is characterized by an important climatic deterioration. If the climatic origin of the succession of increases and decreases in agricultural activities seems thus demonstrated, socio-economic origins could also explain these phenomena.

Keywords: pollen analysis, agriculture activities, climatic fluctuations, north Alps and Jura, Bronze age, Iron age.

C88-10

Klaus OEGGL (Innsbruck, Austria)

Sustainable vegetation changes in the central part of the Alps – anthropogenic or climatic triggered?

Abstract: Recent palynological investigations in a valley system of the Eastern Alps, the Montafon valley in the province Vorarlberg, reveal a sustainable change in the montane forests since the Bronze Age. Before human interference the montane forests are dominated by spruce (*Picea abies*) and fir (*Abies alba*). Since the beginning of human colonisation a gradual decline of fir (*Abies alba*) is recognized in this area, in which this tree is displaced from high montane (ca. 1800 m) to low montane regions (ca. 1000 m) during the period from the Bronze Age till the Mediaeval Times. This stepwise decrement is connected with intensive periods of human expansion, which seem synchronous with climate oscillations in the Eastern Alps. The coactive factors of this sustainable vegetation change, human interference or climate, is discussed by a compilation of pollen data from the geographical extension of fir (*Abies alba*) in the central parts of the Alps.

Keywords: *Abies*, Eastern Alps, Bronze Age, Iron Age, Mediaeval Times, climate oscillations.

C88-11

Pierre-Jérôme REY (Gresy-sur-Aix, France)
Bernard MOULIN (Gigors et Lozeron, France)
Dominique SORDOILLET (Besançon, France)

Approche de l'occupation humaine autour d'un grand col alpin de la Préhistoire à l'Antiquité ; données archéologiques et paléoenvironnementales sur les versants du Petit-Saint-Bernard (2188 m).

Résumé: Dans le cadre d'un projet européen Interreg, une campagne de sondages archéologiques systématiques a été réalisée sur les versants français et italiens du col du Petit-Saint-Bernard, afin d'étudier les premières occupations de la montagne alpine dans une région encore très mal documentée.

La méthode employée, caractérisée par la réalisation d'un grand nombre de petits sondages manuels, permet à la fois un premier diagnostic archéologique et une approche de la dynamique pédo-sédimentaire (Bernard Moulin et Dominique Sordoillet). 320 sondages implantés sur des zones de piégeage sédimentaire réparties entre 800 et 2400 m d'altitude, de Bourg-Saint-Maurice (Savoie) à Pré-Saint-Didier (Vallée d'Aoste), ont permis de découvrir une quinzaine de nouveaux sites et de recueillir une quarantaine d'indices datables de la Préhistoire à l'Antiquité. Les résultats préliminaires de l'étude pédo-sédimentaire ont permis d'individualiser trois séquences types qui témoignent d'alternances de phases de stabilité et d'instabilité de la couverture des versants. La répartition chronologique des témoins de présence humaine montre des regroupements autour de trois périodes de durées très inégales : le Néolithique au sens large, le Hallstatt ancien et l'Antiquité au sens large avec semble-t-il une forte représentation du Haut-Empire. La répartition en altitude des indices datés montre un développement parallèle de l'occupation des zones d'alpage. 26 dates C14 en cours de comptage vont venir conforter et affiner ces premiers résultats.

Cohérent dans ses grandes lignes avec les résultats acquis dans les régions voisines, ce schéma ne peut être considéré sans précautions comme une image de la dynamique de l'occupation humaine autour du Petit-Saint-Bernard. On observe par exemple une lacune tout à fait surprenantes au second Âge du Fer. La critique de la représentativité des résultats archéologiques s'appuiera sur l'appréciation de la dynamique sédimentaire, sur l'analyse des biais de l'échantillonnage et permettra une première approche des variations de l'occupation humaine.

Sans détailler les données archéologiques déjà présentées par ailleurs, l'objectif de la communication sera de mettre en perspective la dynamique anthropique et les données paléo-environnementales.

Variations d'intensité de l'anthropisation et variations climatiques ne paraissent pas systématiquement synchrones dans cette zone de relief élevé et contrasté. Les déconnexions observées feront l'objet de propositions d'explications. A partir de la Protohistoire, l'importance économique et sociale du contrôle du col pourrait par moment l'emporter nettement sur les facteurs climatiques.

Mots-clés: Alpes, occupation humaine, dynamique de l'anthropisation, circulations, Néolithique, Protohistoire, Antiquité.

C88-12

Mona COURT-PICON (Marseille, France)
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 Philippe PONEL (Marseille, France)
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Man/environment interactions in mountainous areas during the Holocene: an integrated research program for the reconstruction of patterns and chronologies of human occupations in the Champsaur valley (Southern French Alps).

Abstract: It is now widely accepted that human impact has been the most important factor effecting vegetation change, at least in Europe, during the last 6000 years. With the onset of agriculture and stock breeding, at the so-called Neolithic revolution, the human role changed from a passive component to an active element which directly affects nature. This change had dramatic consequences for the natural environment and landscape development. Arable and pastoral farming, the actual settlements themselves and the consequent changes in the economy significantly altered the natural vegetation and created the cultural landscape with its many different and varying aspects. In the XIXth century, a discussion on the causes of erosion and increase in natural disasters in the southern French Alps led to an aggressive policy of reforestation, while intensive grazing and agricultural activities were considered the main factor of the forest cover deterioration.

In order to better understand anthropogenic/natural processes interactions in these mountainous ecosystems and with the aim of elucidating human action on the vegetation history, an integrated research program based on a multi-proxy approach has recently been undertaken in the Champsaur valley. The investigations initiated in this interdisciplinary project involving palaeoecology, history and

archaeology begin to fill the gap in our knowledge of the development of the cultural landscape in the French Alps, and propose to highlight the complexity of the causalities which determine the vegetation cover of the alpine valley. The project aims at studying a small area at high spatial and temporal resolution to investigate the human occupation dynamics and agropastoral rhythms. The goal is to define accurately the variations of the type of land-use since the first Neolithic forest clearances.

Palaeoecological approach is developed in an attempt of reconstructing palaeoenvironmental evolution throughout the last ten thousand years, especially by distinguishing human impact from natural trends since prehistoric times. Although previous pollen analyses have been carried out in these regions and have outlined the general vegetation features, none of them was employed in combination with archaeological data to trace the history of habitation and settlement and to elucidate the different forms of agricultural economies in both the prehistoric and historical periods. Cores were collected from several lakes and peat bogs situated in different vegetation structures and at various altitudes in order to provide good examples of different landscape exploitations by mountain populations.

Palaeoenvironmental records are then synthesized and compared with the results of archaeological and historical researches carried out in the area of study, which allow us to better understand the man/environment interactions in different site types and for different periods in the past, from the origin of the alpine massif populating up to the present. Reconstructed rhythms of landscape evolution and exploitation systems are finally related to the Holocene climate variable.

C88-13

Neva CHIARENZA (Pisa, Italy)
Renata GRIFONI CREMONESI (Pisa, Italy)
Irene LAMBERTINI (Pisa, Italy)

Settlements and routes : the effect of environment on settlement strategies and traffics in the Central-Northern of Italy during the Eneolithic.

Abstract: This study presents a global vision of the Northern-Central Italy's peopling in Eneolithic and Campaniform, based on the analysis of settlement and funeral modalities testified in this area during this period. For this purpose we have proceeded to make a census of the sites which have been found up to now, including traces of frequenting and religious usages: in this way we have been able to outline a map which has let us formulate hypotheses about the priorities that could explain the preferences for some altimetrical strips and geomorphologic conditions.

We could observe that most of the sites situated in the North of Italy (54%) are in plain or on the lowest relieves up to 200 m above sea-level; frequenting reduces constantly when the altitude increases, but some proofs of human presence are even certificated on very high height up to over 1400 m above sea-level (Similaun Man was found at 3278 m).

There is a completely different situation in the Center of Italy: some sites are concentrated between 0 and 50 m above sea-level, in pericoastal zones (17%) and between 200 and 400 m (34%), with an appreciable decline in intermediate areas. The altitudes up to 700 m are less represented but not less important, on the contrary the peopling in higher altitudes is just isolated and it isn't higher than 1000 m.

The route system that connected different sites was strictly linked to the settlement choices. The analysis of material evidences and their distribution, added to the observation of the territory's geomorphology has permitted an hypothetical reconstruction of trade routes, across which people living in Eneolithic had to move to:

- 1) find food (hunting routes) and practice stock-rearing (transhumance routes): mostly short routes on the ridges;
- 2) supply with raw material and to make exchanges: mostly long and reticulate routes; the passes utilization is very important in the Nord and in the contacts between Tyrrhenian and Adriatic coasts, specially in the Tosco-Emiliano Appennine. In this panorama, the rivers are not only sustenance sources, but effectual trade routes.

The arrangement of the data we have obtained brings out that settlement choices made in the North are different from the ones which are made in the Center of Italy because they depend on the different

geomorphologic characteristics. Secondly we could underline the importance of contacts which has been possible thanks to a deep knowledge of the territory.

C88-14

Mauro CREMASCHI (Milano, Italy)
Maria BERNABÒ BREA (Parma, Italy)

Over-exploitation of resources and a possible climatic co-factor in the collapse of the Terramare culture (Middle and Late Bronze age – Northern Italy).

Abstract: The Terramare, archaeological sites generated by a civilisation which settled the centre of the Po plain during the Middle and Recent Bronze ages, were abruptly abandoned at the end of this period. The reason for this collapse is still a matter of debate. Beyond possible historical factors, the particular kind of land use performed by the Terramare culture may have played an important role. The primary economy was based on intensive agriculture and pastoralism; need of open spaces and high demand of wood for building were the causes of the heavy deforestation characteristic of the late Bronze age landscape in the Po plain. The relevant increase in settlement density, consequent to demographic pressure, at the end of the Recent Bronze age may have produced an unsustainable land use, a depletion of resources and therefore a scenario of crisis.

However recent research points to the occurrence in this same period of a drought episode. Chronological contiguity, supported by the archaeological context between this occurrence and the abandonment of the Terramare system, strongly suggests a causative link between the two events.

The climatic event, a minor episode in the history of the Holocene climate, nevertheless acted as a catalyst in a stressed environment whose resources were over-exploited by rising and uncontrolled demographic pressure.

C88-15

Odile PEYRON (Besançon, France)
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Michel MAGNY (Besançon, France)
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Hervé ROUECHE (Besançon, France)
Amandine BORDON (Gif-sur-Yvette)

Climatic changes during the Bronze Age in Eastern France from pollen and lake-levels data.

Abstract: In the Jura Mountains, peaks of frequency of the Neolithic and Bronze Age lake-shore villages correspond to warm climatic conditions. However, the links between societies and environment are complex, because the development of Neolithic and Bronze Age lake-shore villages depended not only on climate, but also on cultural factors. Therefore, the reconstruction of past climate could help to better understand the socio-environmental interactions and the possible impact of climate oscillations on cultural changes.

The purpose of this study is to obtain robust and precise quantitative estimates of the Bronze-Age climate from two high-resolution pollen and lake-level records taken from Tresserve, Lake Le Bourget, eastern France. From the 2 cores, the modern analogues technique has been used to reconstruct the annual temperature, the mean temperature of the warmest/coldest month, total annual precipitation, and the ratio of real to potential evapotranspiration. To reduce uncertainties in the reconstruction, an additional constraint based on lake-levels records have been used.

Results show that phases of high lake-levels during the Middle Bronze-Age and the beginning of the Iron Age are synchronous to a temperature decrease (1°C for the temperature of the coldest month), associated to an increase of the hydrological parameters (100 mm for annual precipitation, 50 mm for summer precipitation). Furthermore, the two cores taken from Tresserve provide similar climate signals.

This study shows unambiguously that we're able to provide reliable quantitative climatic reconstruction for the Bronze-Age from pollen, given the possible human perturbation on vegetation.

Keywords: palaeoclimatic reconstruction, Bronze Age, pollen, lake-levels, Jura.

C88-16 Jean-François BERGER (Valbonne, France)
Jean GUILAINE (Toulouse, France)

Néolithisation et environnement. Une perspective méditerranéenne.

Résumé: Les reconstitutions paléoenvironnementales récentes nous amènent à reconsidérer les schémas classiques sur la néolithisation de l'Europe méditerranéenne. L'optimum climatique de l'Atlantique se caractérise par une forte variabilité climatique enregistrée dans les variations des niveaux lacustres et dans les métamorphoses des lits fluviaux, qui modifient considérablement les conditions d'exploitation agraires. Les sols lessivés évolués qui dominent au début de la période atlantique ne présentent pas une bonne fertilité chimique et physique, ce qui limite les rendements par rapport aux modèles proposés. La chênaie mixte apparaît moins uniforme et fermée que celle présentée traditionnellement dans les diagrammes paléobotaniques. Elle est parcourue par des feux périodiques et de forte intensité qui mettent à mal les écosystèmes forestiers, tout en favorisant le redéploiement des surfaces cultivées ou pâturées. Le rôle réel de l'essartage et de son impact sur la « forêt primaire » est ainsi posé, tout comme celui d'une gestion plus opportuniste du milieu par les premiers agriculteurs.

Les facteurs climatiques et environnementaux ont-ils été des facteurs de la néolithisation, ou au contraire ont-ils contrecarré la diffusion de l'économie agricole; expliqueraient-ils alors les phénomènes d'arythmie observés d'est en ouest et le retour au moins temporaire à des activités vivrières plus traditionnelles comme la chasse (au Cardial par exemple). Les données archéologiques du Nord-ouest de la Méditerranée montrent des dynamiques évolutives en phase avec les fluctuations climato-environnementales observées durant le VI millénaire av. J.-C. et des adaptations aux changements des conditions du milieu (de l'Impressa de l'Italie méridionale à l'Epicardial du sud de la France). De quoi remettre au goût du jour le vieux débat initié par Gordon Childe, contesté par Braidwood, et d'avancer de nouvelles hypothèses sur la néolithisation dans une perspective socio-environnementale.

C88-17 Antonio MARTÍNEZ CORTIZAS (Santiago de Compostela, Spain)
M. COSTA CASAIS (Santiago de Compostela, Spain)

Reconstructing environmental change in NW Iberia for the period 6500 to 500 BC.

Abstract: Present landscape contains integrated and fossilized elements and structures inherited from past environments that were shaped by natural processes but also by those induced or directly produced by human activities. Several methodologies and techniques enable their detection, identification and analysis. These can be grouped among the several disciplines of the Earth Sciences –geomorphology, sedimentology, pedology, geochemistry, geographic information systems-, those related to the study of the fossil record –palaeontology, palinology- and those dedicated to the study of the material remains of cultures –archaeology, prehistory. The results obtained using these disciplines must be articulated at different scales (macro to micro) for a proper reconstruction of palaeoenvironmental conditions at any given time.

During the last decades we have integrated the information obtained from some of the mentioned disciplines with the aim 1) to characterize the superficial formations and the morphogenetic processes involved in their formation; 2) to establish the sequence of erosive/accumulative events that took place, their possible causes, the main pedogenetic pathways and their chronology; 3) to resolve the climatic and anthropogenic components; and 4) at the same time to explore the value of new proxies –biotic and abiotic signals- as well as their validation.

Our results indicate that after the onset of the Holocene period, during which morphoclimatic processes dominated, human activities played an increasing role in landscape evolution. The earliest evidence of significant transformations by humans in NW Iberia date back to 5.5-5 kyr BC (during the Epipaleolithic) and seem to have been the result of small scale impacts in the forest by means of fires.

It is not until the end of the Hypsithermal period, between 4-3.5 kyr BC, that soil erosion began to be a widespread phenomenon. A decline in forest cover and the first appearance of cereal pollen indicated by palynological studies, the erosive discontinuities, stone and charcoal lines in colluvial soils, as well as the start of a progressive soil acidification point to human activities as the main trigger. Although forests recovered after this phase, soil erosion was still very active and there is evidence of a continued anthropization of the landscape in the Bronze and Iron ages. Landscape sensitivity to human induced changes increased due to the climate deterioration posed by the Neoglaciacion. A critical threshold must have been crossed by 1 kyr BC because many indicators show an acceleration of environmental degradation. A significant forest decline coincides with an increase in soil acidification and the first detection of atmospheric and soil metal pollution. In fact, forest evolution and atmospheric metal pollution (a proxy of mining and smelting activities) in NW Iberia have been coupled since 1 kyr until the beginning of the industrial revolution.

Although human activities seem to have been involved in landscape evolution since at least 5 kyr BC, environmental changes (natural and human induced) have also challenged human societies, which responded to perceived changes adapting to the new conditions in a feedback loop so that landscape and human groups coevolved interacting in a complex way. The results of this interaction expressed as modifications in the vegetation cover, the elimination of the soil resources in many areas and its concentration in more localized, control-demanding sectors, and a progressive acidification and contamination, These transformations may have affected ecological diversity in ways we still have to uncover, that subtly modified the services offered by biodiversity to human societies. To a great extent, present landscape is the end product of these interactions.

Key-words: Erosive episodes, climatic change, human impacts, soil resource, Holocene, NW Iberia.

C88-19 Maria José IRIARTE (Vitoria, Spain)

Paysage végétal et anthropisation du milieu dans l'aire centrale du Nord de la Péninsule Ibérique (Pyrénées Occidentales, Cantabrique orientale et haute vallée de L'Ebre): l'état de la question.

Résumé: Dans cette communication nous présentons une synthèse faisant le point sur l'évolution de l'environnement Holocène du secteur central du Nord de la Péninsule Ibérique (Pyrénées Occidentales, Cantabrique orientale et haute vallée de L'Ebre) à partir des enregistrements archéobotaniques.

Les caractéristiques géographiques de ce territoire favorisent l'existence d'une diversité paysagère intéressante allant des paysages montagnards de type alpin jusqu'au faciès présentant un caractère méditerranéen accentué. Actuellement, bien que nous disposions d'une maille d'échantillonnage et d'analyses polliniques d'une densité remarquable, l'information disponible sur l'évolution environnementale pendant la deuxième moitié de l'Holocène est inégalement distribuée, tant au niveau géographique que chronologique.

Malgré ça, les données polliniques obtenues à la fois sur des dépôts archéologiques ainsi que sur des registres sédimentaires non anthropisés, offrent une perspective sur l'évolution paysagère et les processus de son anthropisation en termes qualitatifs et quantitatifs.

C88-20 Angelo VINTALORO (Corleone, Italy)

Anthropisation de la Sicile et relation avec la Méditerranée.

Résumé: Durant les quinze dernières années, nous avons complété l'étude de la Sicile ancienne par l'exploration de l'ultime partie méconnue de l'île : l'aire corleonaise. Nous nous sommes heurtés à de notables surprises : cette vaste aire sicilienne joint les côtes palermitaine et agrigentine ; elle est par conséquent à la croisée (ou le carrefour) d'incessants flux commerciaux et militaires en provenance et en direction de l'Afrique et du nord de l'Europe. La découverte de céramiques de type campaniforme a confirmé que cette culture européenne était arrivée en Sicile par l'intermédiaire de la Sardaigne. D'autres éléments provenant de l'Égée témoignent de contacts continus qu'eut la Sicile avec le monde méditerranéen et plus qu'elle n'en constitue le point central, elle est à chaque époque

le noeud de communications depuis le début de la navigation. Même les îles mineures comme Pantelleria, Lipari, les Éoliennes ou les Egadi ont joué un rôle fondamental dans l'économie de croissance sicilienne et méditerranéenne. La domestication des plantes et l'élevage des animaux arrivent en Sicile au moins cinq siècles après leur apparition dans le croissant fertile. Le diffusionnisme constitue sans nul doute le facteur principal de l'apport de ces connaissances à travers la terre ferme. Par ailleurs, les céramiques pré et protohistoriques témoignent de contacts continus avec de vastes aires de la méditerranée, principalement avec celle de l'Est, probablement plus riche et développée. La Sicile deviendra par la suite un carrefour de populations à un rythme incessant et dynamique. Terrains fertiles, riches pâturages, commerces prospères, autant d'ingrédients enviés et désirés par les populations qui ont anthropisé cette région en l'inscrivant, sur un plan culturel, parmi les plus riches de la planète toute entière.

POSTER SESSION

Amandine BORDON (Gif-sur-Yvette, France)
 Odile PEYRON (Besançon, France)
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 M. DENÉFLE (Meudon, France)
 EPD MEMBERS

Quantitative reconstruction of the Lateglacial to Holocene climate at lake Maliq, Albania, from pollen data.

Abstract: Pollen analyses carried out in Southern Albania at Maliq (Denèfle *et al.*, 2000) showed that the regional vegetation recorded important changes during the Late Glacial and the Holocene, related to both climate and anthropogenic factors. Here we present the results obtained with the classical best analogues method constrained by the biomes. This method is applied to Maliq lake pollen sequence to estimate the magnitude of temperature and precipitations changes which play a determinant role on the distribution of the vegetation. Attention is paid on the mean temperature of the warmest and coldest months, the annual precipitation, and the annual «growing» degree-day above 5°C and above 0°C.

The calibration of the method is based on the use of modern pollen samples. The dataset includes 2748 samples from Europe, Central Asia and the Mediterranean area. About 31 new modern pollen spectra from Albania and Macedonia between 300 and 1900m have been analysed. Combined with those previously collected by Bottema (1974) in Greece, they provide a reliable record of forest ecosystems and related climate of Southern Balkans, from the two phytogeographical sectors determined by Ozenda (1975) (Pindhos and Macedonia) at the boundary of the Mediterranean area and Central Europe.

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Synchronicous cultural and climatic changes in the Prehistory of Central Spain (Amblés Valley, Ávila, Spain) between 850 and 760 cal BC.

Abstract: A primary objective of archaeological investigation is to reconstruct and explain as fully as possible mechanisms and directions of prehistoric culture change. In this way, human activities have generally been regarded as external forces contributing to landscape change, with a focus on the impacts of agriculture, grazing pressures and atmospheric pollution. However, there has been comparatively little study undertaken that integrates physical and social systems in a historic context to explain the basis of human activity in sensitive landscapes. Archaeological studies distributed to the

long and wide of the whole planet have come to demonstrate multitude of examples of societies that flourished in a given moment and that they collapsed later. In certain cases, the archaeological registrations showed that such events could be related with sudden environmental changes, even unexpected, what has taken to certain authors to establish a causation between both facts. In the last few years, the climatic variability during the Holocene has been a subject of debate. By combining information about glacier fluctuations, lakes evolution and pollen diagrams it can be seen that the Holocene climate has fluctuated. Palynological, sedimentological and geomorphological studies undertaken as an integral part of sophisticated regional and site studies in France, Italy, Portugal and Spain have addressed the question of the human role in environmental change during the Neolithic and Bronze Ages. Recent palaeoclimatic research suggest that the Holocene may have been characterized by a more dynamic climate than previously thought. However, some of the climate changes during the Late Glacial and Holocene occurred in relatively short periods of time (decennia or maybe even shorter) and such abrupt changes generally will not be detected by these long time interval studies. Quaternary palynological data have a fundamental contribution to make to studies of global change, and these data represent the most widely available quantitative record of past climates. Information about abrupt climate change may be extracted from pollen diagrams (at least those with sufficiently close sampling intervals and enough radiocarbon dates). This potential offers scope for new projects with the aim of exploring possible climate changes in relatively short periods of time that are characterized by sharp increases of atmospheric ^{14}C content. Such investigations could provide new and detailed information about climate change and climatic teleconnections during the Holocene. In this way new steps perhaps can be taken in understanding mechanisms of abrupt climate change in the past and the effect of such changes both upon vegetation and upon prehistoric farming in marginal areas. Presently work analyzes the cultural and climatic changes in one very well defined period -the Late Bronze Age-Early Iron Age transition (ca. 850-760 cal BC)- in a well defined area, from a geographical and environmental point of view, like it is the intramountain Amblés Valley (Ávila), in the center of Spain.

Key-words: Climatic change, Cultural change, Late Bronze Age, Early Iron Age, Amblés Valley, Spain.

Florence MAZIER (Besançon, France)
 Carole CUGNY (Toulouse, France)
 Christine RENDU (Toulouse, France)
 Didier GALOP (Besançon, France)

Modelling modern pollen assemblages, actual vegetation and pastoral activities relationships in order to validate pollen signature of the fossil records (Western Pyrenean mountains-France).

Abstract: Several pollen diagrams from Iraty area (Pays Basque mountains) have been analysed, but very few reconstruction of past plant communities or vegetation landscape units involving a comparison of modern and fossil spectra have been attempted. However, such comparative approach is useful in furthering our understanding of the development of the agro-pastoral landscape and of past land-use changes. This approach requires searching modern analogues from past landscape with grazed pasture and woodland. The idea of the project is to take advantage that there are still traditionally managed pastures in the mountains of the Pays Basque.

As a first step, a modern pollen/land-use data set has been developed. It includes 73 samples from various types of plant communities which cover the major relevant grazing and openness gradients. The project describes the major gradients in modern pollen deposits, relates these patterns to environmental and anthropogenic variables, and tests whether different degrees of openness and grazing pressure produce statistically distinct modern pollen spectra. The data were explored by redundancy analysis and associated statistical procedures.

Secondly, modern spectra and fossil spectra from two fossil pollen sequences located in the same geographical area have been compared by transfer functions. This comparison will allow the interpretation of pastoral activities from local pollen diagrams in order to reconstruct pastoralism history of the Iraty area. The results have been compared with available data such as non palynomorph and archaeological data.

Keywords: modern analogues, multivariate analysis, local pastoral indicators, transfer function, interdisciplinary approach.

Anne LE FLAO (Toulouse, France)
 Simon BREWER (Aix-en-Provence, France)
 Guy JALUT (Toulouse, France)
 Didier GALOP (Besançon, France)

The spread of *Fagus sylvatica* and Neolithic impact : a multi-scale spatial and multidisciplinary study.

Abstract: Changes in climate between glacial and interglacial periods have resulted in large-scale shifts in the distribution of forest trees. These changes can be reconstructed using a mixture of palynological data across a network of sites and range-wide phylogeographical surveys, providing complementary and independent studies. Of all the European taxa, *Fagus sylvatica* shows a clear dynamic in the postglacial spread, and provides an ideal case study. The spread of the beech started slowly at the start of the current interglacial, with an expansion from two refugial areas in the south of Italy and the southern Balkan peninsula. The development of beech forests remained slow until the mid-Holocene, when an accelerated westward spread took place across central Europe. *Fagus* reached its modern-day limits in the north of Europe approximately 1000 years ago, but constant rates of spread suggest that it has not yet reached its climatic limit.

Two factors are believed to have controlled the spread of the beech: climatic changes and anthropogenic action, and there has been much debate over their respective importance during the Holocene as it is difficult to distinguish between these factors at the continental scale. Regional-scale studies are therefore necessary to better understand the processes of colonisation. We present here a new study focusing on the spread of *F. sylvatica* in the Pyrenees, based on a set of 25 pollen sites distributed across the the mountain chain. The beech shows a clear expansion between 4500 BP and 4000 BP, which corresponds to increasing human activity in the region. The direct inclusion of archaeological information allows us to identify the type of human impact on the existing vegetation, and so to qualify man's role in the changes of the forest composition of the Pyrenees

Keywords: *Fagus sylvatica*, Neolithic, Western and Central Europe, Pyrenees, phylogeography, palynology.

Marie-Claude BAL (Toulouse, France)
 Laurent CAROZZA (Dijon, France)
 Fabrice MAREMBERT
 Christine RENDU (Toulouse, France)
 Boris VANNIERE (Besançon, France)
 Nicolas VALDEYRON (Toulouse, France)
 Didier GALOP (Besançon, France)

Fire and human activities on the basque mountains (Western Pyrenees), inferred from pedoanthracological, palynological and archaeological data.

Abstract: Palaeoenvironmental investigations performed in the Pyrenean mountain during the last decade (Galop 1998; Vannière et al. 2001; Galop et al. 2002) attest that the use of fire is related to the beginning of agro-pastoral activities since the Neolithic times. Nevertheless history of fire in the Pyrenees is poorly researched.

In this communication we present new results about relation between fire, human activities and vegetation dynamics provided by interdisciplinary investigations carried out in the "Palaeoenvironment and human activities on the Basque mountain" program led by Galop since 2001. This research field is located precisely in massif of Iraty (Western Pyrenees).

On the Basque mountain, macro-charcoal, micro-charcoal and pollen analysis show important phases of fire in relation to agro-sylvo-pastoral activities and confirm the use of slash and burns cultivation since Neolithic (Vannière et al. 2001). These results fit well with palaeoenvironmental and archaeological data obtained in the same area. Strong human impact on the forest cover occurred during Bronze Age as it has been demonstrated by numerous contemporaneous burial mounds found and dated on the slopes (Marembert, 2000; Rendu, 2002; Carozza et al., 2005). Current landscape essentially consists of pastures with small stands of *Fagus* forest. Some isolated old oaks are principally situated near pastoral farms. Pedoanthracological analysis carried out in this area give informations about agro-pastoral activities and their consequences on *Quercus* – beech forest since

Bronze Age period. Radiocarbon dated charcoals found in the slopes soils indicate fire. This induces clearance of the oak forest due to human activities. This progressive deforestation seems to have favoured *Fagus* expansion in the forest cover after 4000 BP.

It is interesting to compare micro-charcoal data and cumul dates of macro-charcoals to show that anthropic phases coincide with fire history in Western Pyrenees. This interdisciplinary approach helps in understanding the intensity of fires and their consequences on the dynamics of vegetation. Methodologically, pedoanthracoanalysis provide informations that confirm palynological and micro-charcoal results, with more precise spatial reconstructions.

José António LOPEZ-SAEZ (Madrid, Spain)

Coprophilous fungi as a source of information of anthropic activities during the Prehistory in the Amblés Valley (Ávila, Spain): the archaeopalynological record.

Abstract. In prehistoric times human activity frequently had a profound effect on the natural vegetation. It therefore registered in the pollen rain and hence, today, can be recognised in pollen diagrams. The value of the pollen diagram in elucidating the human role in vegetational changes was first clearly demonstrated by the classic works of Iversen (1941, 1949), who, at the same time, distinguished those pollen taxa which reflect human occupation and economy. In conclusion, human impact on the vegetation in the past can be deduced from the presence of anthropogenic indicators in the records of pollen and by studying botanical macro-remains from archaeological sites. Nevertheless, the development of certain anthropic activities, especially of the cattle raising and the shepherding, they are difficult to specify only keeping in mind the pollen indicators, since some of them (e.g. *Plantago* sp, *Rumex* sp, *Urtica* sp, Chenopodiaceae) they can be at the same time indicators of areas shepherded as of habitats or nitrophilous pierces for the man. For instance, the presence of *Urtica* pollen has been interpreted usually as reflect of pastoral activities, however relatively high values of *Urtica* are also characteristic in some "regional" phenomenon where the dying-off of the birches enriched the soil with nitrate, which could have been favourable for the growth of *Urtica*. In these cases, the use of other more precise indicators (non-pollen palynomorphs), at the microhabitat level, they help firmly to elucidate the origin and development of such activities. Man and domesticated animals will have been responsible for a range of new habitats, and also the mycoflora of settlement sites and the surrounding arable land, pastures and hay-meadows will have been different from the fungal assemblages of undisturbed habitats in natural ecosystems. The analysis of fossil fungal spores is a rather unexplored field in archaeopalynology. Fungal remains and other non-pollen palynomorphs present in the microscope slides normally are not recorded in palynological studies. However, during the last years the possible paleo-environmental indicator value of fungal spores and various other extra palynomorphs from archaeological and natural sites of the Iberian Peninsula was studied. Although only some of the fungal taxa can preserve, the records show that some fungi represent a new category of secondary anthropogenic indicators. Among the recorded spores are representatives of the Sordariaceae, most of them are coprophilous and often so specialized that they only grow on the dung of a single or of only a few species of animals. In several studies of settlement sites palynological indications were found for the presence of fungi related with animal or human dung. Among the recorded fungal spores were representatives of the Sordariaceae (Ascomycetes). In the present paper we analysed the fossil record of some Sordariaceae species (*Cercophora* sp, *Neurospora* sp, *Sordaria* sp, *Sporormiella* sp) in the archaeopalynological record of Iberian archaeological sites from the Amblés Valley (Ávila).

Key-words: Non-pollen palynomorphs, Coprophilous fungi, Amblés Valley, Spain.

José António LOPEZ-SAEZ (Madrid, Spain)

Pilar LÓPEZ-GARCIA (Madrid, Spain)

Lourdes LÓPEZ-MERINO (Madrid, Spain)

The neolithisation process in the Iberian Peninsula from a palaeopalynological point of view.

Abstract: The Iberian Peninsula and Balearic Islands include a large variety of biomes (deciduous and coniferous forests, evergreen woodland and garrigue, tall and dwarf shrublands, perennial and annual grasslands), relief, climates, and soil types. Within local regions, the relative extent of different vegetation types depends not only on the abiotic environmental status, but also on human impacts.

The development of agriculture has long been considered a major milestone in human evolution. In both biology and archaeology, research into agricultural origins shows increasing long-term promise. A very important number of relates advances in archaeology and archaeobotany, in the Iberian Peninsula and Balearic Islands, now permit accurate recognition of the temporal and spatial context of the initial domestication of cereal species. In addition, small sample accelerator mass spectrometer radiocarbon dating now allows the unequivocal temporal placement of these early domesticates. These, and the agricultural economies subsequently based on them, marked a major turning point in the history of the environment, in that they formed the lever with which humans have relentlessly transformed the earth and its terrestrial ecosystems. Not surprisingly, this 'Neolithic revolution' has attracted increasing attention from both biologists and archaeologists in the last decades. In fact, the transition from hunting and gathering to an agricultural way of life has long been recognized as a major turning point in the human history, and actually continues to represent a very active and expanding general area of research in archaeology.

In the SW Mediterranean context, the major role of human impact in determining the direction of vegetation change over much of the post-glacial has long been recognised. It is only in relatively recent years, however, that detailed reconstruction of the nature and scope of that impact at selected sites has been attempted. This has been facilitated by important methodological, technical and theoretical development in pollen analysis, that includes closer and fine interval sampling, often combined with high counts to improve statistical reliability, increasing the probability of recovering pollen taxa, such as cereal pollen, which are often present at very low frequencies. Also, the use of improved microscopy has led to the identification of many more pollen types which is so essential for detailed reconstruction of past biotopes. On the basis of both theoretical considerations and empirical methods, very specially in archaeological contexts, our understanding of the relationship between anthropogenic indicator curves in the pollen diagrams and human impact has also been considerably advanced. These developments have resulted in increased confidence being placed in pollen analysis as a tool for elucidating and clarifying the effect of human activity in areas where that has already been detected in the archaeological record. Furthermore, it has also proved possible to pinpoint areas and periods (for instance the Early Neolithic) where human impact was particularly strong, but for one reason or another, had not yet been detected by other methods. Understanding the human environment and how humanity functions and adapts within that environment -or alters the environment to fit in with their own universal paradigm is a key aspect in Archaeology. Understanding the grassland environments that gave rise to the agriculture package can only increase our knowledge of when, why and how cereals have come to dominate modern human subsistence. Agricultural communities were established across Europe between 8000 and 5000 years ago. The best evidence currently available to archaeologists indicates that two different processes were involved: the colonization of new habitats by populations of farmers and the adoption of agriculture by indigenous foragers. Despite efforts of archaeologist to clarify which of these processes was active in a particular region, for instance the Iberian Peninsula and the Balearic Islands, there is still considerable regional debate between those who favor colonization and those who argue for in situ development.

Keywords: Neolithic, neolithisation process, palaeopollinology, Iberian Peninsula.

Mona COURT-PICON (Marseille, France)
Jean-Louis DE BEAULIEU (Marseille, France)
Alexandre BUTTLER (Besançon, France)

Relation pluie pollinique actuelle/vegetation/utilisation des terres dans la vallée du Champsaur (Alpes Françaises et leur potentiel dans l'interprétation des enregistrements polliniques fossiles des paysages agro-pastoraux anciens.

Abstract: This study aims at elucidating modern pollen spectra/environmental data relationships from both natural and human-induced vegetation types as an aid for palaeoecological reconstructions. A set of 51 surface moss polsters was sampled from different vegetation and land-use types in the Champsaur area (French Alps) and analysed to obtain modern pollen analogues of ancient cultural landscapes in mountain ecosystems. Samples were selected from grazed areas, mown meadows, cultivated fields, fallow land and deciduous and coniferous forests. Vegetation composition around the sampling points and seventeen types of environmental variables (e.g. management type, soil and topography) were collected all for these 51 sites. Patterns of modern local pollen variation in relation to the environmental variables were explored by means of canonical correspondence analysis (CCA) and associated statistical tests. This correlative model allows us to determine the major explanatory

variables and taxa indicative of particular anthropogenic activities, and thus may help to calibrate fossil pollen assemblages.

The indicator pollen types are evaluated in the light of comparable material from lowlands and mid elevation areas of western Europe. The results of the French data-set confirm some of the conclusions drawn from the North European data-sets, but also show some site specific features. Pollen markers with a broader global significance common to other regions include *Rhinanthus* type, *Apiaceae* and *Dipsacaceae* for mown meadows, *Urtica* type, *Plantago media/major*, *Trifolium* type and *Potentilla* type for grazed areas, and *Cerealia* type, *Centaurea cyanus*, *Polygonum aviculare* for cultivated fields. New pollen anthropogenic indicators typical to our study area are *Sanguisorba officinalis*, *Vicia* type (mowing), *Lotus* type, *Onobrychis* type, *Centaurea nigra* type, *Serratula* type (grazing), *Sinapis* type and *Papaver rhoeas* (cultivation). This study provides potentially valuable analogues for human-induced vegetation types, and it will then become possible to interpret more objectively local pollen diagrams from Alpine mountain environments in terms of past cultural landscape development.

Session C89

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

*Amphitheatre 3, Faculty of Law, Lisbon University
Amphithéâtre 3, Faculté de Droit, Université de Lisbonne*

Statue-menhir and anthropomorphic stelae in Europe, Asia ad Mediterranean Sea

organized by / organisé par

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SESSION'S ABSTRACT

Statue-menhir and anthropomorphic stelae are monuments widely diffused in Europe, Asia and Mediterranean Sea. The appearing of these monoliths in various and remote culture is for sure determined by different causes, be they linked to the Western Europe Megalithism, to the Copper/Bronze Age Mediterranean societies or to the Ancient Turkish peoples. The presence of such monuments from the Western Atlantic coasts of Portugal, to the Sardinia and Corsica Islands, in the Alps or Caucasus, until the steppes of Mongolia, needs to be better explained and studied. The symposium has the aim of introducing the state of the art on this subject. Papers discussing this matter are welcome, especially those taking in account new discoveries, distributions, cultural frames and interpretations of these particular manufacts. Particular attention will be requested to information and news regarding archaeological contexts in which these monuments are put, ethnographic sources to which they can be referred, and art history analisys to which can be subjected.

SESSION PROGRAMME / PROGRAMME DE LA SESSION

14:30 **Opening / Ouverture**

14:30-15:00 Marta DÍAZ-GUARDAMINO URIBE (Getxo, Spain)

C89-01

Between the Atlantic and the Mediterranean: Statue-menhirs and decorated stelae in the Iberian Peninsula.

15:00-15:30 Stefania CASINI
Angelo FOSSATI (Cervano, Brescia, Italy)

C89-02

New Copper Age Statue-stelae from Valtellina, Italy.

15:30-16:00 Stafania CASINI

C89-03

Representation of Weapons from Copper Age Stelae and rock art.

- 16:00-16:30 Arturo GARCÍA DOMÍNGUEZ
Maria A. ALDECOA QUINTANA
- C89-04** **The Final Bronze Age and Iron Age iconographic representations on rupestrian mediums in Campanario (Badajoz, Spain). A new concept of South-western Warrior Stele?**
- 16:30-17:00 Malahat FARAJOVA (Baku, Azerbaijan)
- C89-05** **Statue-Mehrir and anthropomorphic stelae in Azerbaijan.**
- 17:00-17:30 Angelo FOSSATI (Cerveno, Brescia, Italy)
- C89-06** **Iron Age Stelae from Gazzo Veronese, Italy: a case of Greek influence?**
- 17:30-18:00 Juan Javier ENRÍQUEZ NAVASCUÉS
Milagros FERNÁNDEZ ALGABA
Montserrat GIRÓN ABUMALHAM
- C89-07** **South western Stelae from Iberian Península. Iconographic review and technical analysis of Badajoz Museum Collection of southwestern Stelae.**
- 18:00-18:30 **Discussion**

ABSTRACTS / RÉSUMÉS

- C89-04** Arturo GARCÍA DOMÍNGUEZ
Maria A. ALDECOA QUINTANA
- The Final Bronze Age and Iron Age iconographic representations on rupestrian mediums in Campanario (Badajoz, Spain). A new concept of South-western Warrior Stele?**

ABSTRACT: The documentation in Tamajuso Brook of a great amount of rock at open air with engraving made with incisory or axes tools has shown the outstanding of this stream of water as an artistic-symbolic space of the recent prehistory, in particular of Final Bronze Age and Iron Age. The representations show an excellent technical quality and iconographic diversity.

The placing of several rocks with a similar iconographic like Peninsular South-western Warrior Steles next to another one, which there is a female figure comparable to anthropomorphic steles.

The importance of this new artistic whole lies in newness of kind of support, where the representations are place: ordinary slate outcrops instead of mobile elements.

- C89-05** Malahat FARAJOVA (Baku, Azerbaijan)
- Statue-Mehrir and anthropomorphic stelae in Azerbaijan.**

ABSTRACT: It is generally known that rock art is one of the most ancient and widely spread creations of mankind. Materials in the sphere of study of this type of art let us suppose about connection of rock art with the cult of mountains and stones. Worshipping of sacred mountains, the roots of which can be traced in the distant past, was later acquired in some religions. For instance, in the religions of ancient world - the cult of Himalayas in India, Olymp in Greece etc. On the highest peaks of mountains of Central Asia (in Mongolia, Kazakhstan, Uzbekistan and in the other regions of Central Asia) heaps of stones- "obo" were gathered for the building of altars for the spirit of mountains. And now travellers leave in "obo" not only stones, but also sugar, sweets or flat bread. These

sacrifices were made for the spirit of mountains, for him to be favorable to the dwellers of these places.

The cult of mountains and stones has preserved its certain meaning in a number of regions of Azerbaijan. Among them Shakhbuzdag, Beshbarmag in Khizi, Djingirdag (earlier called as "Djingir Baba") in Gobustan, Khazrat-Baba in Konakhkent, Asaf-Kaf, Gemigaya in Ordubad. The old tradition has been preserved in Gobustan-wedding procession to Beyukdash mountain is considered to be an obligatory ritual for local people. Probably, this is an ancient cult of worshipping the mountain, which has been preserved in their historical consciousness. In Gobustan, on Gemigaya in Nakhichevan, in Kelbadjar region ancient artists left pictures on the high rocks, which could be noticed from the far distance and attracted attention of people by their size and beauty. (...)