



Book of abstracts

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**XXV-1. Préhistoire atlantique de
l'Amérique du sud.**

Landscape of Movement, lagunar mobility and pre-historical territorialization of earthen mound builders in the Patos Lagoon basin, southern Brazil

Rafael Milheira *†^{1,2}, Caroline Borges³

¹ Universidade Federal de Pelotas – Brazil

² National Council for Scientific and Technological Development (CNPq) – Brazil

³ Federal University of Pelotas (UFPEL) – Brazil

We present a model for the settlement and landscape management conducted by the earthen mound builders (*cerritos de índios*) at the estuary of the *Patos* lagoon, south of Brazil. Based on studies made at the *cerritos* in *Pontal da Barra*, at the confluence of the *São Gonçalo* canal and the *Patos* lagoon, we propose that - throughout 1,500 years of history – the coastal lowlands at *Pontal da Barra* became a meaningful place in the territory domain of the *cerritos* builders. Being occupied between 2,500 to 1,800 year BP as a camp area, and between 1,800 to 1,200 years BP as a village, the *Pontal* became abandoned around a 1,000 years BP. Such process is outlined archaeologically by the complexification of the mounds architectural structures, by transformations in topography, besides the monumental and multifunction aspects of the mounds and its surroundings including burial activities. As part of a regional territory, we propose that the *cerritos* complex of *Pontal da Barra* was systemically occupied, comprising a community of fishermen, agents of a long-term history.

Keywords: Landscape, Earthen Mounds, Cerritos, Mobility, Movement, Brazilian Pre, history

*Speaker

†Corresponding author: milheirarafael@gmail.com

Entre ” lesmas ” et céramiques, quelle place et quelle identité pour les industries lithiques de l’Holocène moyen dans le Brésil central ?

Amélie Da Costa *† ¹

¹ UMR 7041 (ArScAn - équipe AnTET) – Université Paris Ouest Nanterre La Défense – MAE, 21 allée de l’université 92023 Nanterre, France

Dans le Brésil central, les industries lithiques de l’Holocène moyen, période comprise entre 8.000 et 4.000 BP, ont souvent été décrites non pas en fonction de leurs caractères propres mais en fonction de l’absence des caractères marqueurs des périodes antérieures et postérieures : absence de *lesma* (pièce façonnée unifaciale), absence de céramique.

De fait, les traits techniques spécifiques à la période sont difficiles à cerner à cause de la grande diversité des artefacts. Souvent décrites comme peu élaborées ou simples, ces industries interrogent pourtant par leurs caractères extrêmement différents de ceux de la période antérieure. Des hypothèses liées à des facteurs externes ont été évoquées pour expliquer de tels changements dans la culture matérielle : changement climatique avec une forte modification de l’environnement, remplacement de la population par une nouvelle vague de peuplement. Toutefois, il est difficile d’évaluer les modalités de cette rupture tant les analyses sur des assemblages de la période sont peu nombreuses.

Nous proposons dans ce travail de caractériser les systèmes techniques de l’Holocène moyen et par ce biais aborder le phénomène de rupture technique avec le technocomplexe Itaparica.

Une méthode d’analyse adaptée, alliant étude technologique et techno-fonctionnelle a été appliquée sur des assemblages lithiques de plusieurs sites. Les résultats obtenus mettent en évidence l’existence de caractères partagés et de variabilités importantes entre les différents sites. L’organisation des parties fonctionnelles des outils, structurée par la présence récurrente de pans abrupts, constitue un caractère commun fort. Les supports d’outils sont en revanche très variables selon les sites, expliquant cette impression d’absence d’outils clairement définis déjà soulignée.

Cette étude permet également de souligner l’importance de la méthodologie d’analyse dans le cas d’industries techniquement simples.

Keywords: Technologie lithique, Brésil central, Holocène moyen, Rupture technique, Outil à dos, Techno, fonctionnel.

*Speaker

†Corresponding author: amelie.da-costa@mae.u-paris10.fr

”Acceleration” of Time? South American techno-logical behaviors in light of the temporal contrast of Technical Evolution in the Perimediterranean and Asia

Marcos Paulo De Ramos ^{*†} , Eric Boeda ^{*}

¹, Sibeli Viana

¹ UMR 7041 – Université Paris Nanterre – France

In the last twenty years South America, and especially the eastern portion of the sub-continent, has been the subject of research applied to the recognition and understanding of techno-logic lineages in the knapped material. These researches were theoretically grounded by the Techno-Functional Approach (BO’EDA, 2013). The results from both the pioneering work and the new generations of researchers have shown a previously unsuspected wealth in terms of concepts, methods and techniques applied to knapping. The objectives of the South American lithic industries are as varied as the methods already recognized. The raw materials worked are also very varied and suggest choices culturally guided by techno-logical lineages.

The impression we have as we observe this wealth of technicalities developed over an apparent short span of time - South America is considered to be the last large subcontinental area to be populated (current dates indicate a minimum antiquity of 40,000 years AP) - is that there was, for reasons still unknown, an ”acceleration” in the evolution of the techno-logical lineages, technical convergences and phenomena of invention. This apparent ”acceleration” appears as an effect of comparison with the processes of concretization that have taken place in other regions of the globe. The idea that occurs to us is that the processes of cultural evolution (in their techno-logical dimensionality), which have unfolded on a time scale of hundreds of thousands of years in other large regions of the planet (eg, the Perimediterranean and Asia) , here, in this circumscribed region of South America, occurred ”faster.” This seems to be true both for the processes of concretization in the technical object lineages and for the processes of invention of new lineages.

Our communication aims to present, as a function of its geographical location and chronological contextualization, a general picture of this great variability of techno-logical lineages already recognized by the Paleo-historical researches (BO’EDA, 2013). We will bring empirical data, contextualized chronologically. We seek a first exploratory approach in search of explanatory subsidies. We believe that we can initiate, on a speculative basis, an investigation in the general scenario which astonish us: after all, what could be acting, through the associated milieu and / or in the very techno-logical specificities, that was favoring the genesis of an unsuspected wealth in terms of technical alterity in the eastern portion of South America?

*Speaker

†Corresponding author: argonauta128@gmail.com

Keywords: Techno, logic lineages, South American lithic industries, Processes of concretization, Apparent "acceleration"

PHYTOLITH AND STARCH ANALYSES OF LITHIC ARTIFACTS FROM THE LAPA DO SANTO SITE (EAST-CENTRAL BRAZIL)

Daniela Ortega ^{*†} ¹, Ximena Villagran ¹, Célia Boyadjian ², André Strauss ³

¹ Museum of Archeology and Ethnology of the University of São Paulo (MAE-USP) – Brazil

² National Museum/UFRJ – Brazil

³ University of São Paulo (USP) – Brazil

The karstic region of Lagoa Santa (Minas Gerais state) contains several archaeological sites dating back to the early Holocene with an astonishing number of well-preserved human remains. The Lapa do Santo rockshelter, in the northern part of the karst, contains more than 30 human interments in which complex funerary rituals were identified, including defleshing, decapitation and intentional teeth removal. The sedimentary matrix containing the skeletal remains is mostly made of ashes from ancient combustion structures, lit within a period of about 3000 years. Several lithic artifacts have been recovered from the site, most of them of small dimensions (length around 22 mm). Lithics are mostly flakes (rarely retouched), cores and splinters made from single crystals of hyaline quartz. Previous technological research suggests that lithic artifacts were used to cut and scrape small and soft materials, like plants. To verify whether the lithics from Lapa do Santo were indeed used to process plant resources, analyses of plant microremains (phytoliths and starch grains) were undertaken in 20 artifacts from the site. The artifacts were recovered from three different excavation units following a standard protocol to prevent contamination. Sediment samples from the site were also analyzed in order to differentiate between microremains retained in the lithics after their use or incorporated later from the surrounding sediments. Preliminary analyses revealed a larger amount of phytoliths than starch grains in most of the artifacts. Identification and classification of the plant microremains are still in progress. Here we will present the results of the first study in plant microremains retained in the lithic artifacts of Lapa do Santo, to better understand the role of plant processing in the lithic industries of Lagoa Santa.

Keywords: Archaeology, Plant Microremain, Stone Tool, Tool Use, Early Holocene

*Speaker

†Corresponding author: danielaortega9@hotmail.com

LITHIC ASSEMBLAGES AND POTENTIAL RAW MATERIAL SOURCES IN EARLY COASTAL OCUPATIONS OF TIERRA DEL FUEGO: BINUSHMUKA I SITE.

María Del Carmen Fernández Ropero ^{*†} ¹

¹ CENTRO AUSTRAL DE INVESTIGACIONES CIENTÍFICAS (CADIC-CONICET) – Bernardo Houssay 200 – Ushuaia – Tierra del Fuego, Argentina

This paper presents a preliminary study on lithic assemblage from layer S of Binushmuka (8000-8300 cal yr BP) and the potential raw material procurement. This assemblage provides the earliest evidence of human occupation, together with the Layer S of Imiwaia I (8400-8700 cal yr BP) and the First Component of Tunel I (7600-7900 cal yr BP), at the southern tip of South America. Such occupations have been traditionally interpreted as terrestrial hunter-gatherers. This idea was based on typological differences between these lithic assemblages and those performed by marine hunter-gatherer who inhabited the Beagle Channel since 7300 cal yr BP (Orquera & Piana 1988). Faunal remains and technological evidences allowed defining this littoral adaptation, characterized for intensive use of coastal resources and the development of a specific technology for such exploitation (Orquera & Piana 1999). However, human-environment relationship and subsistence strategies prior to marine adaptations are poorly known due to scarce preservation of organic material characterized these early coastal occupations. This raises several questions about the origin of early hunter-gatherers, and their relationship with the populations of marine hunter-gatherers.

In order to contribute to this subject, two main objectives are addressed: 1) to present a first characterization of the type of occupation that represents the Layer S of Binushmuka; and 2) to assess the interaction of these pioneer populations with the coastal environment. In this vein, technological, functional and taphonomic analyses are provided. Results concerning selection of lithic raw materials and potential sources are also presented.

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*Speaker

†Corresponding author: cfernandezropero@gmail.com

Keywords: Early Occupations, Lithic Assemblages, Raw Materials, Tierra del Fuego

Le concept d'affordance pour penser les assemblages lithiques de l'holocène moyen, région centrale du sud du plateau centrale brésilienne

Sibeli Viana * ¹, Marcos Ramos * † ²

¹ Pontifícia Universidade Católica de Goiás (PUC-Goiás) – Brazil

² Museu Nacional (MN/UFRJ) – Brazil

Cet article vise à présenter les résultats d'analyses d'assemblages lithiques datant de la période de l'Holocène moyen et provenant de sites archéologiques de la région Centre-Sud du Plateau central brésilien, à savoir: les régions Manso, Serranópolis et Palestine de Goiás. Dotés de la perspective théorico-méthodologique tecno-fonctionnelle, notre objectif est de contribuer à l'étude d'un scénario synchronique sur les technicités (y compris par les relations établies entre les individus, les techniques et les espaces), liées à l'utilisation du galet comme matrice pour l'opérationnalisation des schémas techniques de débitage et / ou de confection des instruments.

Le galet, indépendamment de sa matière première et de sa formation, apporte intrinsèquement dans sa constitution une diversité de formes, de volumes, de textures et de dimensions. Sur la base du concept d'affordance, ces caractéristiques ont été appropriées par les populations précédentes des régions concernées en tant qu'éléments techniques faisant partie intégrante des schémas de production de supports et de confection d'instruments. L'utilisation du galet à ces fins suppose un investissement important, en termes de temps et de critères de sélection (effectués au début de la chaîne de production).

Comme pour d'autres régions du Plateau central brésilien, nous avons compris que l'utilisation de galets ne se traduit pas par un comportement opportuniste ou par l'absence d'alternatives. Au contraire, les recherches dans les régions mentionnées, contextualisées dans des espaces géologiques distincts, ont démontré que les populations de l'Holocène moyen avaient des intentions techniques différentes et spécifiques pour l'utilisation de galet.

Cette utilisation implique la sélection de galet pour l'application de différents schémas de débitage de type C, méthode bipolaire sur enclume et trancher, nécessitant la présence d'éléments techniques spécifiques en termes de lignes techno-logiques. Pour l'utilisation du galet pour la confection d'instruments, d'autres catégories de critères techniques ont été recherchées, liées aux potentiels de travail de la partie préhensée (organisation du dos) et de la surface d'attaque (le dièdre de coupe).

*Speaker

†Corresponding author: argonauta128@gmail.com

Keywords: Affordance. Moyen Holocène. Planalte Centrale Brésilienne.

The relationship between Levallois and other lithic reduction methods in Southern Patagonia: the case of the Santa Cruz River

Nora Franco * ^{1,2}, Lucas Vetrivano

¹ Instituto Multidisciplinario de Historia y Ciencias Humanas - Consejo Nacional de Investigaciones Científicas y Técnicas (IMHICIHU-CONICET) – Saavedra 15, 5to. Piso, CABA (C.P. 1083), Argentina

² Facultad de Filosofía y Letras, Universidad de Buenos Aires (FFyL, UBA) – Puán 480, CABA, Argentina

The employment of the Levallois flintknapping method has been identified in the Santa Cruz river basin (Patagonia, Argentina) during the Late Holocene and can be related to a phase of effective occupation of the area during a humid period. During this period, the employment of the method is identified both in the Upper and Lower river basin, both in rock shelters and open air spaces, although always in low quantities. The origin of this method is not clear although the dated evidences are older in the western part of the basin. The end of the use of Levallois coincides with a hiatus in the occupation of the western area. This abandonment, according to current genetic and cultural information, could be related to the entrance of a new population after an arid period, which is possible due to low population densities in Southern Patagonia. In this paper we explore the relationship between the Levallois and other reduction methods, both previous and contemporary, as a way of understanding if technological changes were abrupt or not. Information obtained will also be related to raw material acquisition and changes in the characteristics of the sites occupied.

Keywords: Patagonia, hunter, gatherers, Levallois flintknapping method

*Speaker

THE HUMAN OCCUPATION IN THE CENTRAL PAMPEAN DUNEFIELDS OF ARGENTINA DURING THE HOLOCENE

Pablo Messineo ^{*† 1}, Nahuel Scheifler ¹, María Álvarez ¹, Mariela González ¹, Nélide Pal ², María Barros ¹, Gustavo Politis ^{1,3}

¹ INCUAPA-CONICET, Facultad de Ciencias Sociales, Universidad Nacional del Centro de la Provincia de Buenos Aires. (INCUAPA-CONICET) – Av. Del Valle 5737, Olavarría (B7400JWI), Buenos Aires., Argentina

² CADIC-CONICET, Centro Austral de Investigaciones Científicas, Laboratorio de Antropología. (CADIC-CONICET) – B. Houssay 200, Ushuaia (9410), Tierra del Fuego., Argentina

³ División Arqueología, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata. (FCNyM-UNLP) – Paseo del Bosque S/N, La Plata (B1900FWA), Buenos Aires., Argentina

In the last decades, archaeological investigations were carried out on most areas of the Pampa grasslands of Argentina. These research generated several regional models related to diverse topics of prehistoric hunter-gatherers. However, the West area, recently formally defined as the Central Pampean Dunefields, largely devoid of systematic research, with very discontinuous field work and scarce analysis and 14C dates, did not significantly contributed in the generation of such models. This situation changed after 2010, when new systematic and continuous research started in this area.

In this presentation different lines of archaeological and paleoecological evidences are integrated in order to generate a model of human occupation for the Central Pampean Dunefields. To build this model, the results of faunal, bioarchaeological, techno-morphological, and chronological analyses obtained in several archaeological sites are presents and discussed.

The main landform of the Central Pampean Dunefields are linear dunes, 100–130 km long and 2–3 km wide, with a general N–NE trend, associated with parabolic dunes with temporaries shallow lakes and low frequency of permanent water sources during dry periods. One critical characteristic of this area is the absence of lithic raw materials; all the stone outcrops are located between 120 and > 500 km away from the sites.

The early traces of humans in the Central Pampean Dunefields date back to ca. 10,000 years cal BP (Burial 1 from Laguna de los Pampas). For later period, the archaeological contexts indicate that guanaco (*Lama guanicoe*) was the main faunal resource in this area, followed by the pampean deer (*Ozotoceros bezoarticus*), the greater rhea (*Rhea americana*), armadillos, and other small species. This subsistence pattern is also supported by isotopic values obtained from human remains dated to the middle/late Holocene. The lithic assemblages mainly consist of artifacts made on orthoquartzite and chert from the Tandilia hill range and, in lower frequencies, other raw materials coming from diverse vectors of provenience (south, west, southeast, and northwest). Different types of reduction sequences, chipping techniques, and uses of the tools

*Speaker

†Corresponding author: pablogmessineo@hotmail.com

were identified in different moments of the Holocene. The chronology of the human occupation in the Central Pampean Dunefields shows a strong signal along the Holocene with some gaps. More research is still necessary in order to know if these hiatus are related to changes in human mobility and settlement patterns or it is a sampling bias derived from the limited number of radiocarbon dates available.

Keywords: Central Pampean Dunefields, hunter and gatherers, human occupation model, technology, zooarchaeology, bioanthropology

Warm it up! Using experimental archaeology to test a shark teeth extracting hypothesis

Simon-Pierre Gilson * ^{1,2}, Andrea Lessa ¹

¹ National Museum of Rio de Janeiro/ Federal University of Rio de Janeiro (MN/UFRJ) – Programa de Pós-Graduação em Arqueologia Museu Nacional, Universidade Federal do Rio de Janeiro Quinta da Boa Vista, s/nº São Cristóvão 20940-040 Rio de Janeiro, RJ, Brazil

² Laboratório de Estudos Interdisciplinares em Arqueologia- Federal University of Santa Catarina (LEIA-UFSC) – Departamento de História CFH/UFSC Campus João David Ferreira Lima -Trindade - Florianópolis/SC – BRASIL, Brazil

Shark teeth are common archaeological elements in coastal site around the world. Used by precolonial groups for different purposes, it must be first extract from the jaws, which is an uneasy task when the bones are still fresh. During processing of shark carcasses to develop a faunal reference collection, teeth showed an association between the heat of the boiling water and its spontaneous avulsion from within the alveoli. This is an interesting data when inserted in the context of zooarchaeological studies of the Rio do Meio site (southern Brazil, 500-700 years calBP), which presents a high frequency of 695 (30%) shark teeth with thermal alteration marks. In spite of the large amount of this type of material in the Brazilian coastal sites, it has not been discussed until now how they were removed. On the other side, burn marks observed in some of them have been associated with feeding practices. The present work presents the results of an experimental archaeology experience based on the use of fresh shark heads submitted to the heat by cooking in water inside clay pots, and by direct and indirect heating on campfires. Time and temperature have been monitored, shark teeth adhesion within the alveoli have been regularly checked, and the ashes were carefully screened to recover all fragments. It was also done the spatial distribution of this material in the site, in association with the combustion structures. From these data we intend to discuss the possibility of the presence of shark teeth in the site from a new perspective. It would be the scrap or the result of accidental loss during the processing of the carcasses for the pullout. The objective was to use it in the manufacture of artifacts, quite common among the groups that occupied the studied region.

Keywords: Zooarchaeology, Experimental archaeology, shark teeth, Coastal site, Brazil

*Speaker

Une séquence archéologique du stade isotopique 2 : le site de Barra d'Antonio (Brésil) An archaeological sequence of isotopic stage 2: the site of Barra d'Antonio (Brazil)

Maria Gluchy ^{*† 1}, Eric Boeda ^{*}

², Christine Hatté ^{*}

³, Christelle Lahaye ^{* ‡ 4}, Michel Fontugne ^{*}

³, Haruan Straioto ^{* § 1}

¹ Université de Rio grande do Sul (Brésil – Brazil)

² UMR 7041 – Université Paris Nanterre – France

³ Umr 8212 – CNRS : UMR8212 – France

⁴ Université Bordeaux 3, (France) – Université Bordeaux 3, (France) – France

Dans le cadre de la "Mission archéologique française du Piauí (Brésil), les premiers peuplements préhistoriques en Amérique du Sud", nous fouillons plusieurs sites archéologiques dont celui de Barra de Antônio, depuis 2014.

Le site de Barra d'Antonio est un site d'abri sous roche situé dans le massif calcaire d'Antero à quelques kilomètres de la Serra da Capivara (Brésil). Ce site présente une séquence chronoculturelle Pleistocène et Holocène ancien. On y dénombre plus de 5 couches archéologiques dont la plupart sont comprises entre 20000 et 10000 ans, rendant compte de l'ensemble de la phase de transition LGM/tout début de Holocène. La diversité des industries et la richesse de la faune (mégafaune et mesofaune) témoigne de populations occupant de façon continue un même territoire quelques soient les modifications climatiques. L'identification des traditions techniques de chacun des ensembles archéologiques atteste de changements tout en conservant un fond commun de connaissances. Nous serions plutôt en présence de populations se transformant localement, adoptant au fur et à mesure du temps de nouvelles stratégies techniques associées à une gestion des matières premières différentes.

Ce site est donc un excellent témoin pour aborder cette période méconnue

*Speaker

†Corresponding author: mgluchy@gmail.com

‡Corresponding author: chri.lahaye@gmail.com

§Corresponding author: hharuan@gmail.com

As part of the "French archaeological mission of Piauí (Brazil), the first prehistoric settlements in South America", we excavate several archaeological sites including that of Barra de Antônio, since 2014. The site of Barra d'Antonio is a shelter site under rock located in the limestone massif of Antero a few kilometers from the Serra da Capivara (Brazil). This site presents a chronocultural sequence Pleistocene and Holocene ancient. There are more than 5 archaeological layers, most of which are between 20,000 and 10,000 years ago, accounting for the entire transition phase LGM / early Holocene. The diversity of the industries and the richness of the fauna (megafauna and mesofauna) testify of populations occupying in a continuous way the same territory whatever the climatic modifications. The identification of the technical traditions of each archaeological ensemble attests to changes while maintaining a common knowledge base. We would be dealing, at first, with populations that are transforming locally, adopting over time new technical strategies associated with the management of different raw materials.

Keywords: pléistocène, megafaune, lithique, Brésil

Peuplement et occupation de l'espace dans le sud-ouest de la province de Chubut (Patagonie Argentine)

Cecilia Beatriz Pérez De Micou * ^{1,2,3}, Analía Castro *

^{1,2,3}, María Laura Casanueva * † ⁴, Lucía Gutiérrez * ‡ ^{1,4}, Florencia Ronco * § ^{1,3}

¹ Universidad de Buenos Aires [Buenos Aires] (UBA) – Viamonte 430/44 C1053ABJ, Ciudad de Buenos Aires, Argentina

² Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) – Avda. Rivadavia 1917 - CP C1033AAJ - Cdad. de Buenos Aires, Argentina

³ Instituto Nacional de Antropología y Pensamiento Latinoamericano (INAPL) – Tres de Febrero 1378 1426. Buenos Aires, Argentina

⁴ Instituto nacional de Antropología y Pensamiento Latinoamericano (INAPL) – Tres de Febrero 1378 1426. Buenos Aires, Argentina

Cette recherche a été développée au SO de la province de Chubut (Patagonie Argentine). Elle présente des nouvelles informations sur les sociétés qui ont habité cette région dans le passé, en tenant compte des premières occupations à celles qui ont eu lieu au moment du contact indigène-créole.

L'excavation de la grotte principale du site Casa de Piedra de Roselló (CP1) et l'analyse des vestiges archéologiques récupérées ont permis la clarification de la séquence de peuplement de la zone avec des dates allant de 9 mille ans AP cal.

L'analyse techno-morphologique des artefacts lithiques indiquait, à titre préliminaire, une utilisation du site pour des activités multiples tout au long de la séquence. Les études de provenance de l'obsidienne nous ont permis de discuter des tendances temporelles concernant l'utilisation de cette matière première qui n'est pas présente au SO du Chubut: 1) une utilisation plus diversifiée des sources d'obsidienne pour les premiers moments d'occupation de la zone; 2) une augmentation de la fréquence d'utilisation de l'obsidienne pour la période comprise entre 5 600 et 7 700 ans; et 3) l'incorporation de l'obsidienne à partir de sources situées à de grandes distances pour les moments récents, permettait délimiter des territoires d'exploitation différentiels.

Keywords: Archaeologie, Patagonie argentine, Chasseurs, Territoire, Ressources lithiques, obsidienne

*Speaker

†Corresponding author: mlauracasanueva@gmail.com

‡Corresponding author: luciagutierrez94@gmail.com

§Corresponding author: florencia.ronco@gmail.com

Les productions de lames de hache polies dans des sites de l'Holocène tardif de la Cidade de Pedra (Mato Grosso)

Juliana De Resende Machado ^{*† 1,2}, Agueda Vilhena-Vialou ³

¹ Université Paris Nanterre (UPN) – UMR 7055 - Préhistoire et Technologie – 21 allée de l'Université.
92023 Nanterre Cedex, France

² Musée du Quai Branly – Département de la Recherche et de l'Enseignement – France

³ Muséum National d'Histoire Naturelle (HNHP) – UMR 7194 - Histoire Naturelle de l'Homme
Préhistorique – 1 rue René Panhard 75013 Paris, France

La région la plus occidentale du Brésil Central est considérée comme une aire de confluence des cultures archéologiques pendant la période précoloniale récente. Elle a une histoire encore fragmentaire, principalement à cause de notre méconnaissance d'une chronologie fine des occupations, de l'organisation socioéconomique des sociétés, ainsi que des éléments caractéristiques de la culture matérielle, mis à part la céramique pour certaines cultures. Nous présenterons dans cette communication les productions de lames de hache polies, faites pendant l'Holocène récent, à partir de sites de la région archéologique de la *Cidade de Pedra*, située au sud-est du *Mato Grosso*, dans la transition entre le Brésil Central et le *Pantanal*. Nous avons choisi l'analyse technologique comme méthode de travail. Elle a pour postulat qu'une action technique n'est pas innée à l'être humain, car elle est apprise et transmise. Par cette approche, nous mettons en évidence les techniques et les méthodes de production afin de distinguer les traditions techniques. Dans ce processus, la connaissance de la matière première est fondamentale. De ce fait, nous nous sommes aussi basées sur les précédentes études de caractérisation des roches de la région et de localisation des possibles sources d'approvisionnement. Les lames de hache finalisées, les préformes et leurs restes de taille correspondants sont d'une matière première locale : la roche métamorphique verte. Le processus de métamorphisme ne se manifeste pas de manière homogène sur tout le Groupe *Cuiabá*, formation d'où provient la matière. En outre, elle peut se présenter sous forme de supports plus au moins épais. De telles caractéristiques sont observées sur les pièces finalisées et sur leurs préformes. Ainsi, nous avons identifié deux chaînes opératoires de production : l'une sur bloc aplati et l'autre sur supports plus épais. Ces chaînes opératoires aboutissent en pièces de morphologies également distinctes. Les sites de la *Cidade de Pedra* présentent des éléments pour la reconstitution des traditions techniques des lames de hache, un objet si important pour la période et diffusé dans différentes régions et traditions archéologiques. Notre étude est une contribution ponctuelle, dans le temps et dans l'espace, mais elle aide à reconstituer une partie de l'histoire des groupes précoloniaux de cette région. Pour chaque site, bien connaître les modalités d'exploitation de la matière première et les mettre en lien avec les chaînes opératoires de sa transformation en vue d'obtenir des objets finis est un premier pas vers l'identification d'éventuels contacts entre groupes archéologiques voisins.

*Speaker

†Corresponding author: ju.dr Machado@hotmail.com

Keywords: Holocène récent, sud, est du Mato Grosso, technologie lithique, traditions techniques, lames de hache polies.

Peuplement et Technique: les deux Brésil

Antoine Lourdeau * 1,2

¹ Histoire naturelle de l'Homme préhistorique (UMR 7194 - HNHP) – Muséum National d'Histoire Naturelle (MNHN) – Musée de l'Homme - 17 place du Trocadéro - 75116 Paris, France

² Universidade Federal de Sergipe - Programa de Pós-graduação em Arqueologia (UFS - PROARQ) – Av. Samuel de Oliveira s/n - 49170-000 - Laranjeiras – SE, Brazil

Au cours des premières périodes d'occupation des basses terres sud-américaines, au Pléistocène final et à l'Holocène ancien, le Centre et le Sud du Brésil se distinguent par la nature des vestiges lithiques mis au jour. Ces différences, révélées depuis plusieurs décennies par les approches typologiques de quelques catégories d'artefacts considérés comme fossiles-directeurs, tendent à se confirmer à la lumière de nouvelles analyses technologiques visant à la compréhension de l'ensemble des systèmes techniques. Dans le Sud, typologiquement caractérisé par la production de pointes de projectile bifaciales, les études technologiques et techno-fonctionnelles montrent un fort investissement dans le débitage d'éclats, selon des méthodes relativement élaborées, de même qu'un façonnage bifacial orienté vers l'obtention de supports d'outils variés. Le Centre, en revanche, a livré des solutions techniques assez originales: la production d'outils sur galets, les débitages de petits éclats et le façonnage unifacial, très marqué à partir de la transition Pléistocène-Holocène dans le technocomplexe Itaparica. Les contextes chronologiques et spatiaux dans lesquels s'incluent ces activités techniques révèlent deux processus de peuplement très distincts, entre le Sud et le Centre du Brésil. Alors que l'occupation du Brésil Central semble ancrée assez profondément dans le Pléistocène, profondeur temporelle qui pourrait expliquer, par une évolution sur place, l'originalité des comportements techniques qu'on y reconnaît à l'Holocène ancien, le Sud paraît avoir été peuplé plus récemment, au cours de la transition Pléistocène-Holocène, peut-être par une expansion vers le nord depuis les implantations préhistoriques du cône Sud (en Argentine et en Uruguay). Nous proposons de présenter ici une synthèse sur les peuplements et les premiers moments d'occupation de ces "deux Brésil", en y intégrant les données les plus récentes sur la technologie lithique. Une meilleure connaissance des différences entre ces régions, le Centre tropical et le Sud plus tempéré, est fondamentale pour notre compréhension de la préhistoire atlantique de l'Amérique du Sud, et en particulier des processus de peuplement des basses terres.

Keywords: Brésil, Peuplement, Technologie lithique, Pléistocène final, Holocène ancien, BRAZIL, PEOPLING, LITHIC TECHNOLOGY, LATE PLEISTOCENE, EARLY HOLOCENE

*Speaker

Analyse tracéologique du matériel lithique poli avec dépression semi-sphérique de Mostarda: premières donnés. Rio Grande do Sul – Brésil

Matheus Pereira Da Costa ^{*† 1}, Maria Gluchy ^{* ‡ 1}

¹ université de rio grande do sul – Brazil

La zone du rio Grande do Sul, au Brésil, est un vaste territoire aux caractéristiques environnementales et culturelles singulières. Des sites archéologiques peuvent se trouver sur les dunes près des lacs ou près de la mer et de tumulus "cerritos" dans les zones basses, avec du matériel poli de formes et de matières premières différentes. Pour commencer, nous avons choisi de nous consacrer aux seuls artefacts communément appelés "quebra coco" ce qui peut se traduire par : "pour casser les fruits d'un palmier", et que sa redondance est très importante pas seulement au Rio Grande do Sud- Brésil mais dans tout l'Uruguay. Nous avons choisi deux niveaux d'analyse. En premier lieu l'approche techno-fonctionnelle, reprenant la notion de chaîne opératoire développée par André Leroi-Gourhan afin d'analyser le suivi spatial et temporel des transformations technologiques de la matière première brute à l'outil et en second lieu l'analyse tracéologique. Nous présentons les premières résultat de ces deux niveaux d'analyse qui montre des donnés très différents de ce qui la littérature archéologique proposaient sur la fonctionnalité de ces artefacts.

Keywords: Brésil, Holocène, outils polis, tracéologie

*Speaker

†Corresponding author: mpereiracosta2@gmail.com

‡Corresponding author: mgluchy@gmail.com

**XXV-2. The peopling of the Andes:
Updating and new contributions.**

ANIMAL CONSUMPTION IN A EARLY ANDEAN HUNTER GATHERER CONTEXT: ARCHEOZOOLOGICAL ANALYSIS IN ALERO EL BAJO, ARICA HIGHLANDS-NORTHERN CHILE

Camila Castillo * 1,2

¹ Postgrade in Anthropology Tarapaca University (PhD. Student) – Chile

² TARUKARI ONG – Chile

The hunter gatherer of the first human occupations (10.700-8.000 B.P.) in Arica highlands (2.500-3.800 m.a.s.), northern Chile, developed a close relationship with their environment; reflected in a dialectical bond with the surrounding fauna, essentially camelids, through the exhaustive consumption of these animals for adaptive subsistence and social aspects.

This research presents the results of archeozoological analysis performed on the animals bones evidences of Alero El Bajo (10.710-5.820 B.P) in Arica highlands. The analyzes consist in the contextualization of evidence, taxonomic and anatomical identification and characterization, general quantification index (NISP, MNE, MNI, MAU), quantification of anthropic modifications (IAS, PAR) and taphonomic caracterizacion (weathering, animal intervention, plants marks, and trampling).

The results are interpreted under the concept of human-animal interdependence, wich refers to a link in which animals acquire an equivalent role in importance to human being. We think that the established bond between the first settlers and the animals, apprehensible through the taxonomic dimensions and the anthropic modifications of the archaeozoological record, was an important factor in explaining the consolidation of highlands adaptation in Arica foothills. This research has been funded by Proyect FONDECYT 1130808

Keywords: Archaeozoology, Hunter Gatherer, Northern Chile, Andean archaeology

*Speaker

Peuplement humain ancien (ca. 12.000 ans) dans le désert d'Atacama, nord du Chili: L'industrie lithique bifaciale du site sur carrière Chipana-1

Katherine Herrera *[†] 1,2, Jacques Pelegrin *[‡] 1, Eugenia Gayo *[§] 3,4,
Daniela Osorio *[¶] 5, Paula Ugalde *^{||} 6, Claudio Latorre *^{**} 7,8, Calogero
Santoro *^{††} 2

¹ UMR 7055 Laboratoire de Préhistoire et Technologie, CNRS (Prétech) – Université Paris Ouest
Nanterre La Défense – France

² Laboratoire d'Archéologie et de Paléoenvironnement, Institut de Haute Recherche, Université de
Tarapacá (LAP) – Chile

³ Centre pour la Science du Climat et de la Résilience, Université de Concepción – Chile

⁴ Département d'Océanographie, Université de Concepción – Chile

⁵ l'Institut d'Archéologie de l'Université College London – United Kingdom

⁶ l'École d'Anthropologie de l'Université de l'Arizona – United States

⁷ Département d'écologie, Université Católica de Chile – Chile

⁸ Centre du Désert d'Atacama et à l'Institut d'Écologie et Biodiversité – Chile

Le site Chipana-1, situé au cœur du désert d'Atacama à 1200 m d'altitude dans la bassin " Pampa del Tamarugal ", témoigne de l'adaptation des anciennes sociétés humaines à un environnement hyper aride, et apporte de nouvelles données au débat sur les premiers établissements humains en Amérique du Sud.

La bonne conservation stratigraphique et une dizaine de datations C14 montrent que le site a été fréquenté surtout aux environs de 11 400 cal BP. Chipana-1 est un site de production lithique essentiellement de façonnage bifacial, avec un peu de débitage d'éclats en surface, sur un affleurement de roche silicifiée de bonne qualité. Ce type de site est inédit dans le nord du Chili. On y observe les étapes initiales telles que la sélection qualitative de la matière première et le dégrossissage, puis les éclats de façonnage d'assez grandes pièces bifaciales non retrouvées probablement exportées pour être finalisées dans d'autres sites voisins. Des pièces bifaciales plus petites y ont été également façonnées, dont une pointe de projectile de type " Tuina " connu plus au sud dans les Hautes Terres d'Atacama. On relève aussi la présence de petits éclats de façonnage bifacial en matières premières allochtones, qui montrent l'apport à Chipana-1 d'objets lithiques commencés ailleurs. Enfin, certains outils d'élaboration rapide indiquent la pratique

*Speaker

[†]Corresponding author: herreragodoy@hotmail.com

[‡]Corresponding author: jacques.pelegrin@cnrs.fr

[§]Corresponding author: kenagayoh@gmail.com

[¶]Corresponding author: daniosorio8@gmail.com

^{||}Corresponding author: arqueo.paulaugalde@gmail.com

^{**}Corresponding author: clatorre@bio.puc.cl

^{††}Corresponding author: calogero_santoro@yahoo.com

d'autres activités encore inconnues.

Ainsi Chipana-1 fut, pour des groupes de chasseurs-cueilleurs encore inconnus à la fin du Pléistocène, un important point d'acquisition de roche taillable et de production lithique dans le désert de l'Atacama, inséré dans un circuit de mobilité à peine entrevu.

Keywords: Site préhistorique, Amérique du Sud, Atacama, technologie lithique, chaîne opératoire, bifacial, atelier et carrière.

New insights on the oldest lithic assemblages of El Abra and Tibitó (Cundiboyacense Plateau, Eastern Cordillera, Colombia)

Brunella Muttillio ^{*† 1}, Giuseppe Lembo ¹, Ettore Rufo ¹, Roberto Lleras Pérez ², Carlo Peretto ¹

¹ Università degli Studi di Ferrara – Italy

² Academia Colombiana de Historia – Colombia

The strategic position of Colombia plays a key role in the knowledge of the early human peopling of South America, in the broader debate on the first peopling of the Americas. The scarcity and fragmentary nature of archaeological record, together with the presence of critical elements related to several early sites, prevent a full and detailed comprehension of chronology, routes of dispersion and technology of the earliest hunter-gatherers of Colombia.

The early human settlement of Colombia is characterised by a widespread interregional technological and typological diversity in lithic assemblages, distinctive contemporaneous regional features and patterns, whose origins and interactions are still unclear. How to explain the interregional technological and typological diversity in lithic assemblages of late Pleistocene sites? Does it represent different cultural groups or different functional activities?

From the mid-60s onwards, this diversity was explained by postulating the existence of two different lithic traditions (i.e. *Abriense/Tequendamiense* paradigm, deriving its name from the eponymous sites, El Abra and Tequendama). However, in our opinion the *Abriense/Tequendamiense* definition is not particularly clear, precise and satisfying. This multifaceted definition, which includes several criteria of different nature, not necessarily connected, can easily lead to misleading interpretations and is not adequate to identify the heterogeneity of Colombian lithic industries.

Therefore, we support the necessity to implement a techno-economic analysis of the lithic assemblages overcoming the restrictive traditional distinction and to provide new insights on the interpretation of the oldest lithic industries of the Colombian territory.

In this framework, a reanalysis of the lithic assemblages corresponding to Tibitó 1, El Abra 2 and El Abra 3 (Cundiboyacense Plateau, Eastern Cordillera), traditionally considered the oldest and most significant sites of Colombia, has been conducted.

Our review has highlighted several discrepancies and critical elements contained in previous studies.

*Speaker

†Corresponding author: brunella.muttillio@gmail.com

Keywords: Colombia, lithic industry, early archaeological sites, review

Systèmes techniques et premier peuplement dans la Puna de la province de Jujuy, Argentine

Rodolphe Hoguin *† 1

¹ Consejo Nacional de Investigaciones en Ciencias y Técnicas (CONICET) – Argentina

Résumé

Dans ce travail nous présentons les données techniques issues principalement de la technologie lithique des abris-sous-roche Hornillos 2 (Susques) et Cerro Bayo (Barrancas), dont les contextes les plus anciens sont datés entre *ca.* 12.000 et 10.300 ans cal. BP. Les chaînes opératoires lithiques et d'autres matériaux montrant un bon état de conservation (végétaux, os, peaux, fibres animales, etc.) nous permettent ainsi de restituer des systèmes techniques liés aux activités domestiques et symboliques réalisées sur les sites. Nous observons des chaînes opératoires flexibles et diversifiées, qui seraient le reflet de connaissances techniques de populations en cours d'adaptation à un nouvel environnement (> 3500 m asl). L'approvisionnement des matériaux et leur gestion, seraient en adéquation avec des populations territorialisées dans la Puna, mais nomades selon un axe nord-sud. La révision et la comparaison avec d'autres sites de la région nous indique des groupes à importante mobilité résidentielle, et dont la subsistance est basée sur la chasse et la cueillette de ressources locales, avec une relative spécialisation sur les camélidés. En ne rejetant pas la possibilité d'un peuplement antérieur en vue des dernières découvertes, les contextes ici présentés seraient le reflet de (nouvelles) populations récemment arrivées et adaptées à ce territoire.

Resumen

En este trabajo, presentamos los resultados sobre las técnicas originarias principalmente obtenidos por la tecnología lítica de los aleros Hornillos 2 (Susques) y Cerro Bayo (Barrancas), cuyos contextos más antiguos están fechados entre *ca.* 12.000 y 10.300 años cal. AP. Las cadenas operativas líticas y de otras materias primas bien conservadas (vegetales, huesos, pieles, fibras animales, etc.) nos permiten así reconstituir los sistemas técnicos relacionados a las actividades domésticas y simbólicas realizadas en los sitios. Observamos cadenas operativas flexibles y diversificadas, que serían el reflejo de conocimientos técnicos de poblaciones en proceso de adaptación a un nuevo ambiente (> 3500 msnm). El aprovisionamiento de las materias primas y su gestión, serían en adecuación con poblaciones sectorizadas en la Puna, pero nómadas según un eje norte-sur. La revisión y la comparación con otros sitios de la región nos indican que los ocupantes fueron grupos de alta movilidad residencial, y con una subsistencia basada en la caza y recolección de recursos locales, con una relativa especialización en los camélidos. Sin rechazar la posibilidad de un poblamiento anterior, en relación a los últimos hallazgos, los contextos acá descritos serían el reflejo de (nuevas) poblaciones recientemente allegadas y adaptadas a este sector de las tierras altas.

*Speaker

†Corresponding author: roddh2002@yahoo.fr

Keywords: Peuplement, Puna, système technique, chaînes opératoire

Technological strategies and projectile points diversity during the early Holocene in the South Central Andes: The case of Alero Cuevas site, Pastos Grandes Basin, Puna of Salta Province (Argentina)

Federico Restifo *† ¹

¹ Universidad Nacional de Salta – Argentina, Argentina

The Alero Cuevas site is located in the high lands of Salta Province (Argentina), in a ravine at a height of 4400 masl. The site shows an archaeological sequence extended along the Holocene. Specifically, in this work we analyze the lithic assemblage from the early Holocene archaeological component. This component is dated in ca. 9800 BP; ca. 9600 BP and ca. 8500 BP. From the point of view of the human behavioural ecology theory we evaluate the work investment in the lithics artifacts manufacture and the lithics raw materials selection and use. We measure different variables as blanks, retouch extension, retouch technics, resharpening patterns, among others, and we analyze local and non local raw materials selection. Those rocks comes from more than 200 km (obsidians) until 10 km (andecite, quartzite). The results are interpreted in the frame of the regional paleoenvironmental and demographic scenario proposed for the early chronology. Taking in to account colder and moister environment conditions during the early Holocene and the expectancy of less demographyc density dependent pressures we propose a tendency towards a low work investment in lithics artifacts manufacture, as an optimal decision oriented to an energetic return maximization of the hunter-gatherer niche. Moreover, we discuss the results on a wide spatial scale, considering different study areas of the South Central Andes. Finally, working in that scale, we evaluate projectile points diversity with a focus on classes richness and metric variation, with the aim to discuss cultural transmission patterns in the paleoenvironmental and demographyc context signaled.

Keywords: early holocene, andes, evolution, lithic artifacts

*Speaker

†Corresponding author: federicorestifo@gmail.com

Technological Changes and Social Interaction Networks during the Colonization of Central and Southern Atacama Highlands

Rodrigo Loyola ^{*†} ¹, Lautaro Núñez ², Isabel Cartajena ³

¹ Phd Program, UMR 7055 Prehistoire et Technologie (PreTéch) – Université Paris Ouest Nanterre La Défense – 92023 Nanterre cedex, France

² Instituto de Arqueología y Antropología, San Pedro de Atacama, Universidad Católica del Norte – Gustavo Le Paige N° 380, San Pedro de Atacama, Chile

³ Facultad de Ciencias Sociales, Departamento de Antropología – Ignacio Carrera Pinto 10, Santiago, Chile

The initial peopling of the Central and Southern Atacama (22-25 ° S, northern Chile) began around *ca.* 13,000 yr BP and conclude nearly to *ca.* 9,000 yr BP. During this period, the human groups dispersed to an unknown landscape, characterized by extreme aridity, a steep topography and altitudes ranging between 2,000 to 4,500 masl.

Changes in the social organization and a greater knowledge of the environment, allowed them to integrate new territories, until reaching all habitable environments. Each of those spaces involved different *tempos* and rhythms of colonization, at a time of severe climatic changes. In some cases, they were intensely populated from the beginning and then abandoned, as happened in the Tuina mountains and the Atacama, Imilac and Punta Negra basins, in the Andean *pre-cordillera* (3,000 to 3,800 masl). The occupation of the foothill oasis located in lower altitudes (2,000 masl) instead, took almost two thousand years in the case of the Tambillo marshes. However, they harbored intense human occupations where residential structures and semi-permanent site-camps were built. The access to the high *puna* (above 3,800 masl) occurred only after *ca.* 9,000 yr BP, during brief intra-annual lapses, but stably and continuously in the inter-annual scale, as has been noted in Aguas Calientes, Tuyajto and San Martín.

The study of lithic assemblages provides us an exceptional entry to discuss the process of colonization. The classical archaeological approach has explained technical variability through historical-cultural periods and concept as ‘traditions’, based on the distribution of diagnostic artifacts at micro-regional scales. Contrary to this vision, certain disruptions and continuities in technological systems suggest an extremely dynamic scenario. We propose that in a context of settlement diversification and familiarization with the landscape, learning by ‘trial and error’ were privileged. This encouraged continuous and simultaneous innovations, with different degrees of success. As a result, technologies circulated at different spatial-temporal scales, within the framework of the interaction networks of the human groups. Finally, we link the diversification of lithic technologies during the terminal Early Holocene with an intensification and greater

*Speaker

†Corresponding author:

complexity of social networks.

To contrast this hypothesis, we evaluate and discuss changes in lithic technologies, experienced by the human groups during the colonization of Central and Southern Atacama, favoring the use of broad spatial and temporal scales. Lithic assemblages of archaeological sites distributed in different areas are studied, such as the foothill oasis (Tambillo-1), the Andean *precordillera* (Tuina-1, 5, Tulan-67, -68, -109, San Lorenzo-1, Punta Negra-1, -6, -19, -20 and Imilac-7, -13) and the lacustrine basins of the high *puna* (Aguas Calientes-1, San Martín-4A and Tuyajto-1B).

Keywords: Lithic Technology, Social Networks, Colonization, Early peopling, Central, South Atacama

Morphometric comparative analysis of an early Holocene skeleton from Cuncaicha rock shelter (Pucuncho Basin, Peru) and implications on high-altitude adaptation

Lumila Menéndez ^{*† 1,2}, Hugo Reyes-Centeno ¹, Kurt Rademaker ³,
Katerina Harvati ^{1,4}

¹ DFG Center for Advanced Studies “Words, Bones, Genes, Tools,” University of Tübingen – Germany

² Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata – Argentina

³ Department of Anthropology, Northern Illinois University – United States

⁴ Paleoanthropology, Senckenberg Centre for Human Evolution and Paleoenvironment, Eberhard Karls Universität Tübingen – Germany

Despite the relatively recent occupation of South America, human populations in the continent have been described as presenting larger morphological variation than expected under a neutral evolutionary model. The rich environmental diversity in the region is therefore hypothesized to have triggered multiple adaptive responses that resulted in rapid anatomical diversification. The high-altitude Andes constitute a unique, challenging environment that has led to physiological and anatomical adaptations in extant populations, particularly in thoracic shape. Recent excavations at the Cuncaicha rock shelter, located at 4480 meters above sea level yielded five human skeletons dated from ~ 9 to 3 14C ka cal BP, enabling the study of the anatomy of the earliest humans living at high altitudes. Thus, the aims of this paper are to: 1) analyze the biological affinities of the earliest Cuncaicha specimen with other early and late Holocene samples from South America, and 2) evaluate if its cranial and thoracic anatomy could be associated to high-altitude adaptation. To do so, CT-scans were obtained on cranial and rib fragments, 2D measurements were registered on them, and the shape was posteriorly compared to morphometric databases that include South American samples from the early and late Holocene, and from highlands and lowlands. We hypothesized that the early Holocene skeleton would show affinities to other early and geographically proximate samples from high altitudes. Our results affirm that the facial skeleton of the earliest individual from Cuncaicha shares affinities to other early Holocene samples; however, contrary to expectations, it is more similar to samples from the lowlands (Lagoa Santa, Argentinean Pampas) than to other highland Andean samples (Tequendama, Checua). Indeed, its closest affinities are to the Lagoa Santa series. In thoracic shape, this early Holocene individual exhibits closer affinity to lowland populations (Ancón, Arica) than to other recent Andean highlanders (Atacama, Machu Picchu, Cuzco) or to a late Holocene individual also recovered from the rock shelter. We interpret these results to suggest that the anatomy associated with high-altitude adaptation was not present in this early Holocene individual. Our results therefore have important implications for understanding the mode and timing of biological adaptation to high altitude environments. **Acknowledgements:**

*Speaker

†Corresponding author: lumilam@gmail.com

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Keywords: South America, early Holocene, highlands, morphological variation

LE PEUPEMENT CONTRASTÉE AU NORD-OUEST DE L'AMÉRIQUE DU SUD: CHASSEURS-CUEILLEURS SPÉCIALISÉES ET PREMIERS HORTICULTEURS

Carlos Lopez ^{*†} ¹, Martha Cano[‡] ²

¹ Université Technologique de Pereira, Colombie (UTP) – Carrera 27 10-02 Barrio Alamos - Risaralda - Colombia - AA: 97 - Código postal: 660003, Colombia

² Investigadora (UTP) – Calle 27 No. 10-02 Barrio Álamos, Pereira (Risaralda), Colombia

Les Andes du Nord-Ouest en Amérique du Sud, présentent des caractéristiques particulières du point de vue géographique. La trifurcation de la chaîne des Andes et l'existence des longues vallées du fleuve Magdalena et du Cauca génèrent des couloirs longitudinaux particuliers, paysages en contraste avec les régions du Pacifique, la plaine Atlantique, et les plaines orientales et l'Amazonie. Les recherches interdisciplinaires suggèrent des particularités environnementales qui semblent avoir conditionné les premières voies des peuplements. Au cours du Pléistocène, les glaciers entre 3000 à 5000 m d'altitude et les forêts denses des montagnes subtropicales ont été des obstacles presque inaccessibles, qui ont été temporairement ouverts après certaines éruptions volcaniques. Plutôt que la diminution des températures, les principales contraintes étaient en raison des changements marqués dans les précipitations et aussi des périodes récurrentes de volcanisme actif (principalement au centre et au sud de l'actuel territoire colombien). Les effets sur l'environnement ont été consignés dans les contreforts des montagnes et la dynamique des plaines alluviales des grands fleuves interandins. Grâce à un bon nombre d'études d'archéologie préventive et de la continuité d'une partie de la recherche archéologique, il y a de nouvelles données archéologiques (positives et négatives), des résultats paléoenvironnementaux et des dates C14 de la fin du Pléistocène et du début de l'Holocène, provenant des vallées et montagnes. Ces résultats montrent les premiers peuplements de chasseurs-cueilleurs dans les terres basses et contemporains des horticulteurs précéramiques dans les terres tempérées et hautes. L'approche à partir des instruments lithiques bifaciaux, représentés par des grattoirs et des pointes de projectile triangulaires sera présentée en détail, en contraste avec outils bifaciaux multifaciaux emmanchables, typiques des montagnes subtropicales des secteurs de la cordillère centrale et occidentale. Les données indiquent deux tendances de population; une liée à la dynamique des Caraïbes/Atlantique et des plaines et des terrasses des grands fleuves sud-américains, et une autre influence différente, l'occupation de la montagne qui pourrait être liée aux origines du Pacifique, liés à l'horticulture et au peuplement des forêts subtropicales.

*Speaker

†Corresponding author: cel@utp.edu.co

‡Corresponding author: mcano@utp.edu.co

Keywords: Chasseurs, cueilleurs, premiers horticulteurs, Colombie, peuplement des Andes Septentrionales

**XXV-3. Paints and rupestral
engravings of Americas: cultural and
territorial traces**

Approche multiscalaire des techniques artistiques dans l'art rupestre de l'extrême nord du Chili.

Carole Dudognon *† 1

¹ Travaux et recherches archéologiques sur les cultures, les espaces et les sociétés (TRACES) – Université Toulouse 2, Centre National de la Recherche Scientifique : UMR5608 – Maison de la Recherche, 5 allée Antonio Machado 31058 TOULOUSE Cedex 9, France

En art rupestre, la plasticité d'une œuvre est la première approche pour repérer les caractéristiques d'un groupe. L'archéologue saisit cette unité technique qui l'aide à définir les premiers cadres chronologiques ou cartes physiques du passage des populations préhistoriques. Dans le piémont andin, à l'extrême nord du Chili, les contextes archéologiques des sites d'art rupestre permettent de déterminer d'importantes activités de l'Archéologie récente (6000-3700 ans cal. BP) jusqu'à l'Intermédiaire tardif (500 ans cal. BP) (Sepúlveda et al., 2013). Les groupes se distinguent aisément à travers les différentes techniques employées (peintures, gravures et pétroglyphes) ou selon les différentes aires géographiques occupées (côte, basses vallées, piémont andin). Ces sites d'art rupestre chiliens nous montrent l'existence d'une très forte cohérence entre le biotope, les activités humaines et les techniques artistiques qui vont varier selon les paysages et selon les contextes socio-économiques des populations. Pourtant, à l'échelle de certains sites, la maîtrise de plusieurs procédés artistiques comme la peinture et la gravure par un même groupe, sur un même support nous montre parfois l'impossibilité de différencier ces deux modes opératoires. Le cas le plus significatif provient du site de Vilacaurani (région d'Arica-Parinacota) où l'imbrication de la peinture et de la gravure sur un même dispositif artistique rend cette dissociation inappropriée. L'usage de figures gravées sur un dispositif de peintures semble renforcer le champ lexical de l'artiste en utilisant la gravure comme un signifiant dans le système narratif. Selon les échelles d'analyse la différenciation des techniques artistiques est un atout pour comprendre l'articulation dans le temps et dans l'espace des populations anciennes mais elle ouvre aussi sur l'exploration de la richesse du langage esthétique de certains groupes.

Keywords: Art rupestre, Chili, Techniques artistiques, Etude multiscalaire

*Speaker

†Corresponding author:

Diffusion stylistique Mixteca-Puebla dans l'art rupestre de la fin du Postclassique au sud de la Mésoamérique : le cas de la Cueva Pintada de San Francisco Lempira au Honduras.

Eric Gelliot * ¹

¹ Université Paris1 Panthéon-Sorbonne – Université Paris I - Panthéon-Sorbonne – France

Le projet archéologique Lempira fut mené en 2011-2012 au Honduras, sous la tutelle du Centre d'Etudes Mexicaines et Centre-Américaines (CEMCA), de l'Université de Paris 1 Panthéon-Sorbonne et de l'Institut Hondurien d'Anthropologie et d'Histoire (IHAH). L'un des objectifs principaux était de clarifier la carte archéologique d'une région montagneuse située au sud-est du département de Lempira, au nord du rio Lempa et non loin de la frontière salvadorienne, et qui était au coeur des anciennes interactions culturelles entre la Mésoamérique et l'Aire Intermédiaire. Deux axes de recherche étaient privilégiés : la période de Contact et les traditions locales d'art rupestre, dans la continuité de nos travaux salvadoriens. Concernant l'art rupestre, le site de la Cueva Pintada de San Francisco est remarquable par la diversité de ses peintures et leur symbolique complexe. Au moins deux phases stylistiques sont identifiables, correspondant aux deux niveaux d'occupation révélés par un sondage. Le plus ancien présente de la céramique liée à l'horizon Classique récent (600-900 apr. J.-C.). Pour la seconde phase, différents indices stylistiques, comme des comparaisons avec les codex du groupe Mixteca-Puebla, montrent que ces peintures sont attribuables au Postclassique Tardif (1200-1524 apr. J.-C.). L'usage de la polychromie et celui de canons stylistiques Mixteca-Puebla démontrent une bonne connaissance du sujet représenté (modèle standard comme le serpent) et une parfaite maîtrise des outils, des matières picturales et des techniques. Ces facteurs mettent en lumière la présence d'un ou de plusieurs groupes d'artistes itinérants, sous l'autorité d'une élite mexicanisée, à la fin du Postclassique dans les montagnes au nord du rio Lempa. Cela pourrait possiblement être lié aux migrations pipiles de cette période. A travers l'étude de l'art rupestre, deux voies de diffusion stylistique Mixteca-Puebla sont ainsi mises en évidence depuis la frontière sud-est du Guatemala: une ligne passant par l'arc de la cordillère centrale et se diffusant dans les vallées (Guatemala, El Salvador et Honduras), et une autre passant le long de la côte pacifique (El Salvador, Nicaragua).

Keywords: art rupestre, Hondura, Lempira, Mixteca, Puebla, peintures

*Speaker

Gravures rupestres, religion et guerre au sud du Costa Rica

Felipe Sol * ¹

¹ Universidad de Costa Rica (UCR) – San Pedro de Montes de Oca. San José., Costa Rica

Gravures rupestres, religion et guerre au sud du Costa Rica

La guerre et la religion ont été des importantes forces de changement sociale qui ont influencé l'organisation politique et l'art en temps précolombiens. Cette investigation utilise information à l'échelle régionale et de communauté du sud du Costa Rica pour étudier de façon diachronique les changements dans les formes d'organisation politique. L'étude de l'utilisation de l'espace par les populations précolombiennes aide à connaître l'organisation productive, démographique et politique, mais aussi a découvrir un riche paysage rituel qui nous ouvre une fenêtre a la complexité de la religion et vision du monde de ses peuples.

Petroglifos, chamanes y guerreros en el sur de Costa Rica

Guerra y religión fueron importantes fuerzas de cambio social que influenciaron la organización política y el arte en tiempos precolombinos. El presente trabajo utiliza datos a escala regional y a nivel de comunidades de la zona sur de Costa Rica para estudiar de manera diacrónica los cambios en las formas de organización política. El estudio del uso del espacio por las poblaciones precolombinas ayuda a determinar la organización productiva, demográfica y política, pero también a descubrir un rico paisaje ritual que nos abre una ventana a la complejidad de la religión y cosmovisión de estos pueblos.

Keywords: Gravures rupestres, religion, guerre, Costa Rica

*Speaker

Les représentations d'objets de métal dans l'art rupestre du Rio San Juan del Oro (Bolivie méridionale): indicateurs chronologique et culturel

Françoise Fauconnier *† ¹

¹ Musée royaux d'Art et d'Histoire – Belgium

Sur les roches localisées dans la région du Rio San Juan del Oro, de nombreux pétroglyphes semblent correspondre à la représentation d'objets métalliques: des armes, des outils, des parures... L'analyse de leurs formes caractéristiques et du contexte iconographique dans lequel ils s'insèrent a non seulement permis d'identifier la culture dont ils sont issus et de les situer dans le temps. Bien que certains d'entre eux furent produits durant de longues périodes remontant au Formatif, d'autres n'apparurent que beaucoup plus tardivement, constituant ainsi un *terminus post quem*. La plupart des gravures répertoriées au cours de nos travaux de prospection (2006-2010) ont ainsi put être assignées à la culture chicha et datées entre le IXe et le XVe s.

Keywords: Bolivie méridionale, Rio San Juan del Oro, art rupestre, objets métalliques, Chicha, Développements Régionaux Tardifs, période inca

*Speaker

†Corresponding author: francoise.fauconnier@ekla.be

Les sites d'art rupestre de Guyane française dans les contextes local, régional et anthropologique.

Gérald Migeon * ¹

¹ Ministère de la Culture et CNRS (Centre national de la recherche scientifique) – Ministère de la Culture et de la Communication, CNRS : UMR8096 – Paris, France

Dans l'optique de cette communication, les sites d'art rupestre de Guyane française seront étudiés compris et interprétés dans leur contexte local (trois groupes), régional (amazonien) et anthropologique.

Les difficultés de datation, d'interprétation, d'attribution culturelle des vestiges archéologiques en général, et dans ce cas, des représentations rupestres, sont bien connues des archéologues de tous pays, et en particulier d'Amérique .

Mais cet état de fait ne doit pas nous empêcher d'émettre des hypothèses qui peuvent et doivent être proposées au sujet de ces manifestations souvent spectaculaires du génie humain.

En Guyane, et plus largement en, Amazonie, l'importance dans les mythologies, des montagnes, de la pierre, des représentations animales... a trouvé une expression durable et millénaire grâce au support que représentent les grandes parois, que ce soient celles des monts littoraux que celles des inselbergs émergeant de la forêt luxuriante.

L'intégration de ces manifestations dans le corpus plus général de tous les " artefacts " créés par les peuples anciens et retrouvés très partiellement par les archéologues, vise à mieux comprendre leur caractère, banal ou exceptionnel, et leurs significations pour des peuples ne laissant souvent aucune autre création durable en pierre. De ce fait, ces vestiges acquièrent pour certains chercheurs, un caractère spécial, qui les traitent parfois à part, ce qui pour moi, représente une erreur grave du point de vue méthodologique,

Keywords: archéologie de Guyane, art rupestre guyanais, Amazonie, Guyane, anthropomorphes, zoomorphes

*Speaker

Mixteca-Puebla stylistic diffusion in late post-classical rock art in southern Mesoamerica: the case of the Cueva Pintada of San Francisco Lempira in Honduras.

Eric Gelliot * ¹

¹ Université Paris1 Panthéon-Sorbonne – Université Paris I - Panthéon-Sorbonne – France

The archaeological project Lempira was carried out in 2011-2012 in Honduras, under the supervision of the French Center of Mexican and Central American Studies (CEMCA), of the University of Paris 1 Panthéon-Sorbonne and of the Honduran Institute of Anthropology and History (IHAH). Project's main mission was to clarify the archaeological map of the sector registered in the mountains of the Southeastern department of Lempira, north of the Rio Lempa, near the Salvadoran border, which it used to be the heart of the ancient cultural interactions between Mesoamerica and Intermediate Area. We focused on two research directions: the Contact Period and the study of local rock art traditions, in the continuation of our Salvadoran research. Regarding to rock art, the site of the Cueva Pintada de San Francisco is remarkable for the diversity of these paintings and their complex symbolic. At least two stylistic phases are identifiable corresponding to the two occupation levels revealed by a survey. The oldest one revealed ceramic linked to the horizon Late Classic (600-900 AD). A chronological correlation may exist with our first stylistic phase. For the second phase, different stylistic cues, like the comparisons with the codices of the Mixteca-Puebla group, show that these paintings are attributable to the Late Post-Classic (1200-1524 AD). The use of polychromy and the use of stylistic canons Mixteca-Puebla demonstrate a good knowledge of the represented subject (standard model like the snake) and a perfect mastery of tools, painting materials and techniques. These factors shed light on the presence of one or several itinerant artists groups under the authority of a mexicanised elite at the end of the Post-Classic period in the mountains North of the Lempa river. This could possibly be bound to the pipiles migrations of this period. Through the rock art study, two Mixteca-Puebla stylistic ways of diffusion are highlighted from the south-eastern border of Guatemala: a line passing through the arc of the Cordillera Central and radiant in the valleys (Guatemala, El Salvador and Honduras), and the other one along the Pacific coastline (El Salvador and Nicaragua).

Keywords: rock art, Lempira, Honduras, Mixteca Puebla

*Speaker

Peintures et gravures rupestres du nord du Michoacán, Mexique. Caractérisation culturelle et iconographie au Classique et au Postclassique.

Brigitte Faugere * ¹

¹ Archeologie des amériques (UFR 8096) – Université Paris I - Panthéon-Sorbonne – MAE Av de l' université Nanterre, France

Le centre nord du Michoacán a fourni de nombreux sites d'art rupestre gravé et peint. Si les abris peints sont localisés dans la partie la plus septentrionale, qui jouxte les terres semi-arides du nord du Mexique, les pétroglyphes sont abondants dans l'ensemble de la région et sont plus variés sur le plan iconographique. Dans cette conférence, nous reviendrons sur l'articulation entre peintures et gravures et sur leurs attributions chronologiques et culturelles. Si les gravures sont produites par les agriculteurs sédentaires au Classique et au Postclassique, les peintures restent isolées dans les régions parcourues au Postclassique par des groupes nomades. Cette attribution culturelle est confirmée par leur contenu iconographique et des comparaisons stylistiques. La découverte récente de gravures figuratives datant de cette même époque postclassique ouvre et renforce ces interprétations. Une évolution dans les rites et croyances des agriculteurs se dessine. Les implications dans le domaine historico-culturel éclairent le rôle des migrations dans l'émergence des royaumes postclassiques.

Keywords: peinture rupestre pétroglyphe Michoacan

*Speaker

Petroglyph Caves that Swallow the Sun: Four Examples from Jalisco, Mexico

Joseph Mountjoy * ¹

¹ Universidad de Guadalajara, Centro Universitario de la Costa (Dr.) – Av. Universidad 203, delegación Ixtapa, CP. 48280, Puerto Vallarta, Jalisco, México., Mexico

Caves, both natural and artificial, were important locations for solar observations and rituals in Mesoamerica, in part due to the belief that the sun passed through the underworld during the night and caves were thought to be portals to that underworld. Among the Mexica it was believed that it was the earth god/goddess Tlaltecuhli who swallowed the sun whole every evening and regurgitated it each morning. The modern Lacandon Maya believe the sun spends each night in a cave. During the past 42 years of recording and interpreting rock art in Jalisco, Mexico I have documented four examples of shallow caves having abundant petroglyphs on the walls, most of which appear to be sun symbols. In two cases the mouths of these caves are oriented directly to the east and in the other two cases to the southwest and west. Those oriented westward are well positioned to "swallow" some of the sun's rays in evening. The two oriented eastward are illuminated to the maximum by the sun on the eastern horizon on the March 20th equinox.

Keywords: petroglyphs, sun, Jalisco, Mexico

*Speaker

Rock art in Central and South America: An assessment about the relation between rock art and social differentiation

Pedro Arguello-Garcia * ¹

¹ Universidad Pedagógica y Tecnológica de Colombia (UPTC) – Avenida Central del Norte 39-115 , Tunja, Colombia

Archaeological research in hundreds of rock art sites through Central and South America have consistently proved that the practice of painting and engraving rocks was present since the beginning of the peopling of the continent. Although dating rock art has been particularly difficult, nowadays there are many of this sites whose chronology is properly known, and as a result it is feasible to trace its variation through time. As expected, transformations in modes of living were in accordance with changes in the rock art as well. For instance, it has been documented how changes in the economic sphere, specifically in food procurement –from appropriation economies to production economies-, elapsed parallel to new depiction techniques, different iconographic patterns and diversification on the location of rock art. However, the way as rock art changed as a product of its active manipulation in the political arena is yet poorly understood.

In this presentation an assessment about the variety of contexts of rock art related to sociopolitical changes will be outlined. It will focus on the transformations of ritual activities in which rock art was probably involved, and the different archaeological traces they left. Some examples from different areas of Central and South America will be analyzed in order to propose some pathways in which rock art was actively used as a mechanism of social differentiation.

Keywords: Rock Art, Central and South America, Social Differentiation

*Speaker

UNE TECHNIQUE POUR UN PEUPLE : LE CAS D'UNE TRADITION RUPESTRE MAJEURE DU SALVADOR

Philippe Costa *† ¹

¹ Archéologie des Amériques (ARCHAM) – CNRS : UMR8096 – 20 Allée de l'Université Nanterre,
France

Au Salvador, c'est la gravure qui est la technique la plus répandue en art rupestre ; sur les 70 sites connus, seulement neuf présentent des peintures. À l'intérieur de ces gisements gravés, un groupe a pu être identifié où la technique est combinée ; c'est-à-dire que les gravures ont été peintes, sans doute afin de faire ressortir les gravures sur le fond du support. Si dans un premier temps, l'authenticité de cette technique ne pouvait pas être affirmée, des analyses récentes en laboratoire ont permis de prouver son ancienneté. Elle se rapporte à des gisements qui partagent, en plus des caractéristiques techniques, une iconographie similaire. Ces sites constituent la tradition rupestre la plus importante du Salvador par leur nombre (17 à ce jour), mais aussi car leur foyer est géographiquement concentré sur le pays. En plus des analyses en laboratoires, les recherches franco-salvadoriennes se sont efforcées d'approfondir nos connaissances de ces sites à l'iconographie intrigante. En effet, les éléments figuratifs sont extrêmement rares. Ce sont en particulier des sondages archéologiques menés sur les sites qui sont parvenus à nous apporter des indications chronologiques sur la réalisation des gravures. D'un point de vue culturel, un rapprochement avec un groupe particulier a même pu être avancé ; ces gisements seraient l'œuvre des groupes Lencas du Salvador. Cette tradition rupestre originale illustre l'autonomie culturelle et la capacité créative d'une région trop souvent abordée comme réceptacle des influences mésoaméricaines. La diffusion de cette tradition ne se limite pas uniquement au Salvador puisqu'un gisement est connu dans l'est du Guatemala, proche il est vrai de la frontière avec le Salvador.

Keywords: art rupestre salvador précolombien

*Speaker

†Corresponding author: costa.philippe14@gmail.com

**XXV-4. The Pleistocene Peopling of
the Americas from a Circum-Pacific
Perspective.**

A Last Glacial Maximum Paleo-Sakhalin-Hokkaido-Kuril Peninsula Refugium and its Implications for the Peopling of the Americas

Karisa Terry * ¹, Ian Buvit , Masami Izuho ²

¹ Central Washington University – United States

² Tokyo Metropolitan University – Japan

Paleo-Sakhalin-Hokkaido-Kuril (PSHK) Peninsula, connected to mainland Siberia during the Pleistocene, holds valuable clues to our current understanding of initial human migration into eastern and western Beringia, and subsequently more southerly regions of the Americas. Although not situated in Beringia proper, at only 870 km away, the PSHK Peninsula is the closest region with a continuous occupation record spanning the critical time period from 30,000-14,000 cal BP. Here, we focus our study on present day Hokkaido, Japan. We recognize three distinct events in Hokkaido during this time. First, by 26,000 cal BP during the Last Glacial Maximum, microblade technology appeared in Hokkaido alongside flake and blade assemblages and an influx in archaeological sites. By 23,000 cal BP, flake and blade assemblages disappear on Hokkaido leaving only microblade technology and a general reduction of sites. At 15,000 cal BP, bifacial leaf-shaped and stemmed points are added to microblade technology and an increase in site density. Here, we review paleoenvironments, radiocarbon records, and technological and raw material assemblage composition of each event. These data are linked to key migration signals in the genetic and archaeological records of Beringia, especially in terms of technological assemblage composition and variability of Beringian sites. These events suggest an LGM population movement into a PSHK refugium from interior Siberia, and the possible population source of multiple post-LGM movements from one parent source into western and eastern Beringia, thus producing a high degree of archaeological assemblage diversity. Our data indicates earliest routes into the Americas from PSHK Peninsula as a source population is a viable hypothesis.

Keywords: Last Glacial Maximum, Hokkaido, Japan, Upper Paleolithic, Beringia, Peopling of Americas

*Speaker

Britannia Creek and the late glacial character of the upper Yukon River

Christian Thomas * ¹, P. Hare ¹, Jeff Bond ¹, Nathaly Desjardin-Martin ²,
Margarita De Guzman ³

¹ Government of Yukon (YG) – L-2A, Box 2703, Whitehorse, Yukon, Canada, Y1A 2C6, Canada

² Université du Québec à Montréal (UQAM) – Canada

³ Circle CRM Group – Canada

The Yukon River corridor has been suggested as a possible migration route for early people moving out of Beringia. Evidence for this proposed migration route has been non-existent. The Britannia Creek Site (Yukon Territory, Canada) has late glacial occupations dated between 12,700 and 13,500 cal BP and is currently the only site of this age located on the main branch of the Yukon River. Archaeological surveys of the Yukon River have resulted in many mid-Holocene archaeological discoveries, but only three sites have ever been recorded that are older than 9,000 years before present. In this paper we review the context of the Britannia Creek discovery in relation to observations of sedimentary contexts at localities within 30 km of the site. It is observed that the late glacial character of the upper Yukon River was as a broad and un-entrenched glacial outwash plain with water flowing through many braided channels. This character appears to have resulted in the deposition of stratified loess in riverside areas. It is also observed that the character of the river may have changed, due to post-glacial river entrenchment, after 9000 years before present. Developing and understanding of the late glacial character of the Yukon River will help archaeologists identify the earliest indigenous occupations of this landscape.

Keywords: Beringia, Yukon River, Canada

*Speaker

Chromatographic radiocarbon pretreatment methods and their effects on bone dating accuracy: Case studies from the Americas

Lorena Becerra Valdivia * ¹, Thibaut Deviese ¹, Daniel Comeskey ¹,
Crista Wathen ¹, Katerina Douka ², Tom Stafford ³, Michael Waters ⁴,
Higham Tom ¹

¹ Oxford Radiocarbon Accelerator Unit, University of Oxford – United Kingdom

² Max Planck Institute for the Science of Human History – Germany

³ Stafford Research, LLC, 200 Acadia Avenue, Lafayette, Colorado 80026-1845, USA. – United States

⁴ Center for the Study of the First Americans, Department of Anthropology, Texas AM University
College Station, Texas 77843-4352, USA – United States

The question of when the Americas were first colonised by humans is becoming better understood through new aDNA studies and modern archaeological excavations, but absolute dating of late Pleistocene sites remains crucial to a proper understanding of the timing and process. This endeavour depends on the accurate ¹⁴C dating of fossil remains (i.e. bones, teeth and ivory). We have developed a single-amino acid extraction protocol using preparative High Performance Liquid Chromatography (prep-HPLC) which enables us to extract hydroxyproline, a virtual biomarker of mammalian bone collagen, and thereby produce demonstrably contaminant-free AMS dates of archaeological bones. We re-dated vertebrate fossils associated with the key North American butchering sites of Wally's Beach (Canada), La Prele, also known as Fetterman (Wyoming), Lindsay (Montana) and Dent (Colorado) using this method. We also dated material from the important archaeological site of Anzick (24PA506), Montana, which contains the only known Clovis burial. Our work demonstrates the crucial importance of sample preparation to completely remove contaminants derived from sediments or post-excavation museum curation. Specifically, our work illustrates that chromatographic methods, e.g. preparative High Performance Liquid Chromatography or column chromatography using XAD resins are the only efficient methods for removing extensive environmental and museum-derived contaminants. These advanced methods yield unquestionably accurate AMS ¹⁴C measurements that refine the ages of these sites and thereby advance our understanding of human population dispersals across North America during the late Pleistocene.

Keywords: AMS dating, hydroxyproline, Clovis

*Speaker

Current and Future Directions in Modelling Terminal Pleistocene Paleo-coastal Landforms in British Columbia

Quentin Mackie * ¹, Colton Vogelaar ², Daryl Fedje ^{1,3}, Duncan McLaren ^{1,3}, Alisha Gauvreau ^{3,4}

¹ Department of Anthropology [University of Victoria] – P.O. Box 3050, STN CSC Victoria, BC
Canada V8W 3P5, Canada

² Department of Anthropology (University of Victoria) (UVIC) – Canada

³ Hakai Institute – Canada

⁴ Department of Anthropology, University of Victoria – Canada

A small number of Terminal Pleistocene sites are now known on the coast of British Columbia. Increasing this inventory will require ever-more sophisticated coastal predictive modelling techniques and high-resolution digital terrain models for both the terrestrial and submerged environments. In this paper we review early period archaeology and environments on the coast. While eustatic sea level was globally lower, local isostatic effects create a mosaic of simultaneously higher and lower sea levels, relative to modern. There are also areas of considerable long-term stability. We discuss why it may be helpful to closely examine the differences, especially at a human scale, between transgressing and regressing sea levels, both of which characterize areas of the early B.C. coast. Modelling the ancient coastlines must incorporate both coastally-relevant variables and a humanistic appreciation for the environmental effects of sea level change. We explore this issue with reference to one study area with rapidly regressing shorelines (Quadra Island) and another with rapidly transgressing shorelines (Haida Gwaii) between ca. 14,500 and 11,000 cal. BP. There are indicators of locally-viable environments from near the last glacial maximum and improved paleo-coastal prospection methods should help to find the early human record from this area which is increasingly central to models of the First Peopling of the Americas.

Keywords: Peopling, Americas, Coasts, Canada

*Speaker

Diversity in early Pacific coastal occupations of Subtropical latitudes, Chile

César Méndez ^{*†} ¹, Amalia Nuevo Delaunay ¹

¹ Centro de Investigación en Ecosistemas de la Patagonia (CIEP) – Moraleda 16 Coyhaique, Chile

In South America, a western corridor is bounded by the continuous Andean mountain chain and the Pacific coast providing a remarkable geographical unit for assessing early human dispersals and addressing the antiquity of adaptations to coastal ecosystems. New age controls on late Pleistocene through early Holocene archaeological contexts of subtropical latitudes (32° S) west of the Andes (Chile, South America) allow discussing the antiquity of coastal adaptations framed within a larger local radiocarbon dataset. This refined new chronology is based on samples with high degree of association to human activity, local reservoir effect corrections, and repeated radiocarbon assays. These allow defining minimum occupational events at the site level as means of addressing the intensity of human occupations across time and space. Results indicate that inland occupations, non-dependent on marine resources, predate coastal adaptations as suggested by site location, chronological controls, and faunal assemblages. The Quebrada Santa Julia (12,990-12,730 cal BP) and the Valiente (12,700-11,300 cal BP) sites were located at ca. 8 km and > 30 km distant from the terminal Pleistocene shore, respectively, and show no indication of coastal or marine remains in their assemblages. Though stone tool procurement evolved locally, sharing traits between different sites during the Pleistocene-Holocene transition, food resource selection changed radically. Sites attributed to the locally-known early Holocene Huentelauquén complex have yielded evidence for sea lion hunting, fishing and shellfish gathering and the technology suited for such resource appropriation. Local groups selected coastal/marine foods despite the availability of megafauna. Stable isotope information (¹³C/¹²C; ¹⁵N/¹⁴N; ⁸⁷Sr/⁸⁶Sr) on the few available human skeletal remains of such age agrees with that idea, further suggesting localized populations dependent on marine resources were settled in the coast by the onset of the Holocene. The picture emerging from our local results suggests that the early peopling at this latitude was a diversified process in which coastally adapted groups, though not the earliest, rapidly and consistently occupied landscapes at subtropical latitudes of Central Chile.

Keywords: early human dispersal, Pacific coast, subtropical latitudes, Pleistocene, Holocene transition

*Speaker

†Corresponding author: cmendezmelgar@gmail.com

Evaluating Technological Connections Between Beringian and Pacific Northwestern Late Pleistocene-Aged Lithic Technologies

Loren Davis * ¹

¹ Oregon State University (OSU) – Department of Anthropology, 238 Waldo Hall, Corvallis OR 97331,
United States

In making interpretations about the lithic technological connections between late Pleistocene-aged Northeastern Asian and North American sites, archaeologists have traditionally employed comparisons of tool assemblages or simple bounding box metrics of formed tools. The hypothesis that a strong connection will be seen between early lithic technologies of Beringia and the Clovis Paleoindian Tradition of North America can be rejected due to the fact that nonfluted technologies of the Nenana Complex are earliest and because Alaskan fluted projectile point technology is younger than elsewhere in North America. While some archaeologists have argued that an ancestor-descendant evolutionary relationship may have existed between the Nenana and Clovis technological complexes, this conclusion is based on qualitative pattern matching of tool categories and comparisons of two-dimensional object outlines and requires more rigorous evaluation. In contrast, close morphological similarities are identified between nonfluted stemmed projectile point technologies of western Beringia and Western Stemmed Tradition projectile points from the Pacific Northwest, also based on comparisons of two-dimensional artifact forms. Here, we discuss the use of digital scanning and 3D geometric morphometrics to conduct a more comprehensive approach to evaluating the technological connections between late Pleistocene-aged lithic technologies between Western and Eastern Beringia and the Pacific Northwest of North America.

Keywords: Clovis Paleoindian Tradition, Nenana Complex, fluted point technology, Western Stemmed Tradition, Beringia, Pacific Northwest, North America

*Speaker

From Sapporo to Salt Lake City: Re-Envisioning the Peopling of the Americas without Clovis

Ted Goebel * ¹, Kelly Graf , Jordan Pratt

¹ Texas A M University (Department of Anthropology) – United States

Dare we discuss the peopling of the Americas without Clovis on center stage? In a general sense, this is difficult to do; however, by refocusing attention on the paleoecology, archaeology, and genomics of the northern Pacific Rim, it has become increasingly clear that we may just have to. In this presentation, we review new developments in greater northeast Asia, Alaska, and western North America suggesting the first humans to disperse beyond Beringia followed the Pacific coast as well as the interior Canadian corridor. In their wake, these first Americans left behind very different calling cards, especially once reaching temperate latitudes. East of the Rocky Mountains, Clovis is still king; however, west of the Rockies, early Paleoindians conventionally used different weapon tips-unfluted stemmed points- to predate upon a variety of fauna, not just megamammals of the late Pleistocene. Moreover, new chronologies indicate that stemmed points are as old as Clovis, if not older, and the still emerging archaeological record for the far west indicates radically different settlement strategies than commonly inferred for Clovis. The origin of the stemmed-point complex, however, remains as enigmatic as the origin of Clovis, in that gaps in the archaeological records of coastal and interior Canada still keep us from linking the archaeology of Beringia with that of temperate western North America. We conclude by reviewing these problems as well as the prospects for new research to solve them.

Keywords: peopling of the Americas, Paleoindian archaeology, radiocarbon chronology

*Speaker

Functional Analysis of Chipped-Stone Crescents from the Late Pleistocene-Early Holocene of Far Western North America

Daniel Amick *† ¹

¹ Loyola University Chicago (LUC) – Institute of Environmental Sustainability 1032 W. Sheridan Rd.
Chicago, IL 60660, United States

Techno-functional analysis of 591 prehistoric crescents from ancient lakeshore settings suggests that open-water hunting of waterfowl may have played a significant role in the subsistence strategies of Late Pleistocene-Early Holocene foragers in the Pacific Coastal and interior Great Basin regions of western North America. Variation in the size and shape of lunate crescents appears to be related to original blank forms as well as the individual life-histories of tool manufacture, use-wear, rejuvenation, and recycling. Strong relationships between crescents and concave based projectile point techno-complexes are suggested by patterned associations including identical toolstone preferences, manufacturing techniques, and lateral recycling of these projectile point forms as crescents. Wear damage patterns from an extensive program of experimental manufacture and use of crescent replicas in a wide range of activities best supports the frequently hypothesized use of these distinctive tools as transversely hafted projectile tips for hunting waterfowl, although use in hunting rabbits, animal butchery, and working of bone/antler cannot be ruled out completely. Patterns of landscape context and comparative cases from the archaeological and ethnographic records offer additional support in favor of the suggested use of crescents weapon tips used in waterfowl hunting. These conclusions indicate that lacustrine waterfowl hunting may have been an especially important way for early foragers in the Great Basin to cope with the depressed food resources of this region during the Late Pleistocene-Early Holocene.

Keywords: Late Pleistocene, Pacific Coast, Great Basin, crescent, experimental archaeology, macrofracture, projectile point.

*Speaker

†Corresponding author: damick@luc.edu

Microblade Industries and the Terminal Pleistocene Human Dispersals in Nihewan Basin , North China

Yue Feng ^{*† 1}

¹ School of Archaeology and Museology, Peking University (PKU) – No.5 Yiheyuan Road, Haidian District, Beijing, China. 100871, China

Located in north Central China, Nihewan Basin preserved a well-established sequence of human occupation through early Pleistocene to Holocene, and during Upper Paleolithic most of the microblade sites are situated along the Sanggan River. The site of Youfang indicated that microblades first showed up in the basin before 25 ka B.P. together with blades, and it was followed by a period characterized by boat-shaped cores and a complex featured with relatively high portion of burins around 18 ka B.P., leaving evidence at the site of Erdaoliang. Around 17-15 ka B.P., a new group of highly mobile hunters came with wedge-shape cores and Yubetsu technique. Their tool kits were dominated by side-scrapers, but typical Upper Paleolithic tools like end-scrapers, burins and backed-knives also made up an important part of the whole assemblage, meanwhile bifaces, projectile points and stemmed tools appeared in this area for the first time. Analysis of the sites of Hutouliang, Ma'anshan and Yujiagou suggested that they occupied the river side in a very organized way, but later replaced by other groups with conical cores, ground stones and pottery. Their short appearance in the Nihewan Basin suggested that the dispersals of people in Northeast Asia during terminal Pleistocene might be multidirectional, which could provide a broader view on the peopling of the New World. Why they came and left Nihewan is still under heated debates, but the rapid change of environment during this period, poor quality of local raw material and regional cultural diversity may shed some lights on this question.

Keywords: Microblade Industry, Terminal Pleistocene, Human Dispersals, North China

*Speaker

†Corresponding author:

Origins of Ceramics in East and Northeast Asia with Some Implications for the Peopling of the Americas

Fumie Iizuka * ¹

¹ University of California, Merced – 5200 N. Lake Road Merced, CA 95343, United States

Although the first ceramic technology emerged in Europe, in forms of figurines in the Gravettian context, the first vessel technology began later in Eastern Asia, as early as 18,000 Cal yr BP. The timing and contexts of the emergence have been debated. In this presentation, I review existing data from East and Northeast Asia including southern and northern China, Japan, the Amur River basin, and the Transbaikalian regions in Russia, to re-assess the dates of appearance, technological variability, and environmental and behavioral contexts related to the first pottery, inferring possible causes of the appearance of ceramics. I also suggest why pottery is not found in some areas of East and Northeast Asia. Finally, I infer pottery origins in these areas and their implications for the peopling of the New World.

Keywords: Ceramic origins, East Asia, Northeast Asia, peopling of the Americas

*Speaker

Palaeolithic burins of the Ushki-I site, Kamchatka: traceological and technological analysis

Alexander Fedorchenko * ¹

¹ Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences (IAET SB RAS) – Russia, 630090, Novosibirsk, Acad. Lavrentiev avenue, 17, Russia

The Late Pleistocene complexes of Ushki in Kamchatka is one of the most important sites for the understanding of the prehistory of Beringia. The age of microblade complex of cultural layer VI is 13,000–11,200 cal BP. This assemblage characterized by wedge-shaped microcores to make microblades, bifacial knives, leaf-shaped and oval spearheads and arrowheads, end-scrapers, side-scrapers, axe tools, borers and stone ornaments. The study of the archaeological collections from the N.N. Dikov's excavations (1964–1989) allowed us to reconstruct burin technology, a previously unknown. We detect more than 200 items related to production and use of pieces with burin spalls – 196 tools and 9 burin spalls.

The initial blank for studied tools were bifaces and microcores preparation flakes with a relatively smooth profile (63%), their medial (17,5%), proximal (11%) or distal segments (3%), microblade core tablets (4%), blade-like flakes (3%) and fragments of bifacial tools (1%). Different types of flints (82,7%), chalcedony (16,8%) and obsidian (0,5%) were used as raw material. The length of varied from 12,6 to 65,2 mm, width – 14,9–22,9 mm, thickness – 2–6,6 mm. The first category of burins included the tools with unidirectional spalls on one face (53%): truncation burins, transverse burins, oblique burins, single burins on a break. Another category were tools with two independent burins surfaces of the same type (32%) and mixed multiple burins (15%).

Despite the abundance of morphological variants of studied burins all of them demonstrated a common manufacturing technique. In a vast majority of cases a prepared retouched surface used as a burin platform. The main flaking technique for the burins production is pressure. Burin spalls removal from one and the same platform could be performed two to nine times successively – about 58% of studied artifacts had traces of previous negatives. The use of pressure technique allowed a high level of regularity and standardization of the production process, with burin spalls having predetermined morphological characteristics. As a result of experimental and use-wear studies, 30 pieces with burin spalls have been identified as insert tools – planing knives and scrapers which used to work solid organic materials. The character of wear traces together with the size of tools and the presence of numerous spalls of previous burin blows testify that these tools were used repeatedly over a long period of time.

This study was supported by Russian Science Foundation (Project 14-50-00036)

*Speaker

Keywords: Beringia, Kamchatka, Ushki sites, Late Palaeolithic, burins, experimental use, wear analysis, technological analysis

Paleoindian settlement systems in southern Peru: New chronological and geoarchaeological data from Quebrada Jaguay (QJ-280) and Cuncaicha Rockshelter

Sarah Ann Meinekat * ¹, Christopher Miller ^{1,2}, Gregory Hodgins ³, Kurt Rademaker ⁴

¹ Institute for Archaeological Sciences (University of Tübingen) – Germany

² Senckenberg Centre for Human Evolution and Palaeoenvironment, University of Tübingen – Germany

³ Accelerator Mass Spectrometry Laboratory, University of Arizona – United States

⁴ Department of Anthropology, Northern Illinois University – United States

Recent excavations in Peru have shown that Terminal Pleistocene and Early Holocene sites at the coast and high Andes were connected within larger settlement networks that extended through several vertical ecozones. It is essential to study these sites together -across a vertical transect- in order to understand the routes of settlement and how early Americans rapidly adapted to the extreme conditions of the Andes. A key question in the settlement of the Americas is how forager groups adapted to different ecological settings while maintaining social connections. Quebrada Jaguay (QJ-280) on the Pacific Coast and Cuncaicha Rockshelter in the Andean highlands of southern Peru, with earliest ages dating to the Terminal Pleistocene, exhibit very different subsistence adaptations, yet these sites were linked within a common settlement system. Here, we present the first results of 2017 excavations at QJ-280 and of the geoarchaeological investigations conducted at QJ-280 and Cuncaicha Rockshelter in the last years. One of the main objectives of the excavations was to shed new light on the chronological relationship between these two sites, as well as to improve the chronology of the sites themselves. Furthermore, various structures and anthropogenic features, as well as complex site formation processes, were encountered at the sites during excavation. These were addressed by applying a multi-method geoarchaeological approach, combining micromorphology with pedological and FTIR analyses. These techniques provided insights -invisible to the naked eye- about the sedimentary components, and depositional and post-depositional processes of both sites at a microscale that we could link to the overall site structures. The new chronological data, together with the geoarchaeological approach allowed us (1) to get a better understanding of the influence of natural and human factors in the sites' formation, (2) to link features identified at the sites to paleoenvironmental processes, and (3) to further examine the connection between the coast and the high Andes during the earliest period of human settlement.

Keywords: Terminal Pleistocene, Paleoindian, South America, Chronology, Geoarchaeology

*Speaker

Rethinking alternative routes for early American settlement

Beatriz Fajardo * ¹

¹ Polytechnic University, Escuela Superior Politécnica del Litoral FICT (ESPOL) – Campus Gustavo Galindo Km. 30.5 Vía Perimetral, P.O. Box 09-01-5863, Guayaquil, Ecuador., Ecuador

The origin and dispersion of modern humans is one of the most striking areas of archaeological research, but the first settlement of the New World continues to be a highly controversial issue. American Pleistocene is marked by the scarcity, precariousness and lack of homogeneity of the available data, especially in South America. In many cases, the data come from old excavations, recovered and studied with methodologies that are nowadays overcome. It is generally agreed that the first people in the Americas arrived via the Bering land bridge that connected North America to Asia during the Last Glacial Maximum (LGM). Many archaeologists believe, therefore, that we must look to Siberia to find the origins of the first Americans. There is no doubt, Beringia was a gateway to the American continent, these megafauna hunters from Upper Paleolithic came into the American continent, thanks to the intercontinental ice corridor between Siberia and Alaska at some temporal window at the end of the Pleistocene. But was it was the first and the oldest gateway? The presence of oldest archaeological sites at the Southern Cone (Monte Verde, Arroyo Seco 2, or the oldest sites claimed in Brazil: Mato Grosso, Pedra Furada, advertise more complex settlement strategies. Joint to the aging of the Asian and Oceanian *Homo sapiens* settlement, when coastal lands now underwater were available for movement and settlement, allows us to ask other questions. In Australia, the area between Sunda and Sahul presented a barrier, did this first Australians have the technology to build boats? And could they reach too South America by using Antarctic routes? In this sense, the project Geological evidence of climate change and anthropization at Greenwich Island, aims to test this hypothesis.

Keywords: South America settlement, Antarctic routes, boats.

*Speaker

The New World Was Colonized between 14,200 and 13,400 Years Ago

Todd Surovell ^{*†} ¹, Randy Haas ², Joseph Gingerich ³

¹ Department of Anthropology, University of Wyoming – United States

² Department of Anthropology, University of California, Davis – United States

³ Department of Sociology and Anthropology, Ohio University – United States

The date of human arrival to the New World has been debated for more than a century. In contrast to the traditional method of careful scrutinization of artifacts, stratigraphy, and dates from individual archaeological sites, we approach the problem using two novel but independent quantitative methods: 1) we use basic principles of human demography, archaeological site formation, and archaeological sampling to simulate the age range of plausible earliest archaeological sites, and 2) time series analysis of a large database of archaeological radiocarbon dates to identify the earliest unequivocal signal of human presence in North America. Both methods indicate a late arrival of humans to the New World south of the ice sheets, between 14,200 and 13,400 BP, with a most likely colonization date falling in the century surrounding 13,800 BP.

Keywords: New World colonization, modeling, radiocarbon time series analysis

*Speaker

†Corresponding author:

The earliest microblade core technology in the Paleo-Sakhalin-Hokkaido-Kurile Peninsula

Yuichi Nakazawa * ¹, Fumito Akai ²

¹ Hokkaido University – Japan

² Hokkaido Government Board of Education – Japan

The emergence of wedge-shaped microblade core technology has been often seen as the prominent cultural trait that indicates the population dispersals from northern Asia to North America. The microblade assemblage from the Kashiwadai 1 in central Hokkaido, then a part of the Paleo-Sakhalin-Hokkaido-Kurile Peninsula (Paleo-SHK) has placed in the Last Glacial Maximum (LGM), because the tight range of radiocarbon dates (ca. 25,000 – 22,000 cal. BP) were obtained from the secure stratigraphy with marker tephra. While a series of the LGM dates allow researchers to evaluate this complex to be the earliest microblade core technology in the Paleo-SHK and almost comparable to that of the Transbaikal region in eastern Siberia, technological details of this microblade complex have been little known. The present paper describes reduction sequences to detach microblades through the technological and morphometric analysis of microblade cores, microblades, and related byproducts (e.g., core tablets, core trimming flakes). The refitted specimens show the processes that both blades and microblades were detached from various core blanks made from hard shale. Using refitted and un-refitted specimens that recorded both success and failure, we reconstruct decision-makings of how artisans reduced the cores as the reduction proceeded. We will interpret the organization of reduction processes in consideration to raw material availability and mobility of regional Paleolithic hunter-gatherers. Results of this analysis will also give an implication to the role of microblade core technology to achieve hunter-gatherers' dispersal from northern Asia including Paleo-SHK to North America.

Keywords: technology, microblade core, reduction, northern Asia, Hokkaido

*Speaker

The role of cervids in Pre-Ceramic subsistence strategies at Cerro Mangote and Pedro Gonzalez, Panama

María Fernanda Martínez-Polanco * ¹

¹ Universitat Rovira i Virgili (URV) – 43007 Tarragona, Spain

More than 40 years of archaeological research in Panama has revealed a wealth of information about human populations having inhabited the Isthmus of Panama for more than 13,000 years. People used pacific isthmus route to migrate to South America. The first populations take advantage of natural resources and they direct impact the pristine environment that they found. They hunted deer's (*Odocoileus virginianus*) one of the most important prey because they provided meat, fat and bone marrow. The aim of this presentation is to better understand the evolution of human subsistence strategies through time towards deer hunting and the importance of environmental patterns in these changes in Panamanian pre-ceramic groups. To achieve so, I propose a multi-proxy zooarchaeological and taphonomical analysis. This presentation will be focused on two preceramic Panamanian sites: Cerro Mangote and Pedro Gonzalez. These sites are contemporary. Cerro Mangote is located at the watershed of Azuero Peninsula. Pedro Gonzalez is located at Pearl Island Archipelago. The first human population arrived by sea. They found a dwarf deer population. I will present the results of a taphonomic and zooarchaeological analysis of deer remains founded in this sites, in order to describe deer harvesting (i.e., age, sex, size) and identify human impact in deer population.

Keywords: Cervids, Panama, Preceramic, Hunter, gatherers, zooarchaeology

*Speaker

**XXV-5. Techniques and technologies
of the maritime hunters-gatherers of
the American coast.**

A Qassi revisited: Workshops and Dumps in front of a Mens' House at the Early Thule Site, Nuulliit (NW Greenland).

Asta Mønsted ^{*†} , Claire Houmard ^{*}

¹, Martin Appelt , Anne-Birgitte Gotfredsen , Bjarne Grønnow

¹ Laboratoire Préhistoire et technologie (CNRS UMR 7055) – Université Paris X - Paris Ouest Nanterre La Défense : EA020, CNRS : UMR7055 – 21 allée de l'Université. F-92023 NANTERRE Cedex, France

Erik Holtved's excavations (1947) of House 30 at the early 14th century Nuulliit site uncovered the architectural remains of a large, round turf house situated at a distance behind the 'normal' single family houses at the site. Holtved interpreted this as representing the qassi or mens' house of the Early Thule Culture Nuulliit settlement. Recent excavations by the archaeological team of the NOW Project of an area in front of the structure add important new information on the multiple activities connected to the house. Due to excellent preservation conditions, it is possible through spatial and technological analyses to identify different dumps as well as workshop areas where bone, ivory, baleen, meteoric iron and soap stone were processed and where tool kits including walrus and seal hunting gear as well as hand tools were curated and repaired. A flow of raw materials through the site and different processing techniques are documented. Notably, analyses of preforms and waste of soap stone, whale bone and ivory indicate that unskilled individuals worked in front of the mens' house and thus that it also served as a teaching area for apprentices.

Keywords: Arctic archaeology, Thule culture, Greenland, technology, apprenticeship

*Speaker

†Corresponding author: amoensted@yahoo.dk

Bird bones as raw materials: the production and use of awls at the end of the world (Tierra del Fuego, Argentina)

Angélica Tivoli ^{*†} ¹, Danae Fiore ², Atilio Zangrando ³

¹ Centro Austral de Investigaciones Científicas, CONICET (CADIC-CONICET) – Argentina

² AIA (Asociación de Investigaciones Antropológicas), CONICET (AIA-CONICET) – Argentina

³ CADIC (Centro Austral de Investigaciones Científicas), CONICET (CADIC-CONICET) – Argentina

For more than 6000 years BP, littoral hunter-gatherer-fisher societies lived along the coasts and channels of the southern tip of South America (current territories of Chile and Argentina) (Orquera et al. 2011). Bone technology was abundant and very diverse in these societies and bones from different animals were selected for this purpose: cetacean, pinnipeds, guanacos and birds. In this paper we focus on the use of bird bones to manufacture awls from a perspective that integrates zooarchaeological, technological and ethnographic information of manufacture and use.

In this paper we present information of these artefacts from nine sites located along southern coast of Tierra del Fuego. Regional trends are comparatively evaluated following a west-east transect including Beagle Channel, Moat, Península Mitre and Isla de los Estados. Ethnographic information about these artefacts is integrated to the analysis, in order to discuss data about their functions as well as the gender of their producers/users.

Results show predominance in the use of long bird bones from wings and tibiotarsus for awl manufacture. Selection of specific taxa as shearwaters/small petrels, cormorants, and geese/ducks (small Procellariidae, Phalacrocoracidae and Anatidae) is also recorded in the archaeological assemblages (Scheinsohn 2010, Tivoli 2013, Christensen 2016). Ethnographic data confirm that these taxa were selected for consumption by these societies. They also inform that the production of tools with bird bones was primarily a female task, and that the use of these tools was oriented to weaving baskets and hide processing.

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*Speaker

†Corresponding author: amtivoli@gmail.com

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Keywords: Bone technology, Coastal sites, Middle and Late Holocene

Birnirk and Early Thule Maritime Hunter-Gatherer: Variability in Subsistence Practices and Tool Technologies at Cape Espenberg, Alaska

Lauren Norman *¹, Claire Alix^{2,3}, Owen Mason^{4,5}

¹ University of Kansas – Lawrence, KS, USA, United States

² Archéologie des Amériques (ArchAm) – Université Panthéon-Sorbonne, Centre National de la Recherche Scientifique : UMR8096 – 21 Allée de l'université 92023 NANTERRE CEDEX, France

³ Université Panthéon-Sorbonne (UP1) – Université Panthéon-Sorbonne – 12 place du Panthéon - 75231 Paris Cedex 05, France

⁴ Institute of Arctic and Alpine Research (INSTAAR) – United States

⁵ University of Colorado Boulder Boulder – United States

Archaeological research at the Cape Espenberg Rising Whale site (KTZ-304) reveals houses related to two different groups who occupied a similar landscape within as little as 100 years of each other. The earliest is the Birnirk culture, an enigmatic archaeological entity with origins either in Siberia or northern Alaska, that settled in Kotzebue Sound ca. AD 1050. The Thule people, who subsequently occupied the site, have cultural and genetic links to Birnirk. The precise nature and location of the Birnirk – Thule transition remains unclear. The Thule culture, defined in the Canadian High Arctic, was notable for whale bone houses, which led to a characterization as whale-focused hunters. Further research indicates that while Thule subsistence was broad, often one or two species served as focal resources.

At Cape Espenberg, despite outward differences in material culture (e.g. architecture), the Birnirk and Thule shared many hunting technologies. However, the faunal assemblages reveal different procurement foci. The Birnirk were terrestrially focused, with caribou comprising the majority of the assemblage, although small seals, walrus, dog, and birds occur in significant amounts. The early Thule were marine focused, with small seals composing the overwhelming majority of the assemblage. Tool material types are inversely, and counter-intuitively, correlated; ivory-marine-tools are most abundant in the larger Birnirk house, while caribou antler was much more abundant in the smaller Thule house. Variable climate changes that conditioned faunal resource availability were potentially a major driver in resource availability during the two occupations since the earlier Birnirk house was occupied during the Medieval Climatic Anomaly while the Thule house co-occurs with the onset of the Little Ice Age AD 1250-1300. With stronger ties to Siberia, the Birnirk people were likely migrants to Alaska whose perspective engendered a broader approach to resources than the Thule culture that persisted for centuries in the region. The Birnirk emigration also co-occurred with the disappearance of the preceding Ipiutak culture, providing an uncertainty to the socio-political landscape. Demographic factors such as increasing population may have complicated resource procurement strategies during Thule. Spatially and temporally variable climate, ecology, and social contexts served as drivers

*Speaker

for the differences in faunal assemblages and tool materials, which translates into differential uses of the maritime and terrestrial landscape of northwest Alaska.

Keywords: Arctic, Birnirk, Thule, archaeozoology, technology, subsistence

De la chasse à la pêche : techniques de capture et consommation des animaux marins sur une île du détroit de Magellan / From hunting to fishing: techniques of capture and consumption of marine animals on an island of the Strait of Magellan.

Dominique Legoupil ^{*† 1}, Marianne Christensen^{‡ 2}, Philippe Béarez³,
Consuelo Huidobro⁴, Mathieu Langlais⁵, Véronique Laroulandie⁶,
Christine Lefèvre⁷, Manuel San Román⁸, Jimena Torres^{1,8}

¹ Archéologies et Sciences de l'Antiquité, équipe ethnologie préhistorique (ArScAn) – Centre National de la Recherche Scientifique : UMR7041 – Maison René Ginouvès Boîte 3 21, allée de l'Université 92023 NANTERRE CEDEX, France

² Archéologies et Sciences de l'Antiquité, équipe ethnologie préhistorique (ArScAn) – Université Paris I - Panthéon-Sorbonne : UMR7041 – Institut d'Art et d'Archéologie, 3 Rue Michelet, 75006 Paris, France

³ Archéozoologie, Archéobotanique : sociétés, pratiques et environnements – CNRS : UMR7209 – Muséum national d'Histoire naturelle case postale 56 55 rue Buffon 75005 Paris, France

⁴ Archéologies et Sciences de l'Antiquité équipe ethnologie préhistorique (ArScAn) – Université Panthéon-Sorbonne : UMR7041 – Maison René Ginouvès Boîte 3 21, allée de l'Université 92023 NANTERRE CEDEX, France

⁵ CNRS – PACEA (UMR 5199) – France

⁶ De la Préhistoire à l'Actuel : Culture, Environnement et Anthropologie (PACEA) – Université de Bordeaux, Centre National de la Recherche Scientifique : UMR5199 – France

⁷ Musée National d'Histoire Naturelle - MNHN (France) – Musée National d'Histoire Naturelle - MNHN (France) : UMR7209 – France

⁸ Universidad de Magallanes (UMAG) – Av. Bulnes 01855, Casilla 113-D Punta Arenas, Chile

Résumé en français

Au cours des deux millénaires avant notre ère, des Indiens *canoeros* (en canot) vinrent à de nombreuses reprises sur un minuscule îlot situé au milieu du détroit de Magellan pour chasser des mammifères marins, des cormorans, des Procellariiformes (petits et grands), et pêcher des morues. La fouille d'un campement par la *Mission archéologique française de Patagonie* a permis d'émettre un certain nombre d'hypothèses sur les techniques de capture et d'exploitation de ces espèces grâce à l'observation croisée de l'équipement (lithique et osseux) et des restes animaux consommés retrouvés dans le site.

*Speaker

†Corresponding author: dominique.legoupil@cnrs.fr

‡Corresponding author: marianne.christensen@univ-paris1.fr

S'il est clair que les harpons et les grandes pointes bifaciales sont associés à des armes d'hast destinées à la chasse, notamment aux grands mammifères, et éventuellement (pour les secondes) à des outils, le rôle d'autres artefacts comme les pointes en os d'oiseau ou les pièces biseautées est plus délicat à interpréter.

Par ailleurs, la représentation des parties squelettiques des animaux et les traces d'exploitation enregistrées sur les os nous renseigne sur le traitement des proies. Dans certains cas, ces marques sont des traces de boucherie qui relèvent clairement de l'alimentation ; dans d'autres, elles correspondent à l'exploitation technique des os, des dents ou de la peau des animaux capturés.

English Abstract

During the last two millennia BC, Canoeros Indians frequently occupied a tiny island located in the middle of the Strait of Magellan for hunting marine mammals, cormorants, Procellariiformes (small and large), and fishing cod. The cross analysis of the lithic and osseous equipment with consumed animal remains from the recent excavation of one campsite by the *French Archaeological Project in Patagonia* made possible a number of hypothesis about the techniques of capture and exploitation of these species.

It is clear that harpoons and large bifacial points are related to hunting gear, especially for large mammals, and possibly lithic points may have been domestic tools. The function of other artifacts such as birds bone points or beveled tools is more difficult to interpret.

Moreover, the ratio of faunal skeletal parts and cut marks on these bones provide information about prey processing. In some cases, these cut marks are from butchery which clearly fall within consumption activities, while others are related to the technical processing of bones, teeth or skin for artefact manufacturing.

Résumé en français

Au cours des deux millénaires avant notre ère, des Indiens *canoeros* (en canot) vinrent à de nombreuses reprises sur un minuscule îlot situé au milieu du détroit de Magellan pour chasser des mammifères marins, des cormorans, des Procellariiformes (petits et grands), et pêcher des morues. La fouille d'un campement par la *Mission archéologique française de Patagonie* a permis d'émettre un certain nombre d'hypothèses sur les techniques de capture et d'exploitation de ces espèces grâce à l'observation croisée de l'équipement (lithique et osseux) et des restes animaux consommés retrouvés dans le site.

S'il est clair que les harpons et les grandes pointes bifaciales sont associés à des armes d'hast destinées à la chasse, notamment aux grands mammifères, et éventuellement (pour les secondes) à des outils, le rôle d'autres artefacts comme les pointes en os d'oiseau ou les pièces biseautées est plus délicat à interpréter.

Par ailleurs, la représentation des parties squelettiques des animaux et les traces d'exploitation enregistrées sur les os nous renseigne sur le traitement des proies. Dans certains cas, ces marques sont des traces de boucherie qui relèvent clairement de l'alimentation ; dans d'autres, elles correspondent à l'exploitation technique des os, des dents ou de la peau des animaux capturés.

Resumen en castellano

Hace 2 mil años antes de Cristo, los indígenas canoeros visitaron en varias ocasiones una pequeña isla en medio del estrecho de Magallanes, para cazar mamíferos marinos, cormoranes, Proce-

lariiformes grandes y pequeños, y para pescar brótula. La excavación de un campamento por la *Misión Arqueológica Francesa en Patagonia* permitió realizar una serie de hipótesis sobre las técnicas de captura y explotación de estas especies, gracias a la observación cruzada de las tecnologías (lítico y óseo) y de los restos de fauna encontrados en el sitio.

Si bien es claro que los arpones y las grandes puntas bifaciales están asociados con armas de caza (especialmente de los grandes mamíferos), y posiblemente para las puntas con herramientas, el papel de otros artefactos como las puntas óseas de aves o las piezas biseladas son más difíciles de interpretar.

Además, la representación de las partes esqueléticas de los animales y las evidencias de explotación registradas en los huesos, nos informan sobre el tratamiento de las presas. En algunos casos, estas marcas son huellas de carnicería claramente relacionadas a la alimentación; en otros, corresponden a la explotación de los huesos, dientes o piel de los animales capturados para su uso técnico.

Keywords: Maritime Hunter, Gatherers, Patagonia, Hunting gear, Fishing strategy, marine mammals, birds, Chasseurs, cueilleurs maritimes, Patagonie, équipement de chasse, équipement de pêche, mammifères marins, oiseaux

Differential exploitation of artiodactyls between marine hunter-gatherers of the Middle and Late Holocene of the south-central continental coast of the Strait of Magellan, Patagonia, Chile

Victor Sierpe *† 1,2

¹ Programa de doctorado en antropología (mención arqueología) UTA/UCN, Universidad de Tarapacá, Chile (UTA) – Avenida 18 de Septiembre N° 2222, Arica, Chile

² Centro de Estudios del Hombre Austral, Instituto de la Patagonia, Universidad de Magallanes (UMAG) – Av. Bulnes 01855, Casilla 113-D Punta Arenas - Chile, Chile

The archaeological record of the south-central continental coast of the Strait of Magellan (Brunswick Peninsula), Southernmost Patagonia, Chile, encompasses ages from 6500 years BP to present. The economy of maritime hunter-gatherers of the area was focused on obtaining coastal avifauna, marine fauna such as otariids and cetaceans, fishing, shellfish gathering and hunting of terrestrial fauna such as guanaco (*Lama guanicoe*) and huemul (*Hippocamelus bisulcus*). Differential exploitation -food and technology- of two artiodactyl species among marine hunter-gatherers from Middle and Late Holocene occupations of coastal sites Rio Blanco 2, Punta Carrera 2, Estancia Bulnes 1, Punta Santa Ana 1 and Bahía Buena are discussed. Results show the absence of huemul remains during the Middle Holocene, with guanaco as the most consumed terrestrial taxa. Regarding the later records, the arrival of huemul and a regional shift in the ecological niche would have been beneficial for hunter-gatherer groups. This change is reflected by the exploitation of huemul and the replacement of guanaco in the records of the last 600 years. As for the manufacture of bone instruments, artiodactyl tibias and metapodia are the key anatomical elements present as raw material. However on the technological level there would be differences in the exploitation processes of both species.

Keywords: maritime hunter gatherers, huemul, guanaco, zooarchaeology, bone technology, Southernmost Patagonia

*Speaker

†Corresponding author: victor.sierpe@gmail.com

Entre technique et symbole : le rôle du harpon sur la côte Pacifique du désert d'Atacama (Chili du nord)

Benjamín Ballester * ¹

¹ Archéologies et Sciences de l'Antiquité (ArScAn, Equipe Ethnologie Préhistorique) – Université Panthéon-Sorbonne, Centre National de la Recherche Scientifique : UMR7041 – Maison René Ginouvès Boîte 3 21, allée de l'université 92023 NANTERRE CEDEX, France

Le désert, la mer et l'aridité constituent le cadre d'une société au mode de vie basé sur la chasse, la pêche et la cueillette marine, qui a vécu sur le littoral d'Atacama (nord du Chili), depuis les premiers peuplements, il y a 11500 Cal AP, jusqu'après l'arrivée des Européens au XVIème siècle. Leur stratégie de subsistance et leur situation en marge du civilisé monde andin ont contribué à la création d'une vision primitive, barbare, archaïque et simple de cette société. Une conception ontologique qui a relégué l'activité de la chasse et ses objets aux confins exclusifs de la subsistance et des premières nécessités, en oubliant que ces activités et ces objets interagissent constamment dans un complexe réseau avec diverses sphères de la construction de leur réalité sociale, économique, culturelle, symbolique et politique. Cette image traditionnelle a été construite à partir d'une méconnaissance presque absolue du principal dispositif de chasse marine de cette société, le harpon, alors qu'il n'existe presque aucune définition et synthèse complète de ses aspects technologiques et fonctionnels, encore moins des données sur sa composition, ses parties constitutives, sa morphologie et ses matières premières. Dans ce sens, notre communication se concentre initialement sur la définition du harponnage à partir de la "technologie comparée" avec différentes sociétés côtières du continent américain, pour ainsi pouvoir construire une première typologie des têtes du harpon du littoral du désert d'Atacama. La typologie, fondée sur les solutions techniques et leur combinaison, permet d'évaluer la composition et la distribution chronologique et géographique de chaque type de harpon dans la région pendant les 7000 dernières années. En fait, le harpon se présente pour cette société comme un dispositif extrêmement complexe et sophistiqué, exprimant une vision complètement différente de celle traditionnellement admise. Finalement, nous essayons d'explorer les multiples valeurs et significations des harpons du littoral du désert d'Atacama, en rapport avec les activités de chasse marine, mais aussi au-delà dans diverses dimensions de la vie sociale.

Keywords: Chasse Marine, Harpon, Atacama

*Speaker

Function of pointed tools made from bird bones: a case of study on Indians Canoeros of Strait of Magellan, Chile

Siegfried Léglise * ¹

¹ ArScAn - UMR 7041 - Equipe Ethnologie préhistorique – Université Paris I Panthéon - Sorbonne – France

Awls made from bird bones are the most common artefacts in the maritime sites of Patagonia and Tierra del Fuego. Their use is generally interpreted using ethnographical data recorded by sailors and ethnologists on the last Yamana and Kaweskar people.

These tools are made on various anatomical supports, and their active parts present a large variety of shapes and dimensions. These variations can be explained by a simple adaptation to the available species, the maintenance of the tools, or choices relating to the purpose for which it was made : to pierce skin or bark, to separate vegetable fibers in order to weave baskets, to work whalebone plate or animal tendons, etc.

Pointed tools made from bird bones are divided into two distinct categories. The first, very common, is constituted by " huecos " awls (*sensu* Piana, 1984). They are defined by the presence of an epiphysis. The second, more rare, is characterized by small pointed tools made on diaphysis segments. These were only found at four archaeological sites : Offing 2 (Locus 1), Punta Santa Ana 2, KM 44 et Dawson 3. They are all located in the Strait of Magellan and are dated from the recent intermediate period (3500-2000 years BP.).

In Offing 2, a functional hypothesis was formulated about these small pointed tools made on diaphysis segments (Christensen, 2016). It is based on the discovery of numerous of them (n : 98) in an area of the site where bird and fish bones were rejected. This observation led to consider these tools as elements of composite hook.

This study aims to characterize the " traceological signatures " of " huecos " awls and small pointed tools made on diaphysis segments. The comparison of the use-wear observed on these tools will allow us to discuss fonctionnal hypothesis and how they really were used.

Keywords: Appointed tools, Bird bones, Traceology, Experimentation.

*Speaker

Kayaks and Ecological Improvisation in Greenland: An Ethnoarchaeological Perspective on Watercraft as a Social Technology

Matthew Walls ^{*† 1}

¹ University of Calgary – 2500 University Dr NW Calgary, Alberta, T2N 1N4, Canada

In the North American Arctic, watercraft technologies have been a central feature of the relationship between hunter-gatherer communities and their environments through time. They hold a prominent position in archaeological accounts of migration and adaptation, but their role in such events and processes is typically framed in terms of economic opportunities for hunting and transportation. In this paper, I argue that watercraft are also a social technology, critical to how communities improvise together in complex maritime environments. I draw on observations from ethnoarchaeological fieldwork, conducted with an Inuit community in Greenland who build traditional kayaks and practice hunting skills. Kayaking in modern Greenland is about more than nostalgia; the community is interested in forms of Inuit knowledge that are tied to the skill. Becoming a kayaker involves years of careful training where learners develop sensorimotor ability and environmental awareness that can only be developed in the physicality of practice. Through mutual participation, the technology aligns subjectivity between kayakers and acts as scaffold for the community's ability to perceive and respond together. As a mechanism of intergenerational experience, traditional kayaking has become an important feature of how the modern community experiences and attends to ecological relationships in the current context of climate change in Greenland. Through these observations, I reflect back on the efficacy of watercraft as social technologies, and the impact this understanding can have in how archaeologists assemble accounts of past events and processes.

Keywords: Arctic Archaeology, Ethnoarchaeology, Hunter, Gatherer Sociality, Hunter, Gatherer Theory

*Speaker

†Corresponding author: matthew.walls@ucalgary.ca

Les pêcheries de pierre sur les côtes de Patagonie et de Terre de Feu : la rencontre de traditions techniques aux parcours historiques différents

Jimena Torres *[†] 1,2, Manuel San Román *[‡] 1

¹ Universidad de Magallanes (UMAG) – Av. Bulnes 01855, Casilla 113-D Punta Arenas - Chile, Chile

² Archéologies et Sciences de l'Antiquité (ArScAn) – Centre National de la Recherche Scientifique : UMR7041 – Maison René Ginouvès Boîte 3 21, allée de l'université 92023 NANTERRE CEDEX, France

Les pêcheries en pierre sont des pièges construits par l'homme dans divers environnements d'eau douce et de bords de mer. Cette technique de capture a été utilisée en différents endroits du monde depuis la Préhistoire jusqu'à aujourd'hui. L'utilisation de cette technique de pêche et son efficacité dépendent de conditions environnementales telles que le marnage, la concentration de poissons en un endroit à certains moments de la journée et/ou des saisons, entre autres facteurs. Contrairement à d'autres méthodes de pêche, elle implique un aménagement fixe, inamovible, dont l'efficacité peut varier au fil du temps en raison des variations des niveaux marins, du tectonisme (affaissement et soulèvement de la terre), de la surexploitation des poissons, et de l'ensemble des changements océanographiques et écologiques. Ainsi, ce type de vestiges peut être le reflet du dynamisme des pratiques culturelles et des transformations du paysage naturel. Sur les côtes des archipels de Patagonie et de Terre de Feu au sud de l'Amérique, cette technique correspond à une longue tradition de pêcheurs, depuis la Patagonie du nord (île de Chiloé) jusqu'au canal Beagle, au sud de la Terre de Feu. À Chiloé, les populations chilotes-huilliches les utilisaient encore, il y a quelques dizaines d'années. Outre leur importance économique, elles ont joué un rôle dans la sphère socioculturelle. Dans le détroit de Magellan et les mers adjacentes, ainsi que dans le canal Beagle, les Indiens *canoeros* utilisaient cette technologie, comme en témoignent quelques sources ethnographiques et surtout la présence de ces structures pierreuses en différents points des canaux, des fjords et des îles. Des migrations tardives de populations chilotes-huilliches vers le détroit de Magellan ont pu contribuer à introduire ces nouvelles pratiques économiques et culturelles dans la zone australe. Enfin, à partir du XVIème siècle, des populations d'origine européenne naviguent dans la région à diverses fins : exploratoires, scientifiques, religieuses, politiques et commerciales ; certains marins pouvaient connaître l'utilisation de ce type de pêcheries en Europe, et ils ont pu réaménager les structures en place pour les réutiliser, ou en construire de nouvelles dans le but d'approvisionner les équipages.

Il est difficile d'établir la chronologie de ces installations et leur filiation culturelle sur les côtes de Patagonie et de Terre de Feu, en raison du croisement dans la région de ces différentes populations aux traditions techniques similaires. Ce travail correspond à une première approche

*Speaker

[†]Corresponding author: jimenaatorreselgueta@gmail.com

[‡]Corresponding author: msanromanbontes@gmail.com

archéologique systématique de cette technique de pêche à l'extrême sud du continent américain.

Keywords: pêcheries de pierre, filiation culturelle, Feu, Patagonie, chronologie, pêche préhistorique, pêche historique

Planning, provisioning, and predictability: The organization of microblade technology in the eastern Aleutian Islands, Alaska

Kale Bruner * ¹

¹ University of Kansas – United States

The hunter-gatherers of the eastern Aleutian Islands possessed an almost entirely maritime-oriented economy for the past 9,000 years. Sophisticated technological items such as watercraft and multicomponent bone and stone tools enabled access to subsistence resources and materials for production of critical crafts such as clothing. Chipped stone tools, and the tasks that they are associated with, have received little analytical attention, despite their abundance in the Aleutian archaeological record. Because extractive and processing activities have different material requirements, tool or toolkit attrition rates, and spatio-temporal distributions of need, use, and discard, it is expected that their dynamics of production and replenishment, as well as lithic economies, will also differ. Microblade technology is particularly relevant to understanding Aleutian lithic assemblage variability through the Holocene but the role of this distinctive prepared-core technology in coastally adapted technological systems around the Arctic and North Pacific is not universal. Generally, contextual evidence for the use of microblades in hunting weaponry predominates, however, there is also unambiguous evidence in some coastal locations for the use of microblades in hafted knives and, therefore, as a technology aligned to processing tasks. In this paper, results are presented from morphometric and technical analysis of microblade technology at Russian Spruce and the stratified Margaret Bay site on Unalaska Bay in the eastern Aleutian Islands, Alaska. Reconstruction of the technological system is aided by Minimum Analytical Nodule analysis and an approach guided by the concept of chaîne opératoire. Together these lines of evidence demonstrate variability in microblade production techniques and provisioning strategies between 9,000 and 3,500 cal BP. The persistence of microblade production, but with variability in its organization through time in Unalaska Bay, is interpreted as adaptive responses by Holocene foragers to the proximal effects of environmental change, and the outcome of decisions made in the context of shifting levels of uncertainty and risk.

Keywords: Microblade technology, lithic provisioning, Aleutian archaeology

*Speaker

Pre-contact Yup'ik subsistence technologies: new evidence from the Nunalleq site, Western Alaska

Edouard Masson-Maclean ^{*†} , Claire Houmard ^{*}

¹, Richard Knecht , Yan Axel Gomez Coutouly ^{*}

, Isabelle Sidéra , Kate Britton

¹ Laboratoire Préhistoire et technologie (CNRS UMR 7055) – Université Paris X - Paris Ouest Nanterre La Défense : EA020, CNRS : UMR7055 – 21 allée de l'Université. F-92023 NANTERRE Cedex, France

Limited archaeological research has been conducted along Alaska's Bering sea coast, and the Yukon-Kuskokwim Delta, home of the Central Yup'ik, in particular, despite the region's importance for understanding past cultural developments in southwest Alaska and beyond. As a result little is known of pre-contact Yup'ik lifeways with archaeologists having to rely on the ethnographic record to infer prehistoric subsistence strategies and technologies. However, as the indigenous populations were exposed to the fur trade and Christianity relatively early, these ethnographic accounts only provide limited information concerning pre-contact culture. This study addresses pre-contact Yup'ik subsistence technologies by analysing the faunal remains and hunting technology from the well-preserved coastal site of Nunalleq (15th-17th AD), which offers a unique opportunity to explore the exploitation of the marine environment in the region during the late prehistoric period. Incorporating published isotopic data from the site, the results suggest that people from Nunalleq focused primarily on marine mammals, salmon and caribou, with caribou most likely playing a critical role as a major source of raw material for making the necessary tools to acquire seals and beluga in particular. This tripartite exploitation strategy appears to have underpinned human resilience in the region and the Nunalleq material offers new insights into a local variant of Thule adaptation during the Little Ice Age.

Keywords: Yupik, Alaska, subsistence technologies, Nunalleq

*Speaker

†Corresponding author: edouard.masson-maclean@abdn.ac.uk

Projectile shafts of recent hunter-gatherer's Subarctic and Sub-Antartic societies in America

Gisèle Maerky * 1

¹ Université Paris 1 Panthéon Sorbonne, équipe Ethnologie Préhistorique, ArScAn, UMR7041 –
Université Paris 1 Panthéon-Sorbonne – France

In archaeological contexts, hunting weapons are generally best known through the only part that may be preserved: points and foreshafts of lithic or bone materials. Shafts, because they are made of wood, a perishable material, are only found in exceptional contexts. Thus, most analyses of hunting weapons are based on theoretical knowledge of the shaft and its efficiency for the projectile. To address this lack of data on the importance of the shaft in projectile technology, we are analyzing complete ethnographical hunting weapons collected among the Alutiiq and Aleut people of southern Alaska (Subarctic) and the Kaweskar and Yahgan of southern Patagonia (Sub-Antarctic) in late 18th to early 20th century. These four hunter-gatherers societies had to adapt their hunting equipment and strategies to similar cold and coastal fauna and environments. They hunted almost identical types of prey and conceived similar projectile types (harpoons and lances). We compared the projectile shafts from these different contexts in order to get at similarities and differences and identify the essential technical characteristics as well as what underlies variability. To explore selection choices in these four cultural groups, the analysis of the shafts is three-fold: form and metric recording, raw material identification and manufacturing techniques. Our results show that criteria such as weight, balance point and length are essential to specify the differential functioning of the harpoon and lance shafts. However, some differences in manufacturing and wood selection stress the importance of cultural choices.

Keywords: Projectile, shaft, wood, maritime hunter, gatherer, technology, hunting

*Speaker

Quebrada de los Burros : une exploitation intensive des ressources marines au début de l'holocène dans le sud du Pérou

Philippe Béarez * ¹, Michèle Julien , Danièle Lavallée

¹ Archéozoologie, Archéobotanique : sociétés, pratiques et environnements – CNRS : UMR7209 – Muséum national d'Histoire naturelle case postale 56 55 rue Buffon 75005 Paris, France

La période archaïque est relativement bien documentée sur le littoral du sud du Pérou. La Quebrada de los Burros, située à une soixantaine de kilomètres au nord de la frontière chilienne a fait l'objet de multiples campagnes de fouilles et d'une étude pluridisciplinaire. Les datations sur charbon et coquille ont permis de placer l'occupation humaine du site entre 10 000 et 7000 Cal BP. L'abondance des restes d'origine marine, en particulier de mollusques et de poissons, indique que la subsistance des groupes était en majorité basée sur l'exploitation des ressources aquatiques. Le milieu marin est très productif le long des côtes du Pérou où il constitue l'écosystème de Humboldt. L'étude détaillée des nombreux restes de poissons ainsi que des artefacts de pêche retrouvés nous permet d'obtenir une image relativement claire des modes d'exploitation par pêche de ce riche écosystème. Une pêche côtière, mais variée, était manifestement suffisante pour subvenir amplement aux besoins des groupes vivant dans la *quebrada* et ceci sans affecter visiblement l'écosystème.

Keywords: Peru, Holocene, Archaic period, fishing strategies, fishing artefacts, Humboldt ecosystem

*Speaker

The Lithic Industry from the Pre-Contact Yup'ik Site of Nunalleq (South-West Alaska)

Yan Axel Gomez Coutouly ^{*† 1}, Rick Knecht ², Edouard Masson Maclean ³

¹ UMR 7055 Préhistoire et Technologie – Université Paris Nanterre – France

² Department of Archaeology, University of Aberdeen – United Kingdom

³ Department of Anthropology, University of Aberdeen – United Kingdom

The Nunalleq site is a pre-contact Yup'ik site from Southwest Alaska dating to the XVIth-XVIIth century. This coastal site represents the first archaeological site excavated in Yup'ik territory relating to the Bow-and-Arrow Wars period with evidence of warfare, given that the site has been abandoned after it was destroyed and burnt during an attack. Through its rich lithic industry, it also provides one of the best examples of pre-contact Yup'ik polished stone tool technology. Indeed, thousands of polished artefacts made of slate, jade and other raw materials, give a clear insight into the Central Yup'ik tool kit of the pre-contact era. So far, the stone tool collection has provided a wide array of artefacts, including end-blades, lance points, adzes, multi-faceted chisels, ulus, drill bits, large knives, small knives, scrapers, and so on. Other than a technological approach to all these artifacts, the analysis also enables discussions relating to the Bow-and-Arrow Wars (through the study of end-blades used as arrow points) or to the gender distribution in the Nunalleq village (through the analysis of the spatial distribution of certain types of tools such as ulus). Located in a permafrost context, the site has produced archaeological remains with an extraordinary preservation of organic materials. Thus, when studying the stone tool component, the organic preservation permits to replace the stone industry within a larger technical system including organic materials relating (bows, arrow shafts, bone points, harpoons, armor plates, etc.). The Nunalleq site being a pre-contact Yup'ik coastal village, studying the site and its archaeological remains represents a window for understanding a coastal settlement of past hunter-gatherers-fishers in a region where this type of excavated site is non-existent.

Keywords: Nunalleq, Yup'ik, Alaska, Lithic technology, Slate, Polished artefacts

*Speaker

†Corresponding author: yanaxel@northpacificprehistory.com

Tracking fish and fishing practices over time in sambaquis of the Santos estuarine complex, southeastern Brazil (4900 – 1900 years BP)

Caroline Borges * ¹

¹ Universidade Federal de Pelotas – Brazil

Sambaquis were shell mounds constructed along the southern and southeastern coast of the Brazilian Atlantic coast by fisher-hunter-gatherer groups during the mid-Holocene.

Faunal remains from four archaeological sites located in various areas of the estuarine complex of Santos, São Paulo State, south-east of Brazil, were analysed and compared with the archaeozoological results published for others *sambaquis* in the same region. These sites, Piaçaguera, Mar Casado, Maratuá and Buracão, have dates ranging between 4930 and 1950 years BP.

The aim was to determine the diet of these populations, and to identify the subsistence practices and the ecosystems exploited.

The results prove that the marine resources, primarily fish (teleostei and chondrichthyes), were the most important food resource in all of the archaeological sites studied. The wide faunal spectra of these sites illustrate an opportunistic exploitation of a varied range of the estuarine and marine habitats by sambaquis groups.

The ichthyological profile identified is roughly equivalent between sites, with the dominant presence of the families Ariidae, Sciaenidae, Centropomidae, Eleotridae and Mugilidae, but the importance of each family and each species differs over time, indicating that human groups exploited their environment in different ways.

Size estimation of archaeological fish was performed using osteometric models and the measurements taken on the archaeological bones and otoliths. This provides further insight on the type of fishing techniques that could have been potentially employed as well as the identification of associated fishing practices.

On the basis of these data, we discuss the changes and continuities of the fishing strategies and ecosystem exploitation in the Santos estuarine complex.

*Speaker

Keywords: sambaquis, fishing strategies, subsistence practices, archaeoichthyology, Brazil