



Book of abstracts

XVIII^o CONGRES UISPP PARIS JUIN 2018
18th UISPP WORLD CONGRESS, PARIS, JUNE 2018

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**XXII-1. North African and Saharan
archaeology recovering from the
turmoil: Reconstructing the climate
and cultures of the final Pleistocene
and Holocene through innovative
research strategies and rock art
enhancement.**

Distribution of rhyolites from Jebel Sabaloka (central Sudan): the case of gouges.

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There is a number of key issues of the social and economic conditions in Northeast Africa during Neolithic period, which have not been dealt with satisfactorily yet. One of these is the issue of the emergence of intensive forms of exchange. In my paper I would like to present case study on this topic. As an example of the artefact, which was distributed over a significant distances, were chosen gouges (axe like lithic artefacts). They are an iconic artefact of the early phase of the Neolithic period in central Sudan (the Gouge Culture – *Arkell 1949*; now known as the Early or Khartoum Neolithic *Arkell 1953*). These artefacts are usually made of rhyolites from Sabaloka area and often were transported over long distances.

There is a significant number of issues connected with distribution of gouges. Even when there were many important articles published on this issue (e.g. *Kobusiewicz 2011*; *Magid 2003*), there are many questions which are not answered clearly enough:

1) function

2) technology of production

3) distribution

This paper focus on the technological aspect of their production and distribution. High professionalism in their production is very important for better understanding of their role in the society. There are several lines of explanation of role of these artefacts from purely utilitarian to highly symbolic. I would like to present preliminary information which comes from comparative analysis of gouges from several sites in central Sudan. Especially compare differences between materials which are from sites which are right near the source of the raw material to the collections which come from more distant areas.

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Kobusiewicz, M. 2011: Lithic implements. In: Chlodnicki, M. – Kobusiewicz, M. – Kroeper, K. eds. *Kadero: the Lech Krzyżaniak excavations in Sudan*. Poznań. p. 267-297.

*Speaker

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Keywords: Lithics, Neolithic, Central Sudan, Distribution, Technology

The cultural evolution of the Western Sahara after the statistical analysis and the geographic distribution of the prehistoric rock-art

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The long term conflict for the control of the Western Sahara has constrained the archaeological research for 40 years and has impacted to a great extent on the selection of the archaeological sources and methodologies. In this context most of the research of the University of Girona has been focused on the study and protection of the most exposed heritage, specially rock art. Since 1995 our team has been documenting rock-art sites with the aim to discover the chronocultural evolution of the Western Sahara in absence of complementary archaeological sources that can not be obtained in the actual context. As result, a set of regional styles sorted in relative chronological order have been defined with the rock-paintings. However the stylistic classification of the engravings, which are far more abundant and territorially widespread, has always been a major unresolved challenge. In our contribution we introduce the results of statistical analysis developed on a representative sample of more than 5.000 Western Saharan paintings and engravings, which are helpful in order to determine the styles of engravings. These results, coupled with accumulating evidence of thematic coincidences between paintings and engravings, will be discussed in order to evaluate the effectiveness of this methodological approach. Finally the chronology and geographic distribution of the styles will be presented in order to interpret the cultural evolution detected by the rock art studies.

Keywords: Western Sahara, rock art, prehistory

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TIOUT : APPORT DES REPRÉSENTATIONS PARIÉTALES À LA COMPRÉHENSION DU CLIMAT ET DES PREMIÈRES SOCIÉTÉS HUMAINES DURANT L'HOLOCÈNE DANS LE SUD DES MONTS KSOUR (ALGÉRIE, SUD-OUEST ATLASIQUE)

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Le site de Tiout, publié en 1847, jouxte l'oued du même nom (source en tamazight), qui rejoint l'oued principal El-Bre'idj et ses ramifications (Oueds Tiourtelt, Rtem et Krouabi – nord-est ; el-Khreneq et el-Melah -est) forment un réseau hydrographique dynamique (sud-ouest du Massif atlasique, Algérie) et rejoignant l'oued el-Rhou'iba et plus au sud l'Oued Namous avant de mourir dans les sables du Grand erg occidental. Ils alimentent les grandes vallées des piémonts atlasiques avant d'atteindre les dépressions endoréiques septentrionales du Sahara nord-occidentale. Actif durant l'Holocène ancien-moyen, il a attiré des communautés animales et humaines diverses ayant abandonné des vestiges signalés.

Les représentations pariétales gravées sur la face verticale sud d'un rocher évoquent une faune assez abondante et variée d'herbivores (grands bovins, antilopes, gazelles), de carnivores (félins, canidés) d'autruches, accompagnées de personnages. Ce corpus suggère des ressources et une attractivité certaine du milieu pour la grande faune et les hommes qui y installèrent leurs campements dont certains sont datés. Les espèces fauniques et la diversité animale représentées sont les mêmes que celles déjà signalés sur l'ensemble des piémonts atlasiques et les Hautes plaines du Constantinois et de l'Ouarsenis.

Le site de Tiout peut nous aider à mieux comprendre l'organisation de l'espace domestique à l'abri de la falaise. Ces données témoignent de circulations et de relations ouest-est et sud-nord reliant les régions sahariennes, atlasiques et hautes plaines entre elles. Il est probable que les premières formes de domestications aient lieu dans ces piémonts atlasiques. Le réseau hydrographique de ce territoire charnière a servi de voie de communication au sein d'une vaste région allant des côtes atlantiques aux côtes méditerranéennes de l'Afrique du Nord, aujourd'hui désertique. Evoquer les aspects d'un climat favorisant l'installation d'une faune variée au cours de l'Optimum climatique holocène passe par le réexamen de nombreuses gravures rupestres signalées dès la fin du XIXème siècle (Jacquet, 1847, Frobenius 1923, Flamand, 1925, Solignac,

*Speaker

1925, Vaufrey, 1939) et d'autres plus récentes confirmant l'existence de présences tardives ininterrompues (nombreux monuments funéraires).
Les derniers témoignages de liaisons transversales soulignent l'importance des communications et des traversées de ce territoire que désenclave aujourd'hui un réseau routier. Faire le point des connaissances s'impose au moment où ces régions se transforment.

Keywords: Atlas saharien, gravures rupestres, Holocène, réseau hydrographique, monts des Ksour, Tiout.

Les spirales sur les roches du Sahara: l'art de communiquer avec les archétypes

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La spirale est une des grands symboles de la préhistoire et histoire humaine avec des correspondants précis dans la nature. elle est présente pratiquement dans chaque culture post paléolithique du globe et elle semble assumer de différentes fonctions symboliques propre dans chacune d'elle et a chaque groupe d'elle, mais elles sont toute focalisées sur une idée générale de développement, évolution surtout liées a la sphère féminine.

Ce rapport présente la manifestation du symbole dans le sahara avec des confrontations sommaires avec celles d'autres régions africaines, européennes et américaines.

Selon le compte de plus de 300 images, jusqu'a présent repérées, on peut affirmer que 200 images sont localisées dans oued Djerat (Illizi) . Cette zone semble particulièrement caractérisée pour ce symbole. on trouve d'autres zones, moins importantes, à oued Didier farnim , Abalema Hoggar et en Arakim (sahara occidentale) et une douzaine d'autres localités qui ont peu d'exemples attribués dans la quasi totalité au néolithique pastoral, l'association plus courante est avec les figures des animaux spécialement les bovidés

les spirales sont figurées ici, intérieurement aux gabarits des animaux et extérieurement elles apparaissent avoir particulière relation avec le ventre et la zone pubienne, avec le dos et avec la tête et les cornes . Souvent dans les mêmes espaces, nous avons un fuseau de ligne a voute et d'une façon secondaire des cercles concentrés avec une variété d'impressions, a disques de rayons variés, des figures quadrangulaires et des divisions internes. Les associations avec des animaux répétables féminins représentent la majeure des cas et il on trouve des chiens avec des chiots et une visible référence forte aux appareils génitaux et au cordon ombilical.

L' enquête porte a considérer les spirales de prévalence dans un contexte de maternité, grossesse procréation et développement de la vie.

Keywords: art supestre, Sahara, spirales, Djerat, Didier

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Kom W and X Basin: expanding the landscape archaeology of the Fayum, Egypt

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The results of new studies of the formational history and age of the Kom W deposit, along with new analyses of the stone artefacts, pottery, and fauna are related to the analysis of the surface deposits of artefacts that surround the site. Rather than a village as some have claimed, Kom W accumulated over a period of around 1000 years without evidence for occupation structures. Dates obtained from surface heat retainer hearths suggest that the dense artefact deposits that surround the site accumulated over a similar period. When placed within its landscape context, Kom W is not as unique as once imagined nor does it have the attributes of a permanently occupied village as some have suggested. Instead, Kom W is similar to other deflated deposits in X Basin all of which indicate a combination of storage and considerable mobility. These results suggest a settlement pattern and socio-economy in the Fayum different to that reconstructed for the Levant.

Keywords: Fayum, Neolithic, Egypt, Geoarchaeology, chronology

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Bone artifact collection coming from Wadi Ti-n-Torha (northern Tadrart Acacus, Libya). A re-study in the light of innovative methodologies

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From the second half of the past century, the adoption of new analytical methods has given strong impetus to the study of artifacts made on raw materials of animal origin. The revision of bone collections from old excavations in North Africa, now stored in museums, has positively incorporated the previous information and expanded the interpretation possibilities. In this context, this paper illustrates a sample of bone artifacts coming from the two sites Ti-n-Torha East and Ti-n-Torha North in the Tadrart Acacus Libyan desert, excavated in the early 1970s. The technological study of this collection allows to observe and define some techno-economic trends pertaining to the social group that manufactured them. This is evident in the choice of raw material, in the selection of animal species, in the techniques used, up to the morphometry of the tools and to the decorative patterns applied on their surface. Considering the stylistic choices and the selection of faunal species, it is possible to observe a significant continuity between the pre-pastoral phase of Torha Est and the pastoral one, recorded in the Torha North shelter. At the same time, the discovery of a human bone with traces of anthropic manipulation in the Torha East sample is an exceptional case for these desert areas that deserves to be carefully evaluated. The results achieved give greater importance to this category of objects made from hard animal raw materials, traditionally considered as less informative in comparison with lithics and ceramics, and lead to reconsidering their role for a more articulate reconstruction of the prehistoric society that produced them.

Keywords: North Africa, methodologies, technology, bone collection

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The Palaeoenvironmental Implications of the Small Mammal Fauna of Haua Fteah Cave, Northern Libya

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Haua Fteah Cave, located on the northern steppes of the Gebel Akhdar massif in Northern Libya, is one of the most important prehistoric archaeological sequences in north-eastern Africa. Contexts from the earliest trench of the sequence, the Deep Sounding, date to approximately MIS 5, a period in which it is hypothesised that modern humans crossed the Sahara and moved out of Africa and into Eurasia. The palaeoenvironment and palaeoclimate of this period is therefore of particular interest, and can be used to test hypotheses concerning human dispersal across the region. Several features of small mammals make them ideal palaeoecological proxies, and they can be used in the construction of localized, high resolution palaeoenvironmental reconstructions. In this study small mammal remains were identified, and taphonomic analyses were carried out to identify the predator responsible for assemblage accumulation. Changes in community structure were examined at different numerical and temporal scales to evaluate the stability of the system, and the habitat preferences and corresponding climate indicated by each taxon was determined. Fluctuations in the proportion of taxa in each climate category could then be used to produce a reconstruction of palaeoenvironmental change throughout the sequence. The results showed that the climate of the period surveyed was semi-arid, broadly similar to that seen today, with no large-scale changes in the composition of the community. There was, however, a peak in the proportion of taxa indicating humid conditions in the lower section of the sequence, in contexts approximately dated to MIS 5e. This peak coincides with higher lithic densities in the cave deposits, suggesting that the improved climatic conditions of the period allowed dispersal to and heavier occupation of the cave site. Overall the results of this work offer support to the "Green Sahara" hypothesis, that humid conditions in MIS 5e may have opened up corridors of dispersal across the region.

Keywords: Microfauna, Palaeoecology, Palaeoenvironment

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A multi-proxy approach to reconstructing ecological change in the Green Sahara.

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Whilst the Holocene African Humid period is perhaps one of the most thoroughly documented and well-dated climate change events, the rate of change to the terrestrial environment and its spatial distribution are poorly understood. Current palaeoenvironmental proxies fail to produce consistent temporal trends on regional ecological conditions due to the proxies encoding different levels of information (e.g. cores from groundwater fed versus precipitation fed lakes yielding conflicting results on the timing of aridification at the end of the AHP). In this paper we present results from the GreenSahara project on ecological change over the course of the AHP in North Africa. Using compound-specific carbon ($\delta^{13}\text{C}$) and deuterium (δD) isotopes from organic residues in pottery, to reconstruct vegetation trends and humidity levels, alongside high resolution palaeohydrological maps derived from remote sensing data, we present a new approach for mapping terrestrial ecological change.

Keywords: Sahara, ecological change, stable isotopes, palaeohydrology

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Entangled Africa - Intra-African relations between rain forest and Mediterranean, ca. 6000 – 500 BP (New Project)

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In April 2017 the DFG Senate established the *Schwerpunktprogramm* "Entangled Africa: Intra-African relations between rain forest and Mediterranean, ca. 6000 – 500 BP" (SPP 2143) for a run time of 6 years. The project attempts a fundamental change in perspective. According to our hypothesis intra-African relations had a more substantial impact on the development of human societies in Africa than previously acknowledged. In order to test this hypothesis, we will reverse the traditional viewing perspective. The focus of the project will be on intra-African interactions rather than extra-continental contacts. Our objective is to understand which kind of intra-African interactions existed and the impact they had on neighboring regions. The main objective of the SPP is to render visible the multilayered entanglement of wide ranging contacts in the African past between the Mediterranean and the rain forest. Entanglements and interactions which had a formative influence on human societies during the last 6,000 years will be studied with the help of a wide spectrum of multidisciplinary methods.

Keywords: North Africa, Research Project

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Sources of pigments for the Neolithic rock art of Wadi Sura, Gilf Kebir, Western Desert, Egypt

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The paper deals with the 2010-2013 field activity of the 'Italian Archaeological and Conservation Project in the Gilf Kebir, Egypt' carried out in the framework of the Egyptian Italian Environmental Cooperation, and directed by B.E.Barich. The conservation work focused on the two caves of Wadi Sura that required the most urgent intervention - Cave of Swimmers and Cave of Archers – and followed a multidisciplinary approach integrating archaeological and geomorphological reconstruction (Tomassetti et al.2016). We discuss geological, mineralogical and geochemical characteristics of the proposed sources of pigments used in the Neolithic Wadi Sura rock art and compare them with similar data from other rock art contexts already known (e.g. Darchuk et al., 2011). Colors used in the paintings comprise white, yellow and a number of reddish hues ranging from pale red to dark reddish brown as well as rare black and greenish hues. White pigments were recorded in the field as thin laminated beds and lenses inside the Wadi Sura sandstone bedrock and also in ancient lateritic palaeosol layers as reworked fragments mixed with ochre. Our study, applying Raman spectroscopy, XRD and XRF techniques on both raw and archaeological materials, shows that the ancient artists widely used inorganic earthen pigments: e.g. kaolinite, anhydrite and gypsum, among others, were used as white substrate of the rock art works; a mixtures of aluminosilicate based clays with iron oxide, gypsum, hematite, goethite or magnetite and quartz, provided reddish pigment; while high content of graphite and birnessite along with goethite and magnetite produced the dark brownish pigments widely used in the rock art of the archaeological area.

Surprisingly, a content of lazurite (Na₃Ca (Si₃Al₃) O₁₂S) was also recognized among the raw materials, although actually this blue pigment doesn't seem to have been used in the Wadi Sura rock art panels (however, blueish and greenish traces as violet-reddish hues, along with bluish greenish yellow colors are reported). Lazurite is not well known in the geology of Egypt and has been detected by the present study for the first time.

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Our research highlighted notable similarities in the mineral and chemical composition of both geologic and archaeological raw pigments. Highly noteworthy was also the fact that all the proposed earthen pigments have high binding media properties that make them very suitable for rock art, without any need for using organic binders such as albumen, vegetable resin or blood.

Keywords: Saharan rock art, paintings, inorganic earthen pigments, sandstone bedrock, mineralogical and geochemical analyses

Assessing settlement pattern in middle Holocene Egypt with ceramics

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Contemporary approaches to settlement pattern assess mobility, occupation duration, and use-of-place. These are measured through analysis of material culture such as stone artefacts and of the concentration features such as houses on a landscape. However, more examples are required that use material culture types that are abundant and preserve well, such as pottery. In Egypt pottery occurs from the early Holocene and it is often used in reconstructions of settlement pattern. This research uses portable x-ray fluorescence to identify the geochemical signatures of the materials used in pottery manufacture. The approach used looks for groups based on relative differences among objects in order to identify materials that fall outside of the most common geochemical composition within an assemblage. In addition, relative levels of fragmentation are compared to determine the occupation duration of particular places. Ceramic artefacts from four assemblages from middle Holocene contexts in Egypt are assessed. The results are used to interpret mobility and settlement patterns indicating more variability than previously thought.

Keywords: Egypt, middle Holocene, Neolithic, northeast Africa, pXRF, ceramics, pottery, fragmentation, mobility

*Speaker

Late Pleistocene-Early Holocene Human Occupation in the Nile First Cataract Region

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In North Africa, the period between c.50,000 and 8,000 cal. BP was characterized by the alternation among arid and humid conditions. This alteration triggered environmental changes and effected human occupation. Based on archaeological and paleoenvironmental data from the Lower Nile Valley Vermeersch and Van Neer (2015) suggest a low population density during the Upper Palaeolithic (c.50,000 cal. BP/MIS3), a significant increase during the Late Palaeolithic (from the Late Glacial Maximum/MIS2, c.25,000-14,500 cal. BP to the Younger Dryas/MIS1, c.12,900-11,700 cal. BP), and again a low density during the Early Holocene humid phase (c.10,000-8,200 cal. BP). The work of the Combined Prehistoric Expedition at Wadi Kubbaniya in the late 1970s and early 1980s (Wendorf et al. 1989), is a major source of data documenting human occupation in the region of the First Cataract during this period. Kubbaniya is the largest wadi in Upper Egypt as it extends from the Western Desert into the Nile Valley north of Aswan. Exceptionally well-preserved floral and faunal remains provided a detailed reconstruction of the settlement-subsistence patterns of hunter-gatherers here. In 2012 a consortium comprised of the Aswan-Kom Ombo Archaeological Project, the Combined Prehistoric Expedition Foundation, and the PaleoResearch Institute resumed work at Wadi Kubbaniya, along with a section of the west bank north and south of the wadi and in Wadi Abu Subeira, on the east bank (Banks et al. 2015, in press). These investigations provide new data on less documented periods of the local sequence, including the Upper Palaeolithic, the end of the Late Palaeolithic, and possibly the Early Holocene. Paleobotanical research that focused on the microscopic analysis of residue on grinding equipment was an integrated aspect of these investigations. Pollen and phytoliths were recovered and provide further evidence of the role of plants in the subsistence pattern. These new investigations further clarify the response to the climatic changes that characterized this period. This contribution will present the result of these investigations in the frame of its regional setting and the impact of climate change.

Banks, K., Snortland, J.S., Scott-Cummings, L., Gatto, M.C. and D. Usai 2015. The terminal Late Palaeolithic in Wadi Kubbaniya, Egypt. *Antiquity Gallery*: <http://antiquity.ac.uk/projgall/banks346>.

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Keywords: Late Pleistocene, Early Holocene, Climatic changes, Human occupation, Nile First Cataract region, Wadi Kubbaniya

The ‘silent millennia’: Population dynamics and social interaction along Mediterranean Africa during the Late Holocene

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This paper presents the results of a programme of gathering and modelling of already published data, carried out in the framework of the ‘*MedAfrica – Archaeological deep history and dynamics of Mediterranean Africa, 9600-700 BC*’ project, funded by the Leverhulme Trust. Maintaining investigative momentum during an enforced partial cessation of field activity is a manifest priority in North Africa today in order to better shape future investigative strategies. The Neolithization process along the North African coast and the Sahara have been thoroughly investigated in recent years. Current evidence seems to indicate profound internal variation across Mediterranean Africa, some of it associated with climate-driven environmental change. Such variation includes earlier Holocene aquatic foraging lifestyles along the Nile; primary pastoral mobile practices spreading out of north-east Africa from the 7th -6th millennia BC; a long-lived mosaic of foraging, pastoral and mixed ways of life elsewhere, often evincing a broad multi-spectral exploitation of resources; and, from the 6th millennium BC, confined enclaves of farming that long remained restricted to the Nile and the western Maghreb.

In contrast, the millennia ranging from the beginning of the irreversible climatic deterioration of the Sahara, around 4000/3500 BC, and the onset of the classical period in North Africa still remain *terra incognita*. The evidence everywhere except in the Nile delta declines sharply and recovers only around the period of Phoenician and Greek settlement.

Why does our information reduce so sharply from the 4th millennium BC onwards until the threshold of the colonial Iron Age? To what extent can this really be attributed to aridification in the Mediterranean zone, as undoubtedly holds good for the Sahara, given that the same process elsewhere in the Mediterranean coincides with a burgeoning of Copper and Bronze Age societies? Alternatively, is it a product of the failure to look for the right kinds of material and sites, and of their relative visibility?

We carried out a programme of comprehensive data-gathering and modelling, which included all (a) the existing chronometric evidence for the Holocene Mediterranean Africa; (b) reliable available palaeoenvironmental and climate data; and (c) standardised typological criteria, published information by site on principal cultural traits, plus faunal and botanical remains. This allowed us to understand how real the informational dearth from the 4th to early 1st millennium BC really is, and whether it reflects low archaeological visibility and/or prospection versus an absence, or reduction, of past activity during this period.

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Keywords: Mediterranean Africa, Late Holocene, Data modeling, GIS, Social dynamics, Bronze Age

The meal is served! Continental shell midden at al-Khiday Mesolithic site, Central Sudan.

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Located on the west bank of the White Nile, Al-Khiday is a complex prehistoric site area that produced the first stratified and structured Mesolithic and Neolithic evidence so far known in Sudan. The rich assemblage of artefacts and ecofacts recovered there is allowing the first diachronic overview of hunter-gatherer-fishers pottery-bearing Mesolithic population of the Nile Valley.

The diet of this population occupying a particularly rich ecosystem was mainly based on fish, with Clariidae being the most common taxon, while mammals seem to have provided a much smaller amount of food. Shells of snails have commonly been found in settlements dating to this period, but never in such quantities suggesting that they were a substantial part of the subsistence system. An exceptional discovery at one of the Mesolithic sites at al-Khiday (site 16-D-3), suggests freshwater snails were highly prized by this population and may have been more than a complementary meal. Large accumulations of mainly *Pila* shells are present at this site in a well-preserved stratified deposit, spanning nearly one millennium, from 7000 to 6100 cal BC. Whether the diet of the population occupying the site also included plants needs to be further explored but currently it is possible to infer that plant resources must have played a role in the diet as the abundant grinding equipment and the recovery of phytoliths from grasses (in which Panicoid silica skeletons millet-like plants predominate) seems to suggest.

Isotopic analysis on the *Pila* shells from different phases suggests a possible climatic shift towards more arid conditions. In the archaeological record, the climatic shift seems to correspond to a change in the in faunal assemblages likely representing a human response to environmental change.

Keywords: Sudan, White Nile, Mesolithic, shell midden, diet

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New data from a forgotten excavation: the early Holocene transition at Saint-Trivier (Mascara, Algeria)

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At the end of the 1950s, during the Algerian War of Independence, Georges Simonnet – a lieutenant in the french army and archaeologist- excavated several test pits at the site of Saint-Trivier (Mascara, Algeria). The site is an accumulation of remains of more or less ashy prehistoric occupations and shell levels, located at the edge of a steep ravine that partially carves into it. Three main trenches were excavated with rigorous methods, resulting in the discovery of abundant knapped flints, animal bones and gastropods, as well as several pits and hearths and stone blocks levels. This site is located in a geographic zone away from most of the early Holocene Algerian sites, and therefore the data collected here are particularly valuable. After the war, the excavator returned to France with his collection, which was left in the family cellar for several decades, before being temporarily handed over to the TRACES laboratory of Toulouse. The examination of photographs, slides, section drawings and written notes enabled us to reproduce the field operations and identify several occupations in a one meter thick stratigraphic sequence. The study of the lithic and bone industry shows a clear evolution in the operative debitage schemes and the typological range of tools. The lowest occupations are probably related to a final Iberomaurusian complex while the main levels can be pertinently compared to a poorly known specific Mediterranean Epipalaeolithic facies in North Africa; the Columnatian. The Bayesian modelling of the radiocarbon dates on bone apatite obtained in the stratigraphic sequence places the first occupations towards 11 ky BC cal., whereas the central occupations date to the second half of the 8th millennium BC cal. These new data from an old excavation thus provide an unprecedented insight into the early Holocene transition in western Algeria.

Keywords: North Africa, Algeria, Lithic technology, Columnatian, Iberomaurusian

*Speaker

Perception des félins à travers les représentations rupestres du plateau d'Ifetessen (Immidir, Sahara central, Algérie) durant l'Holocène.

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Le mode d'expression artistique rupestre s'illustre par de nombreuses figures d'animaux sauvages et domestiques et par des scènes de la vie sociale des divers groupes ayant évolué dans les massifs du Sahara central.

Les fresques rupestres du plateau de l'Immidir présentent un riche panel des différentes périodes, dominé par la longue séquence du mode de vie pastoral. Cette dernière s'inscrit pleinement dans l'Holocène et elle correspondrait à la phase climatique du " Grand humide " et durerait jusqu'aux derniers étages caballin et camelin marquant le grand aride.

Ces figurations montrent que l'homme accordait beaucoup d'intérêt à la faune qui l'entourait. Il a illustré sa diversité et a exprimé les rapports qu'il entretenait avec certaines espèces. Les sujets de ces fresques permettent de reconstituer l'environnement de cette période mais c'est également un moyen pour comprendre le rapport de l'homme à son milieu et les comportements de subsistance.

Nous évoquerons dans notre présentation, particulièrement deux exemples que nous avons relevés dans deux abris du plateau d'Ifetessen : une fresque peinte à l'ocre rouge où sont associés personnages, bovins et félin. Une figure gravée d'un grand félin à proximité de bovins. Ces deux scènes de prédation renseignent sur la place qu'occupent les félins carnassiers et la réaction des pasteurs face à la menace de ces prédateurs.

Keywords: art rupestre, félins, Holocène, Immidir, Sahara central.

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Methodologies and applicability: what answers? The case study of the Upper Capsian tecno-complex

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In the Upper Capsian, a tecno-complex developed in the eastern Maghreb between the IX and VII millenium cal. B.C., bone and egg shells prevail among the material culture. Understanding the interactions between the different category of materials and identify their mode of manufacturing allow to reconstruct the organization of a cultural group and how them perceived and related the resources provided by the environment. The reconstruction of the *chaîne opératoire* aimed to identify the manufacturing and using process of archaeological artefacts, takes advantages by the development of new technologies and methodologies. In this paper we present the work we carry out on an experimental activity that takes into account two elements of material cultures always founded associated in the Upper Capsian archeological deposits: bone tools and ostrich egg shells. The latter are often engraved or trasformed in beads. Pointed tool, manufactured in series, characterized by a small section (1-3 mm) associated with beads from egg shells suggested their use such as drillers. The experimental activities complemented with microscopy rejects the initial hypothesis and instead reveals how the ostrich egg shells were perforated by lithic tools.

Keywords: North Africa, Upper Capsian, Materials, Methodologies, Bone tools, ostrich egg shells beads

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Population movements towards refuge areas during the Mid-Holocene aridification of the Sahara: a comparative study at a supra-regional scale

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In this paper we use the concept of refuge areas for characterizing regions having benefited from population movements between plains and massifs during the last millennia of the Holocene "climatic optimum" of the Sahara. This paper displays results of the research project on refuge areas of the Holocene Sahara (Équipe Ethnologie Préhistorique, UMR 7041, CNRS, France). We present a comparative study on two massifs: the *Dhar* Tichitt-Oualata-Nema in Mauritania and the Gilf el-Kebir in Egypt during the Early and Mid-Holocene periods. These two regions share the common topographical feature of being rocky massifs overhanging sandy plains. Palaeoenvironmental evidence show that they remained attractive places for centuries after the deterioration of the Holocene optimum climatic conditions. A regionally favourable environment was created by the hydrological characteristics ensuing from the interaction between the pluvial maximum and the incised tabular geomorphology. The presence of water resources that were still available in these regions at the time of an increasing aridification in the rest of the Sahara was an attractive feature. Through the study of archaeological evidence and the comparison of the regional records of cumulated radiocarbon dates, we try to highlight population dynamics towards refuge areas during the Mid-Holocene period and then the final diaspora that accompanied the last desertification of the Sahara, in order to better understand how prehistoric groups have coped with fluctuating environmental conditions.

Keywords: Sahara, Holocene, arid environment, desert, palaeoenvironment, refuge area.

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La contribution de l'archéologie rupestre à une meilleure connaissance de l'économie de production (élevage et pastoralisme), du peuplement et du paléoclimat (Maghreb et Ouest saharien)

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Aux côtés de l'archéologie matérielle, l'archéologie rupestre de l'Afrique du Nord -que souvent les préhistoriens n'apprécient pas à sa juste valeur- est pourtant une source documentaire incontournable et d'autant plus nécessaire dans les régions où la culture matérielle est absente. De la Mauritanie jusqu'à l'Atlas saharien (Algérie) et la Dorsale (Tunisie) en passant par la Seguiet el-Hamra et les régions présahariennes du Maroc (Anti Atlas, Djebel Bani et versants méridionaux, vallée de l'Oued Drâa, etc.), cette discipline jette un puissant éclairage sur les premières espèces domestiques ainsi que le peuplement et les crises paléoclimatiques.

Sur le plan de l'économie de production (élevage et pastoralisme), l'Auteure présente cinq phases chronologiques. La représentation des espèces domestiquées et leur augmentation numérique montrent une nette correspondance entre les stratigraphies archéologiques et la chronologie rupestre. Celles-ci vont d'un petit élevage daté de 7600 cal BP avec des Caprini (*Ovis ammon f. aries* et *Capra aegagrus f. hircus*) et moins couramment le bœuf (*Bos primigenius f. taurus*) (Etage du Style figuratif) suivi d'un vrai pastoral où le bélier et le bœuf dominant vers le 7e millénaire cal BP (Etage du Style figuratif stylisé et Etage Tazina *sensu stricto*). Ces trois étages sont suivis de l'Etage Pastoral atlasique au bœuf à cornes courtes connu uniquement dans l'Atlas saharien et de l'Etage Pastoral présaharien et saharien d'origine méridionale, au bœuf et troupeaux au cornage varié, qui se généralise à l'Ouest saharien et au Maghreb. L'archéologie rupestre donne ainsi à voir les " portraits " vivants de ces espèces domestiques.

Sur le plan du peuplement, l'Etage figuratif représente nettement deux types anthropologiques appartenant toutefois à la même civilisation. Dans la vaste famille des Protoméditerranéens constituant le peuplement nord-africain à l'Holocène moyen, l'un pourrait-il appartenir au type protoméditerranéen robuste et l'autre au type mechtôïde aux formes gracilisées ? Cette archéologie rupestre donne aussi à voir des Noirs dont l'archéologie matérielle est encore impuissante à établir l'existence. Elle montre de longues migrations géographiques du nord vers le sud et du sud vers le nord, les plus importantes liées à la progression de l'aridité. Par exemple, ce groupe de chasseurs-pasteurs noirs ayant effectué le plus grand périple connu sur près de 2000 km, du plateau du Zemmour à l'Atlas saharien central (Age du Bronze, 1e millénaire avant notre ère). Autant de précieux éléments de connaissance que l'anthropologie physique devra mettre au jour.

*Speaker

Keywords: Archéologie rupestre du Maghreb et de l'Ouest saharien. Elevage et pastoralisme. Peuplement. Crises paléoclimatiques et migrations.

Rock art in central Sahara: the landscape and the figurative language.

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The prehistoric rock art of the central Saharan massifs, in particular the Tadrart Akakus and the Messak Settafet (2001-2008 field missions of the Italian –Libyan Archaeological Mission in the Akakus and Messak), is characterized by a frequent allusion to activities involving wild or domestic fauna. The relationship man-environment is depicted in different ways according to the styles and the executive techniques more or less elaborated. The chronology, a still debated question, encompasses the Holocene or, in another perspective, the final Pleistocene and the Holocene.

The present contribution will deal with a selected series of rock art sites highlighting:

- **The accessibility**

The majority of the rock art sites recorded are located along the wadi bottoms but there are also higher sites located on a series of terraces. Sometimes, close to the sites, it is possible to observe the presence of temporary water supplies (the so-called "gueltas") which are an important signal of the connection between the human presence and the water reservoirs today and in the more remote past (Cremaschi, Zerboni, Sp'otl, Felletti 2010, di Lernia, Massamba N'siala and Zerboni 2012).

- **The typology of the sites**

Open-air sites (boulders or small slabs) and shelters are the most frequent kind of context while caves are rare (di Lernia, Zampetti 2008, Gallinaro 2013). It should be stressed that behind the painted and/or engraved decoration, important settlement traces add a specific interest to the artistic record even if, as we know, it is not easy to connect the archaeological deposits to a specific figurative repertory.

- **The state of preservation of the sites and of the decorations**

The state of preservation of the sites depends both on climatic factors and on human activities, including in past times the recording of rock art using invasive methods and the activities of oil companies. In the question of the preservation of the sites were involved, in a completely different way, small families of tuaregs still living in the T.Akakus (Biagetti 2014). They represented a precious source of information on the recent history of those territories.

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*Speaker

- The depiction of man-environment relationships and the problems of interpretation

As a consequence of the just mentioned factors influencing the state of preservation, the deciphering of the subjects and of the scenes is not a simple work. Moreover besides the explicit iconic representation, there can be an encoded symbolic meaning. This last topic will be included as the final part of our analysis on the Saharan imagery.

Keywords: Central Sahara, Rock Art, Iconography, Symbolic contents

The Sahara, dispersal route and / or barrier to migrations: drawing on central Sahara (Algeria and Libya) rock art when the Sahara was not a desert.

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The rock art paintings from the Tassili, Algeria, first inventoried and made famous by Henri Lhote in 1958, are testimony of a most striking feature of the African climate history, namely the transformation of the increasingly arid Sahara during the Pleistocene into a humid and green landscape sprinkled of lakes during the Early-Middle Holocene (EMH, 11 to 5.5 ka BP). The "têtes rondes" paintings are evidence of a Saharo-Sudanese neolithic culture contemporaneous with the onset of this humid period in the Sahara. This dramatic humid period in the Sahara is well documented by various paleoenvironment studies.

We present here various rock art illustrations representative of the EMH in the central Sahara from six trips undertaken from 2006 to 2011 in Algeria (Tassili and Immidir) and Libya (Acacus, Tassili and Messak).

On the basis of these trips and recent palaeoenvironment and prehistoric research by various workers, we raise the question: was the humidification and greening of the Sahara a unique event?

It would seem that the response is negative. Evidence of alternating wet and dry episodes in the Sahara and eastern Africa during at least the last 250 ka due principally to the northern migration of the summer ITCZ leads us to think that while the Sahara might have been an insurmountable ecological barrier during extreme arid conditions, probably preventing human dispersals from southern Africa during glacial periods, it became a natural migratory path during humid periods (coeval with northern hemisphere deglaciations) when the Sahara was covered of grasslands.

During periods of extreme aridification it is clear that North Africa must have acted periodically as refugia and may be as hybridization zone for circum-mediterranean hominid populations. The widespread presence of Acheulean and Middle Palaeolithic sites throughout the Sahara is proof that the Sahara was a zone of passage for archaic and probably modern human population groups emerging from southern / eastern Africa.

The volatile cyclical climatic role of the Sahara caused by shifting tropical monsoon and saharan anticyclones may represent an important factor with regard to the explanation of a major late demographic expansion that led to the dispersal of modern humans into Eurasia.

*Speaker

Keywords: Green Sahara, rock art, human refugia

**XXII-2. The Nile Valley in
Prehistory – did it play a role in
human dispersals?**

Using lithic assemblages to trace human dispersals; did the Nile Valley always act as a corridor between Africa and the southern Levant?

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During the late Pleistocene several events of technological diffusion, possibly due to human dispersals are recorded in the lithic assemblages of eastern Africa, the Nile Valley and the southern Levant. Most notably is the spread/diffusion of the Nubian technology associated with MIS 5e. A similar diffusion of technological traits from eastern Africa to the Nile Valley is seen in MIS 4. Inter assemblage variability in these neighboring regions present a mosaic of concurrent technological traditions. While the Nile Valley, a geographical and ecological corridor linking between them, displays large amplitude variability. Several human dispersal events have been suggested to take place during the late Pleistocene. These were suggested to coincide with periods of climatic amelioration, blurring geographical boundaries between sub-tropical Africa and the Levant. During the later stage of MIS 4 and MIS 3 assemblages within the Nile Valley display a technological change, when alongside MP/MSA technological traditions appears a new volumetric, blade oriented technology. Cautiously, due to paucity of available data, it seems that this change is different to what is mirrored in the east and north African MIS 3 assemblages as well as in the southern Levant.

During periods of climatic amelioration (such as MIS 5e), the Nile Valley played an important role in human dispersals 'out of Africa', what role did it play during MIS 3? While using lithic assemblages to trace human dispersals across the landscape is far from being a simple task, these assemblages are the most visible evidence of past societies and their behaviors. Using inter-site variability together with geographical and climatic data it is proposed that during MIS 3 the Nile Valley acted more as a refugium than as a corridor.

Keywords: Late Pleistocene, Human dispersals, Nile Valley, southern Levant

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What, if any, evidence is there for contacts between the Nile Valley and the Negev Desert during the terminal Pleistocene?

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At the end of the Pleistocene (25-15ka), there is a global shift to more arid conditions, corresponding to the Last Glacial Maximum. For the Nile Valley and the Levant, the lowering of Mediterranean sea levels, the expansion of the Sahara and the desiccation of some major eastern African lakes had important consequences on: (1) the general behaviour of the River Nile; (2) the landscape around the Nile Delta; and (3) sand dune activity. Despite this shift to more arid conditions, there is abundant evidence for human occupation in the Egyptian Nile Valley and in the arid zone of the Southern Levant at this time. In addition, contacts between these two regions have sometimes been suggested, mainly by genetic studies, including early Back-to-Africa dispersals. In this paper, Terminal Pleistocene (ca. 25-15ka) lithic assemblages from the Nile Valley and the southern Levant are compared in order to test the hypothesis of contacts between populations in these two regions. The study focuses on comparisons between two 'Late Palaeolithic' chipped stone industries in the Idfu/Esna area of Upper Egypt and six Early and Middle Epipalaeolithic industries from the western Negev Desert dunes in Israel. The chrono-stratigraphic contexts of the sites are critically reviewed and the assemblages are compared using the *chaîne opératoire* approach combined with attribute analysis that enables quantification of typo-technological differences. Results are used to discuss hypotheses of technical diffusions between these two regions at the end of the Pleistocene.

Keywords: Nile Valley, Negev Desert, dispersal hypotheses, lithic technology, terminal Pleistocene

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The Nile Valley and the Levant: Settlement, Chronology and Interactions During the Late Pleistocene. James L. Phillips and Ofer Bar-Yosef

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The Nile Valley was host to a number of groups living within the Nile floodplain, and subsisting on a wide range of resources associated with the river valley and its adjacent terrestrial environments. Between Qena and Aswan, several archaeological traditions occurred, some of which occupied several areas along the Nile, while others occurred tethered to one locale. In the Levant, on the other hand, the archaeological record indicates shifting settlement and regional archaeological traditions, moving between a varied landscape and exploiting mainly terrestrial resources, with the exception of sites located near Lake Kinneret. Indications that there were population movements between the Nile Valley and the Levant are inferred from the recognition of ‘guide fossils’ such as La Mouillah Points and Helwan lunates occurring earlier in Egypt than in the Levant. We present new radiometric dates as well as reanalyses of assemblages in order to discuss possible population movements and exchanges between the Nile Valley and The Levant.

Keywords: Nile. Levant. Settlement. Late Pleistocene.

*Speaker

GO WEST ‘Out of Africa’ through the desert side? A review of archaeological and environmental records across the NE Sahara

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Due to its landscape attributes and perennial flow, the Nile River Basin has long been idealized as a corridor for dispersals of species from the Eastern African ‘cradle of evolution’ to Eurasia (and beyond). Sourced by monsoonal tropical rainfall, the Nile traverses ~6800 km through the northeastern Sahara and flows toward the Mediterranean coastline and Levant. A prevailing paradigm holds that environmental conditions have facilitated *hominin* occupation within, and migration routes in and out of Africa, and that the desert acted as a “pump”, forcing cultures out and preventing migrations during dry intervals. This model remains entrenched because of the paucity of documented sites and the limited number of radiometrically dated archaeological and environmental contexts located outside of the Nile Valley, particularly in the modern desert areas. Across the NE Sahara region, a variety of records suggest that wetter conditions occurred during Marine Isotope Stage (MIS) 6a–5e, which coincides with an apparent migration of Anatomically Modern Humans “Out of Africa”. We present a synthesis of archaeological and environmental records from the “desert” areas of Saharan Northeast Africa, with particular emphasis on contexts with MSA (Middle Stone Age ~ Palaeolithic) remains. We review the evidence for episodic flow along modern defunct Nile tributaries near Aswan in Upper Egypt, and paleosprings, lakes, and other ecological refugia ‘oases populations’ persisting or occasionally present within the desert areas during the Pleistocene.

Keywords: Sahara, Marine Isotope Stage (MIS) 6a–5e, Anatomically Modern Humans, “Out of Africa”, Middle Stone Age, refugee, Nile

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Between Nature and Nurture: Continuity, discontinuity and continuum in prehistoric Egypt: The socio-political landscape 10000 BCE to the Predynastic

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In a recently published and extensive study *Prehistoric Egypt* (2014) Geoffrey Tassie decisively expanded the extent of early Egypt's earliest antecedent material culture and the developments thereof. Important as this is it has taken over a century for such a study to emerge to link key material and technological advances during the prehistoric with social and cultural developments within the changing environments of North-east Africa. This has had an important impact on our complete thinking of the civilisation of the Nile Valley during its formative historical period from 6000 BCE onwards. Tassie's work has helped radically alter our view of the socio-political landscape without over-referencing the emergence of the so-called 'state'.

Methodologically, my research - up to this point - has been less concerned with state formation and with intrinsic political change linked to grounded socio-political dynamics founded upon real rather than abstract constructs. This has meant emphasising familial developments and associated behaviour in line with the traditional anthropological approach relating to kinship reckoning. Furthermore, I am interested in how social structure, along with any residual influence from outside North-east Africa and within Africa impacted upon the formation of Egyptian Dynastic civilisation as a compact and resilient model. As such, I will look at the relationship between humans and their environs on an interactive level as exhibited through the cultural record. Importantly, how each cajoled, influenced, and mitigated one another over time.

The focus therefore of this proposal is one that intends to clearly understand the extent and influence of antecedent prehistoric socio-cultural behaviour and characteristics upon the emergence of Predynastic Egypt as the consequence of a nuanced observation of the environment. My hypothesis, therefore projects the idea that the demographic of the incipient early historic Nile Valley happened within an exclusive mutual existence with that which was primarily natural rather than nurtured occurring from the prehistoric onwards.

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Keywords: Prehistoric, Predynastic, North, East Africa, Egypt, Society, Environment