BONES EXPERIENCES AT EL ESQUILLEU CAVE (WESTERN CANTABRIA, NORTHERN SPAIN) : DOMESTIC HEARTHS MANAGEMENT, HUMAN BEHAVIOUR AND ADAPTATIONS TO ENVIRONMENTAL TRENDS BETWEEN 53-30 KYRS. BP

INTRODUCTION

Abundantly burnt bones found in a Cantabrian Mousterian site, El Esquilleu, let us consider the possible fuel qualities of this material related to the domestic fires developed in this site.

A summary of burnt bones experiences have been carried out in view to test such fuel qualities and its implications into the study and interpretation of archaeological bone assemblages: El Esquilleu have yielded in some occupation levels around 90% of bones carbonized and calcined. Otherwise to evaluate if the use of bone as fuel was directly related to unfavourable environmental causes (haloed scarcity) we have developed an interdisciplinary thinking taking into account the natural and human factors convergence.

SETTING OF SITE

El Esquilleu opens on the SE calcareous slopes of the La Hermida Gorge (Western Cantabria, Spain) at 300 mx 20 Km distant of the sea. East-Western mountain range disposition stop the wettest winds and high precipitation regime generating different shallowed conditions. The decrease in precipitations lead to a lighter and clearer atmosphere that make possible the development of Cantabrian Evergreen Oak formations along the calcareous slopes of this gorge.

BONES EXPERIENCES AND EXPERIMENTS: BONES AND WOOD CORRELATIONS

A gradual increase in burnt bones since late XVJol downwards is noticed (figure on the left): level XIX, 60%; levels XXI, XXII, >85%; lowest levels XXI-XXII, >95% (red course). There is a direct correlation between burnt bones (red course) the size of fragments (blue, green and yellow course) and the determination degree of bones. Undeterminable bones increase from 5% in level XVJ to 75% (even 100%) in levels XIX to XXX. Combustion of bones determines its fragmentation and identification. Abundant burnt bones and its combination degree (carbonated and calcined) let us suppose its employment as fuel at least in levels where hearths have appeared (levels XVJ, XIX, XXII, XXIII). A serie of experimental Cupra bones combustions have been conducted in view to test this hypothesis (figure on the right). Results have shown the good properties of bones in the duration of fires and in the maintenance of stable temperatures, specially by carbonated and calcined bones (red course fig. on the right) and exist bones (light blue course fig. on the right). Why bone was employed as fuel in this cave?

Scarcity of wood as the consequence of unfavorable environmental conditions? Fluvial information doesn’t seem indicate it. Or do respond rather to a human behavior set as: economy of time and effort in the supply of fluvial species, aesthetic practices or elimination of organic residues, and specially in a clear interest in the maintenance and duration of the flame?. Woodfire employed along hominin occupations of this cave reinforce this first assumption as indicated below: mixture of low and rapid combustion species (Pinus-Betula-Sorbus) as well as the systematic employment of some shrubs considered as ignition taxa according to ethnographic record (Fabaceae, Arctius) ensure a longer duration of flame, higher and more stables temperatures and a better conditioning of habitat in caves (lighting, heating and other domestic and technological uses).

CHRONOSTRATIGRAPHIC RECORD

Thirty stratigraphic layers have been excavated, all of them being Mousterian. Chronology opens a period of time from >53 Kyrs BP (TL 53 Kyrs BP, level XXII) to AMS 34.3 Kyrs BP obtained on level VI. Human occupations can be summarized in 3 phases up to the downwards: levels IV-VIII slight human occupations (Discolite lithic technology); levels VII- XIII important human occupations (mainly Levallois technology with main Quina technology); XV-XIX more specialized habitation focused to Cave hunting with main Levallois/Discocite and occasionally Quina technologies.

POLLEN DATA RELATED TO CHARCOAL AND WDS DYNAMICS

Pallinological data show Pinus continues eminently along pollen record. Natricous plants are also relevant. Aquatics and submerged taxa are present suggesting an optimum in water resources availability and althigymn climate. Three phases are outlined according to palynogram: Phase I (-XXIII) with open landscape dominated (Alnus, Fraxinus, Corylus); Phase II (XXIII-XIII) with fen landscape dominated (Cyperaceae, Potamogetonaceae); Phase IIIb (XIII) with woods landscape dominated (Cereales, Poaceae).

Dated charcoal maximum age (AMS 53.491±5114 12.030±130 53000±1200) 12000±1200 BP 39000±1800 36500±2000 BP have been excavated all levels. The charcoal maximum age of these charcoal samples has been dated using the AMS method. The charcoal maximum age is related to the tree species and its growing period. Carbonization degree of charcoal and its picture (red course on the right) lets us to suppose the use of charcoal along the occupation levels. Changes in woodfire management observed are strongly related to those experienced in the same levels by bones techniques (Levallois/Quina) and by hunting strategies (Cervus/Capra/Boo)

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FAUNISTIC ASSEMBLAGE: SEASONALITY

Capra pyrenaica, Rupicapra rupicapra are the dominant taxa along Esquilleu stratigraphic record, occasionally Cervus elaphus and some Bow occurrence (levels XX and XXX) have been detected. Bone preservation is related to taphonomic characteristic surrounding Esquilleu site catchment territory (La Hermida abrupt calcareous Gorge). Such environments evidenced a familial exploitation close to the site during the most human occupations recorded in this cave (level XVJ to XXX BP). However, Red deer, present between V and XV upper levels, also suggests long distant hunting strategies occurred since those occupation (level XVJ and XX). Bone preservation of these levels should also confirm such long distant strategies made by neanderthals during this period of time. Dentichronos variations observed in faunistic assemblages clearly indicate changes in the subsistence strategies and subsequently in the site-function and in the occupation of this cave. Faunical and Anthropological interpretations are strongly matched. Concerning seasonality, the most summer captures with occasional late spring and early fall ones. Such data are not surprising bearing in mind the location of the cave in the mountains and the site -2.3 climatic variability (alternation between cool and warm climate conditions).

Explanations inexact record in scarce taphonomic environments for upper levels XVJ (34.3-26.5 Kyrs BP). Level XVJ express a shorter and longer seasonal occupation as indicated by Capra captures during all year, suggesting a more intensive occupation. Raw material are also very rich and charcoal spectrum has recorded the most floristic diversity in this level.

MAIN CONCLUSIONS

Bone combustion-experiences have demonstrated the good qualities of bones as fuel permitting us to evaluate its use besides wood in El Esquilleu Mousterian hearths. The interdisciplinary approach developed offers evidence of changes in seasonality and environmental conditions on the surroundings of this cave, diurnal frequency and managed by humans in view to obtain all bone resists to 12000±1200 BP. On the other hand, the site-function and occupation of this cave depend on the woodfire supply modalityes have been observed between lower and upper levels related to Pinus gradual decrease and coinciding with changes in the hunting strategies and lithic technologies. Changes on the site-function and subsequently on the exploitation and management of the cave have been the main human adaptations to the MIS 3 climatic oscillations. Environmental trends (mixture increase) were favourable to the development of some mixture increase (level II)- but they weren't so good to the Pinus continuous occupation. The woodfire resource mostly employed by neanderthals along their seasonal occupations of this cave. The use of bones as complementary fuel into hearths is related to human activities and adaptation strategies developed in the different occupations of this cave as a consequence of the changing environment resulting of the MIS 3 climatic instability.

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