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Neanderthal mobility and technological change in the northeastern of the Iberian Peninsula: The patterns of chert exploitation at the Abric Romaní rock-shelter

Mobilité des Néandertaliens et changements technologiques dans le Nord-Est de la péninsule Ibérique : les modalités d'exploitation du silex dans l'abri sous roche Abric Romaní

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ABSTRACT

Understanding the changes in the technological organization of prehistoric hunter–gatherers is important to research into hominin foraging activities. During the Middle Paleolithic, the coexistence or the replacement between Levallois and discoid technologies has frequently been recorded, but there is still no clear understanding of the reasons for their alternating and fragmented use in the archaeological record. This paper aims to contribute with new data to the current debate, by exploring the chert assemblages from levels O and M of the Abric Romaní rock-shelter. The results reveal that the change from Levallois in level O to discoid in level M is accompanied by the use of different axes of mobility, a reduction in the foraging radius and a more careful management of raw materials. A cross comparison with other archaeological evidences indicates the general pattern in the Northeast of the Iberian Peninsula during the late Middle Paleolithic, in which the use of Levallois technology is associated with chert and high mobility patterns whereas discoid technology is more closely linked to the use of local raw materials and a lower degree of mobility. The modifications to the mountainous environments and to the distribution of preferred prey animals may have influenced the Neanderthals' mobility patterns and contributed to modifying their technical behaviours in order to obtain better foraging incomes.

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RÉSUMÉ

Comprendre les changements dans l'organisation technique des chasseurs–cueilleurs est important pour l'étude d'activités humaines liées à la recherche de subsistance (nourriture). Pendant le Paléolithique moyen, la coexistence des technologies ou le remplacement de la technique Levallois par la technique discoïde a été souvent soulignée mais, à partir des données archéologiques, il est difficile de comprendre à ce jour les raisons de leur alternance ou de l'usage de l'une plutôt que de l'autre. Le but de cet article est d'apporter un éclairage à cette question à partir des données provenant des assemblages présents dans les niveaux O et M de l'Abric Romani. Cette étude montre que le changement entre l'assemblage Levallois présent au niveau O et l'assemblage discoïde du niveau M va de pair avec un changement de mobilité, une réduction du rayon de recherche de nourriture et une plus grande exploitation de la matière première. La comparaison avec d'autres ensembles archéologiques dans le Nord-Est de la péninsule Ibérique montre que, pendant le Paléolithique moyen tardif, dans lequel la technique Levallois est associée au silex, une grande mobilité s'observe, alors que la technique discoïde est plutôt en relation avec un usage local de la matière première et une moindre mobilité. Les modifications relatives à un environnement plus montagneux et à une préférence pour certaines proies pourraient avoir influencé la mobilité des Néandertaliens et avoir modifié leur comportement technique afin d'obtenir de meilleures ressources.

1. Introduction

An important aspect of studies of human evolution is an understanding of the factors that caused prehistoric hunter–gatherers to change their knapping strategies, and the benefits that these changes brought to their subsistence activities. Since the beginning of the Paleolithic investigation, the typological changes, detected in the archaeological record, have been interpreted as the result of cultural differences between Paleolithic tribes (Breuil, 1913; Peyrony, 1920). After the post-war years, this concept has been developed by Bordes (1950, 1953, 1961) to explain the variability of the Middle Paleolithic record assuming the existence of different and neighbouring cultural traditions identified on the base of typological frequencies of retouched tools and Levallois blanks. In the same period, the advent of processual archaeology promoted other hypotheses to explain the changes in the prehistoric material culture (Binford, 1962, 1972). Technological organization, mobility patterns and raw material availability have been considered to be the main influences on the technical behaviors of forager groups (Andrefsky, 1994; Bamforth, 1986; Binford, 1979; Bousman, 1993; Kelly, 1983; Kuhn, 1992; Surovell, 2009; Torrence, 1983). Generally speaking, individuals organized their technologies according to their needs, and lithic production could be resumed between activities in anticipation of use (curation) or based on immediate demands (expediency) (Binford, 1977, 1979). Hunter–gatherers repeatedly plan their feeding strategies, moving through their territory on the basis of water availability, animal migrations or mating events (Binford, 1983; Kelly, 1995; Liebermann, 1993). These movements made provisioning raw materials for tools a crucial activity, as it made it possible to cope with the daily need for cutting edges for hunting, butchering animals and accomplishing diverse domestic tasks (Binford, 1980; Kuhn, 1992). In this situation, technological variability in prehistoric hunter–gatherers might be interpreted as a set of behaviours and expedients aimed at obtaining better results from foraging incomes.

During the Middle Paleolithic, Neanderthals used various technologies, changing between methods with relatively rigid schemes of core shaping (preferential Levallois, uni-/bipolar recurrent Levallois, laminar) and methods with lower degree of blank predetermination (Levallois recurrent centripetal, discoid, Quina, handaxe *façonnage*) (Boëda et al., 1990; Delagnes and Meignen, 2006). Within these flaking strategies, special attention has been paid to two of the most widely used methods: the Levallois and discoid technologies. Levallois is the technology that marks the beginning of the Middle Paleolithic in Eurasia (Picin et al., 2013; Rolland, 1995; Scott and Ashton, 2011). This new knapping concept was characterized by a hierarchical division of the core volume and by preparing the flaking surface, which made it possible to predetermine the shape of the final product. This feature has been interpreted as marking a significant improvement in the cognitive and neurological capacities of late Middle/Upper Pleistocene populations, because configuring and exploiting the core entailed imagining the shapes of the flakes before they were detached, and therefore required complex mental templates (Boëda, 1994; Wynn and Coolidge, 2010). Conversely, discoid technology is a more simplistic flaking method, which was used from the Lower Paleolithic to the Neolithic (Boëda, 1993; Peresani, 2003; Shea, 2013; Stout et al., 2010; Vaquero and Carbonell, 2003). It is characterized by the alternant exploitation of two production surfaces and the lacking of any technical procedures used to impose specific core morphologies. The applicability of the discoid concept is highly flexible and could be employed at any stage of different flaking reduction processes. In this scenario, the complex sequences of Levallois production could be associated with a curated technology, whereas the discoid method reflects a more expedient approach (Vaquero et al., 2012; Wallace and Shea, 2006). During the Middle Paleolithic, the coexistence or the replacement

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