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Large flake Acheulean in the middle of Tagus basin (Spain): Middle stretch of the river Tagus valley and lower stretches of the rivers Jarama and Manzanares valleys

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ABSTRACT

The highest concentration of Palaeolithic sites known in the Iberian Peninsula is located in the lower stretches of the Manzanares and Jarama rivers. This area, together with a number of zones in the Tagus valley, constitutes one of the most important archives for the knowledge of the European Pleistocene. The purpose of this paper is to establish the chronological frame and the technological strategies implemented in manufacturing lithic tools during the Acheulean techno-complex in the middle stretch of the Tagus basin. Use of large flakes for making bifaces is common in the Acheulean assemblages from this area, as well as in the rest of the Iberian Peninsula and the south of France.

The earliest Acheulean evidence has been dated to between MIS 15 and MIS 13. From MIS 11/MIS 9 on, this techno-complex is widespread in the region, until MIS 6, when the last evidence has been recorded. Handaxes, cleavers on flake and trihedral picks dominate in the *châines opératoires of façonnage*, which are present in significant percentages. Short *châines opératoires of débitage* prevail in quartzite, and discoid and polyhedric in flint. Most retouched tools are seldom elaborate. Lithic assemblages with *châines opératoires of façonnage* exclusively represented by handaxes start to be recorded towards the end of the Middle Pleistocene. These handaxes are more elaborate than previous and the retouched tools are more complex.

Among the activities identified in the sites excavated in *overbank* facies, exploitation of large mammals, particularly proboscideans, is outstanding, as well as the manufacture of lithic tools and the exploitation of primary flint outcrops. The recording of long recurrent settlements on the same location is remarkable.

1. Introduction

The beginning of the Acheulean period in Europe is still being debated (Moncel et al., in press; Mosquera et al., in press). In Southern Europe it is recorded since at least MIS 12, although older dates have been published for sites belonging to this techno-complex (Falguères et al., 2004; Barsky and de Lumley, 2010; Lefèvre et al., 2010; Moncel et al., 2013; Pereira et al., 2015). However, confirmation of these dates by alternative dating methods would be desirable (Demuro et al., 2014). In other cases, the Acheulean character of the lithic industry is not decisive enough for corroboration (Vallerdú et al., 2014; Santonja et al., in press).

The diversity of technological strategies in the manufacturing of lithic tools, particularly handaxes, has prompted some authors to allude to "Acheuleans" rather than a single Acheulean period in Western Europe (Moncel et al., in press). The Acheulean in the Iberian Peninsula and the south of France shows certain technological characteristics in common with the African Acheulean, which are not found in the rest of Europe (Clark, 1994; Sharon, 2010). This suggests possible connections with North Africa via

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the Strait of Gibraltar (Santonja and Villa, 2006; Doronichev and Golovanova, 2010; Sharon, 2011; Bar-Yosef and Belfer-Cohen, 2013).

The most characteristic morphotypes of the Acheulean, handaxes, cleavers, and picks, are frequently made on large flakes in Africa (Roche et al., 2003; Semaw et al., 2009). Production of these blanks has been considered one of the most important features of this techno-complex (Isaac, 1969; Leakey, 1975). The "large flake" definition of Kleindienst (1962), as one larger than 10 cm, has been accepted by most researchers. In Europe, the use of large flakes for bifaces is common only in the Iberian Peninsula (Santonja and Pérez-González, 2010) and in the basins of the rivers Garonne, Rhône, Roussillon and Tarn, in Southern France (Tavoso, 1986; Mourre, 2003; Turq et al., 2010). The availability of coarse grained rocks, combined with the presence of appropriate -blanks, as sometimes occurs in the Iberian Peninsula and Southern France, has been considered as the key factor concerning this distinction. However, large flakes can also be knapped from fine-grained rocks (Rolland, 1995; Sharon, 2010), as occurs at sites such as La Noira (Moncel et al., in press), or at Caune de l'Arago, levels P and Q (Barsky and Lumley, 2010; Barsky, 2013). However, only a few of these were used for manufacturing handaxes and cleavers.

Since the end of the Lower Pleistocene, lithic assemblages composed of cores and flakes have been recorded in Europe (Parfitt et al., 2010; Turq et al., 2010; Jiménez-Arenas et al., 2011; Toro et al., 2011; Ollé et al., 2013). These industries could actually be the substratum of the European Ancient Middle Palaeolithic (EAMP), which has been recorded in the continent since the final MIS 9 or early MIS 8 (Moncel et al., 2005; Bourguignon et al., 2008; Koehler, 2008; Richter, 2011; Santonja et al., in press). Therefore, in Europe, the earliest Acheulean coexisted with flake and core industries which existed on the continent since the final Lower Pleistocene, and later, since the end of MIS 9, with EAMP. As a result of this coexistence, the European lithic assemblages developed between MIS 8 and MIS 6 show different technological solutions derived from mutual influences (Santonja et al., in press).

In the middle stretch of the Tagus basin, as in the rest of the Meseta of the Iberian Peninsula (Santonja and Pérez-González, 2010), using large flakes for manufacturing bifaces is a common practice from the first to the last examples of the Acheulean, regardless the availability of coarse-grained rocks, although access to these raw materials can be noticed from its proportional representation. The purpose of this paper is to identify the timeframe and the technological strategies used in manufacturing lithic tools during the Acheulean techno-complex in the middle stretch of the Tagus basin.

The highest density of Palaeolithic archaeological sites known in the Iberian Peninsula lies within the fluvial deposits of the last stretch of the Manzanares and Jarama rivers, as well as in some areas of the Tagus valley (Fig. 1) (Rubio-Jara et al., 2002). This is due on the one hand to the geological characteristics of these valleys, and on the other hand to modern day demand for aggregates in Madrid, which have favoured first the accumulation of Pleistocene deposits, and then access to large sections of those deposits in sand and gravel quarries (Rubio-Jara et al., 1999; Santonja and Vega, 2002).

The Pleistocene at the Tagus basin has been studied since 1850, when two elephants were excavated in Tejar de las Ánimas, at Cerro de San Isidro in Madrid (Paz Graells, 1897; Santonja et al., 2001). Shortly after, the first knapped lithic artifacts were recognized, including a flint cleaver, which were published in 1863 (Verneuil and Lartet, 1863). Between 1917 and 1931, under the initiative and supervision of Hugo Obermaier (1879–1946), several sites were discovered and investigated (Obermaier, 1925). These works were carried out during the 1950's and 1960's, with an approach distant from the accepted premises of the time, although with certain international repercussion thanks to the 4th International Congress of Prehistoric and Protohistoric Sciences and the 5th International Quaternary Congress (INQUA), which were held in Madrid in 1954 and 1957 respectively. From 1970 there was a renewal of Palaeolithic research, but despite the innovative approaches (Santonja et al., 1980), the 20th century ended with disappointing results regarding the knowledge of this period.

During the first decade of the current century, data regarding Pleistocene human occupation in this area has been significantly updated. Since the late nineties, systematic research projects have been implemented in the middle and lower stretches of the Jarama and Manzanares rivers (Uribelarrea, 2008; Panera, 2009; Rubio-Jara, 2011), as well as in their interfluve (Bárez et al., 2010; Baena Preysler et al., 2015), and in the middle stretch of the Tagus river (Rodríguez de Tembleque, 2008, 2010; López-Recio et al., 2015). The research programs carried out during the last years in the Manzanares and Jarama valleys, as well as in the Tagus valley, are considered as regional studies of the Pleistocene. They have been based on systematic field surveys on sections of fluvial deposits, where a large number of industrial assemblages have been recorded in stratigraphical context. Many of them in gravel bars, and others on overbank facies. Finally, a series of numerical dates have updated the general knowledge of the Pleistocene in the South Submeseta of the Iberian Peninsula, in particular the Acheulean, which has highlighted this area as one of the most important European archives for the knowledge of this period.

The lithic industries found in stratigraphy in Pleistocene fluvial deposits of the low stretches of the rivers Manzanares and Jarama valleys, and between the mouth of the river Algodor and Puente del Arzobispo in the river Tagus valley (Fig. 1), are described in this paper, based on their geomorphological and chronological frameworks. In this paper we shall use the term bifaces (handaxes, cleavers and trihedral picks) in the context of current knowledge about the Acheulean, as it has been recently considered by several scholars (cf. Díez-Martín and Eren, 2012: 325 ff.; Sahnouni et al., 2013: 309 ff. and references therein).

2. Geomorphology and chronostratigraphic sequence of the terraces at the Tagus, Jarama and Manzanares rivers

The Tagus basin is located within the South Sub-Meseta of the Iberian Peninsula. It is bounded by the Sistema Central (Gredos and Guadarrama mountains) to the north, by the Cordillera Ibérica to the east, and by Montes de Toledo to the south.

The geological uniqueness of part of the valleys of the Tajo, Jarama and Manzanares rivers has contributed to the preservation of lithic industry and faunal remains from the Pleistocene. These valleys are characterised by the development of a great number of fluvial terraces, related to Quaternary climatic oscillations; techtonics (Alia, 1960; Pérez-González, 1980; Silva et al., 1988a,b; Pérez-González, 1994), isostatic rising and blocks adjustment, and lithological structural controls (Pérez-González, 1971), which were responsible for their configuration.

In the Tagus valley, near the city of Toledo, 12 terrace levels have been distinguished (Pérez-González, 1994; Roquero et al., 1999) between +4–6 m and +125 m. Upstream from Toledo, in Aranjuez, karstification of the Miocene evaporite-gypsum has led to the thickening of the fluvial terraces (Pérez-González, 1971).

In the high-middle trench of the Jarama valley, 19 terrace levels have been recorded between +3–5 m and +190 m (Fig. 2). In the lower part of the valley, Miocene evaporite-gypsum, which crop out to the east and south of Madrid, have facilitated synsedimentary subsidence processes in the underlying karst, affecting terraces with a relative level lower than +40 m. These terraces, which upstream are of stepped and perched types, overlap the oldest ones, giving rise

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