instruments (de la Torre *et al.*, 2012). Many retouched pieces suggest their recycling. The double patinas identified in some pieces could correspond to artefacts recovered on the site or in the surrounding landscape which are reactivated to obtain new supports (Mora *et al.*, 2008).

This intense management does not obey the lack of this material in the area, allowing us to approximate these groups techno-cognitive environment. Likewise, especially N10 suggests short-term activities; the archaeological site served as a stop in the movements between residential displacements. If so, Roca dels Bous represents a web of Neanderthal settlements inside this regional environment in the Prepyrenees of Lleida and Huesca (Mora *et al.*, 2008).

Future prospects

These arguments, discussed in other contributions (Casanova *et al.*, 2009; Martínez-Moreno *et al.*, 2010; de la Torre *et al.*, 2013), point out that these techno-typological tendencies do not respond to techno-economic factors such as the lack of raw materials in the environment. N12 notes the option of using local rocks.

These behaviours related to flint management must be attached to a fragmented *chaineo peratoire* along a wide techno-temporal scale, converting Roca dels Bous into a privileged place in the movement of Neanderthal groups (Mora *et al.*, 2008; de la Torre *et al.*, 2013).

The settlement´s strategic position allows an effective control of the seasonal animal movements, especially equids (horse and wild ass) and deer, between the Ebro Depression and the Pyrenees. This short-term settlement– pattern should be attached to annual cycle short periods in which the environment offered opportunities to obtain prey and transport them to the archaeological site.

The inferences from Roca dels Bous, and in general the pre-Pyrenees settlements at Noguera, suggest that this area will have a prominent role in the investigation of the Middle Palaeolithic in the Northeast of the Iberian Peninsula.

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A key sequence in the Western Mediterranean Prehistory: Cova Gran de Santa Linya (Pre-Pyrenees in Lleida)

This large rock shelter was discovered in 2002 during a survey program coordinated by the Centre d'Estudis del Patrimoni Arqueològic de la Prehistòria (CEPAP). This settlement contains a large chrono-cultural sequence covering Middle Paleolithic, Early Upper Paleolithic, Magdalenian, Neolithic and Chalcolithic. The use of this site by hunter-gatherers and farmer-shepherds turned the place into a key location for analyzing human settlement of the Pyrenees during Prehistory.

Geographical situation

Cova Gran (X=318541, Y=4643877, UTM H31N ETRS89) is located in the eastern Pre-Pyrenees, in Lleida (see Fig.1A in *Roca dels Bous*

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paper), 385m A.S.L., and in a lateral valley of the Noguera-Pallaresa river where the ravine of Sant Miquel digs into the limestone of the Upper Cretaceous creating a shelter of over 2000 m² (Fig. 1A). The chrono-stratigraphic sequence of the sedimentary and cultural processes of the deposit is made up from the sectors Ramp, Transition and Platform which are correlated from 40 14C AMS and T1 dates (Fig. 1B). We do not reject the appearance of new chrono-cultural segments. Cova Gran is relevant for contextualizing last 50.000 years of the human presence in the Western Mediterranean (Mora *et al.*, 2011).

The longitudinal profile of the shelter permits appreciation of the deposit shaped from two large juxtaposed platforms (Fig. 1B). The sequence of the first one –point west and external to the rock-shelter– is defined in the Ramp sector. Transition and Platform sectors record the sedimentary development under the visor.

The Ramp Sector: Archaeo-Stratigraphy of the Outer Platform

The Ramp sector –R– is a 200 m² platform with a 20º east gradient. The dug area extends 120 m² and some levels go on outwards. In this area of 2.5 m thickness, the sedimentary units S1 and 497 are differentiated, originated by different climatic processes (Fig. 1C). The basal unit S1 is a set of 2m made by medium and coarse gravels, sand-clayey matrix and limy-angular debris of a gravitational origin which indicate cold conditions. Unit 497 –0,5m– is composed of granular sediments affected by water flow indicating relatively milder environmental conditions. Relevant sin-post depositional processes are not detected (Benito Calvo *et al.*, 2011).

In sector R, 8 archaeological levels are stratified punctuated for being sterile. Unit S1 contains levels S1E, S1D, S1C, S1B1 andS1B which correspond to Mousterian, and 497D assigned to an undetermined Early Upper Paleolithic. Sedimentary unit 497, levels 497C and 497A, are attached to other stages of Early Upper Paleolithic cycle. All levels are rich in lithics, bones and hearths. Marine ornaments, especially *Nassarius incrassatus* (Martínez-Moreno *et al.*, 2011) have been recovered in 497D, 497C and 497A. These artifacts are considered markers of the irruption of *H. sapiens* in Western Europe.

The techno-typological change detected between S1B and 497D –on the roof of the unit S1– indicates several implications. In these stratigraphycally overlayed levels, recovered lithic assemblages correspond to different cultural traditions, with changes affecting raw material, knapping systems, blanks and the retouched tools (Fig. 2A). This technological change redirects to the debate about the Middle/Upper Paleolithic transition, and the possible extinction of *H. neanderthalensis* in parallel to the dispersion of *H. sapiens* in Western Europe.

S1B summarizes the general trends of the Mousterian in Cova Gran (Martínez-Moreno *et al.*, 2011; Mora *et al.*, 2012). Cores are reduced to obtain centripetal flakes similar to those observed in Tragó and Roca dels Bous (de la Torre *et al.*, 2013). The flint coming from the Garumnian formations adjacent to the site is the most used raw material in all levels. Similarly, metamorphic rocks are transported configuring large pseudo-*Levallois* blanks elaborated outside the site –Fig. 2B-. In other words, whole materials are obtained in the immediate area (see Fig. 1A article about Roca dels Bous). Regarding the retouched tools, denticulates are more common than pieces with continuous edges (Mora *et al.*, 2012).

497D shows important differences. Metamorphic rocks disappear and although the Garumnian flint is the main resource, the contribution of configured supports from Serra Llarga –20 km far away– increases. The knapping system is intended to obtain blade-elongated supports with a low morpho-technical standardization degree. This includes end-scrapers and burins on blade, backed and points on bladelet, artefacts unknown in the



Figure 1. A) Cova Gran de Santa Linya.

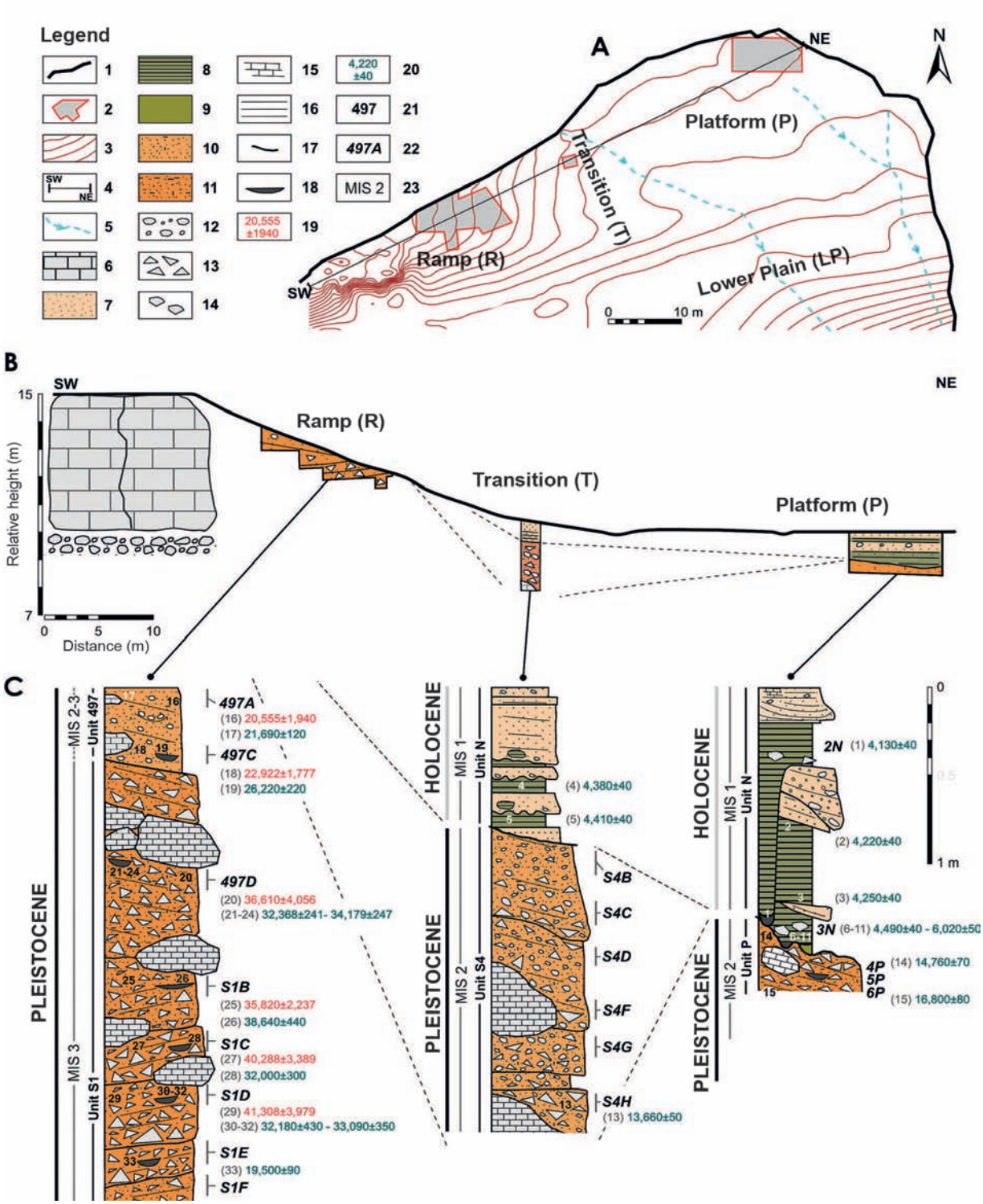


Figure 2. B) Archaeo-stratigraphic sequence: A) shelter´s floor where the dug sectors are located –Platform, Transition and Ramp– B) Longitudinal transection of the deposit. C) Sectors R, T and P chrono-stratigraphy (see Mora *et al.*, 2011)

Mousterian. Although, an important component of scrapers, denticulates and notches on flake persist –Fig. 2B–. These features do not match with the trends described in the first techno-complexes of the Upper Paleolithic in Western Europe (Martínez-Moreno *et al.*, 2010).

Some anomalies are appreciated in the dating of this sector, which can be related to the protocols used in C14 laboratories. However, the dates provided for 497D from charcoal coming from a hearth, place this level in the interval 40-38.5ka-calBP. The archaeo-stratigraphic resolution and the chronometrical intervals of these levels contribute to the debate about of Middle/Upper Paleolithic transition (Martínez-Moreno *et al.*, 2010).

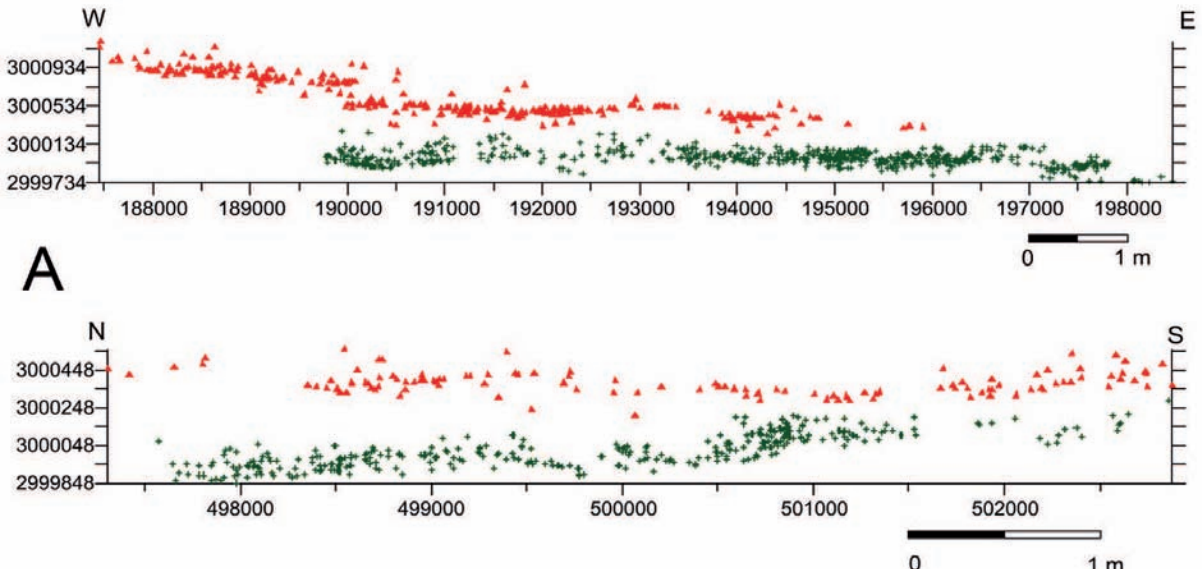
Archaeo-stratigraphy of the inner platform: Transition and Platform sectors

The central platform is a surface extended under the visor of the shelter of about 2000 m^2. This delineation restricts the most ancient archaeological levels to sector R –Fig. 1B–.

This sequence is known by the Transition sector (T) –a survey of 2x2 m–, and the Platform sector (P), which embraces a dug area of 32 m^2. Two units are identified in both sectors: unit N corresponds to the Holocene, unit P is attached to the final of MIS 2 (–Fig. 1B–.)

The most ancient human presence is detected during the Last Maximum Glacial (LMG) in the sedimentary unit P of the Platform sector, made by very angular debris and falls from large blocks with limited fine sediments –Fig.1B–. Levels 4P, 5P, 6P and 8P take place in this sequence, with 1.7 m thick, dated between 20.4-18 ky calBP –stage Gs2b–. Points and backed bladelets, burin and end-scrapers on blade are associated with massive antler projectiles, needles and perforated gastropods. These artefacts can refer to the Early Magdalenian. Sector T is a survey of 3.5 m depth in which several levels with different technical features from sector P take place –Fig.1B–. A dating on the survey´s basis (17-16.8 ky calBP) allow sector T to be attributed to Middle Magdalenian and possibly Upper Magdalenian levels (Mora *et al.*, 2012).

The Holocene sequence N erodes levels P in sectors T and P, creating complex geometries over which farmer-shepherds communities settled from the Early Neolithic, just as it is identified in the Platform sector –Fig. 1B–. The most intense settlement moment occurs during the Late Neolithic –5500-5100 calBP, recording 30 domestic structures –hearths, post-holes and pits– (Mora *et al.*, 2012). Above these settlements, this area is used for stabling sheep-goat during the Late Neolithic (5000-4600 calBP), Calcolithic and Late Bronze Age (3950-3000 calBP). These accumulations, each 0.5 m thick, include several stages of intentional burning in order to condition the place for future visits. These appreciations open new perspectives to analyze the origins of pastoralism in northeast Iberia (Polo *et al.*, 2014).



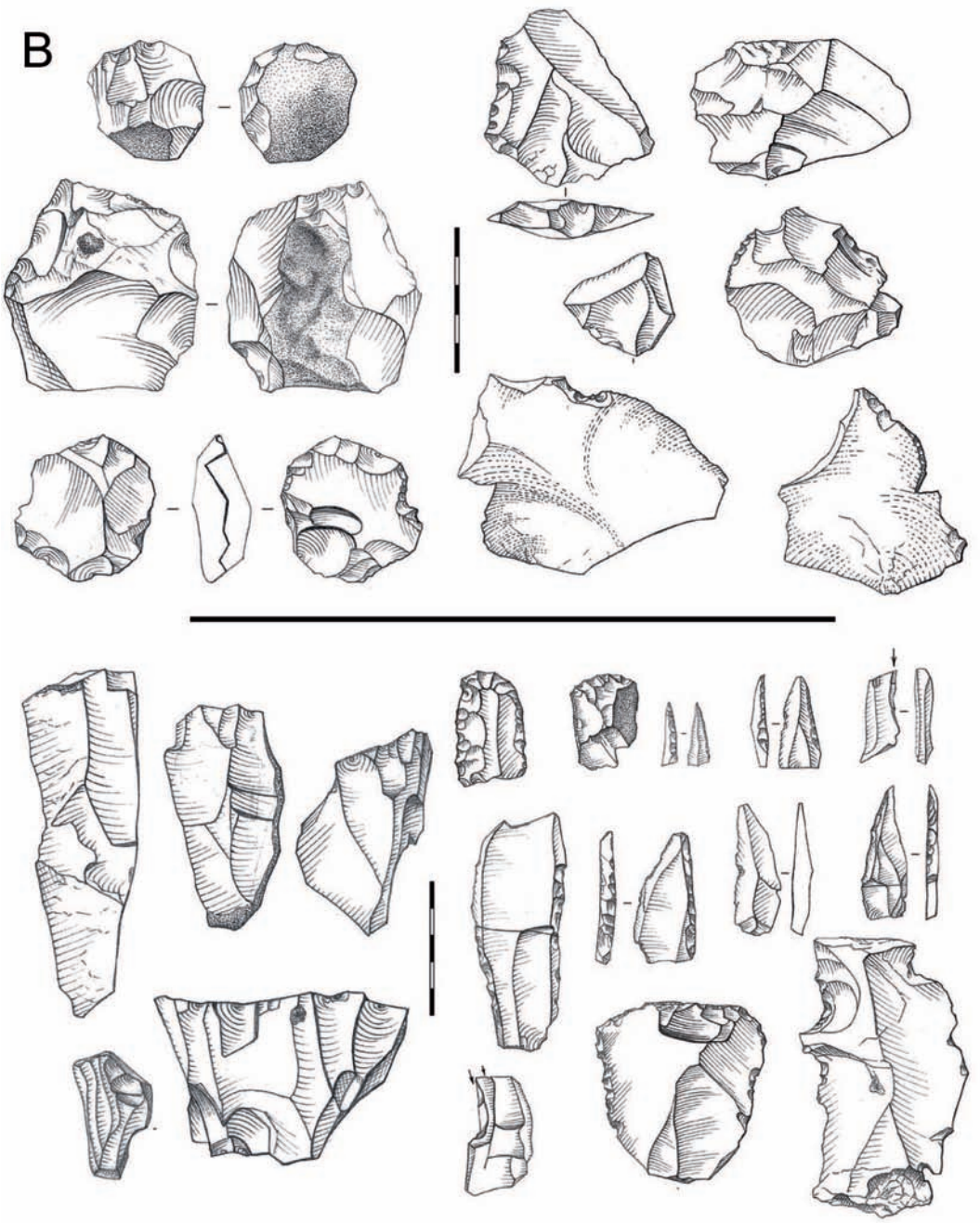


Figure 2. A) N-S and E-W projections of 497D –triangles– and S1B –points– separated by sterile. B) Lithic artifacts of S1B Middle Paleolithic –on top– and 497D initial Upper Paleolithic –below–.

Future prospects

Cova Gran de Santa Linya articulates several important research questions in the current scientific debate: the disappearance of the Neanderthals and the appearance of modern humans, hunter-gatherer adaptations during the LMG and the emergence of the first farmers. These issues are essential to analyze human presence in the southern Pyrenees, an area in which important progress is taking place. We think that this is a privileged place to analyze the course of different human groups which occupied this shelter for 50.000 years.



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PLEISTOCENE AND HOLOCENE HUNTER-GATHERERS IN IBERIA AND THE GIBRALTAR STRAIT:

THE CURRENT ARCHAEOLOGICAL RECORD

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