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A fundamental archive for the European Pleistocene: The Manzanares and Jarama valleys (Madrid, Spain)

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## Editorial

**A fundamental archive for the European Pleistocene: The Manzanares and Jarama valleys (Madrid, Spain)**

The Iberian Peninsula plays a key role in the study of the peopling of Europe during the Pleistocene. It provides an alternative migration route from Africa to Europe, via the Strait of Gibraltar (Santonja and Villa, 2006; Doronichev and Golovanova, 2010; Sharon, 2011; Bar-Yosef and Belfer-Cohen, 2013), and could have acted as a shelter area for plant and animal species during the glacial periods (Gamble et al., 2004). The valleys of the rivers Manzanares and Jarama are located strategically directly in the centre of the Iberian Peninsula, and preserve one of the largest assemblages of Pleistocene sites in Europe (Santonja and Querol, 1978; Panera and Rubio-Jara, 2002; Rubio-Jara et al., 2016; Rubio-Jara and Panera, in this issue).

The geological characteristics of the rivers Manzanares and Jarama valleys, together with the exploitation of sand and gravel and its proximity to Madrid, have favoured plentiful discoveries of Pleistocene lithic industry and faunal remains since 1862 (Vernuil and Lartet, 1863; De Prado, 1864). Since the 19<sup>th</sup> century this area has become an international historical landmark (Panera and Rubio-Jara, 2002): Obermaier paid special attention to it in "Fossil Man in Spain" (1923); the 15th International Geological Congress was held in Madrid in 1926; H. Breuil took part in the study of lithic assemblages from the Manzanares valley in 1932; the 4<sup>th</sup> Congress of UISPP and the 5<sup>th</sup> Congress of INQUA were held in Madrid in 1954 and 1957 respectively; in 1974 L.G. Freeman carried out a review of the Palaeolithic of the Manzanares; in 1980 the exceptional monograph about Áridos, one of the key Acheulean sites in Europe, was published (Santonja et al., 1980). However, the long and varied interruptions in research, the troubled Spanish Second Republic, the Civil War and Franco's dictatorship meant that research froze for nearly half a century, preventing the knowledge of the Palaeolithic to reach the level of other European regions of similar importance. For the last two decades, systematic research projects have been implemented in the middle and lower stretches of the Jarama and Manzanares rivers (Uribelarra, 2008; Panera, 2009; Rubio-Jara, 2011; López-Recio, 2017), as well as in their interfluve (Báñez et al., 2010; Baena Preysler et al., 2015; Baena-Preysler and Navas, 2019). Our multidisciplinary research group was set up in 2002 with the purpose of updating the knowledge of the Pleistocene in the Manzanares and Jarama rivers. The starting point was the publication of a monograph in which different experts updated the existing archaeological, paleontological and geologic information (Panera, J., and Rubio-Jara, S. (Eds), 2002. "Bifaces y elefantes. La investigación del Paleolítico en Madrid". Zona Arqueológica, 1. Edited by Museo Arqueológico Regional de la Comunidad de Madrid). Field work was carried out between 2002 and 2009, and as a result several archaeological sites were found and excavated. The research programs have been based on systematic field surveys on sections of fluvial deposits, where a large number of industrial assemblages have been recorded in stratigraphic context (Panera, 2009; Rubio-Jara, 2011). Many were found in gravel bars, and others on overbank facies. This, together with a strong chronological timeframe (ESR, TL/OSL; AAR, biostratigraphy and paleomagnetism), provides one of the most complete and continuous documents about the Pleistocene in Europe, from MIS 19 to MIS 3, making this area one of the most important European archives for our knowledge of the Pleistocene. A good part of the data retrieved during field work has been processed, and some of the results are gathered in this special issue about climate evolution, landscape, faunal remains, and behaviour of the different species of hominins which inhabited the valleys of the rivers Manzanares and Jarama for 800.000 years.

The Jarama and Manzanares rivers have created a great number of fluvial terraces, related to Quaternary climatic oscillations; tectonics (Alia, 1960; Pérez-González, 1980; Silva et al., 1988, 1988a; Pérez-González, 1994), isostatic rising and blocks adjustment, and lithological structural controls (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. 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 to the Complex Terrace of Arganda (hereafter CTA) (Pérez-González, 1971, 1994), over which the current floodplain is set. CTA is made up of successively stacked fluvial sequences, named from bottom to top Arganda I, II, III, which match up with terraces +30-32 m, +23-24 m, and +18-20m respectively (Pérez-González and Uribealdea, 2002; Panera et al., 2011). In the Manzanares valley, upstream from Madrid, 13 terrace levels have been recorded between +4-5 m and +95 m (Pérez-González, 1994). This system of stepped terraces gives way to a system of complex terraces, named Complex Terrace of Butarque (hereafter CTB) (Goy et al., 1989). The terraces formed over evaporitic rocks +25-30 m, +18-20 m and +12-15 m, are overlapped and affected by the synsedimentary subsidence, resulting in a huge thickness increase of dozens of meters. The characteristics of CTA and CTB have favoured the preservation of several archaeological sites in autochthonous or allochthonous position.

The chronostratigraphy of these fluvial valleys has been established based on the terrace sequence combined with paleomagnetism, biochronological and numerical data. In the Jarama and Tagus valleys the first terrace belonging to Matuyama Chron (1r) is T+60–65 m ( $> 0.780$  Ma; Pérez-González et al., 2013; Pinilla et al., 1995), therefore in the Manzanares valley the T+60 m is likely to be the equivalent (Pérez-González et al., 2013). Moreno et al., in this issue, provided new numerical ages obtained through ESR for CTA, which are consistent with the timeframe obtained through AAR analysis together with biostratigraphic data (López-Martínez, 1980; Sesé et al., 2011; Panera et al., 2011): Arganda I unit may be chronologically positioned between MIS10 and MIS9, Arganda II unit between MIS8 and MIS7 and Arganda III close to the MIS6. Furthermore, these authors propose a new chronology for PRERESA site in the Manzanares valley, and therefore for the outcrop of the CTB. Previous OSL dates,  $84 \pm 5.6$  ka (Yravedra et al., 2012), and the presence of *Microtus cabreræ* (Sesé et al., 2011a), pointed to PRERESA being characteristic of the first half of the Upper Pleistocene. But ESR dates provided by Moreno et al. place this site at the beginning of the MIS 6, making PRERESA the oldest record of *Microtus cabreræ* in the Iberian Peninsula.

Rubio-Jara and Panera provide a synthesis of the timeframe for the Manzanares valley, and for the first time a geochronological context to several tens of Palaeolithic sites since 800 ka, whose research will enable their integration into the general framework of the European Pleistocene and information about the peopling dynamics in the European SW. This will enable research on the variability of the technocomplexes in the same geographic area: flake and core industry during the first half of the Middle Pleistocene; Acheulean between MIS 13/11 and MIS 7/6; the coexistence between the Acheulean and the Middle Palaeolithic towards the end of the Middle Pleistocene; the peopling dynamics of Neanderthal groups in the open air during the Late Pleistocene; and the human occupation in the interior of the Iberian Peninsula during the Late Pleniglacial.

The analysis of micromammals, herpetofauna, malacofauna and pollen identified in several Middle and Late Pleistocene sites has allowed the reconstruction of the landscape and climate from MIS 11/10 to MIS 5 at the Manzanares and Jarama valleys. The study of long archaeological successions and chronological periods in the same environment, presented in these works, is key to understanding the differences between global and regional climate evolution, as well as the study of the ecosystem dynamics, which is of great relevance on the Iberian Peninsula due to the current Global Change scenario (Van Kolfschoten et al., 2003; Tzedakis et al., 2013). Gil-García et al. presents in this volume the landscape evolution during

the last 379 ka through the pollen analysis of eight sequences obtained at different sites of CTB and CTA, which point to a high pollen variability that is consistent with the climatic changes recorded to millennial/multimillennial scale, although some local and/or regional particularities exist. On the other hand, Blain et al. show a regional synthesis of the palaeoclimatic and palaeoenvironmental data and their influence on the biodiversity during the Pleistocene through amphibian and reptile assemblages obtained from six archaeological sites of CTB and CTA, from MIS 11b to MIS 5a, which has allowed the reconstruction of part of the climate instability with high-amplitude and rapid shifts of the last 450 ka, among three different landscapes: glacial landscape, a landscape of transition from cool to temperate climatic conditions, and an interglacial landscape. Finally, through non-marine mollusc analysis, Aparicio et al. has characterized the climate and the landscape of the Acheulean site Valdocarros II (end MIS 8-beginning MIS 7). The Pleistocene history of non-marine molluscs in the Iberian Peninsula has been scarcely addressed. Twelve freshwater specimens and eighteen land mollusc taxa have been differentiated, such as *Xerotricha madritensis* endemic to the Iberian Peninsula. The malacofauna shows a site characterized by a temperate climate and open areas with riverside vegetation, and could correspond with an interstadial.

PRERESA is one of the few open air sites of the end of the Middle Pleistocene of the Iberian Peninsula with a well contextualized association of lithic industry of the Middle Palaeolithic and faunal remains, and with evidence of Neanderthal exploitation of this fauna. The publication to date highlighted the anthropic exploitation of a proboscidean of which the marrow had been used (Yravedra et al., 2012). In this issue, Yravedra et al. analyse the rest of faunal remains, among which a significant number of cut and percussion marks have been identified, suggesting human exploitation of the flesh and the marrow, and proving that the site was recurrently visited by Neanderthal groups with the purpose of processing such mammals. In addition, the presence of two individuals of *Haploidoceros mediterraneus* is outstanding, as this species barely has been identified (Made and Mazo, 2014). During the excavation seasons at PRERESA, several clusters of small mammals, named fossil pellet, were identified. The presence of such concentrations is uncommon in open-air sites. In this volume, García-Morato et al. analyse the taphonomy of the microvertebrates, which must be considered essential in order to establish the degree of completeness of the archaeological record in fluvial environments. This analysis has enabled the description of the sedimentary environment of the floodplain where the PRERESA site was developed, suggesting a fluvial system characterized by low or null energy flow. Also, a humid environment probably existed, which provides consistency to the pellet forming a mass of hair and bones. The analysis of several taphonomic traits, such as anatomical representation, breakage, and digestion, have allowed the identification of the agent that produced the small mammal assemblage of PRERESA, a nocturnal raptor, most likely an Eagle owl (*Bubo bubo*).

ETB-H02 (MIS 6 or MIS 7 cold event) is one of the few Middle Pleistocene sites of the Iberian Peninsula where lithic industry and faunal remains are associated, and have been retrieved from an excavated area of 1029 m<sup>2</sup> (Álvarez Catalán et al., 2009; De los Arcos et al., 2008; 2010). The association of amphibia and reptiles of ETB-H02 show the coldest climatic conditions registered in palaeolithic sites in the interior of Iberian Peninsula (Blain et al. in this issue). Through the taphonomic and zooarcheological analyses of faunal remains, Yravedra et al. show in this volume that the human occupations were occasional although recurrent at ETB-H02. Therefore, if the human occupation of the Spanish Meseta occurred during a cold climate event, then neither the continental climate nor the height of this area were an obstacle to occupation during the Middle Pleistocene.

Bones of *Praedama* sp. (the same as *Megaloceros* according to Lister, 1994 and Made, 2001) were found in Transfesa/Tafesa, in the T +25-30 m of the Manzanares valley. Through the revision of these remains, Made in this issue maintains that this is not *Megaloceros savini* but a different subspecies, *Megaloceros matritensis* (the last descendent of the species *Megaloceros*). It has been described here for the first time based on material from ten localities along the

Manzanares River. It should be contemporary with *Megaloceros giganteus* and would be placed between MIS 11 and MIS 10.

An updated revision and a state of the art of the hominin exploitation of proboscideans in the Central Iberian Peninsula has been carried out by Yravedra et al. in this issue. In the Manzanares and Jarama valleys, a substantial number of sites with Acheulean lithic industry associated with elephant remains, as well as evidence dating to the Middle Palaeolithic have been recorded. This implies that Mousterian groups made use of these animal resources in a similar way to the Acheulean groups, and therefore the exploitation of mega-mammals for food was a recurrent phenomenon during the Acheulean and Middle Palaeolithic in the interior of the Iberian Peninsula, whereas in the European sites the evidence of proboscidean exploitation is substantially greater in number during the Lower Palaeolithic than during the Middle Palaeolithic.

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### References

- Alia, M., 1960. Sobre la tectónica profunda de la fosa del Tajo. Notas y Comunicaciones del Instituto Tecnológico y Geominero de España 58, 125-162.
- Alvárez Catalán, V., de los Arcos Fernández, S., Gallego Lletjos, N., Gil Ortiz, C., González García, I., Herráez Igualador, E., Ruiz Zapata, B., Yravedra, J., 2009. Yacimiento Paleolítico del Estanque de Tormentas de Butarque. In: Santonja, M. (Ed.), Actas de las Cuartas Jornadas de Patrimonio Arqueológico en la Comunidad de Madrid. Los primeros pobladores: Arqueología del Pleistoceno, Alcalá de Henares, pp. 333-337.
- Aparicio, M.T., Panera, J., Rubio-Jara, S., Uribelarrea, D., Pérez-González, A., Late Middle Pleistocene malacofauna of the Acheulean site of Valdocarros II, Jarama River valle, Madrid, Spain, *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.04.011>.
- De los Arcos, S., Gallego, N., Gil Ortiz, C., González García, I., Yravedra, J., 2008. Geoarqueología del yacimiento paleolítico del Estanque de Tormentas de Butarque (Villaverde, Madrid). In: OrJIA (Ed.), Actas de las I Jornadas de Jóvenes en Investigación Aqueológica. Dialogando con la cultura material I, pp. 135-140.
- De los Arcos, S., Gallego, N., Gil Ortiz, C., González García, I., Yravedra, J., 2010. El nivel 4 (arcillas) del yacimiento paleolítico del Estanque de Tormentas de Butarque (Villaverde, Madrid). In: Actas de las V jornadas de patrimonio arqueológico en la Comunidad de Madrid. Museo Arqueológico Regional de la Comunidad de Madrid, Alcalá de Henares, Madrid, pp. 287-291.

Baena Preysler, J., Ortiz, I., Torres, C., Báñez, S., 2015. Recycling in abundance: re-use and recycling processes in the Lower and Middle Paleolithic contexts of the central Iberian Peninsula. *Quaternary International* 361, 142-154.

Baena Preysler, J., Torres, C., 2019. Explaining links from the past: material distribution in Charco Hondo 2 Acheulian archeological site (Madrid, Spain). *Archaeological and Anthropological Sciences*, <https://doi.org/10.1007/s1250-019-00816-5>.

Bar-Yosef, O., Belfer-Cohen, A., 2013. Following Pleistocene road signs of human dispersals across Eurasia. *Quaternary International* 285, 30-43.

Báñez, S., Rus, I., Pérez-González, A., Vega de Miguel, J., 2010. Los yacimientos achelenses de “Los Ahijones”, metodología geoarqueológica y resultados preliminares de la intervención. *Actas de las V jornadas de patrimonio arqueológico en la Comunidad de Madrid Celebradas en el Museo Arqueológico Regional de la Comunidad de Madrid del 12e14 de noviembre de 2008*. Alcalá de Henares, Madrid, pp. 173-189.

Blain, H.-A., Bisbal-Chinesta, J.F., Martínez-Monzón, A., Panera, J., Rubio-Jara, S., Uribealraea, D., Yravedra, J., Pérez-González, A., 2018. The Middle to Late Pleistocene herpetofaunal assemblages from the Jarama and Manzanares valleys (Madrid, central Spain): An ecological synthesis. *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.03.004>.

De Prado, C., 1864. *Descripción física y geológica de la provincia de Madrid*. Imprenta Nacional.

Doronichev, V., Golovanova, L., 2010. Beyond the Acheulean: a view on the Lower Paleolithic occupation of Western Eurasia. *Quaternary International* 223-224, 327-344.

Gamble, C., Davies, W., Pettitt, P., Richards, M., 2004. Climate change and evolving human diversity in Europe during the last glacial. *Philos. Trans. R. Soc. Lond. B Biol.Sci.* 359 (1442), 243–254.

García-Morato, S., Sevilla, P., Panera, J., Rubio-Jara, S., Sesé, C., Fernández-Jalvo, Y., Rodents, rabbits and pellets in a fluvial terrace (PRERESA site, Madrid, Spain). *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.04.012>.

Gil-García, M.J., Ruiz-Zapata, M.B., Rubio-Jara, S., Panera, J., Pérez-González, A., Landscape evolution during the Middle and Late Pleistocene in the Madrid basin (Spain) vegetation dynamics and human activity in the Jarama-Manzanares rivers (Madrid) during the Pleistocene. *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.02.034>.

Goy, J.L., Pérez-González, A., Zazo, C., 1989. Cartografía geológica del Cuaternario, geomorfología y Memoria correspondiente de la Hoja a E, 1: 50.000 de Madrid (559). Instituto Tecnológico Geológico y Minero de España, Madrid.

Lister, A.M., 1994. The evolution of the giant deer *Megaloceros giganteus* (Blumenbach). *Zoological Journal of Linnean Society* 112, 65-100.

López Martínez, N., 1980. Los micromamíferos (Rodentia, Insectivora, Lagomorpha Chiroptera), del sitio de ocupación Achelense de Áridos-1 (Arganda, Madrid). In: Santonja, M., López Martínez, N., Pérez-González, A. (Eds.), *Ocupaciones Achelenses en el Valle del Jarama (Arganda, Madrid) Arqueología y Paleoecología*, 1. Diputación Provincial de Madrid, pp. 161-202.

- López Recio, M., 2017. Contextualización geoarqueológica y cronocultural de yacimientos del Pleistoceno Medio y Superior en la Cuenca de Madrid. Universidad Autónoma de Madrid. Tesis Doctoral.
- Made, J. van der, 2001. Les Ongules d'Atapuerca. Stratigraphie et biogéographie. *L'Anthropologie* 105 (1), 95-113.
- Made, J. van der, 2018. i.p. The dwarfed "giant deer" *Megaloceros matritensis* n.sp. from the Middle Pleistocene of Madrid - a descendant of *M. savini* and contemporary to *M. giganteus*. *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.06.006>.
- Made, J. van der, Mazo, A.V., 2014. Los grandes mamíferos del yacimiento de Preresca. In: Baquedano Beltrán, I., Laplana, C. (Eds.), *Haploidoceros mediterraneus* una nueva especie de ciervo en el Pleistoceno Ibérico. Museo Arqueológico Regional - Alcalá de Henares, pp. 39–53.
- Moreno, D., Duval, M., Rubio-Jara, S., Panera, J., Bahain, J.J., Shao, Q., Pérez-González, A., Falguères, C., ESR dating of several Middle to Late Pleistocene archaeo-paleontological sites from the Manzanares and Jarama river valleys (Madrid basin, Spain). *Quat. Int.* <https://doi.org/10.1016/j.quaint.2017.09.003>.
- Panera, J., 2009. La ocupación del medio fluvial en el Paleolítico antiguo. Caracterización geoarqueológica de depósitos pleistocenos del valle del río Jarama (Madrid) y estudio tecnoeconómico de la industria lítica. Departamento de Prehistoria y Arqueología. Facultad de Geografía e Historia. Universidad Nacional de Educación a Distancia (Tesis Doctoral inédita).
- Panera, J., Torres, T., Pérez-González, A., Ortiz, J.E., Rubio-Jara, S., Uribebarrea, D., 2011. Geocronología de la Terraza Compleja de Arganda en el valle del río Jarama (Madrid, España). *Estudios Geológicos* 67 (2), 495-504.
- Panera, J., Rubio-Jara, S. (Eds.), 2002. Bifaces y elefantes. La investigación del Paleolítico Inferior en Madrid. Museo Arqueológico Regional de la Comunidad de Madrid, Zona Arqueológica, vol. 1, pp. 510.
- Pérez-González, A., 1971. Estudio de los procesos de hundimiento en el valle del río Jarama y sus terrazas (nota preliminar). *Estudios Geológicos* XXVII (4), 317-324.
- Pérez-González, A., 1980. Geología y estratigrafía de los yacimientos de Áridos en la llanura aluvial de Arganda (Madrid). In: Santonja, M., López, N., Pérez-González, A. (Eds.), *Ocupaciones achelenses en el valle del Jarama. Arqueología y Paleontología, I.* Diputación Provincial de Madrid, pp. 49-61.
- Pérez-González, A., 1994. In: Elorza, Gutiérrez (Ed.), *Depresión del Tajo. Geomorfología de España*, Rueda, pp. 389-436.
- Pérez-González, A., Gallardo-Millán, J.L., Uribebarrea del Val, D., Panera, J., Rubio-Jara, S., 2013. La inversión Matuyama-Brunhes en la secuencia de terrazas del río Jarama entre Velilla de San Antonio y Altos de la Mejorada, al SE de Madrid (España). *Estudios Geológicos* 69 (1), 35-46, enero-junio 2013. <http://dx.doi.org/10.3989/egeol.40862.173>.
- Pérez-González, A., Uribebarrea del Val, D., 2002. Geología del Cuaternario de los valles fluviales del Jarama y Manzanares en las proximidades de Madrid. In: Panera, J., Rubio-Jara, S. (Eds.), *Bifaces y elefantes. La investigación del Paleolítico Inferior en Madrid, Zona Arqueológica, vol. 1*, pp. 303-317.

Pinilla, L., Pérez-González, A., Sopena, A., Parés, J.M., 1995. Fenómenos de hundimiento sinsedimentarios en los depósitos cuaternarios del río Tajo en la provincia de Madrid (Almoguera-Fuentidueña de Tajo). In: Aleixandre, T., Pérez-González, A. (Eds.), *Reconstrucción de paleoambientes y cambios climáticos durante el Cuaternario* Monografías del Centro de Ciencias Medioambientales, vol. 3, pp. 125-139.

Rubio-Jara, S., 2011. El paleolítico en el valle del río Manzanares (Madrid). Caracterización geoarqueológica de depósitos pleistocenos y estudio tecnoeconómico de la industria lítica. Universidad Nacional de Educación a Distancia (Tesis Doctoral inédita).

Rubio-Jara, S., Panera, J., 2018. Unravelling an essential archive for the European Pleistocene. The human occupation in the Manzanares valley (Madrid, Spain) throughout nearly 800,000 years. <https://doi.org/10.1016/j.quaint.2018.08.007>.

Rubio-Jara, S., Panera, J., Rodríguez de Tembleque, J., Santonja, M., Pérez-González, A., 2016. 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. *Quaternary International* 411, 349–366.

Santonja, M., López, N., Pérez-González, A. (Eds.) (1980). *Ocupaciones achelenses en el valle del Jarama. Arqueología y Paleontología I.* Diputación Provincial de Madrid, pp. 351.

Santonja, M., Querol, M. A. (1978). Yacimientos paleolíticos en el valle de Jarama". *Boletín de la Asociación de Amigos de la Arqueología*, 8.

Santonja, M., Villa, P., 2006. The Acheulean of Western Europe. In: Goren-Inbar, N., Sharon, G. (Eds.), *Axe Age. Acheulean Toolmaking from Quarry to Discard.* Equinox, London, pp. 429-478.

Sesé, C., Panera, J., Rubio-Jara, S., Pérez-González, A., 2011. Micromamíferos del Pleistoceno Medio y Pleistoceno Superior en el Valle del Jarama: Yacimientos de Valdocarros y HAT (Madrid). *Estudios Geológicos* 67 (1), 131-151.

Sesé, C., Rubio-Jara, S., Panera, J., Pérez-González, A., 2011a. Micromamíferos del Pleistoceno Superior del yacimiento de PRERESA en el valle del Manzanares y su contribución a la reconstrucción paleoambiental de la cuenca de Madrid durante el Pleistoceno. *Estudios Geológicos* 67 (2), 471–494.

Sharon, G., 2011. Flakes crossing the straits?. Entame flakes and Northern Africa e Iberia contact during the Acheulean. *African Archaeological Review* 28 (2), 125-140.

Silva, P., Goy, J.L., Zazo, C., 1988. Neotectónica del sector centro-meridional de la Cuenca de Madrid. *Estudios Geológicos* 2, 133-136.

Silva, P.G., Goy, J.L., Zazo, C., Hoyos, M., Alberdi, M.T., 1988a. In: *El valle del Manzanares y su relación con la depresión Prados-Guaten durante el Pleistoceno inferior (Madrid, España).* II Congreso geológico de España. Comunicaciones, vol. 1 (Granada, 1988), pp. 403-406.

Tzedakis, P.C., Emerson, B.C., Hewitt, G.M., 2013. Cryptic or mystic? Glacial tree refugia in northern Europe. *Trends Ecol. Evol.* 28 (2), 696-704.

Uribelarra, D., 2008. Dinámica y evolución de las llanuras aluviales de los ríos Manzanares, Jarama y Tajo, entre las ciudades de Madrid y Toledo. Tesis Doctoral. Universidad Complutense de Madrid. Facultad de Ciencias Geológicas. Departamento de Geodinámica, pp. 396.

Van Kolfschoten, T.H., Gibbard, P.L., Knudsen, K.L., 2003. The Eemian interglacial: a global perspective. *Introduction*. *Global Planet. Change* 36, 147-149.

Verneuil, E., Lartet, E., 1863. Note sur un silex taillé trouvé dans le diluvium des environs de Madrid". *Bulletin de la Société Géologique de France*, 2a Serie XX, 698–702.

Yravedra, J., Panera, J., Rubio-Jara, S., Pérez-González, A., Gallego, N., González, I., Middle Pleistocene human occupation in the interior of the Iberian Peninsula during cold climate conditions: Zooarchaeology and taphonomy of ETB-H02 site in the Manzanares valley (Madrid, Spain). *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.03.014>.

Yravedra, J., Rubio-Jara, S., Panera, J., Made, J. van der, Pérez-González, A., Neanderthal diet in fluvial environments at the end of the Middle Pleistocene/early Late Pleistocene of PRERESA site in the Manzanares Valley (Madrid, Spain). *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2018.01.030>.

Yravedra, J., Rubio-Jara, S., Panera, J., Martos J.A., Hominis and Proboscideans in the Lower and Middle Palaeolithic in the Central Iberian Peninsula. *Quat. Int.*, <https://doi.org/10.1016/j.quaint.2017.12.002>.

Yravedra, J., Rubio-Jara, S., Panera, J., Uribealarea, D., Pérez-González, A., 2012. Elephants and subsistence. Evidence of the human exploitation of extremely large mammal bones from the Middle Palaeolithic site of PRERESA (Madrid, Spain). *Journal of Archaeological Science* 39, 1063–1071.

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