

THE UPPER PALEOLITHIC IN EL MIRÓN CAVE (RAMALES, CANTABRIA, SPAIN)

Lawrence G. STRAUS & Manuel GONZÁLEZ MORALES

The site of El Mirón – scientifically discovered by H. Alcalde del Río and L. Sierra in 1903, but largely ignored and dismissed by prehistorians until 1996 – is finally revealing one of the longest, most complete cultural sequences in the Cantabrian region of northern Spain, rivalling the classic stratigraphy of El Castillo established in 1904-1914 by Alcalde del Río, Obermaier and Breuil. El Mirón is a large cave located at an elevation of about 280 m above sea level on the northern edge of the Cantabrian Cordillera, 25 km upstream along the Río Asón from the Holocene shore of the Bay of Biscay at Laredo/Santoña (and about 27 km from the Pleniglacial shoreline). Facing due West, it is at the strategic confluence of two tributary gorges with the Asón, and has relatively easy access to the *meseta* of Old Castile via the nearby 920 m Los Tornos Pass and to the Basque Country via the Carranza Valley, which is lined with cave art sites including Venta de la Perra, Sotarriza, Arco, Pondra, et al. El Mirón is surrounded with mountain ranges many of whose summits exceed 1000 and even 1200 m. It is directly below the cave art site of Covalanas, adjacent to La Haza and only a couple of km from Cullalvera. The classic Magdalenian-Azilian site of El Valle is located midway down the Asón between El Mirón and the estuary, which itself is surrounded by several sites with Mousterian, Aurignacian, Magdalenian, Azilian and/or Mesolithic deposits and/or cave art (El Otero, La Chora, Cobrantes, La Fragua, El Perro, et al.). The El Mirón vestibule measures 30 m deep x 8-16 m wide x 13-18 m high and the total accessible cave length is c. 130 m.

Since 1996, the authors have directed five 2-month campaigns of excavation in El Mirón, with a sixth campaign underway in summer 2001. The work has consisted of digging two 10 sq.m. block excavations in the cave vestibule (one near the front and the other near the rear), connected by a 9 m-long, 1 m-wide trench. A 2 sq.m. *sondage* has been excavated at the back of the vestibule at the bottom of a crater that had been dug by clandestine looters. In addition, we straightened the walls and extended the depth of a trench that had been dug across the 8 m-wide dark inner cave in the 1950s. Maximum aggregate depth dug so far in the vestibule totals c. 5 m, but remote sensing methods indicate the presence of some 9 m of sedimentary deposits there.

The analytical team of the El Mirón Prehistoric Project includes the following specialists:

- W.R.Farrand & W. Hubbard (University of Michigan): sedimentology
- M.A.Courty & N.Fedoroff (Institut National Agronomique, Paris): micromorphology & pedology
- B.Ellwood (Louisiana State University): paleomagnetic susceptibility
- J.Clapés (Universidad Politécnica de Catalunya, Barcelona): geophysical survey
- A.Cherkinsky (Geochron Labs, Cambridge, Massachusetts): radiocarbon dating
- J.Bischoff (US Geological Survey): uranium series dating
- M.J.Iriarte (Sociedad de Ciencias Aranzadi, San Sebastian): palynology
- L.Zapata (Cambridge University/Universidad de País Vasco): anthracology
- L.Peña (Università di Como): carpology
- J.Altuna & K.Mariezkurrena (Sociedad de Ciencias Aranzadi): zooarcheology
- M.Pérez Ripoll (Universidad de Valencia): bone modification analysis
- R.Shahack-Gross & S.Weiner (Weizmann Institute, Jerusalem): bone combustion analysis

- G.Cuenca Bescós (Universidad de Zaragoza): micromammalian paleontology
 E.Roselló (Universidad Autónoma de Madrid): ichthyology
 C.García de Leániz & S.Consuegra (Centro Ictiológico de Arredondo): salmonid DNA analysis
 R.Moreno (Universidad Autónoma de Madrid): malacology
 F.Borja Sanchiz (Museo Nacional de Ciencias Naturales, Madrid): batrachian paleontology
 C.de la Rúa (Universidad del País Vasco): human paleontology
 M.Elorza (Sociedad de Ciencias Aranzadi): avian paleontology
 M.L.Ramos (Universidad de Cantabria): ceramic typology
 F.Guitián (Universidad de Santiago de Compostela): ceramic technological analysis
 J.González Urquijo (Universidad de Cantabria) & J.J.Ibáñez (Museo Histórico de Vizcaya): lithic microwear analysis
 A.Astorqui (Universidad Complutense de Madrid): database management & photogrammetry
 E.Torres (Universidad de Cantabria): topography
 S.Báñez del Cueto (Universidad de Salamanca): petrography

In total, 47 radiocarbon dates (both conventional and accelerator, on both charcoal and bone collagen) have been run as of early 2001. All conventional determinations were done at Geochron Labs, which also prepared the targets for all the AMS determinations done at Lawrence Livermore Labs in Berkeley, California. This radiocarbon record is the most extensive of any single Stone Age site in Spain (and one of the most extensive of any site in Europe). Use of a single laboratory for sample preparation avoids problems of inter-laboratory error and, indeed, the dates are almost all stratigraphically coherent, especially when standard deviations are taken into consideration. All but 18 of the dates concern the Upper Paleolithic sequence; those 18 cover the rich sequence of Neolithic, Chalcolithic, Bronze Age and Medieval levels (5800-540 BP uncal.).

The sequence uncovered to date begins with a terminal Mousterian (flake denticulates) dating to c. 41,000 BP (all dates uncalibrated), an age very similar to the terminal Mousterian at El Castillo (Cantabria) and La Viña (Asturias). This deposit--which has lion remains--is overlain by a series of culturally and paleontologically poor colluvial silts, one layer of which (with no diagnostic artifacts) dates to c. 27,600--equivalent to a terminal Aurignacian or early Gravettian. This is followed in the deep *sondage* by a series of levels containing Solutrean points (including concave base and shouldered types, often on "exotic" flints) with two dates of c. 19,000 BP. Discovery of this Solutrean occupation of El Mirón, together with Solutrean points that had casually been found earlier in La Haza and in an adjacent open-air locality, tend to bolster the stylistic arguments that would attribute the red dot outline drawings in La Haza, Covalanas and other regional sites to this period.

The extraordinarily rich Lower-Middle Magdalenian series of layers (with no sterile zones) is present in both vestibule block excavation areas. These date between c. 17,000-14,000 BP. As at many sites in the Cantabrian region (including El Castillo, Altamira, El Juyo, La Paloma, Cueto de la Mina, Las Caldas, La Viña, Ekain, among others), the thickness of these deposits and the density of their lithic and osseous artifacts, faunal remains, manuports and features such as hearth remnants, all point to repeated, intensive human occupations. At El Mirón these even included use of the dark inner cave, where blades and blade cores were found in association with charcoal dated to c. 14,600 at the bottom of our *sondage* in the bottom of the old trench. Characteristic artifacts include abundant *sagaies* (including many with square cross-section and tectiform or other geometric engraved decorations, others with circular cross-section and single-bevel base, and others with longitudinal grooves), bone needles, perforated shells and red deer canines, bone needles and awls, masses of lithic *débitage*, small exhausted cores, retouched tools (very often dominated by backed bladelets, along with small nucleiform endscrapers and mainly dihedral

burins--but in some levels many "macrolithic" denticulates, notches and sidescrapers made on local non-flint raw materials). Many of the flints appear to come from outcrops in Lower Cretaceous limestone now exposed along the present coast, but the (also non-local) sources of other flints have yet to be located, though they might include outcrops in northern Burgos, across the mountains. (The aggregate El Mirón lithic collection -- mostly from the Magdalenian levels -- totalled some 200,000 items by the end of the year 2000 campaign.) The rich faunal assemblages of these Magdalenian levels are dominated by ibex, together with red deer, some horse and other large ungulates, as well as abundant fish (mostly salmon and trout).

It is to this period that date a number of linear engravings on a huge roof-fall block at the rear of the vestibule. The block had fallen atop a level dated to c. 16,000BP, was engraved, and then covered over by Mid- and Upper Magdalenian levels spanning the period 15-12 kya. Other engravings--both linear and figurative--have been found to cover the cave walls of the vestibule rear, and more are likely to be found as we clean more surfaces. They are at heights suggestive of having been made during Magdalenian times. The abundance of Magdalenian occupations would tend to support the stylistic attribution of paintings in nearby Cullalvera to this period.

Upper Magdalenian levels are present in both the vestibule rear and front, but, although there is a unilaterally barbed harpoon closely associated with a charcoal sample precisely dated to 12,970 BP, they are far less rich in cultural or faunal materials. This suggests less frequent and/or intensive human use of the cave in the period between 14-12 kya. In contrast, materials pertaining to this period (and the succeeding Azilian) are abundant (and include some spectacular finds) in the small Horno Cave at the foot of the mountain in which El Mirón and Covalanas are located. This site--heavily disturbed by looters and spelunkers--has recently been tested and dated to c. 12.5-11.6 kya by M.A.Fano, working in association with the El Mirón Project.

At El Mirón the entire transect along the vestibule has evidence of terminal Magdalenian/ early Azilian occupation, with dates between 11,950-11,650 BP. Although flat-section harpoons have not (yet) been found, these levels do contain simplified lithic assemblages that notably include backed micropoints and thumbnail endscrapers. Continued visits to the cave in the late Azilian are attested by a few bones, teeth and flints brecciated to the base of a flowstone remnant adhering to the cave walls at the top of the colluvial/alluvial slope leading up into the inner cave. One of the teeth yielded two dates averaging c. 10,500 BP. There is also a late Azilian-age date of c.10,300 in the mid-vestibule. Evidence of great humidity in the cave in the immediately following period (early Holocene) includes the flowstone remnant above the interior slope, a thick mondmilch layer exposed in the inner cave trench between the Magdalenian and Medieval horizons, a thick layer of fine sandy gravels the top of which is enriched with calcium carbonates in the vestibule rear, a mondmilch in the connecting trench, and a layer of ponded, calcium carbonate-rich (locally cemented) silts in the outer vestibule. There are a few non-descript lithic artifacts and bone fragments scattered throughout these deposits in the vestibule, evidence of some ephemeral visits to the cave by humans based along the coast around the Asón estuary, where there were many sites during Mesolithic times. Dates from the ponded, locally cemented silt layer in the outer vestibule range from c. 9500-8400 BP. After this there is an hiatus in sedimentation and occupation, followed by a series of Neolithic layers that include some of the earliest (with domesticated ovicaprines and ceramics) in the Cantabrian region at c. 5800 BP.

Acknowledgements

The El Mirón Cave Project has been supported by grants from the Fundación M. Botín of Santander, the US National Science Foundation, the National Geographical Society, the L.S.B.Leakey Foundation, the Spanish Ministry of Education & Culture, the Regional Government of Cantabria, and the University of New Mexico. It has received material help

from the University of Cantabria, ICI Investigaciones Cibernéticas SA, the Asón-Agüera PRODER Program of the European Union, and especially from the Town and School of Ramales de la Victoria. We thank our multinational excavation crews for their excellent, hard, patient work and Joaquín («Pencho») Eguizábal, the guide of Covalanas Cave, for his unflaggingly enthusiastic support of the Project and its participants.

Addresses of the authors :

Lawrence G. STRAUS : Department of Anthropology,
University of New Mexico, Albuquerque, NM 87131, USA
Manuel GONZÁLEZ MORALES : Departamento de Ciencias Históricas,
Universidad de Cantabria, 39005 Santander, España

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