
CALDEIRÃO CAVE

The site of Gruta do Caldeirão is near the city of Tomar, Portugal, about 150 kilometers northeast of Lisbon. The entrance opens about 120 meters above sea level and dominates a small valley at the bottom of which a temporary stream flows into the Nabão River, the subtributary of the Tagus River that cuts (from north to south) the small limestone plateau where the cave is located. The stratigraphic succession defined in the cave's "back chamber" is about 6 meters thick and features three major discontinuities that divide it into four major blocks. At the bottom are Middle Palaeolithic levels K through P, dated to more than 28,000 B.P. (beyond 30,000 B.C.); these are followed by early Upper Palaeolithic and Solutrean levels Fa through Jb, dated to more

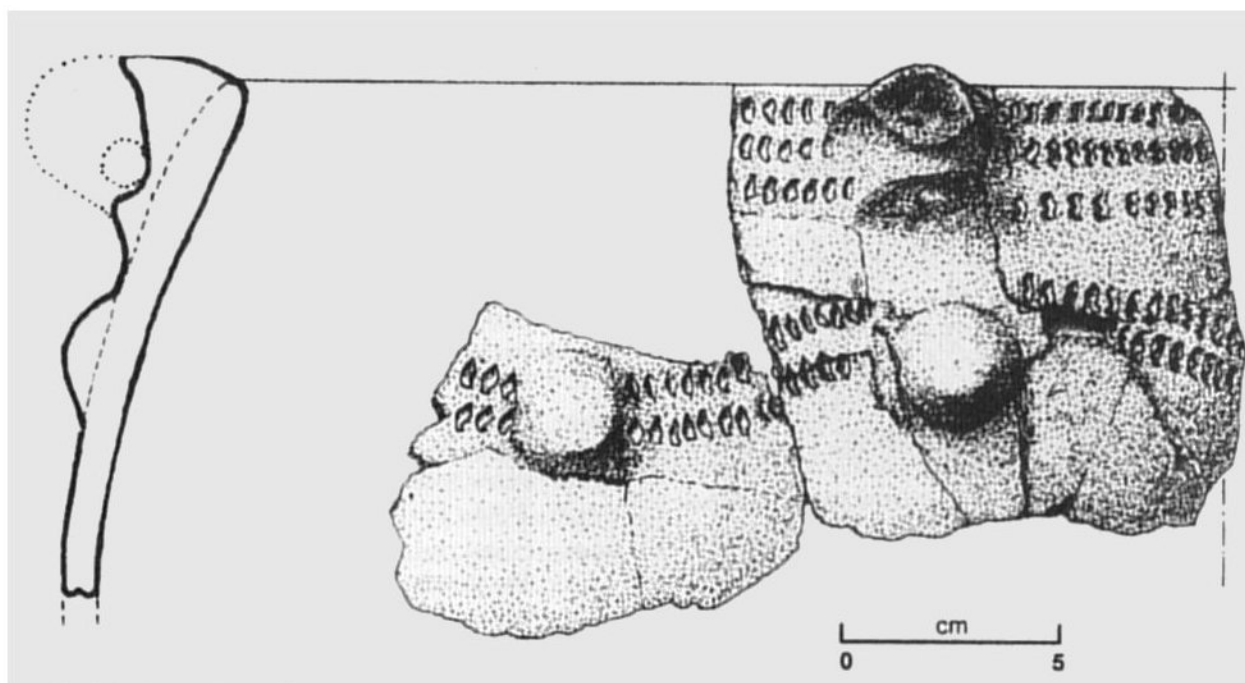


Fig. 1. Fragments of decorated Cardial-impressed vessel from Caldeirão Cave. COURTESY OF JOÃO ZILHÃO. REPRODUCED BY PERMISSION.

than 18,000 B.P. (beyond 20,000 B.C.), and by Magdalenian level Eb, dated to between c. 16,000 and c. 10,000 B.P. (between c. 17,500 B.C. and c. 9500 B.C.). The accumulation of the overlying Neolithic and post-Neolithic deposits began with level Ea, c. 6000 B.C.

The Early Neolithic remains form two different archaeological horizons, NA2 and NA1. The earliest, NA2, is a funerary context defined by an assemblage of human bones and associated pottery, ornaments, lithics, and animal bones. Most of this material was recovered as discrete concentrations inside level Eb. The hiatus in sediment deposition after the end of the last glacial explains the intrusion, because it implies that the floor of the cave at the time of the first Neolithic human activities was still the same that existed at the end of the Magdalenian era. As a result of those activities, as well as of the contemporary disturbance caused by burrowing animals, the remains of the Early Neolithic burials became incorporated in the immediately underlying deposits. The contents of the latter, therefore, were a mix and for the most part accumulated in the cave much earlier—a common phenomenon in Mediter-

anean caves but one that often goes unnoticed and is responsible for much of the controversy regarding the exact timing of the appearance of farming in the region.

Horizon NA2 contains the remains of at least four adult individuals and a child, and estimates based on the dental material suggest that a fifth adult is also present. The spatial distribution of the bones and associated artifacts suggests that a female was buried against the north wall and that a cardial-decorated ceramic vessel was emplaced with her. A male buried against the south wall has been associated with three microliths (one trapeze and two segments), and a second nearby male has been associated with a cluster of 120 shell beads made of the species *Theodoxus fluviatilis* (freshwater snail), *Hinia pfeifferi* (netted dog whelk), and *Glycymeris glycymeris* (dog cockle). The postdepositional scattering of these inferred contexts further suggests that the bodies were not placed inside protective burial features but simply laid down on the cave floor. The location of the clusters of cranial material suggests that the heads were probably leaning against the side walls.

The human bone material ascribed to horizon NA1 represents a minimum of thirteen individuals: six were less than fifteen years old; two were between fifteen and twenty; and five were adults, two of whom (one male and one female) were still young (twenty to twenty-five), and the other three of whom (two males and one female) were of an older age. The postdepositional disturbance, or the scattering and breakage of the human skeletons by such animal cave dwellers as foxes and badgers, was in this case too severe to identify patterning in the spatial distribution of the different people. Burial gifts in horizon NA1 include polished stone axes and impressed (epicardial) ceramic vessels.

The animal bones indicate that this burial site was also episodically used as a warm-season shelter for the hunting of wild boar and the herding of sheep. Permanent villages in the region of this site are still archaeologically unknown but must have been located farther south, in the good soils of the alluvial plain of the Nabão. The absence of cereal grains or other direct proof of the existence of domesticated plants in the cave deposits must be related to the specialized use of the site; it does not mean that agriculture was not part of the economic system. Stable isotope analysis of the human bone shows a diet where aquatic resources were absent, in sharp contrast with the evidence for regional late Mesolithic people; the latter, moreover, do not seem to have settled inland areas devoid of close access to the sea or the major estuaries. The fact that such a settlement was achieved by Early Neolithic people strongly indicates that cereal agriculture was introduced at the same time as domesticated animals. The Cardial ceramics in horizon NA2 can therefore be taken as a proxy for the complete Neolithic package, which means that the presence of ceramics presumes the presence also of other things that accompany it in western Mediterranean Europe: cereal agriculture, plus sheep and goats, as the basis of the economy and the diet, as well as sedentary village life, and, where technology is concerned, polished stone axes.

Stylistically, this pottery is relatively evolved; the decoration is restricted to a band below the rim, occupying the space between small, horizontally perforated handles, from which garlands of impressions descend to the body, bridging the space between regularly placed buttons. Similar vessel types associ-

ated with identical radiocarbon ages are also known from nearby sites in the northern half of the Central Limestone Massif of Estremadura such as Buraca Grande (Pombal) and Pena d'Água (Torres Novas). Stylistically earlier, baroquely decorated Cardial vessels have been recovered in the cave burial site of Galeria da Cisterna (Almonda karstic system, Torres Novas), located about 40 kilometers to the southwest of Caldeirão; they are associated with characteristic ornaments (pierced red deer canine teeth and bone beads imitating their shape) directly dated by AMS radiocarbon dating to c. 5423 B.C.

The contemporaneity and the close similarity in vessel decoration and personal ornamentation between Cisterna and such sites as Cova de l'Or on the Mediterranean coast of Valencia, Spain, support the hypothesis that the spread of farmer-herders along the shores of Mediterranean and south-Atlantic Iberia was effected through a process of maritime pioneer colonization. The sourcing of raw materials—shells and clay—used for the manufacture of artifacts recovered in such inland sites as Caldeirão is consistent with this hypothesis, since it indicates exchange systems oriented toward the estuaries and the sea. Given the dating evidence, it would seem that it took some six generations before the descendants of the Neolithic people who first arrived in coastal Portugal started to settle in the Nabão Valley. Since the physical anthropological analysis of the Caldeirão human remains reveals no signs of stress, it must be inferred that the new economic system they brought with them was successful right from the beginning.

See also Spread of Agriculture Westward across the Mediterranean (vol. 1, part 3); Arene Candide (vol. 1, part 3).

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