

The Gravettian burial known as the Prince (“Il Principe”): new evidence for his age and diet

P. B. Pettitt, M. Richards, R. Maggi & V. Formicola*

The famous upper Palaeolithic (Gravettian) burial with shell ornaments known as “Il Principe” was discovered in Italy sixty years ago. Here the authors present recent scientific research on his skeleton, leading to new assessments of the date of the burial and indications of diet.

Keywords: Gravettian, burial, Italy

Introduction

“Il Principe” (the Prince) is the nickname given to a spectacular Mid Upper Palaeolithic (Gravettian) burial discovered at Arene Candide, Italy in 1942. Arene Candide is a large cave located about 90 m above sea level on the slope of the Caprazoppa promontory, along the Ligurian coast near Finale Ligure (Savona, Italy). The cave is named after a dune of white siliceous sand of aeolian origin, banked against the wall of the promontory, today destroyed by quarrying activity. Systematic excavation of its rich deposit was carried out at the beginning of the 1940’s by Bernabò Brea and Cardini who exposed a stratigraphic sequence which ranged from the Upper Palaeolithic to historical times and included many burials of Late Epigravettian and Neolithic date (Bernabò Brea, 1946; Cardini 1980 1994; Maggi 1977).

The burial of “Il Principe” (Arene Candide 1) came to light on 1 May 1942, during the excavation of a *sondaggio* (test core) into the Pleistocene deposits, shortly before the excavations were interrupted by the war (Cardini 1942). The skeleton of an adolescent male (Sergi *et al.* 1972), spectacularly ornamented (hence “Il Principe”), was found at a depth 6.70 m in a bed of red ochre, its head surrounded by hundreds of perforated shells and canines of deer, probably originally forming a kind of cap. Shells (*Ciprea* sp.), pendants of mammoth ivory, four perforated “bâtons de commandement” of elk antler, three of which were decorated with thin radial striations around the hole (Molari 1994), and a 23 cm long flint blade held in the right hand were additional components of the extraordinary ornamentation of this specimen (Figure 1).

*Pettitt, Department of Archaeology, Keble College, Oxford OX1 3PG, UK. (paul.pettitt@keble.ox.ac.uk)

Richards, Department of Archaeological Sciences, University of Bradford, Bradford BD7 1DP, UK (M.P.Richards@Bradford.ac.uk)

Maggi, Soprintendenza Archeologica della Liguria, via Balbi 10, 16126 Genova, Italy. (museoarchiavari@libero.it)

Formicola, Dpt. di Etologia Ecologia ed Evoluzione, via A. Volta 6, 56126 Pisa, Italy. (vformi@discau.unipi.it)

Received 13 December 2001; Revised 9 January 2003.

The recent work carried out by the authors and reported here employed scientific analysis of Il Principe's skeleton, preserved in the Museo di Archeologia Ligure, to measure a direct date by AMS and examine the stable isotope assemblage for information about diet.

AMS radiocarbon dating

A sample of 380mg drilled from a femur of the Arene Candide 1 skeleton was pre-treated using the standard Oxford procedure for bone. As the curatorial history of the sample was unknown, it was suspected that an unidentified form of preservative may have been used and pre-treatment methods were undertaken assuming potential

contamination. Of particular relevance was the use of an ultrafilter (Brown *et al.* 1988), which has been shown to successfully remove preservatives applied to bones. This allowed us to be confident about the absence of contaminating carbon from the sample we measured. After pre-treatment, a sample of 0.4 mg carbon was measured in the Oxford Accelerator Mass Spectrometer, and the result was as follows:

OxA-10700 Arene Candide 1 "Il Principe", bone, Homo sapiens, $-\delta^{13}\text{C} = -17.6$
 $\delta^{15}\text{N} = 12.4$, C/N ratio = 3.2.
 23440 ± 190 years BP

The result is uncalibrated and expressed in radiocarbon years BP (where Before Present = AD1950), using the half life of 5568 years. Isotopic fractionation has been corrected for using the measured $\delta^{13}\text{C}$ values quoted (to ± 0.3 per mil relative to VPDB). At two standard deviations, the result shows that the burial was emplaced between 23820 – 23060 BP, clearly within the 24th millennium (uncal) BP.

Comparison with other ^{14}C dates available for the archaeological layers at Arene Candide shows that our direct date is statistically the same age at one standard deviation as that



Figure 1. Arene Candide 1 ("Il Principe"). Note perforated shell 'cap', perforated batons, flint blade grasped in right hand, and mass of yellow ochre between the left clavicle and mandible.

The Gravettian burial known as the Prince ("Il Principe"): new evidence for his age and diet

obtained from charcoal recently recovered from "Hearth VI" of Cardini's stratigraphy (Beta-53983: 23450 ± 220 , $23890 - 23010$ at 2σ : Macphail *et al.* 1994). At first sight this is potentially problematic as the two dates pertain to distinct stratigraphical units: Arene Candide 1 was found "just below or at the bottom of the fifth of a series of eight hearths" (Cardini 1994:38), so, based on the amount of deposit between hearth V and VI (see Bietti and Molari 1994: Figure 7), one might expect some age difference between the two.

However, all but the fifth of the so-called "hearths" were nothing more than "shallow and limited lenses of fine charcoal occurring where the deposit was stone free" (Cardini 1994:37). The charcoal sample was taken in 1991 during work to preserve the exposed sections of the 1942 trench. It is difficult to correlate the archaeological sections exposed today with Cardini's original stratigraphy, particularly in relation to the correspondence between "hearths" (Bietti and Molari, 1994; Macphail *et al.* 1994). Moreover, both dates clearly belong to the 24th millennium (uncal) BP, and reading the two results at two standard deviations, up to 800 radiocarbon years may separate the two.

Dietary information

The carbon and nitrogen stable isotope values of the extracted and dated collagen provide us with information on the diet of 'Il Principe'. Stable isotope analyses provides information on protein sources in diets over the last years of life, and is particularly well suited to distinguishing between marine and terrestrial protein sources (Tauber 1981, Chisholm *et al.* 1982, Richards and Mellars 1998, Richards and Hedges 1999). The $\delta^{13}\text{C}$ value of -17.6 and the associated $\delta^{15}\text{N}$ value of 12.6% are indicative of a contribution of marine foods to the diet. If we use Holocene end-point values of $-20 \pm 1\%$ for a 100% terrestrial diet and -12 ± 1 for a 100% marine diet, the 'Il Principe' values indicate that approximately 20 to 25% of dietary protein is from marine protein, probably from the Mediterranean. This links in well with a larger study of Gravettian humans from Eurasia which have also been dated directly using the AMS Radiocarbon technique (Richards *et al.* 2001) in which evidence for the use of aquatic resources was indicated for a number of individuals through stable isotope analyses.

Wider context

These results fit well with the emerging context of reliable dates for other Mid Upper Palaeolithic ochred and accompanied European burials (summarized in Table 1). Mid Upper Palaeolithic burials were clearly emplaced from the 27th to 24th (and possibly early 23rd) millennia BP. The new AMS result suggests that Arene Candide 1 was one of the last known elaborate mid Upper Palaeolithic burials. The new stable isotope data for Arene Candide 1 supports the notion of significant increase in dietary breadth from at least c. 27 000 BP.

Table 1.

Site	Sample context	Date	Reference
Paviland 1 (the “Red Lady”), Wales	skeleton	OxA-1815, 26350 ± 550; OxA-8025, 25840 ± 280	Aldhouse-Green & Pettitt 1998, Pettitt 2000
Lagar Velho 1, Portugal	fauna and charcoal from grave fill	OxA-8421, 24660 ± 260; OxA-8423, 24520 ± 240; OxA-8422, 23920 ± 220; GrA-13310, 24860 ± 200	Duarte <i>et al.</i> 1999
Brno 2 (Francousk-Street), Czech Republic	skeleton	OxA-8293, 23680 ± 200	Pettitt & Trinkaus 2000
Dolní Vestonice site II DVXIII–XV, Czech Republic	From the “triple burial”	GrN-14831, 26640 ± 110	van der Plicht 1997
Sungir, Russia	skeletons of adult male (burial 1) and double burial (2 & 3)	Respectively OxA-9036 22,930 ± 200; OxA-9037 23830 ± 220; OxA-9038 24100 ± 240	Pettitt and Bader 2000

Acknowledgements

We are most grateful to the curators of the Museo di Archeologia Ligure in Genoa Pegli for their kind assistance during the sampling of Arene Candide 1, and to the staff of the Oxford Radiocarbon Accelerator Unit for carrying out the Radiocarbon measurement. This work was supported by the National Environmental Research Council Radiocarbon Facility (P.B.P.), MURST and IIPP (R.M.) and CNR (99.03689.PF.36) (V.F.).

References

- ALDHOUSE-GREEN, S. H. R. & P. B. PETTITT 1998. Paviland Cave: contextualizing the Red Lady. *Antiquity* 72(278). 756–772.
- BERNABÒ BREA, L. 1946. *Gli scavi nella Caverna delle Arene Candide*, (Bordighera: Istituto di Studi Liguri).
- BIETTI, A. & C. MOLARI. 1994. The Upper Pleistocene deposit of the Arene Candide cave (Savona, Italy): general introduction and stratigraphy. *Quaternaria Nova* 4: 9–27.
- BROWN, T. A., D. E. NELSON & J. R. SOUTON. 1988. Improved collagen extraction by modified Longin method. *Radiocarbon* 30:171–177.
- CARDINI, L. 1942. Nuovi documenti sull’antichità dell’uomo in Italia: reperto umano del Paleolitico superiore nella Grotta delle Arene Candide. *Razza e Civiltà* 3:5–25.
- CARDINI, L. 1980. La necropoli mesolitica delle Arene Candide (Liguria). *Memorie dell’Istituto Italiano di Paleontologia Umana*, n.s. 3:9–31.
- CARDINI, L. (ed. Taschini, M) 1994. Le industrie dei livelli mesolitici e paleolitici della caverna delle Arene Candide (Savona). *Quaternaria Nova* 4:29–78.
- CHISHOLM, B.S., D. E. NELSON & H. P. SCHWARZ. 1982. Stable carbon ratios as a measure of marine versus terrestrial protein in ancient diets. *Science* 216:1131–1132.
- DUARTE, C., J. MAURICIO, P. B. PETTITT, P. SOUTO, E. TRINKAUS & J. ZILHAO. 1999. An earlier Upper Palaeolithic human skeleton from the Abrigo do Lagar Velho (Portugal) and modern human emergence in Iberia. *Proceedings of the National Academy of Sciences (USA)*, 96. 7604–9.
- MACPHAIL, R.I., J. HATHER, S. HILLSON & R. MAGGI. 1994. The Upper Pleistocene deposits at Arene Candide: soil micromorphology of some samples from the Cardini 1940–42 excavations. *Quaternaria Nova* 4:79–100.
- MAGGI, R. 1997. The excavations by Luigi Bernabò Brea and Luigi Cardini of the cave of Arene Candide within the historical context of the study of Prehistory in Italy. In R. Maggi (ed.) *Arene Candide: a functional and environmental assessment of the Holocene sequence (excavations Bernabò Brea-Cardini 1940–1950)*. *Memorie dell’Istituto di Paleontologia Umana*, n.s. 5, 11–30.
- MOLARI, C. 1994. The industry on bone of the Pleistocene layers from the Arene Candide Cave (Savona, Italy). *Quaternaria Nova* IV, 297–340.

The Gravettian burial known as the Prince ("Il Principe"): new evidence for his age and diet

- PETTITT, P. B. 2000. Radiocarbon chronology, faunal turnover and human occupation at the Goat's Hole, Paviland. In Aldhouse-Green, S. (ed) *Paviland Cave and the 'Red Lady': a Definitive Report*. (University of Wales College, Newport and National Museums and Galleries of Wales. Bristol: Western Academic and Specialist Press): 63–71.
- PETTITT, P. B. & O. N. BADER. 2000. Direct AMS Radiocarbon dates on the Sungir mid Upper Palaeolithic burials. *Antiquity* 74: 269–70.
- PETTITT, P. B. & E. TRINKAUS. 2000. Direct radiocarbon dating of the Brno 2 Gravettian human remains. *Anthropologie* (Brno). 38.2:149–50.
- RICHARDS, M.P., & R.E.M. HEDGES. 1999. Stable isotope evidence for similarities in the types of marine foods used by Late Mesolithic humans at sites along the Atlantic coast of Europe. *Journal of Archaeological Science* 26:717–722.
- RICHARDS, M.P. & P. MELLARS. 1998. Stable isotopes and the seasonality of the Ornsay middens. *Antiquity* 72:178–184.
- RICHARDS, M. P., P.B. PETTITT, M. STINER & E. TRINKAUS. 2001. Stable isotope evidence for increasing dietary breadth in the European mid-Upper Palaeolithic. *Proceedings of the National Academy of Science (USA)* 98(11): 6528–6532.
- SERGI, S., R. PARENTI & G. PAOLI. 1974. Il giovane paleolitico della Caverna delle Arene Candide. *Memorie dell'Istituto Italiano di Paleontologia Umana*, n.s. 2:13–38.
- TAUBER, H. 1981. ¹³C evidence for dietary habits of prehistoric man in Denmark. *Nature* 292:332–333
- VAN DER PLICHT, J. 1997. The Radiocarbon dating. In: *Pavlov I – Northwest, the Upper Paleolithic burial and its settlement context. The Dolni Vestonice Studies, Vol. 4* (Academy of Sciences of the Czech Republic, Brno). ISBN 80–86023–04–4.