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MARIA BITIRI

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THE PALAEOLITHIC SEQUENCE OF THE ARMA DELL'AQUILA (FINALE LIGURE, SAVONA, NORTH-WESTERN ITALY)

Paolo BIAGI^a, Elisabetta STARNINI^b

^a Ca' Foscari University of Venice, Department of Asian and North African Studies, Italy; e-mail: pavelius@unive.it

^b University of Pisa, Department of Civilizations and Forms of Knowledge, Italy; e-mail: elisabetta.starnini@unipi.it

Keywords: North-western Italy, Liguria, Finalese, Upper Palaeolithic, Radiocarbon chronology

Abstract: The excavations carried out in the rock-shelter of Arma dell'Aquila by C. Richard in 1938 and 1940 led to the discovery of a thick stratigraphy, the lowermost deposit of which yielded evidence of different periods of Upper Palaeolithic occupation. The recent re-examination of the knapped stone assemblages, and the radiocarbon dating of two Palaeolithic layers, have shown that the site was briefly occupied most probably during the beginning of the Upper Palaeolithic and the Early Epigravettian OIS-2 cold stage.

Cuvinte-cheie: nord-vestul Italiei, Liguria, Finalese, Paleolitic superior, cronologie radiocarbon

Rezumat: Cercetările arheologice desfășurate în adăpostul sub stâncă de la Arma dell'Aquila de C. Richard în 1939 și 1940 au pus în evidență o secvență stratigrafică adâncă, din care stratul cel mai de jos a adus dovezi din perioade diferite de locuire atribuite Paleoliticului superior. Reexaminarea recentă a industriei litice cioplite și datarea cu radiocarbon a două niveluri paleolitice indică mai degrabă o scurtă ocupare a adăpostului la începutul Paleoliticului superior și pe durata episodului rece OIS-2 a Epigravettianului timpuriu.

INTRODUCTION

This paper discusses some aspects of the excavations carried out in the Arma dell'Aquila by Camillo Richard in 1938 and 1942 (Richard 1940; 1942). The rock-shelter opens along the Aquila River Valley, which crosses the Finalese limestone massif from north to south, a few kilometres from the small town of Finale Ligure in north-western Italy (Fig. 1/ 1). Pia Laviosa Zambotti was the first to re-evaluate the importance of the discoveries Richard made in the Aquila rock-shelter in her seminal volume entitled "*Le più antiche culture agricole europee*" in which she wrote a paragraph regarding the archaeology of the Ligurian caves (Laviosa Zambotti 1943, p. 103-105). The Arma dell'Aquila is known mainly because of its important Neolithic sequence that Luigi Bernabò Brea reported in his volumes on the Arene Candide Cave, and integrated into the wider picture of the Mediterranean and Balkan Neolithic (Bernabò Brea 1956).

In contrast, the Palaeolithic layers discovered in the lowermost part of the Aquila sequence were mentioned very rarely (see f.i. Laviosa Zambotti 1943, p. 103; Bernabò Brea 1947, p. 62), and have never been given much relevance before the publication of the site's final report (Biagi, Starnini 2018). After many years of oblivion, the study of the archaeological finds from the site was resumed in the 1980s (Arobba *et alii* 1987). During the following years a systematic, interdisciplinary work encompassing analysis, revision, restoration, and documentation of the assemblages retrieved during the 1940s and previous excavations finally took place (Biagi, Starnini 2018). Moreover, while new excavations were carried out in other Ligurian caves since the 1970s onward (the Arene Candide and Pollera caves for example) and other less known prehistoric complexes were reconsidered and studied, the Arma dell'Aquila was almost definitively forgotten.

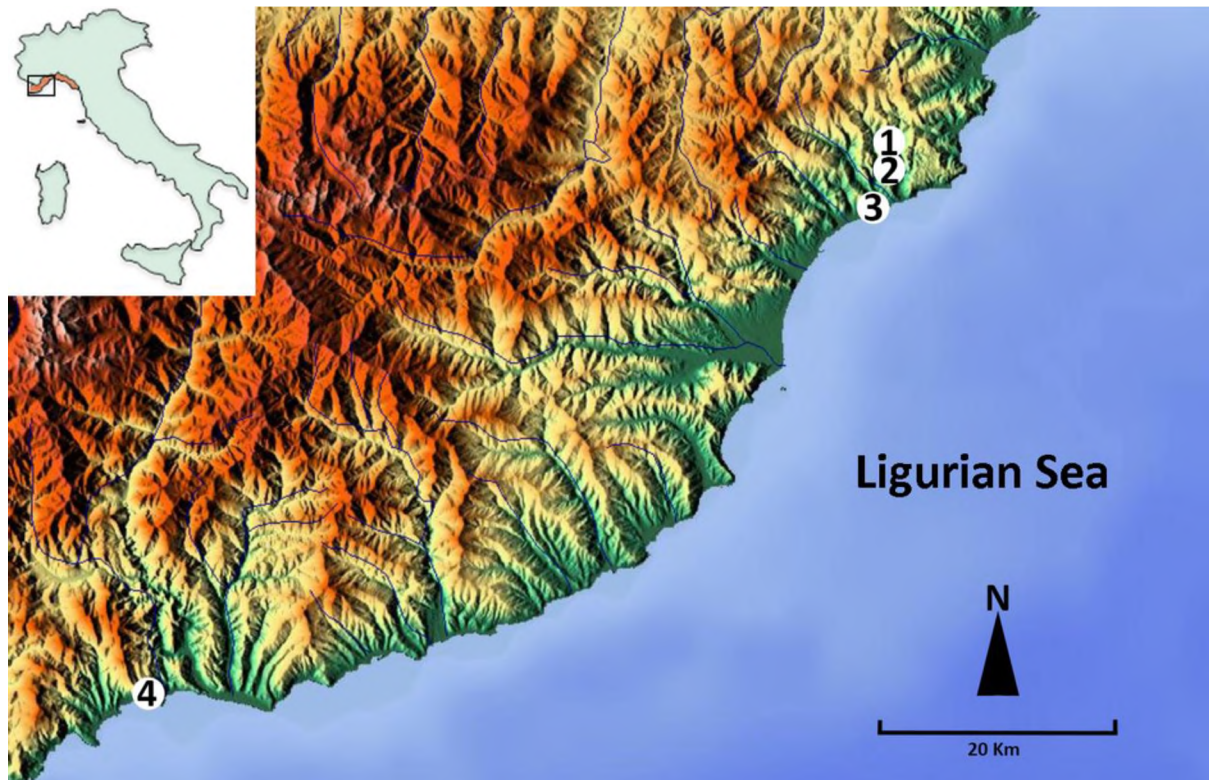


Figure 1. Distribution map of the sites mentioned in the text: Arma dell'Aquila (n. 1), Arma degli Zerbi (n. 2), Arene Candide cave (n. 3), Balzi Rossi: Riparo Mochi and Riparo Bombrini (n. 4) (map by E. Starnini).

THE SITE AND THE MATERIAL CULTURE ASSEMBLAGES

The original morphology of the rock-shelter and the two small caves that originally constituted the karstic system called Arma dell'Aquila (Fig. 2, top), were almost completely destroyed or dismantled during the 1940s due to the progressive Finale Stone quarrying, a pinkish limestone variety employed for building purposes, inside which the cave opens (Cabella *et alii* 2019). A few authors, such as Federico Hosmer Zambelli who excavated the deposit of the two small caves reported above, suggested that in prehistoric times the site was probably just one wide shelter, and that its vault collapsed in more recent, historical times (Zambelli 1937). We know that at least during the early and middle Holocene, the cave did not present a complex hypogeal development. In these periods it most probably looked like a wide shelter facing the Aquila River Valley, where it opens at ca. 230 m of altitude, along the western slope of Bric Spaventaggi, ca. 4.5 km from the present sea-shore (Fig. 3). At a short distance, just below the Aquila, opens another cave, called Arma degli Zerbi (Fig. 1/ 2), where unpublished excavations carried out during the last century and now under study yielded Aurignacian and Epigravettian finds (Negrino *et alii* 2018).

The Aquila anthropogenic deposits, the radiocarbon dates, and the typological characteristics of the different assemblages show that the occupation of the site was very discontinuous from a chrono-cultural point of view, and topographically diversified at least during the Neolithic (Biagi, Starnini 2018). The site was settled in different periods of prehistory, as is shown by the discoveries made in the area where Richard opened trenches. Here, we witness a sequence of several more or less intensive periods of habitation, funerary utilisation (Sparacello *et alii* 2018; 2019) and abandonment, starting from the beginning of the Upper Palaeolithic up to historical, post-medieval times (Richard 1942, p. 99; de Vingo 2018).

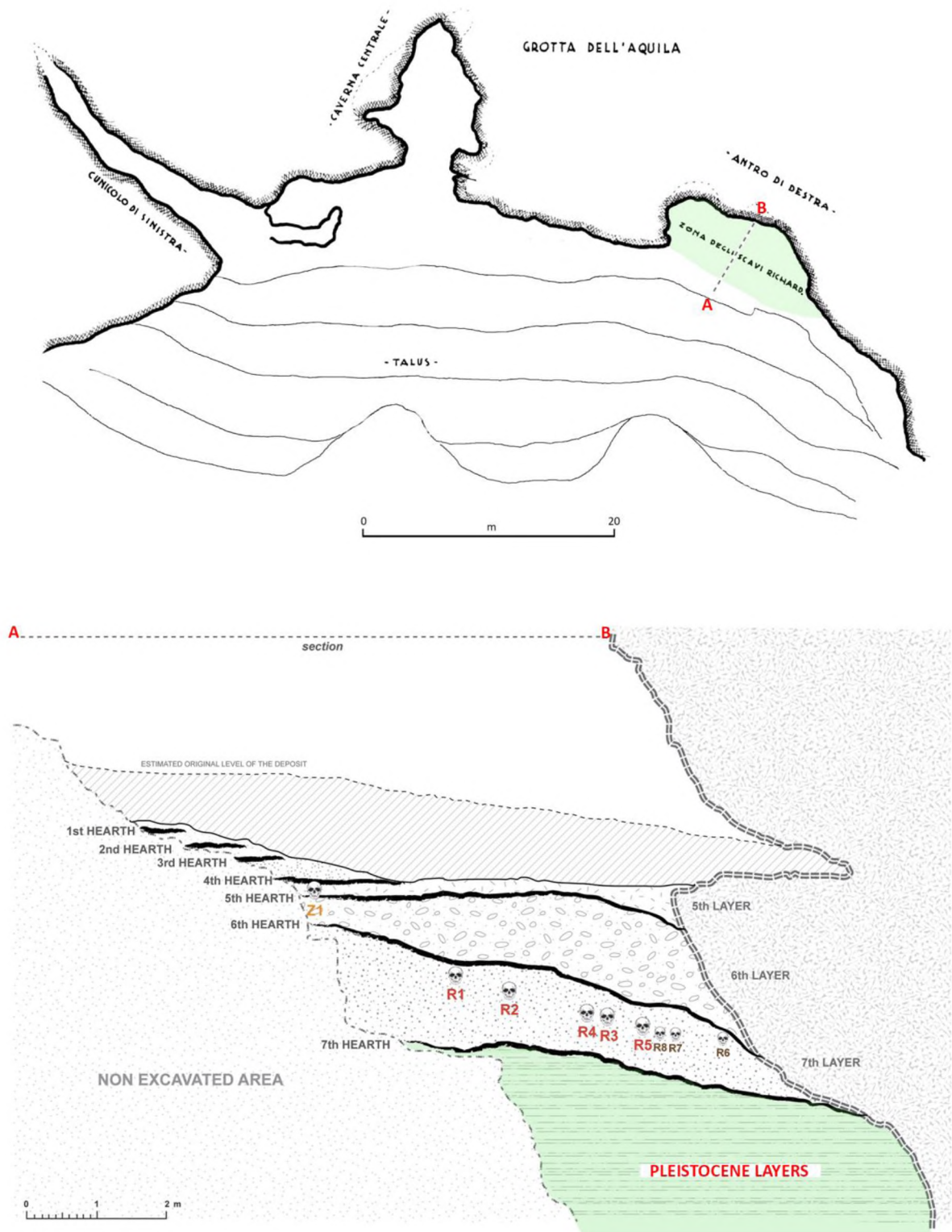


Figure 2. Arma dell'Aquila: plan of the site (top) and A-B profile of Richard's excavation (bottom) redrawn from the originals with the indication of the different parts into which the rock-shelter had been subdivided and the "antro di destra" where Richard opened his trench (light green) (after Starnini, Biagi 2018, Fig. 1, and Sparacello *et alii* 2018, Fig. 2).

THE PALAEOOLITHIC SEQUENCE OF RICHARD'S EXCAVATIONS

C. Richard, who was helped by G. Chiappella to conduct most fieldwork (De Pascale, Stefani 2018), excavated a wide trench in the deposits located at the foot of the rock shelter, which are delimited, along one side, by the natural limestone wall. He decided to open the trench in the so-called "*antro di destra*" (Fig. 2, top), where he brought to light a complex sequence 1.60 or 1.70 m thick. The excavations were interrupted at this depth due to the presence of a large rock-fall that had covered the entire surface of the trench, though the deposits most probably continued below it (Richard 1942, p. 72) (Fig. 2, bottom). According to the data reported in his daybook, and also in the 1942 excavation report, the Palaeolithic deposit was separated by the Neolithic sequence by an almost sterile formation ca. 3.10 m thick that Richard called "*transitional zone*". He described this deposit "*a series of many thin levels of marl alternated with others of thin limestone detritus and soil*", formed by "*hydraulic currents*" (Richard 1942, p. 65, translated from the original in Italian). Moreover, he specified very clearly that the lowermost part of this deposit consisted of cave clay (Richard 1942, p. 90). Given the difficulties he met during excavation, Richard decided to continue the exploration of the lowermost part of the sequence opening a sub-rectangular trench 2x3 m wide (Fig. 4, pozzo di esplorazione H).

At the depth of ca. 5.50 m, he discovered the uppermost Palaeolithic horizon that he called "*1st Palaeolithic hearth*" or "*Layer 8*". According to his report it consisted of a charcoal layer, ca. 10 cm thick. It yielded 16 knapped stone artefacts, scattered over a surface of 4 m², three fragments of "*ivory tusks*", and faunal remains represented almost exclusively by cave bear bones (Richard 1942, p. 91). It is important to remark that the great quantity of cave bear bones that recur throughout most of the Palaeolithic series is due almost exclusively to the presence of individuals naturally deceased during winter hibernation and have nothing to do with the human occupation of the cave (Bon, Stefani 2018, p. 198).

Ca. 90 cm below the "*1st Palaeolithic hearth*", Richard discovered another charcoal layer, 10 to 14 cm thick, rich in cave bear bones, that he called "*2nd Palaeolithic hearth*" or "*Layer 9*", from which he collected a few knapped stone artefacts. Below it, he removed another 90 cm thick water floated deposit, rich in cave bear bones that yielded very few chert and three sandstone artefacts (Richard 1942, p. 92).

The lowermost Palaeolithic layer, that Richard called "*3rd Palaeolithic hearth*" or "*Layer 10*", was discovered beneath this deposit. It consisted of another charcoal lens ca. 7 cm thick. It yielded a few knapped stone artefacts, among which he described one microlithic abruptly retouched point (Fig. 7/ 4). Richard continued the excavation removing a sterile formation rich in rock fragments and blocks down to the depth of 10.60 m, as he showed in two schematic, though complete section drawings of the cave (Richard 1942, Fig. 2, Fig. 6 and Fig. 7) (Fig. 5). All the sterile deposits below the Neolithic sequence were excavated in artificial spits or cuts, most probably 20 cm thick that were called I, II, III etc...

Unfortunately, Richard did not provide us with a detailed description of the lithic artefacts that he collected from the Palaeolithic horizons, although he illustrated some specimens according to their recovery layer and spit (see Richard 1942, Tav. X and XI). However, the number of knapped stone artefacts stored at present in the Finale Archaeological Museum does not correspond with that published in his 1942 paper. To make an example: from the uppermost part of the Palaeolithic sequence we have analysed 32 artefacts (25 from the 1st Palaeolithic hearth, four from the first spit and one from the second spit below it, and two from spits below the Neolithic Layer 7) (Biagi, Voytek 2018). In contrast, Richard reports that the 1st Palaeolithic hearth yielded a rich lithic assemblage, including 16 artefacts recovered from a surface of 4 m² (Richard 1942, p. 91).

Also the number of lithics retrieved from the 2nd Palaeolithic hearth is uncertain because Richard reports only the occurrence of a few chert artefacts ("*qualche selce*": Richard 1942, p. 92). This fact contrasts with the presence of 12 items in the collections of the Finale Archaeological Museum labelled as coming from the 2nd Palaeolithic hearth. The finds from the 3rd Palaeolithic hearth are even more intriguing, mainly because Richard did not provide us with any information, with the exception of the discovery of the microlithic abruptly retouched instrument published by Richard as *La Gravette* point (see Richard 1942, Tav. 5, n. 5). At present, three small unretouched artefacts are in the collections of the Finale Archaeological Museum labelled with this provenance, and two more flakes as coming from the second and third spits below the 3rd hearth.

Richard suggested that the Aquila Palaeolithic assemblages may be attributed either to the French Aurignacian or the Italian Grimaldian (Richard 1942, p. 93 and 94), despite the presence of a microlithic *La Gravette* type point (Richard 1942, p. 92) that can be more accurately described as a backed bladelet.

A rather similar opinion was expressed by Bernabò Brea who attributed the poor lithic assemblages from the three overlapping hearths to the upper Aurignacian (Bernabò Brea 1947, p. 62)



Figure 3. The Finale Stone quarry where the Arma dell'Aquila opens (red circle) from the Aquila River Valley top, and the same valley from the entrance of the shelter, seen from the south-east (photographs by P. Biagi, winter 2014).

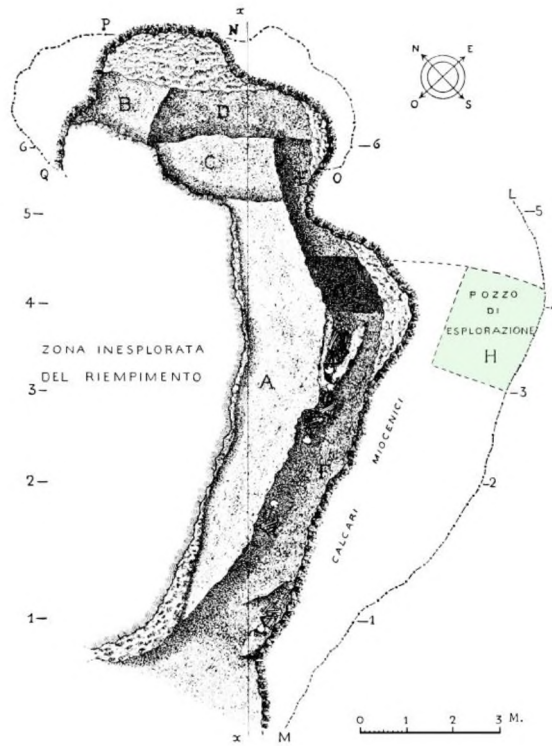


Figure 4. Arma dell'Aquila: plan of the area excavated by C. Richard with the location of the H trench opened to explore the Pleistocene deposits (light green area).

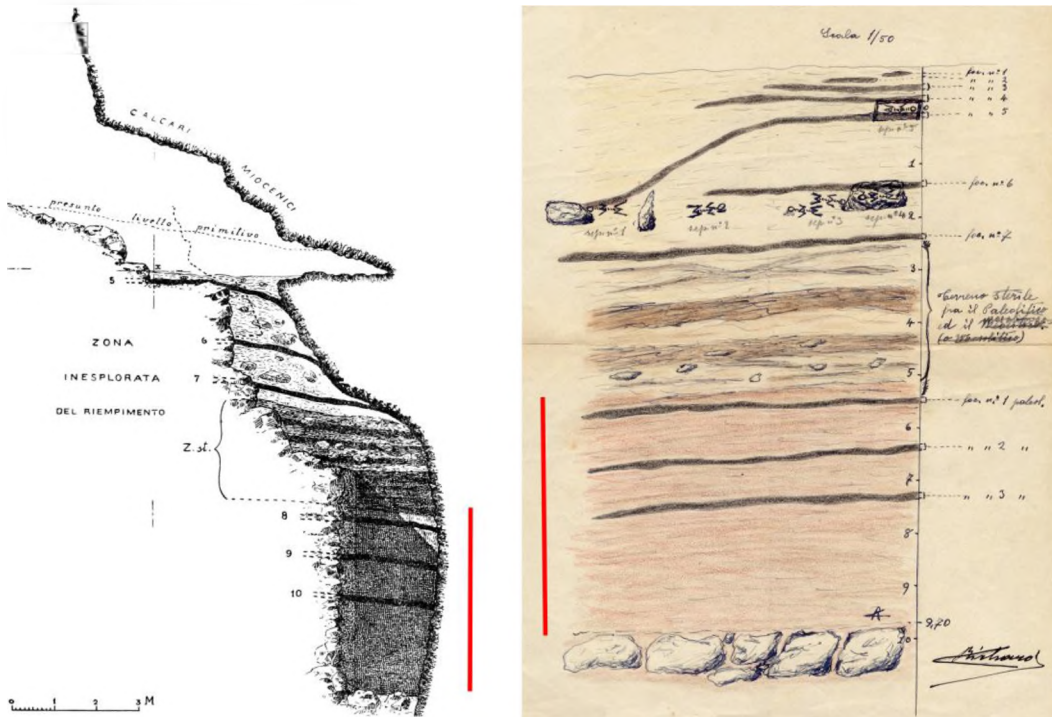


Figure 5. Arma dell'Aquila: schematic sections of the deposits with the indication of the three Palaeolithic hearths. The depth of the Pleistocene deposits is marked by vertical red lines (original drawings by C. Richard from his 1942 excavation daybook).

THE PALAEOLITHIC ASSEMBLAGES

The knapped stone assemblages from the Arma dell'Aquila, at present stored in the collections of the Finale Archaeological Museum, have been republished recently by P. Biagi and B. A. Voytek (2018). Altogether, the industries from the three Palaeolithic hearths consist of 48 artefacts plus 2 more implements from spits I and II below layer 7. The artefacts are made from different raw materials, some of which are undoubtedly exogenous, as least as regards the finds from the 1st Palaeolithic hearth, from which one point is made from brown Marche flint (Fig. 7/ 1) and two artefacts, among which a subpyramidal core (Fig. 7/ 15), most probably from French flint (Table 1) (see also Biagi, Voytek 2018, p. 118). As already observed, this pattern seems quite normal for Liguria (Tomasso, Porraz 2016).

Palaeolithic Hearths	Generic flint	Marche flint	Ciotti flint	French flint	Radiolarite	Limestone	Quartzite	Total
1 st hearth	21	1	1	3	5	2	0	33
2 nd and 3 rd hearth	11	0	0	0	5	0	1	17

Table 1. Distribution of implements by raw materials and Palaeolithic hearths.

One conventional radiocarbon date was obtained from a sample of *Pinus* and *Larix* charcoals collected by Richard on October 23rd, 1942, from the 1st Palaeolithic hearth discovered at 5.50 cm of depth. It yielded the result of 20,430±480/-450 BP (GrN-17485, $\delta^{13}\text{C}$ -24.12). The human occupation of the cave during this period is confirmed by a similar date obtained from a fragment of *Panthera Leo* molar that, although collected from the lowermost Neolithic Layer 7 in a secondary position, yielded a comparable date of 20,460±80 BP (GrA-51010, $\delta^{13}\text{C}$ -19.68) (Bon, Stefani 2018, p. 196).

The two results show that the uppermost part of the Palaeolithic sequence was briefly settled during the Late Glacial Maximum (LGM) OIS-2 stage (Davies, Gollop 2003). According to the chrono-cultural scale proposed for Central Europe (Lengyel, Wilczyński 2018, Fig. 1; Wilczyński *et alii* 2020; Polanská *et alii* 2021) they fall into the period during which the Epigravettian Culture started to develop. Unfortunately, this period is still poorly known all over the Italian Peninsula (Gambassini, Moroni 2004; Mussi, Peresani 2004). However, a few sites excavated in western Liguria have yielded evidence of settlement or burial practises of this age. Among them are the Arene Candide cave (Riel-Salvatore *et alii* 2018, Table 1) (Fig. 1/ 3), as well as Riparo Mochi (Bietti 1990, Table VIII) (Fig. 1/ 4) and possibly the Barma Grande ceremonial burial, both at the Balzi Rossi, despite the controversial radiocarbon results (Mussi, Peresani 2004, p. 59).

Moreover, a sample of *Pinus* charcoals collected by Richard on October 27th, 1942, from the 2nd Palaeolithic hearth at 6.40 m of depth, was radiocarbon dated to 39,900±5100/-3100 BP (GrN-17486, $\delta^{13}\text{C}$ -24.09) that most probably falls into a warmer oscillation of the OIS-3 (Carbonell *et alii* 2000, p. 9; Davies, Gollop 2003). Despite the high standard deviation, the result shows that ca. 20,000 years elapsed between the 1st and the 2nd Palaeolithic occupations of the cave (Fig. 6). During this period a colluvial clayey layer ca. 90 cm thick, containing medium-sized rock fragments, formed (Richard 1942, p. 91). Unfortunately, no radiocarbon result has been obtained from the 3rd Palaeolithic hearth, which is composed exclusively of *Picea/Larix* charcoal fragments (Nisbet 2018, Table 1).

The lithic assemblage from the 1st Palaeolithic hearth is represented by nine instruments among which are four abruptly retouched bladelets and microbladelets (Fig. 7/6, 9, 12 and 16), one abruptly retouched point (Fig. 7/ 8), two straight, long points (Fig. 7/ 1 and 2), two side scrapers (Fig. 7/ 11 and 13) and one microbladelet subpyramidal core (Fig. 7/ 15) (for a complete description of the finds, see Biagi, Voytek 2018, Table 2). The industry from the 2nd hearth consists of 12 artefacts among which are three side scrapers (Fig. 7/ 20-22), one transversal scraper, one bilaterally retouched bladelet (Fig. 7/ 23) and one crested blade (Fig. 7/ 24). The only instrument from the 3rd hearth is the aforementioned backed bladelet of dark brown flint (Fig. 7/ 4).

Besides the typological characteristics of the small assemblages, a few more observations can be made for the artefacts from the 1st hearth. Some tools show traces of wear showing that they were employed to cut wood (Fig. 7/ 11 and 18) and to bore medium soft material (Fig. 7/ 6-8), while one scraper shows evident impact traces at its distal edge (Fig. 7/ 3). Moreover, very few bones show different types of butchering traces due to the use of a lithic tool (Bon, Stefani 2018, p. 198). In contrast, the very small assemblage from the 2nd hearth does not provide us with any information regarding activities practised during this period, although the presence of the crested blade (Fig. 7/ 24) shows that at least some knapping activity took place within the site. Nothing can be said of the very few

specimens from the 3rd hearth, despite the fact that the aforementioned backed bladelet (Fig. 7/ 4) was undoubtedly recovered from a secondary position. It comes most probably from the uppermost part of the Palaeolithic sequence and may be attributed to the 1st hearth.

DISCUSSION

The knapped stone assemblages recovered from the three Palaeolithic hearths of the Arma dell'Aquila, although not represented by very characteristic types and of problematic cultural attribution, are nevertheless important. Radiocarbon chronology (Fig. 6) indicates that this part of the site was briefly occupied during important periods of the Pleistocene that are still very scarcely documented in most regions of northern Italy (Mussi 2001). According to the available data, we can suggest that the 1st Palaeolithic hearth was made by Early Epigravettian hunters, while the cultural attribution of the 2nd hearth is more intriguing because of the high standard deviation of the conventional radiocarbon date GrN-17486 and the very poor knapped stone assemblage yielded by this layer. However, the five lithic artefacts from this hearth do not show any typological Middle Palaeolithic techno-typological characteristic. In contrast, two laminar products may help attribute the complex to the beginning of the Upper Palaeolithic (Fig. 7/ 23 and 24).

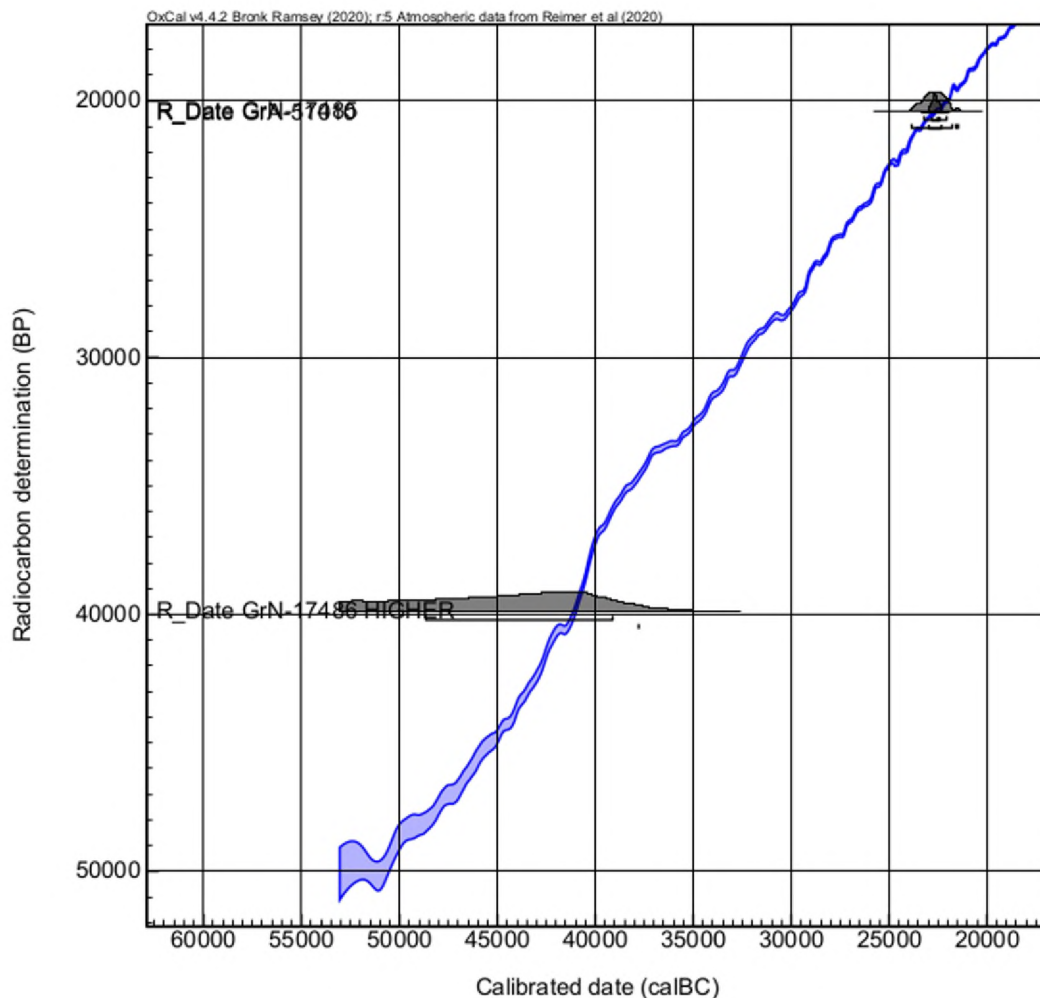


Figure 6. Arma dell'Aquila: plot of the radiocarbon BP and calibrated BC dates from the Palaeolithic deposit. Calibration according to OxCal v4.4.2 (courtesy of T. Fantuzzi).

The problems of the origin of this cultural unit are far from being clear (Chu, Richter 2020, p. 7). Moreover, the radiocarbon chronology of this period is rather controversial (Zilhão, d'Errico 2003; Higham *et alii* 2009; Banks *et alii* 2013; Negrino, Riel-Salvatore 2018, p. 167 and 173; Marciani *et alii* 2020, Fig. 3). This fact is most probably affected

also by the small number of sites so far known in Italy, which contrasts with that known in Western and Central Europe in general (Falcucci *et alii* 2017; Schmidt, Zimmermann 2019; but see also Haws *et alii* 2020). However, it is important to point out that, regarding Liguria, the proto-Aurignacian layer G of the Riparo Mochi yielded a series of dates spanning from 36,350±260 BP (OxA-19569) to 32,280±580 BP (OxA-3588) (Kuhn, Stiner 1998; Douka *et alii* 2012; Tejero, Grimaldi 2015, Table 4), which is more or less comparable with that from the Riparo Bombrini in the Balzi Rossi caves (Benazzi *et alii* 2014, Table S7) (Fig. 1/ 4).

To sum up, the Arma dell'Aquila sequence yielded scarce evidence of Palaeolithic occupations and the knapped stone assemblages from the three hearths of this period are very poor. However, their presence is very important to complete the general picture of the Palaeolithic archaeology of northern Italy. Though three radiocarbon dates show that the site was undoubtedly occupied roughly around 20,000 BP (GrN-17485 and GrA-51010) and 40,000 BP (GrN-17486), the small extension of the trench opened by C. Richard in 1942 cannot help us learn more about the human presence during these two periods.

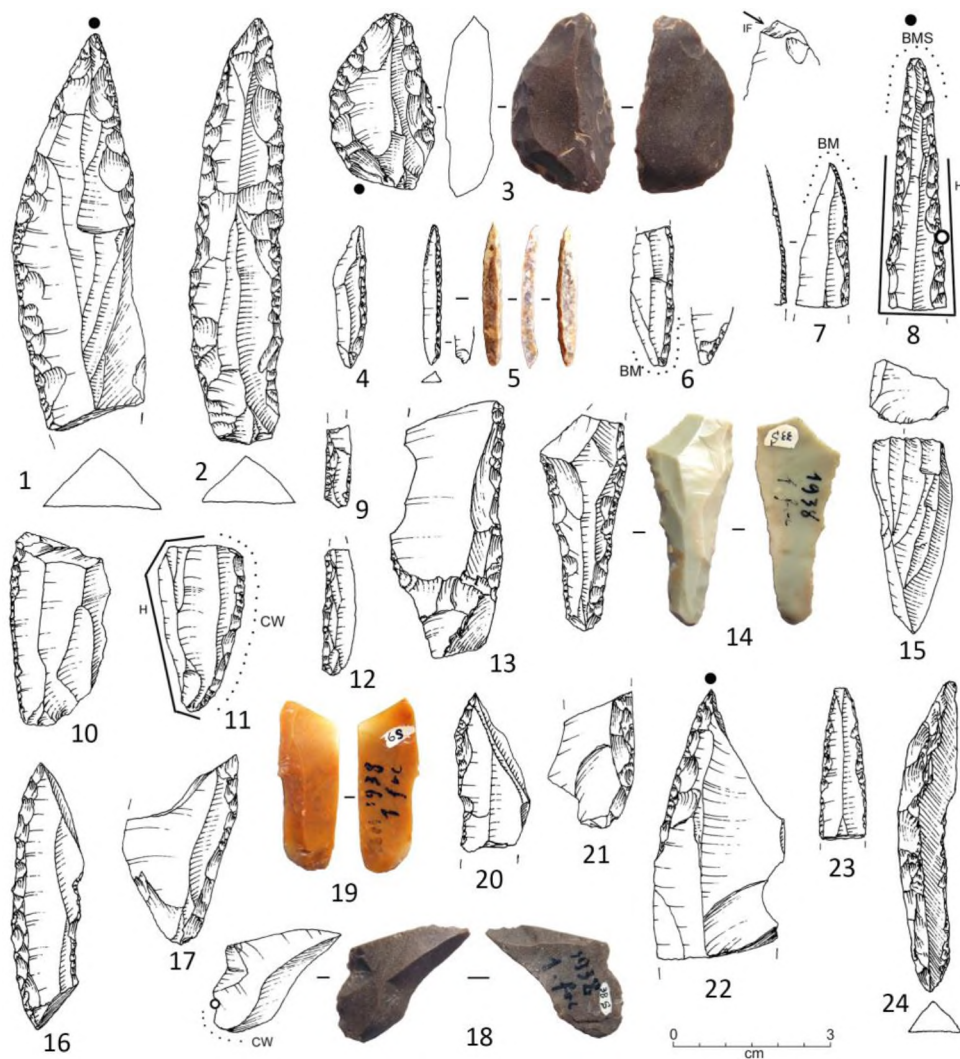


Figure 7. Arma dell'Aquila: knapped stone artefacts from the Palaeolithic deposit. 1st hearth (nn. 1-3, 5-19), 2nd hearth (nn. 20-24), and 3rd hearth (n. 4). Black dot represents the position of the butt. CW= cut wood, BM= bore medium, BMS= bore medium soft, H= haft traces (drawings by P. Biagi and G. Almerigogna, photographs by E. Starnini).

Moreover, the data presented by Richard and the archaeological data at our disposal show some clear discrepancies that we are not able to solve. They regard 1) the presence of the aforementioned backed bladelet in the

lowermost 3rd Palaeolithic hearth (see Fig. 7/ 4), which shows that at least part of the Pleistocene sequence was undoubtedly affected by some kind of reworking (in this respect we have to point out that the excavation trench was opened along the shelter wall), and 2) the absence of characteristic Mousterian late Middle Palaeolithic artefacts from the 2nd Palaeolithic hearth despite its radiocarbon chronology that would include this possibility, as well as from the deposits excavated below it, among which is the 3rd Palaeolithic hearth. In contrast, the presence of cave bear bones from the clayey soil surrounding the 1st Palaeolithic hearth and inside it reported by Richard (1942, p. 91), fits well into the general chronology of the latest occurrence of cave bears in northern Italy (see Terlato *et alii* 2018).

Given the above discrepancies and the present impossibility of resolving them, we can only say that the Arma dell'Aquila Pleistocene deposits show evidence of short occupations characterised by well-defined charcoal horizons, lithic artefacts, and faunal remains that we can refer to distinctive periods of the Upper Palaeolithic, showing that the Finalese, and in particular the Aquila River Valley, fell into the general pattern of the territories exploited by mobile groups of Palaeolithic hunters. The first is represented by the 2nd hearth most probably during a slightly warmer period of the OIS-3, while the 1st hearth was settled during the LGM OIS-2, around 20,000 BP, and it may most probably be attributed to the very beginning of the Epigravettian culture.

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