

Tall guys and fat ladies: Grimaldi's Upper Paleolithic burials and figurines in an historical perspective

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Summary - *The importance of the Grimaldi complex of caves and rock shelters is twofold: scientific and historical. Scientifically, it is one of the major Upper Paleolithic sites, considering the variety of mobiliary and parietal art, the number of single and multiple burials and associated grave goods, and the abundant lithic and fauna remains. Historically, the documentation of activity that took place in this site starting from the second half of the 19th century and the studies carried out on the materials that have been recovered in the decades between 1870s-1910s, provide instructive examples of methods and goals of Paleolithic archeology and anthropology of the epoch. This paper combines the scientific and the historic interest of the site through a chronicle of the events that took place during the period of the most sensational discoveries, i.e. beginning with the identification in 1872 of the first Upper Paleolithic burial and ending with the results of the excavations carried out in 1901 at Grotte des Enfants published in four volumes a few years later. The paper discusses early interpretations and modern views on the different findings and documents changes in perspectives and goals of paleoanthropological research in over a century, raising some of the major issues of contemporary Upper Paleolithic studies.*

Keywords – *Upper Paleolithic, Grimaldi caves, Paleoanthropology, Paleoethnology, Italy.*

The importance of the site

The prominent cliff of dolomite emerging from the Mediterranean Sea, just at the boundary between Italy and France, is known both as Balzi Rossi, Italian translation of the local patois referring to the reddish color of the rocks, and Grimaldi caves, after the nearby village of Grimaldi (Fig. 1). Starting in the second half of the 19th century, these caves were the scene of an extraordinary sequel of discoveries and of events marking the history of Paleolithic archeology. The context of these discoveries, the motivations moving laymen and scholars, and the information that the material has provided through a century of studies, run across the stages of evolution of scientific thought and the goals of paleoanthropological research from its inception.

Formation of most of the archeological deposit dates back to the Late Pleistocene, as a

consequence of the marine regression effect of the Würm glaciation that uncovered large areas of coastline. While most of the deposits belong to the Middle and Upper Paleolithic, indicating the presence of both archaic and anatomically modern forms of *Homo sapiens*, only the latter left evidence of funerary utilization of the caves.

Twelve burials, including two double and a triple interment, associated grave goods, fifteen figurines, expressions of parietal art, abundant lithic and bone industries and fauna, qualify these caves as one of the most important Upper Paleolithic complexes of Europe.

A first spectacular burial

Archeological activity at the Grimaldi caves started around the middle of 19th century,



Fig. 1- View of the caves before the construction of the railway. The colour version of this figure is available at the JASs website.

promoted by two factors: accessibility of the caves, close to renown localities of the Riviera and the Cote d'Azur, and the echoes from the debate on the origin and evolution of man. After an initial exploration carried out in 1846 in the cave that takes its name from the Prince of Monaco, Florestan I, the first productive excavations were carried out by Emile Rivière, a French doctor who temporarily moved to Cannes because of health problems. His interest in the site was stimulated by the archeological material emerging from the *talus* of these cavities during the construction of the railway line connecting Genoa to Nice.

In 1872 Rivière discovered a first Upper Paleolithic burial while working in the Caviglione cave (Rivière, 1887) (from here on cave names follow Alciati *et al.*, 2005). The skeleton (Fig. 2) belongs to an adult individual, diagnosed as male by Rivière, but probably a female, according to subsequent analyses (Henry-Gambier, 2002).

The skull was ornamented with marine shells and pierced deer canines, both forming part of a headdress. Other shells, possibly decorating the legs, were found close to the proximal tibia. Abundant ocher marked the bones, grave goods, and soil with a red color. The skeleton was lying on its left side, hands close to the face, lower limbs slightly bent and showed a fracture of the distal third of the left radius healed with residual deformation. Rivière (1887, p. 309), based on the position of the skeleton and the fact that he had not recognized the presence of a pit, maintained that this individual was left where he died, possibly out of respect or superstition, and that the funerary treatment consisted simply in the sprinkling of abundant ocher over the body. Interestingly, position and ornaments strongly resemble those of the Gravettian young adult female from Ostuni (Apulia, Italy) (Vacca & Coppola, 1993; Coppola, 2012). The attribution to the Gravettian of the Caviglione skeleton on archeological grounds is



Fig. 2 - The Caviglione skeleton, as it appears in Rivière's book. The colour version of this figure is available at the JASs website.

supported by the age range provided by C^{14} dating of four shells from the headdress (Henry Gambier, 2001). Unfortunately, besides the description given by Rivière more than a century ago, no other published accounts are available.

In the history of paleoanthropology, the Caviglione skeleton provided one of the first evidence for Paleolithic funerary treatment of the body. Further discoveries confirmed such interments as one expression of the Gravettian, an Upper Paleolithic culture that left beautifully ornamented burials across Europe. Interestingly, comparisons of Gravettian burials from the Russian plains or from Central Europe to those found in Portugal or in Southern Italy show only minor differences reflecting primarily availability of material used for ornamenting the body (e.g. ivory instead of marine shells, or polar fox teeth instead of deer canines). This highlights a peculiar cultural homogeneity that also emerges

in technological and artistic aspects, indicating an expanded network connecting distant populations (Gamble, 1986; Mussi *et al.*, 2000b).

Tall guys

Shortly after the discovery of the Caviglione skeleton, Rivière (1887) explored the Bausu da Ture, a cave completely destroyed a few years later by quarrying activity by the owner, Francesco Abbo, a character that will re-surface in the history of the site. These excavations yielded the remains of an adolescent described as lying in an unusual position, i.e. face down, and of two adult males. Only the latter remains showed traces of ocher. The three skeletons, long considered lost (see Oakley *et al.*, 1971), were identified in the last decades, in part (BT 2) in the storerooms of the Musée des Antiquités Nationales at St



Fig. 3 – The specimen Grotte des Enfants 4 provides an example of the tall and linear body build characterizing Gravettian populations (Courtesy of Musée d'Anthropologie préhistorique de Monaco). The colour version of this figure is available at the JASs website.

Germain-en-Laye, and in part (BT 1 and BT 3) in the Musée Lorrain of Nancy. The events leading to the dispersal and re-discovery of these skeletons can be found in Legoux (1962, p. 114 and Fig. 2) and Villotte & Henry-Gambier (2010). Preliminary analyses confirm Rivière's sex attribution, provide details on the age of the specimens and identify foot and wrist developmental abnormalities, indicative of genetic relationship between the two adults (Villotte & Henry-Gambier, 2010; Villotte *et al.*, 2011).

According to Rivière (1887), the two adult skeletons showed cranio-facial "Cromagnonoid" features, already emphasized in the Caviglione remains by the typological approach followed at the time, and a stature of about two meters. These overestimates of actual stature, along with evaluations drawn from subsequent finds (Verneau, 1906), gave rise to the belief in a gigantic height of the Grimaldi specimens (Parenti, 1971). More reliable techniques indicate that the Upper Paleolithic males (Bausu da Ture 2, Barma Grande 1, 2, 5 and 6, Grotte des Enfants 4) were very tall (around 180 cm), ranging from 173 to 188 cm (Formicola & Giannecchini, 1999) (Fig. 3).

High stature is a characteristic that the Balzi Rossi specimens share with contemporary remains all over Europe (e.g. the Moravian male sample with a mean stature of about 176 cm, and Sunghir 1 exceeding 180 cm). The well-known importance of nutritional conditions for the growth process (Malina, 1987; Steckel, 1995) suggests that a high quality diet, rich in animal protein, was one of the

most significant factors responsible for the large body size of those populations. Paleodietary data and archeological evidence indicating availability of a broad range of resources support this point of view (Richards *et al.*, 2001).

Children from the past, characters of the time

In 1873, Rivière's attention turned to one of the westernmost caves in the Balzi Rossi cliffs (Fig. 4). This relatively small cave, whose upper levels he had already explored, was named Grotte des Enfants after the discovery in 1874-1875, at a depth of 2.7 meters, of two skeletons belonging to two very young children (Rivière, 1887). The children were buried in an extended position close to each other, with numerous pierced *Cyclope neritea* shells probably embroidered to garments covering the abdominal region. The children were lying in the upper part of the deposit attributed to the Late Epigravettian. Coherently, a recent AMS date drawn directly from one of the two children (Grotte des Enfants 1) places the burial at 11,130 +/- 100 BP (Henry-Gambier, 2001). Re-examination of the material by Dominique Henry-Gambier (2001) added important information concerning the age of the children and cause of death. The younger of the two children (Grotte des Enfants 2) shows a retouched bladelet embedded in the T4 vertebral body, following an injury that likely resulted

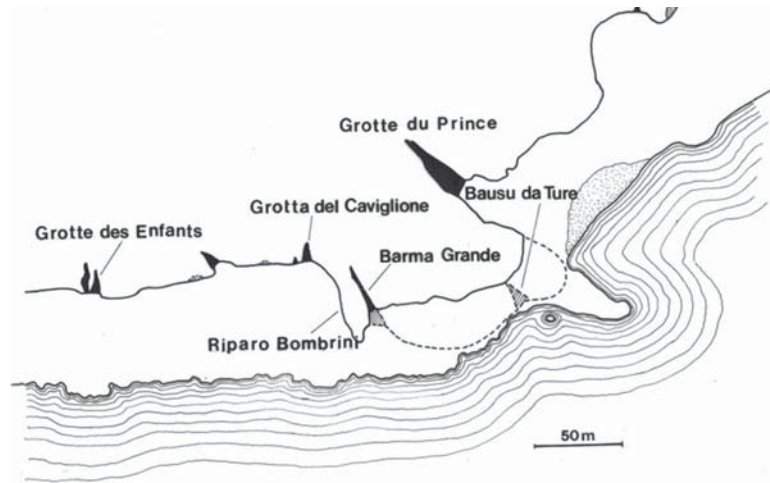


Fig. 4 – Map of the site indicating caves and rock shelters where human remains have been found.

in death. Interestingly, morphological observations and radiological analyses of the skull have highlighted minor changes indicative of localized pressure, probably the effect of a bandage passing over the head and the auricular region.

In 1884 a new character appears at the site. His name is Louis Jullien, a French antiquities dealer, who began excavating the large and archeologically-rich cave of Barma Grande (“big cave” in local patois) with the support of an amateur naturalist, Stanislas Bonfils, living in Menton (Mussi *et al.*, 2008). The cave was first explored in 1872 by Rivière who, claiming the property of the cave, firmly opposed the work planned by the Prince of Monaco, Albert I. This was unfortunate because it prevented scientific excavations such as those Albert I subsequently promoted at the Grotte des Enfants and Grotte du Prince. In the meantime Francesco Abbo, a dynamic local entrepreneur, bought Barma Grande and Bausu da Ture for different purposes, i.e. to extract limestone and to use the fill in his vineyard. This goal probably played a role in getting Jullien the permission to excavate Barma Grande. Apparently, Jullien fulfilled Abbo’s expectations considering that within a few weeks, approximately 8 meters of deposit close to the entrance of the cave were removed. Here, in February 1884, long flint

blades and the burial of an adult male sprinkled with red ocher came to the light. With Jullien’s permission the skeleton was prepared to be moved to the Museum of Menton curated by Bonfils. Only part of the material reached its destination, unfortunately. A quarrel regarding the rights to this find exploded a few days later and ended with the destruction of most of the skeleton.

Fat ladies

Deposits removed by Jullien’s activity at Barma Grande yielded a rich archeological assemblage, likely including two beautiful “venus” figurines in steatite, known as “the yellow venus” and “the goitered lady”. The history of these figurines, as well as of other 13 found by Jullien probably in the nearby Grotte du Prince, is obscured by personal rivalries, suspicions of forgery, and by general skepticism during this period about the existence of Upper Paleolithic art (Mussi *et al.*, 2008). In addition, Rivière’s attribution of the skeletons he found to the Upper Paleolithic was denied by eminent archeologists such as Gabriel de Mortillet, who claimed them to be Neolithic. These prejudices help to explain why Jullien concealed his discoveries (White, 2003). The value

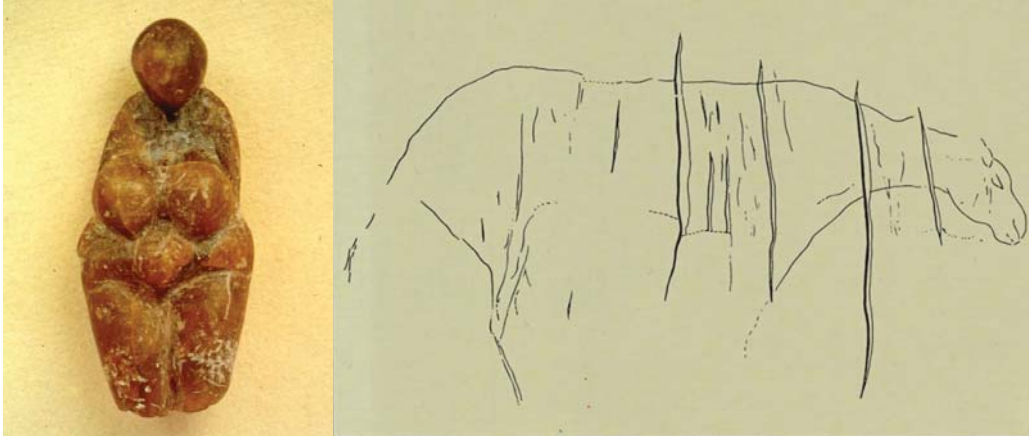


Fig. 5- Evidence of mobiliary (the yellow venus) and parietal art (the Caviglione horse) at Grimaldi. (Courtesy of Musée des Antiquités Nationales de Saint Germain en-Laye and Soprintendenza ai Beni Archeologici della Liguria). The colour version of this figure is available at the JASs website.

of his archeological collection would have been greatly diminished if considered more recent, or even worse, a forgery. Only after the recognition of Upper Paleolithic art, following the discoveries at Brassempouy in 1894, did Jullien decide to make public and sell a few of these figurines. Seven were acquired by the Musée des Antiquités Nationales in Paris, one by the Harvard Peabody Museum, and the remaining seven were long considered lost. In 1990 the seven missing figurines re-appeared in Montreal where Jullien emigrated (Bisson & Bolduc, 1994). A few remained in the possession of Jullien's last descendants, while others were for sale in an antiquarian shop where the figurines were first noticed and identified.

Among the objects that characterize Gravettian material culture, none are more emblematic than those delicately carved "fat ladies". These clay, stone, bone, antler or ivory representations of generally plump female forms can be quite different, ranging from a naturalistic, detailed anatomical reproduction of an obese woman (Trinkaus, 2005) to a harmonious combination of lines and volumes. The "yellow venus" from Grimaldi (Fig. 5) and the venus from Willendorf exemplify well the two models.

This artistic production represents one of the signatures of a culture connecting populations

from the Russian plains to those living along the Atlantic and Mediterranean seashores between 28 and 20 Ky BP. It is very likely that these representations allude to something different and more complex than a simple representation of fertility, as the development of breasts and buttocks characterizing a few figurines could suggest. Jullien's findings, by far the largest collection of mobiliary art from this time period, allow one to speculate with new elements about function and significance of the figurines (Mussi *et al.*, 2000a). These figurines were mostly intended as pendants, as suggested by perforations or remnants of perforations, polishing and wear facets. Beyond the "classic venus" statuettes, the Grimaldi sample includes a few figurines, such as the "doublet" and the "bicephalous", exhibiting combinations of elements that, according to Mussi and co-workers (2000 a) point to a complex system of beliefs in different but interconnected levels of reality.

The strong prejudices that existed until the end of the 19th century about the existence of Paleolithic art also help explain why the presence of parietal engravings in the Grimaldi cave was not recognized for a long time. Only at the beginning of the 1970s a systematic survey promoted by the Istituto di Studi Liguri and the Musée

d'Anthropologie préhistorique de Monaco led to the discovery of linear incisions, sexual schematic representations and, at about seven meters from the base of the Caviglione cave, the naturalistic representation of a horse (Fig. 5) (Vicino & Simone, 1972; Vicino & Mussi, 2011).

Three individuals together and properly buried

Following the quarrel generated by the discovery of the first skeleton at Barma Grande, the excavation of the deposit was performed by the owner of the cave itself, Giuseppe Abbo, who proceeded to extract material in view of terracing a vineyard. Ironically, Abbo's subsequent discovery of a triple burial and of two additional single burials earned him a place in the history of excavations.

The triple burial was found in February 1892, at a depth of about 8 meters, by one of Abbo's children while playing and digging holes in the cave. The news of the discovery spread rapidly, attracting many amateurs and a few scientists. Among those René Verneau, naturalist at the Musée d'Histoire Naturelle de Paris, was known as anthropologist for his studies on the Guanches, a Canary Islands' extinct population. Having arrived at the cave a few days after the discovery, he saw the material in the original position and noted that the skeletons were lying in a pit in which only the posterior wall was still intact (Verneau, 1906, p. 21). The geologist Arturo Issel (1908) added a few comments about the state of preservation and position of the archeological material. He also reported that the skeleton in the middle was partly covered by the other two, indicating that it was the first to be placed into the grave.

Verneau's observation about the presence a pit, partly preserved in spite of inaccurate excavations and trampling around the skeletons, provided the first evidence that the bodies were not left on the surface of the deposit, as suggested by Rivière. The digging of a pit and the presence of other funerary structures were confirmed by



Fig. 6 – Long flint blades (top) and ivory ornaments (below) associated with the triple burial of Barma Grande. (Courtesy of Soprintendenza ai Beni Archeologici della Liguria). The colour version of this figure is available at the JASs website.

scientific excavations carried out a few years later at Grotte des Enfants.

Having succeeded in gaining Abbo's confidence, Verneau displaced Rivière as the anthropologist in charge at Grimaldi. In fact Verneau had access to the remains of the triple burial as well as the two additional skeletons that Abbo found in Barma Grande. Following these discoveries, Thomas Hanbury, an English philanthropist living in the village of Grimaldi where he created the beautiful botanical garden named after him, decided to build a little museum where the remains found by Abbo could be displayed. In the absence of any law protecting archeological heritage, this is the only skeletal material resulting from the activity carried out at Grimaldi until the beginning of the 1900s that is preserved in Italy.



Fig. 7 - The adolescents of the triple burial from Barma Grande still located in the cave, i.e. before the losses suffered during world war II. The colour version of this figure is available at the JASs website.

The skeletons of the triple burial, based on Verneau's description and drawing, were lying side by side in an extended position. The apparent absence of perturbation of anatomical connections between skeletal elements and of the associated grave goods indicates that the burial was simultaneous. The skeletons were richly ornamented with abundant ocher, perforated marine shells, deer canines, pendants in carved ivory, and extraordinary long blades (Fig. 6). Grave goods and lithics strongly recall those associated with the skeleton of the Gravettian adolescent found in 1942 in the nearby Arene Candide cave (Finale Ligure) during stratigraphic excavations (Cardini, 1942). The skeleton of this beautifully ornamented youth ("Il Principe") is directly dated by AMS technique to 23,440 \pm 40 BP (Pettitt *et al.*, 2003).

The remains found by Abbo belong to two adolescents and to an adult male (Barma Grande 2). Verneau attributed the skeletons of the adolescent in the middle (Barma Grande 3) to a female, and the other (Barma Grande 4) to a male. The sex diagnosis of the adolescents should, however, be taken with caution considering that the criteria used are not specified (Barma Grande 3), or are based on long bone lengths (Barma Grande 4), an unreliable sex indicator. No mention was made of hip bone morphology, the most dimorphic part of the skeleton, present at the time of the discovery but destroyed during world war II (Fig. 7).

Following the anthropological tradition of his time, Verneau focused his analysis on typology, paying little attention to young individuals and sex diagnosis. This issue is particularly interesting, however, considering the peculiarity of

the burial. Re-examination of the material using dental dimensions, cranial morphology and post-cranial robusticity, confirm the female attribution for Barma Grande 3 but provides equivocal results as far as Barma Grande 4 is concerned (Formicola, 1988a,b). The problem could be finally clarified by DNA analyses recently performed by Olga Rickards and co-workers. These results confirm the male sex for the adult individual (Barma Grande 2) and suggest both adolescents (Barma Grande 3 and 4) are female (Tarsi *et al.*, 2006).

Interestingly all three individuals share a rather uncommon anatomical variant, i.e. a groove on the same side of the frontal squama (Formicola, 1988a, Fig. 2), suggestive of genetic relationships (Ossenberg, 1976) linking the adult male and the two adolescents. Close relationship between the two adolescents is also shown by mtDNA analyses (Tarsi *et al.*, 2006). Based on morphological data, genetic relationships have been also hypothesized for the members of the multiple burial from Dolní Věstonice (Moravia) (Alt *et al.*, 1997), the only other Upper Paleolithic triple burial known (Klíma, 1987), as well as among the two adults from Bausu da Ture (Villotte *et al.*, 2011).

The adult male Barma Grande 2 exhibits a high stature (about 188 cm) coupled with exceptional upper and lower limb robusticity. Moreover, right and left scapulae display a deep and well defined dorsal sulcus, a configuration also observed in contemporary remains from Predmostí, Dolní Věstonice and Sungir, and more frequently in strongly built Neandertals (Trinkaus *et al.*, 2014). Although both functional and genetic models have been proposed to explain morphological variations of the axillary border of the scapula, the early appearance of the “dorsal pattern” in the one year old Neandertal child Kiik-Koba 2 suggests a genetic origin (Trinkaus, 2008).

The adult male also shows an unusually high degree of upper limb bilateral asymmetry, with the right side well above the mean values of other Upper Paleolithic male specimens (Churchill & Formicola, 1997) (Fig. 8). Marked levels of upper limb lateralization are not uncommon in Upper Paleolithic samples, reflecting in most cases bone

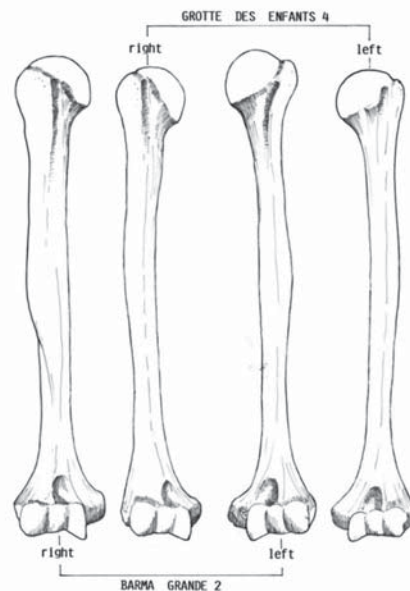


Fig. 8 - Humeral bilateral asymmetry exhibited by Barma Grande 2. Note the extraordinary right-left difference in comparison with Grotte des Enfants 4, another robust male from Grimaldi.

remodeling related to limb dominance, and, in other cases, the effect of pathologically induced changes. The Barma Grande 2 skeleton lacks any evidence of trauma or pathology affecting the smaller left side. However, comparisons involving normal and pathological Paleolithic remains, as well as recent skeletal samples, suggest that the phenomenon may be a secondary effect of pathological conditions such as entrapment neuropathy, direct muscular trauma, or glenohumeral joint instability (Churchill & Formicola, 1997).

About artifacts, bones, teeth and behavior

Long flint blades, ivory ornaments associated with the Barma Grande and Arene Candide skeletons, as well as figurines, provide important clues about lifestyle of these populations. In particular, while analysis of the blades indicates that



Fig. 9 - Interproximal grooves between M1 and M2 shown by Barma Grande 5 (top) and Barma Grande 2 (below). The colour version of this figure is available at the JASs website.

the flint originates from the mountain of Lure (Haute Provence) in Southern France (Onorardini *et al.*, 2011), it is well known that ivory is a very rare material both in Italy and Southern France because of the near absence of mammoth during this time period in these regions. In addition, as pointed out by Mussi and co-workers (2000a), ivory carving requires experience and skills that can only be acquired in Central or Northern Europe where the material is abundant. Thus, lithic material and ivory items found far away from where their origin support the idea that both logistical and residential mobility were important components of the lifestyle of Gravettian populations (Gamble, 1986; Flébot-Augustin, 1997).

Coherently with these observations, biomechanical analyses of lower limb bones of Mid-Upper Palaeolithic remains show diaphyseal hypertrophy and shape reflecting high habitual loading levels and hence high mobility (Holt,

2003). It is likely that high mobility in Gravettian groups was linked both to subsistence strategies, and to the need to maintain intergroup contacts for assuring biological continuity in a vast depopulated territory. In addition, archeological data, artistic production and funerary behavior point to cultural homogeneity bridging European populations from this time period. This cultural homogeneity implies an expanded network of direct or indirect contacts between geographically very distant populations. Perhaps the essence of these “Gravettian connections” is best expressed by Mussi *et al.* (2000 b) words:

“It is a fascinating thought that, more than 1000 generations ago, humans of Siberia may have been aware that many months of walking to the west—actually more than 8000 kilometers away—there were still people, different from themselves, yet in many respects similar”



Fig. 10 –The alveolar prognathism emphasized by Verneau on the “Negroids” from Grimaldi: Grotte des Enfants 5 (on the left) and 6 (on the right). The colour version of this figure is available at the JASs website.

Meanwhile, back at the cave. Two years after the discovery of the triple burial, Abbo ran into two additional skeletons at Barma Grande. The first skeleton (Barma Grande 5), labeled as “a Cro-Magnon” by Verneau, belongs to an additional robust and tall adult male. What makes this individual remarkable, however, are the deep interproximal grooves affecting maxillary posterior teeth at the cemento enamel-junction. The grooves are well polished, show a tubular appearance or, more precisely, a conical outline with the buccal diameter much larger than the lingual one. Position, orientation, and shape of such grooves, also exhibited by other specimens from Grimaldi (Barma Grande 2 and Grotte des Enfants 4) (Fig. 9), are quite similar to those observed, among others, in North American Indians, Krapina Neandertals, and Atapuerca hominids (see Bermudez de Castro *et al.*, 1997 for references). This peculiar kind of wear most probably results from abrasion by thin and flexible material inserted repeatedly between adjacent teeth from the buccal side (Formicola, 1988c; 1991). Experimental evidence supports this interpretation (Hlusko, 2003). Repetitive probing, extending beyond the needs of oral hygiene and entering in the domain of stereotyped behavior, may have been the activity responsible for such changes.

Additional cases of activity-induced wear in the Grimaldi material can be found on the anterior teeth of Grotte des Enfants 4 (Formicola & Repetto, 1989) and in a deciduous incisor recovered in 1976 at Riparo Bombrini in an

Aurignacian context (Formicola, 1989a). Both cases provide evidence of non-alimentary use of teeth. In Grotte des Enfants 4, the clear labial rounding affecting the lower anterior dentition on the right side is the probable effect of the treatment of flexible material held between teeth and pulled down with the right hand. In the deciduous incisor, the small bucco-lingually directed groove visible on the occlusal edge of the crown, based on Larsen (1985) observations, possibly results from holding and pulling thin, fibrous material between the teeth. The age of the child suggests that this kind of activity was probably performed as an imitation of adults.

The last burial found by Abbo came to light in the most internal part of Barma Grande in 1894. The skeleton (BG 6), mostly represented by lower limb bones, was lying on black soil rich in charcoal. Verneau (1906) suggested intentional combustion of the body, a hypothesis resurrected a few years ago (Groenen, 1997). However, lack of evidence of bone fractures, deformations or warping (Formicola, 1989b) do not support this interpretation and indicates that this individual was buried atop an ancient hearth.

Available information about depth and spatial distribution of the different Barma Grande burials suggests that BG 6 is probably one of the last examples of the funerary use of the cave. A direct AMS date obtained from a metatarsal bone places the material at 24,800 +/- 800 BP (Formicola *et al.*, 2004). Due to very low collagen preservation in the contemporary Grimaldi samples, this date

represents the only result till now obtained for Gravettian human remains from this site.

The “Negroids” dilemma

At the end of the 19th century, only one of the Balzi Rossi caves still preserved a deposit largely intact. The cave, already explored in the upper levels by Rivière, was named Grotte des Enfants because of the recovery in the 1870s of the remains of two children. The careful scientific work carried out by clergyman Louis de Villeneuve on behalf of the Prince of Monaco, Albert I, provided a base of reference for the reconstruction of the Upper Paleolithic archeological sequence at Balzi Rossi, and removed remaining doubts about the antiquity of the burials.

One of the most relevant results, however, was the discovery in 1901 of the double burial of the so-called “Negroids of Grimaldi”. The burial, including the skeleton of an old female (Grotte des Enfants 5) and of an adolescent (Grotte des Enfants 6), provided René Verneau the opportunity to define a new Upper Paleolithic “race”. According to Verneau (1902, 1906), the two skeletons were quite different from other Upper Paleolithic remains, generally labelled as “Cro-Magnons”, and exhibited a “primitive”, negroid facial morphology (Fig 10).

Artistic production seemed to support this typological attribution. In fact, as noted by the French archeologist Edouard Piette (White, 2003; see also Boule, 1921, Fig. 194), the protruding buttocks characterizing “Venus” figurines were nothing but the representation of a feature typical of Bushman females, a Southern African population at this time considered very primitive both morphologically and culturally.

The popularity of Verneau's findings is emblematically reflected by the museum arrangement of the “Negroid” skulls, incorrectly positioned in order to let the public appreciate their facial peculiarities. In fact, as reported by Suzanne Simone (1987), curator of the Musée d'Anthropologie préhistorique de Monaco, where the skeleton are on display, De Villeneuve's

notebook clearly points out that the adult woman was buried face down while the adolescent face was partly covered by her skull (Fig. 11).

It is important to stress that the term “Negroid” was meant by Verneau (1902, 1924) as an evolutionary grade preceding the Cro-Magnon “race” and more in general modern “races”. This point of view was consistent with stratigraphic data. The burial of the “Negroids” lied deep in the archeological sequence, 0,70 m below the layer that included the burial of a “Cro-Magnon” adult male (Grotte des Enfants 4) recovered in the same year. Thus, the “Negroid type” from Grimaldi was more ancient than the “Cro-Magnon type”, and possibly directly linked to it.

This typological attribution, mainly grounded on the characteristic facial prognathism was challenged sixty years later by a French dental anthropologist. According to Pierre Legoux (1963) the protrusion of the maxilla of the adult female resulted from adaptations of masticatory mechanism to the loss of the posterior dentition, while the reconstruction and assembling of the adolescent face was incorrect. Legoux's critical revision removed the difficult problem of the origins of these “exotic” individuals and how people of African ancestry could have arrived on the Mediterranean coasts of Europe. These reasons contributed to make Legoux's thesis successful.

Starting with the 1980s, however, archeological, paleoanthropological and biomolecular data provided increasing evidence that Africa played a central role in the origin of anatomically modern humans (Stringer & Andrews, 1988; Stoneking, 1993; White *et al.*, 2003; Underhill & Kivisild, 2007). This hypothesis is strongly supported by tropical body proportions characterizing Gravettian samples (Holliday, 1997). Among those, the tall and linear body build of Grotte des Enfants 4 (Fig. 3) is taken by Pearson (2000) as a clear example of a tropically adapted physique. On the other hand, the fact that no other case of African facial traits can be found in the contemporary material, except perhaps the Sunghir 2 child (Trofimova, 1984, but see Trinkaus *et al.*, 2014), raises serious doubts on Verneau's typological attribution.



Fig. 11 – The original position of the skeletons from the double burial from Grotte des Enfants. The old woman is buried face down in a highly contracted position, while the adolescent is lying on his right side with bent lower limbs (Courtesy of Musée d'Anthropologie préhistorique de Monaco). The colour version of this figure is available at the JASs website.

The suspicious nature of multiple burials

Upper Paleolithic multiple burials from Grimaldi, as well as contemporary similar forms of inhumation from overall Europe, raise intriguing questions. The large majority of Upper Paleolithic burials from this site belong to the Gravettian and include eight single (Caviglione 1, Bausu da Ture 1, 2 and 3, Barma Grande 1, 5 and 6, Grotte des Enfants 4) one double (Grotte des Enfants 5 and 6) and one triple burial (Barma Grande 2, 3 and 4). The Late Epigravettian sample, only represented at Grotte des Enfants, includes the double child burial (Grotte des Enfants 1 and 2) and a single burial of an adult female found by de Villeneuve in 1901 (Grotte des Enfants 3). Evidently multiple interments are frequent, both considering the two periods separately and all together. This ratio could

obviously be the random effect of small sample size. However, looking at the Gravettian and Epigravettian European record, multiple burials remain surprisingly frequent (about 1/5) and in addition share a few intriguing aspects with those from Grimaldi (Formicola, 2007). Most of them include individuals of different sex and often of very young age. In addition, the systematic absence of bone and grave goods perturbations indicate that the multiple interment was simultaneous. This could also be the case for the double burial of the “Negroids”, given that the displacement of a few shell ornaments noticed by De Villeneuve (Cartailhac, 1912, p. 261) could easily result from animal activity.

Frequency, composition by age and sex and simultaneity of interment suggest that death by natural cause may not be the most likely explanation for these findings. One of us (V. F.) proposed that the hypothesis of human sacrifice should be

taken into account (Formicola, 2007, 2008). This hypothesis becomes inescapable when the burial pattern is reminiscent of a ritual defined by Testart (2004) as “mort d'accompagnement”, i.e. the sacrifice of an individual to accompany the defunct. Examples of such a pattern are provided by the double burial of the Romito (Italy) adolescent dwarf carefully interred with the head resting on the left shoulder of an adult woman who surrounds him with her left arm (Bachechi & Martini, 2002), and by the double burial from Grotta delle Veneri (Parabita, Italy) (Cremonesi *et al.*, 1972) which includes two adults of different sex buried in a position strongly evocative of an intimate relationship, i.e. with the legs interconnected and facing each other.

The main objection to the hypothesis of sacrifices is that no evidence of violent death can be found, except for the double burial of the Grotte des Enfants children. The absence of traumatic injuries, however, does not exclude other procedures that may not leave traces on the bones.

Grimaldi caves after the “Golden Age”

De Villeneuve's work at Grotte des Enfants closes the period of the most sensational discoveries at Balzi Rossi. The four volumes published in the following years by de Villeneuve himself, and by the archeologist Emile Cartailhac, the paleontologist Marcelin Boule, and the anthropologist René Verneau stand as a milestone in Upper Paleolithic literature. The importance of the discoveries and the reputation of the authors would long discourage reanalysis of the material. Members of the newly founded Istituto Italiano di Paleontologia Umana returned to the site two decades later, in 1928. Among the people directly involved in the work, an eminent archeologist, Luigi Cardini will link his name to the excavations carried out a few years later in the Pleistocene deposits of nearby Arene Candide cave (Finale Ligure). This phase was fruitful from an archeological point of view, providing new and more precise information on the sequence of cultures and on ecological changes (Blanc, 1938; Graziosi, 1939). The activity

focused specifically on remnants of deposits left intact by previous excavations and on newly discovered small cavities or rock shelters kept hidden by sediments at the base of the cliff, such as Grotta Costantini, Riparo Mochi and Riparo Bombrini.

World war II strongly disrupted this activity and had destructive effects on Barma Grande in particular. Faunal remains, as well as the specimen n. 5 found by Abbo and the two adolescents from the triple burial were still preserved in the cave (Fig. 7), while the adult male from the same burial was in display in the nearby museum built by Hanbury. Only a providential intervention by Cardini allowed the rescue of part of that material from an explosion, provoked in 1944 in order to interrupt the railway line towards France, that destroyed the bottom of the cave (Graziosi, 1945).

After the war, the Istituto Italiano di Paleontologia Umana resumed excavations at Riparo Mochi, while in the 60s Louis Barral and his team from Monaco started working in the Grotte du Prince. The activity at both sites continues today and was supplemented in 2000 by the systematic excavations carried out at Riparo Bombrini by members of Italian and American institutions. This site and the nearby Riparo Mochi have yielded abundant lithic industry, ornaments and important information on the tempo and mode of the Middle-Upper Paleolithic transition (Del Lucchese *et al.*, 2004; Negrino, 2005; Douka *et al.*, 2012). In addition, a deciduous incisor was recovered in 1976 by Giuseppe Vicino from an Aurignacian layer of Riparo Bombrini (Vicino, 1986). This finding, together with the incomplete hip bone recovered in the Grotte du Prince in 1968, represent the only human remains found after the excavations by de Villeneuve at Grotte des Enfants. The hip bone, based on the results of γ spectrometry, is dated at 220 ky BP. This, as well as the lithic industry from the same site, documents the early Neandertal presence at Grimaldi (Barral & Simone, 1987).

From an anthropological point of view, the lack of alternative to the typological approach underlying Rivière's and Verneau's work resulted in a long stasis in studies of the human remains, only interrupted by Legoux's (1962, 1963) revisions

and a few closely related contributions (Barral and Charles, 1963; Vlček, 1965; Oliver & Mantelin, 1974). Frayer's 1978 work "Evolution of the dentition in Upper Paleolithic and Mesolithic Europe" marks the beginning of a series of studies in which the Grimaldi remains, together with contemporary findings from all of Europe, provide the material for new approaches to the study of the Upper Paleolithic (e.g. Holt & Formicola, 2008). Based on large samples, the population rather than single specimens, becomes the foundation for these studies. Further developments in methodological approaches and in our understanding of ecological and cultural contexts, improvement in dating techniques and biochemical and biomolecular analyses, as well as new Early Upper Paleolithic findings, attract the attention of a growing number of students to the problem of the origin of modern humans and to the biocultural adaptive processes affecting these populations after their dispersal. These issues emphasize the value of European remains and, among those, the ones from Grimaldi, which in spite of the troubles described here, still provides one of the most important record on biology, culture and behavior of early anatomically modern populations of Europe.

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