10. AROUND AN ELEPHANT CARCASS: CIMITERO DI ATELLA AND FICONCELLA IN THE BEHAVIOURAL VARIABILITY DURING THE EARLY MIDDLE PLEISTOCENE IN ITALY

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ABSTRACT

A great number of Lower Palaeolithic sites in Italy yielded lithic industries associated with elephant remains. This recurrent association can give an impression of homogeneity, but in fact the situation is much more complex. This association must rather be seen as a prism to understand the cultural and behavior variability. We investigate this topic through the evidence of two early Middle Pleistocene Italian sites, Cimitero di Atella and Ficoncella, and we try to insert results obtained previously in the framework of the Middle Pleistocene in Italy.

10.1 INTRODUCTION

A great number of Lower Palaeolithic sites in Europe and especially in Italy yielded lithic industries associated with elephant remains (Fig. 10.1). This association has been present since the earliest settlement and all along the Lower Palaeolithic period in various archaeological contexts and in different geographical areas (Konidaris and Tourloukis, this volume).

This rich record stimulated the scientific community to debate the human-elephant relationship issue. One of the most debated issues deals with the role of elephants in the alimentation during human evolution (Agam and Barkai, 2016). From a nutritional point of view, what was the role of meat and fat in the way these human groups fed themselves? From an economic point of view, which were the human strategies to find and exploit these resources? Were the elephants hunted or scavenged? Was the carcass exploited only for food or to provide also bone tools? From a technical point of view, what skills and technical activities were used on these carcasses? Was there a range of tools or only one type of bone tool? Can

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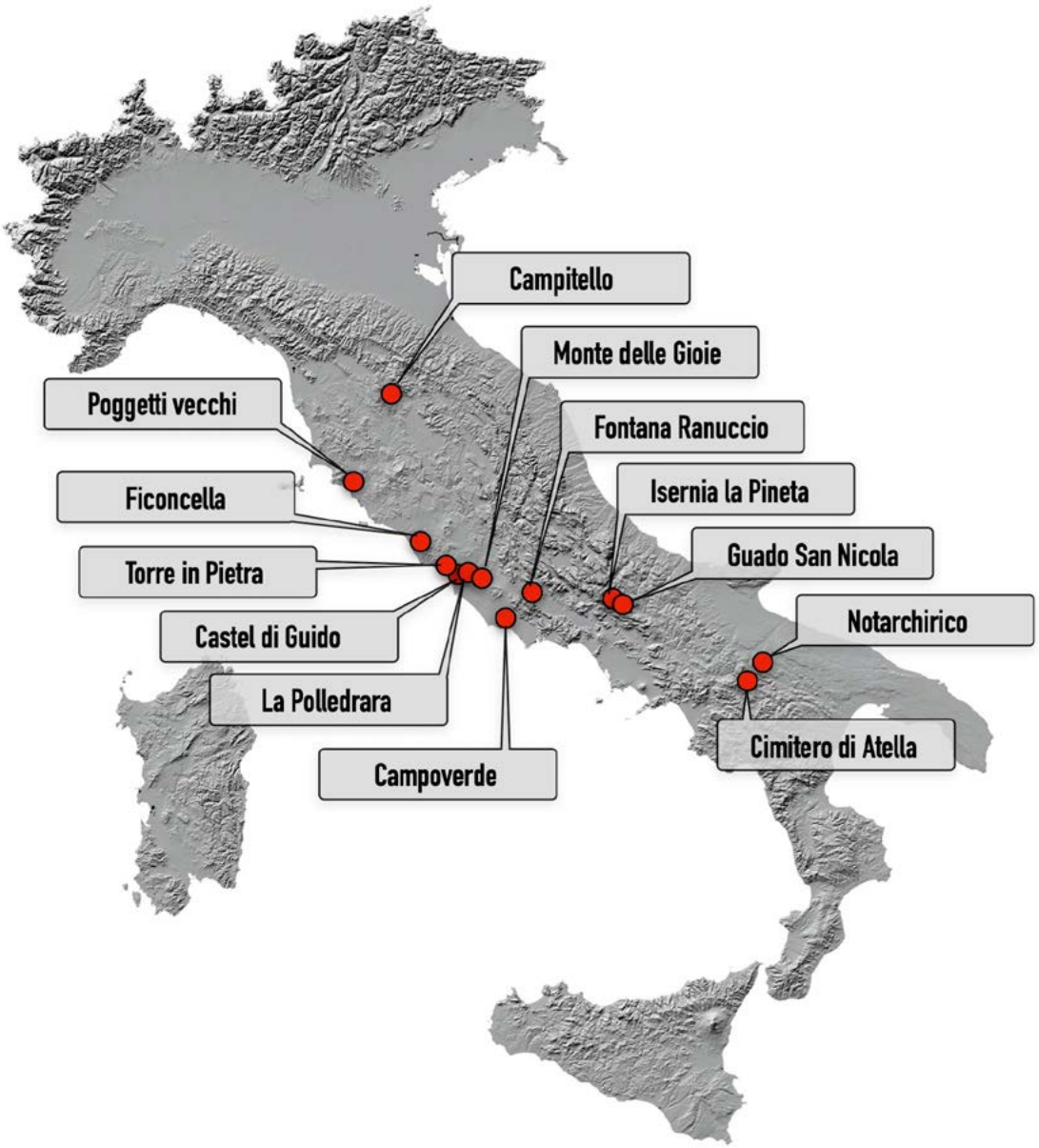

Figure 10.1: Map of the main sites in Italy with elephant remains during the Middle Pleistocene.

we observe changes in the bone tool technical traditions over time and space? And at last, was the role of elephants linked also to the question of the spreading of the genus *Homo* from Africa to Europe (Ben-Dor et al., 2011; Palombo, 2016)? All these issues are of various nature and need to be faced thanks to multidisciplinary studies.

All these in order to emphasize the methodological complexity needed to investigate these archaeological contexts with elephant and lithic industries during the Lower Palaeolithic. This complexity is often increased by the difficulty of interpretation due to the partiality or the lack of preservation, as well as the limited knowledge on the technical and cultural expressions of human groups. The pre-eminence of the environmental studies used as a prism for the human behavior determinism, often makes us lose sight of what the archaeological data has already shown us about well-defined technical traditions in such remote periods.

In this work, we will not present new data on Cimitero di Atella and Ficoncella, but we will rather try to insert the results obtained so far in the framework of the Middle Pleistocene in Italy. The aim is to investigate how these archaeological contexts with elephant and lithic industries enable us to recount important technical and cultural changes over time. Even if this recurrent association between humans and elephants gives a homogeneous pattern, in fact the situation is not as simple as it seems. Indeed, the human and elephant pair should be seen as a prism, which has followed over time the behavior variability and the evolution of technical traditions.

We will investigate this topic through the evidence of two early Middle Pleistocene Italian sites: Cimitero di Atella and Ficoncella. The site of Cimitero di Atella is located in southern Italy. The excavation brought to light an important sequence containing at least two archaeological levels attributed to the lower Acheulean (Borzatti et al., 1997). The lithic implements and faunal remains (*Palaeoloxodon antiquus* and middle-sized mammals) are at the moment dated to ca. 600 ka on the basis of stratigraphic, volcanological and biochronological correlations (Borzatti et al., 1997; Rocca et al., 2016). The site of Ficoncella is located in central Italy, on the left slope of a river valley, in an alluvial sedimentological context, where animal bones and well-preserved lithic remains, dated to the Lower Palaeolithic, were found. The presence of two volcanic layers, as well as other geological evidence, enabled to date the site to ca. 500 ka (Aureli et al., 2012, 2015). Notwithstanding their differences in terms of taphonomic and archaeological context, these two sites allow us to investigate the relationship between humans and elephants during the Lower Palaeolithic in Italy. Therefore, we will compare the site formation processes, the modality of faunal exploitation, the lithic reduction sequence, the tools and the spatial and territorial patterns. Then, we will place our results in the Italian Lower Palaeolithic framework in order to investigate the variability of human-elephant relationships.

10.2 CIMITERO DI ATELLA

10.2.1 PRESENTATION OF THE SITE

The Lower Palaeolithic site of Cimitero di Atella was discovered in the early 1990's and excavated for almost twenty years by Professor Borzatti von Löwenstern and his team (Borzatti et al., 1997). Our new research project is supported by the French school of Rome, and other scientific and local institutions (Rocca et al., 2016, 2018; Rocca and Aureli, 2019).

GENERAL CONTEXT | The Lower Palaeolithic site of Cimitero di Atella is located in southern Italy (Fig. 10.1) in the Basilicata region, at about 10 km south of Monte Vulture. The studied area is located in the frontal part of the south-Apennines orogenic chain. The Atella site is included in a narrow area between the southernmost base slope of Monte Vulture Volcano and the Atella palaeolake.

We observe the presence of lacustrine deposits at the bottom of the stratigraphic succession, related to the Atella palaeolake. The second part of the succession is formed by a debris flow composed of volcanoclastic sediments, and an alluvial sequence is present in the upper part. Several levels, belonging to the Monte Vulture eruptive events, allowed us to re-collocate the sequence within a more precise chronological context (Giannandrea in Rocca et al., 2016). The absolute dating on the volcanic layers identified in this sequence has been directly dated with the $^{40}Ar/^{39}Ar$ method on single grain. The results obtained have shown that all the sequences are comprised between about 650 ka at the base and 585 ka at the top (Pereira, 2017). Further $^{40}Ar/^{39}Ar$ and ESR dating will refine in the future this chronological estimation.

ARCHAEOLOGICAL SEQUENCE | The site of Atella yielded several archaeological units displaying different formation processes (Fig. 10.2). A probable primary position level with quite fresh lithic industry and elephant remains on the top of the lacustrine level, probably linked to a palustrine en-

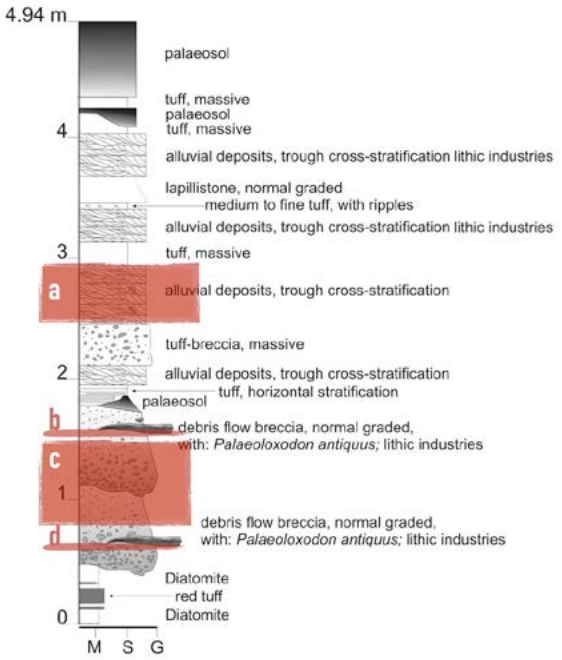

Figure 10.2: Stratigraphic log of Cimitero di Atella, Basilicata, Italy (modified from Rocca et al., 2016). a, sandy deposit of alluvial origin; b, archaeological layer covered by tephra ashes; c, debris flow; d, archaeological level covered by the debris flow.

vironment. A secondary position level with rounded lithic industry and fragmented fauna including a few elephants remains. A primary position level with fresh lithic industry and elephant remains, this level was directly covered by a primary tefra level. And in the alluvial sequence, another horizon with poor lithic industry and a few elephants remains (Rocca et al., 2018; Rocca and Aureli, 2019).

10.2.2 LITHIC INDUSTRY

LITHIC REDUCTION SEQUENCES | The lithic industry of all levels presents on the whole the same characteristics (Fig. 10.3). The assemblage can be divided in three main reduction sequences (Abruzzese et al., 2016; Rocca et al., 2018).

The first reduction is represented by flint small tools and their confection flakes. Not only can small tools be defined by their small size, but also by a common blank structure and a specific confection reduction sequence (Burdukiewicz, 2003; Aureli et al., 2016; Rocca, 2016; Rocca and Serangeli, 2020). The small tools are made both on natural fragments and flakes (Fig 10.3: 4, 5, 6). Whatever is the nature of the selected blanks, they share some important features: small size, considerable thickness, and flat ventral surface used as a striking platform to create the functional part through retouch. The category of retouch flakes coming from the confection of small tools is very well represented. This reduction sequence, small tools and retouch flakes (Fig. 10.3: 2, 3) is mostly represented in the assemblage.

The second reduction sequence is aimed to obtain unretouched flint flakes. The cores belong to the SSDA (surfaces of alternate debitage) production (Forestier, 1993) system or additional types (Boëda, 2013), as the production only affects a sub-volume of the starting block and it is generally limited to a few detachments (Fig. 10.3: 1). The obtained flakes are of medium size, often with one cutting-edge and a lateral back.

At last, we introduce the large tools or large cutting tools in siliceous limestone. Because the shaping of these tools affects almost exclusively only one of their surfaces (Fig. 10.3: 7), we state that the tools previously considered as handaxes are not true bifaces. The blanks used for the confection of these tools are mainly large flat/convex flakes in limestone. They represent a few pieces and no shaping flakes were found, maybe for taphonomic reasons.

LITHIC TOOLS | A techno-functional analysis was conducted on the small tools, aimed to identify the functional potential of stone tools through the description and the analysis of the structure and the tool and its production processes (Boëda, 2013). This preliminary study led to the identification of two main groups: convergent or spina and rectilinear cutting edges (Fig. 10.3: 4, 5, 6) (Rocca et al., 2016, 2020).

The convergent specimens are characterized by a higher degree of transformation: a central arris is omnipresent on the convergence giving strength to the active unit. The prehensile function is per-

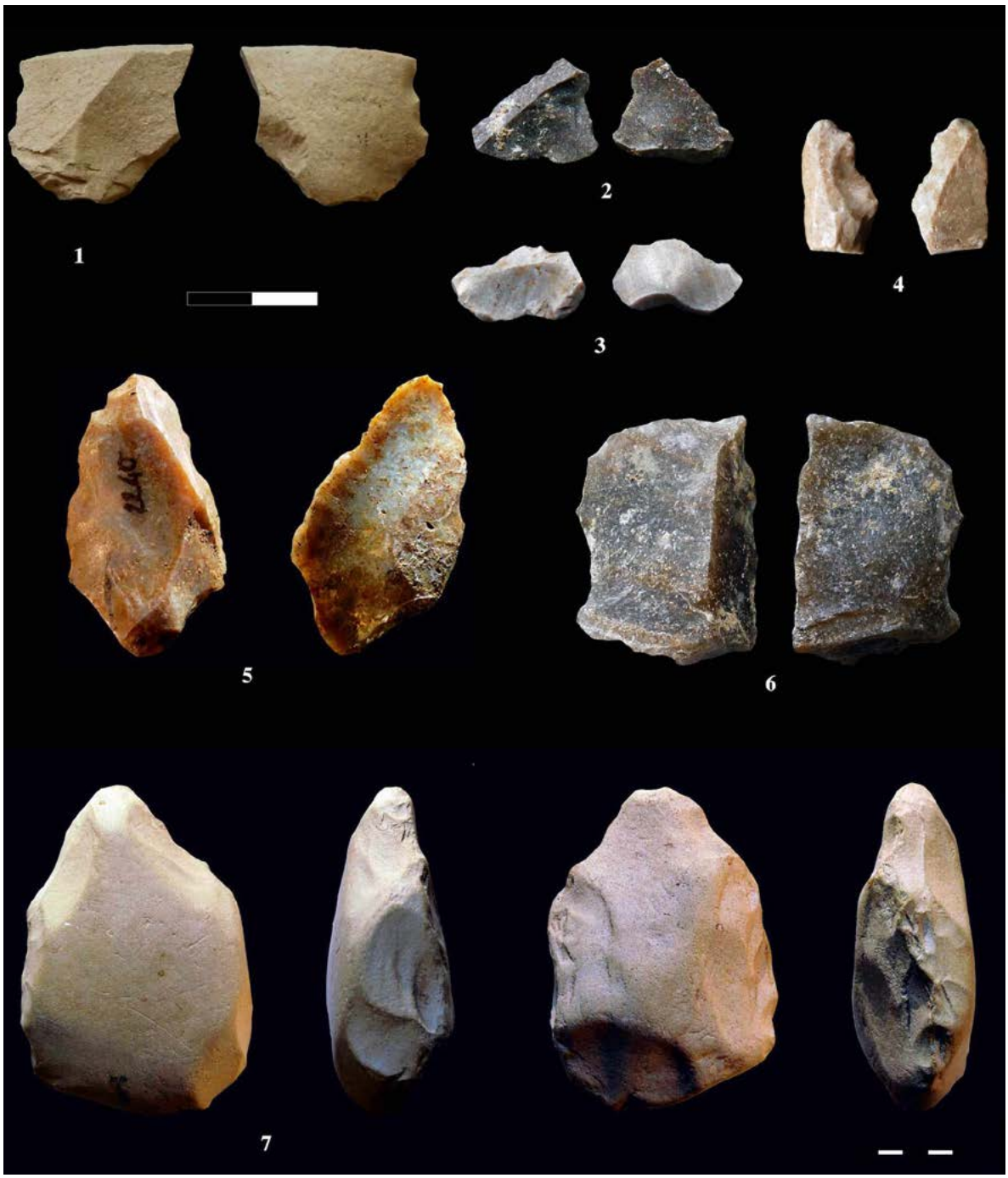

Figure 10.3: Lithic industry of Cimitero di Atella, Basilicata, Italy. **1,** flake; **2–3,** notch flakes; **4–6,** small tools; **7,** large tool.

formed by the thicker portions of the blank, such as the back or the bulb area.

The few and very eroded large tools display open angle cutting-edges, and mainly convergence and rostrum types associated with rectilinear or denticulate edges.

10.2.3 FAUNAL REMAINS

Preliminary observations on the old excavation material have stated that the fauna is highly fragmented and therefore contains few identifiable specimens. Previous excavation, restoration and

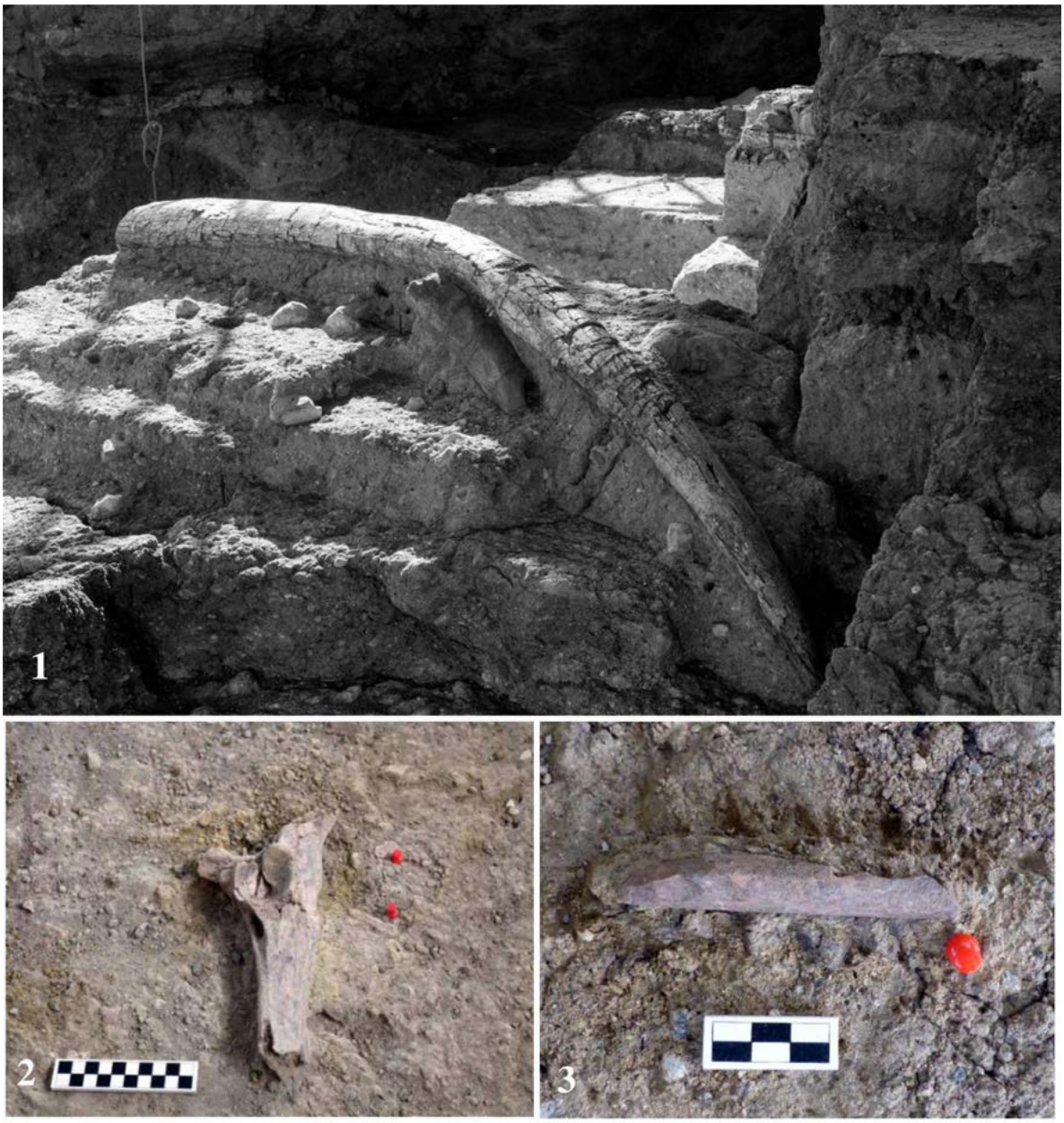

Figure 10.4: Fauna of Cimitero di Atella, Basilicata, Italy. **1,** *Palaeoloxodon* tusk (photo P. Levy); **2,** cervid coxal; **3,** cervid rib.

conditioning procedures have probably affected the conservation of the fauna.

The cervids are the most represented in the assemblage in number of remains, and we can notice the absence of other taxa typical of such assemblages, such as horses. Carnivores and lagomorphs have not been yet identified in the assemblage. The presence of large bovids is confirmed, but the distinction between *Bos* and *Bison* is still in progress (Fig. 10.4: 2, 3). The elephant remains (tusk, molar and long bones) are fragmented and were not found in anatomical connection (Fig. 10.4: 1). No evidence of human modification on the elephant carcass was identified. We hope that the new excavations will increase the degree of diagnostic remains and allow to conduct taphonomic analyses on the fauna.

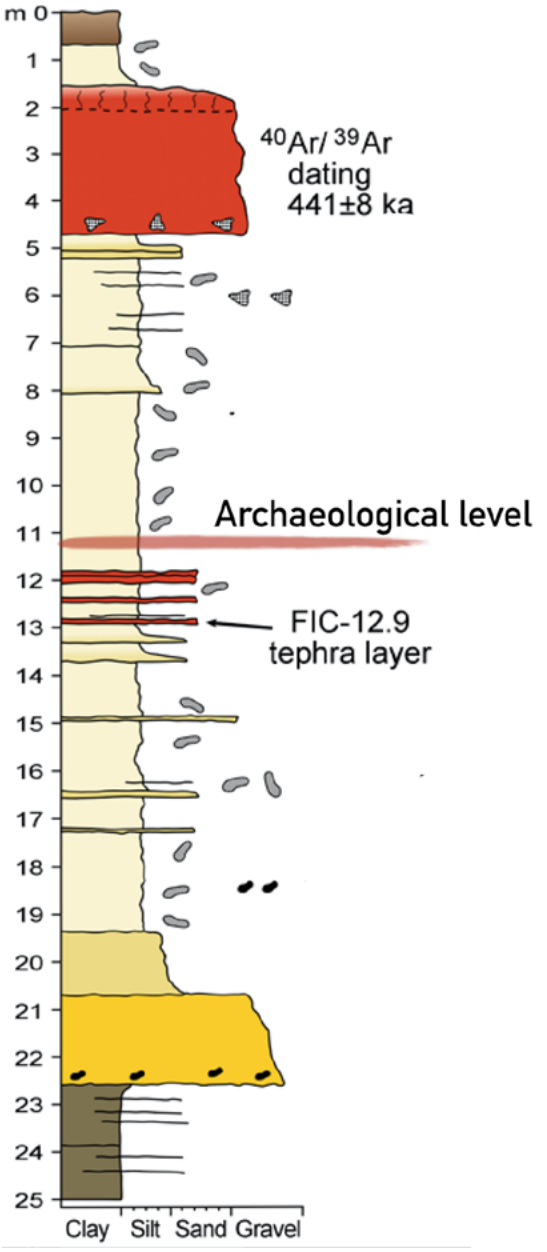

Figure 10.5: Stratigraphic log of Ficoncella, Lazio, Italy (modified from Aureli et al., 2015).

10.3 FICONCELLA

The site of Ficoncella, was discovered by local amateurs, who recovered one elephant scapula in a reworked area and one elephant right tusk. The site was stratigraphically excavated from 2010 to 2015 (Aureli et al., 2015, 2016).

10.3.1 GENERAL CONTEXT

The site is located in central Italy (Fig. 10.1), near the city of Tarquinia on the left slope of the Mignone river valley and consists of an alluvial sedimentological context. Depositional setting is related to the filling of an ancient small valley tributary of the Mignone river.

The presence of two volcanic layers, together with other geological evidence, dated the site between 500 ka and 450 ka. The part of stratigraphic sequence, where animal remains and lithics were deposited, seems to be related to more palustrine conditions, that in a broader floodplain context is generally characterized by the alternation of flood events with sub aerial exposures during dry periods (Fig. 10.5).

The results of the taphonomic and geological analyses, as well as the presence of several refittings, suggest that the formation processes of the Ficoncella site seem to be similar to a snapshot, and that the lithic and faunal remains were buried not long after the elephant's death.

10.3.2 LITHIC INDUSTRY

LITHIC REDUCTION SEQUENCE | The presence of hominin activities is attested by about 500 lithic implements, including very small flakes. No bifaces or other large cutting tools were found in the excavated area. Thanks to technological analyses, we have determined two distinct reduction sequences (Aureli et al., 2016). The first reduction sequence is performed on small flint pebbles, in order to obtain "small-tools" with several cutting-edges (Fig. 10.6: 2, 3). The small flakes coming from this reduction sequence, retouch and notches flakes (Fig. 10.6: 4, 5) are as well used on several work materials. The second one concerns large limestone pebbles exploited to obtain simple unretouched flakes (Fig. 10.6: 1).

LITHIC TOOLS | The unretouched flakes present a rectilinear edge, convergent or not, associated with

Figure 10.6: Lithic industry of Ficoncella, Lazio, Italy. **1,** Flake; **2–3,** small tools; **4,** notch flake; **5,** retouch flake.

an opposite or adjacent back. The presence of macro-traces of use confirms the intended functional potential of the transformative area inferred from the techno-functional analysis (Aureli et al., 2016). For example, some items have edge-removals and edge-rounding interpreted as working of materials of medium hardness through cutting. So, this group is characterized by flakes with a high cutting potential and relatively strong edges, given their use for the processing materials of various hardness (Lemorini in Aureli et al., 2016).

Among the small tools, two main groups were identified. The first group called spina, shows a small pointed part of the tool with a trihedral section, and a central ridge. They are generally associated with an edge of a few millimeters in length, that can be rectilinear, concave or slightly denticulate. We always observe on these pieces one, or more frequently two backs that may play an important role in the grip and the trans-mission of energy. The second category is represented by the mini-rostrum, a small robust bevel with an important angle, of a few millimeters long with a slightly denticulate delineation. We also note the presence of a thick back adjacent to the transformative part that may play an important role in the grip.

The use-wear analysis shows edge-removals on four small tools. Along one of the lateral edges forming the spina and very small edge-removals were observed on the marginal portion of the edge left before the re-sharpening aimed to produce the mini-rostrum (Lemorini in Aureli et al., 2016).

10.3.3 FAUNAL REMAINS

Almost all the faunal remains are fragmented and mostly smaller than 30 mm. Most of the specimens are unidentified due to fragmentation, but a number of them are unidentified skull fragments and flat bones probably linked to the alteration of the elephant skull (Boschin et al., 2018).

The *Palaeoloxodon* skull is incomplete, and comprises the occipital area, the left zygomatic and the maxilla, whilst the right zygomatic bone is not present. The braincase is missing and fragments of

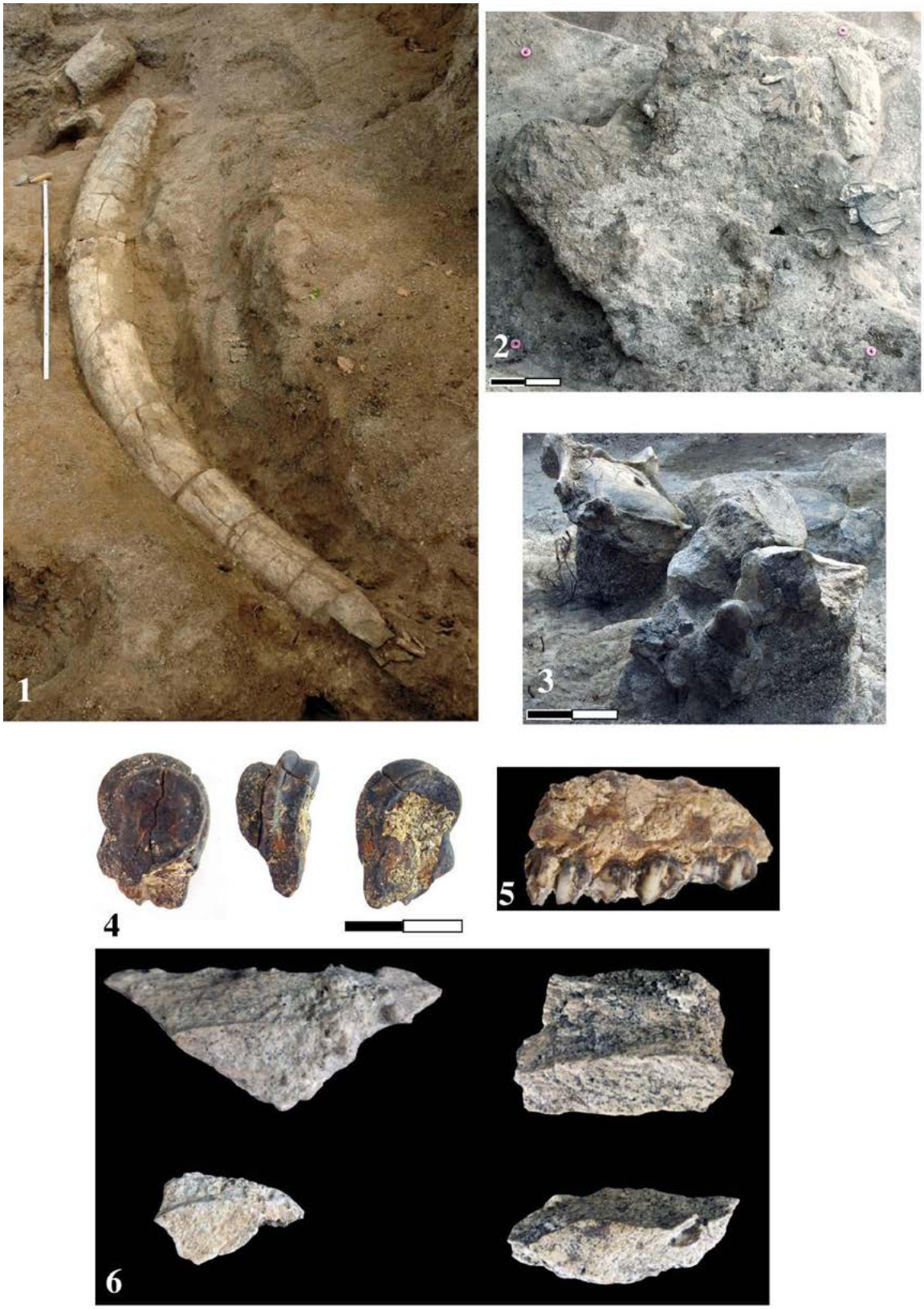

Figure 10.7: Fauna of Ficoncella, Lazio, Italy. **1,** *Palaeoloxodon* tusk; **2,** *Palaeoloxodon* skull; **3,** *Palaeoloxodon* vertebrae; **4,** roe deer distal metapodial; **5,** fallow deer maxilla; **6,** megafauna bone flakes.

Sites	OIS	Large-tool	Hand-axe	Small-tool	Flake	Levallois	Hafting	Bone tool	Digging sticks
Campitello	OIS6?					+++	+++		
Poggetti vecchi	OIS6			++	++		++	+	+++
Campoverde	OIS7			++	++				
Torre in Pietra d	OIS7			++	++	+			
Monte delle Gioie	OIS8			+	+	+			
La Polledrara	OIS9			+++	++			+	
Castel di Guido	OIS9	+	+++	++	+			+	
Torre in Pietra m	OIS10		+++	++	++				
Guado San Nicola	OIS10		+++	+	++				
Fontana Ranuccio	OIS11	+	++	+++	++			+	
Ficoncella	OIS13			+++	++			+?	
Isernia la Pineta	OIS15	+		+++	++				
Cimitero di Atella	OIS15	++		+++	+				
Notarchirico	OIS16	++	+?	+++	+				

Table 10.1: Main features of the Middle Pleistocene elephant sites in Italy.

the premaxillary bones were found near the skull (Fig. 10.7: 2). Tusks were found still in the alveoli (Fig. 10.7: 1). Two complete *Palaeoloxodon* cervical vertebrae, together with the axis, two caudal vertebrae and a fragment of the innominate were found near the apex of the left tusk (Fig. 10.7: 3).

Fallow deer and equid remains were found next to the elephant skull along with other cervids as well as small to mediumsized ungulate remains. In particular, one proximal fallow deer metacarpus was found with the plesio-metacarpal bones still in anatomical connection. In the same area, one roe deer distal metapodial (Fig. 10.7: 4), some cervid remains and a hyaenid coprolite were also found.

Archaeozoological analyses indicate that the elephant carcass was scattered and modified by both carnivores and hominins. On the one hand, a coprolite and a skull fragment with crenulated edges were found at the site, whereas on the other hand, impact flakes from megafauna bones may point to direct evidence of elephant carcass exploitation (Fig. 10.7: 6). As for the hominin modification of the elephant carcass, bone flakes may indicate the intentional breakage of skeletal elements for various purposes: marrow extraction? Bone tool production?

It is intriguing to note that fragments of elephant long bones, most probably the blanks where those bone flakes come from, were not found. It may testify a transport of elephant long bones, perhaps as fragments, to other areas of the site or to other sites, or that the bones flakes were produced elsewhere and introduced in this area of the site. This may confirm that the occurrence of other taxa should not be considered to be originated from the reworking of older sediments as previously hypothesized, since traces of intentional bones breakage were observed, and modifications related to transport by water were not detected. Consequently, Ficoncella cannot be considered as a single carcass site. At the moment, due to the small excavated area and the scarcity of data, it is difficult to know whether individuals belonging to other taxa died at site due to natural factors or if their carcasses were brought there by hominins.

10.4 DISCUSSION

We will now try to compare the results obtained with the published data on the other Italian sites

between OIS 15 and 6, where elephant remains were found. To be able to examine the archaeological data in their wholeness, we took into account the following parameters: the archaeological context (geological context, chronological attribution and temporality of occupation), faunal data and technical aspect (Table 10.1).

10.4.1 ARCHAEOLOGICAL CONTEXT

The archaeological contexts of these sites appear quite diversified, some sites being the results of secondary position occupation and others of different degrees of primary position occupation. This needs to be taken into account for the comparison and interpretation. This is also the case for the temporality of occupation, that can influence the interpretation of the data and the nature of the activities on the site.

We can observe different situations: a single and very short occupation, as for example at La Polledrara (Anzidei et al., 2012, Santucci et al., 2016; Pereira et al., 2017) or Ficoncella (Aureli et al., 2012, 2015), but also different occupations repeated for a long time as at Isernia la Pineta (Coltorti et al., 2005).

The geological context is less various, as many sites were buried in lacustrine (Borzatti et al., 1997), alluvial (Radmilli and Boschian, 1996; Lefèvre et al., 2010; Aureli et al., 2015) and in a case at Poggetti Vecchi in a hydrothermal condition (Benvenuti et al., 2017), so often in relationship with a water agent. Sediments of volcanic origin are almost always present and give to the Italian record a particular interest regarding the precision of the chronological resolution (Pereira, 2017).

10.4.2 FAUNAL DATA

As for the fauna, we observe that elephants are never the only represented taxon (Mazza et al., 1992, 2006; Borzatti et al., 1997; Piperno and Tagliacozzo, 2001; Boschian and Saccà, 2010; Aureli et al., 2012; Saccà, 2012; Peretto et al., 2016; Rocca et al., 2016, 2018; Santucci et al., 2016; Boschin et al., 2018), even in short time occupation, at the exception of one level of La Polledrara (Anzidei et al., 2012). We need to remind that the dimension of megafauna remains has also contributed to the overrepresentation of this taxon in the site, as it is often at the origin of the site discovery.

Concerning the bone taphonomy: if some elephant bones are often in anatomical connection, some parts of the carcass were in many cases moved by humans and/or carnivores, even in a well preserved primary context, such as Ficoncella (Boschin et al., 2018), some levels of Notarchirico (Piperno and Tagliacozzo, 2001) or La Polledrara (Santucci et al., 2016). The impact fractures on elephant bones are well represented (Peretto et al., 2004, 2016; Saccà, 2012; Santucci et al., 2016) and mainly interpreted for the marrow extraction, unlike the cut marks that are very rarely present on the elephant bones, even when observed on the other taxa, as for example at Castel di Guido (Saccà, 2012; Boschian and Saccà, 2015), Guado san Nicola (Peretto et al., 2016) and Poggetti Vecchi (Aranguren et al., 2019).

The exploitation of elephant bones for tool making is in state of art poorly represented (Anzidei et al., 2012; Boschian and Saccà, 2015; Aranguren et al., 2019). This could be linked to taphonomic reasons and to the difficulty to identify the elephant bones among fractured remains. This can also be explained by interpretative bias. Indeed, the bone flakes are often interpreted as the results of alimentary activities. These remains should be studied more deeply to confirm this hypothesis thanks to technological (Christensen and Goutas, 2018) and techno-functional analysis in comparison with the stone tool kit.

10.4.3 TECHNICAL TENDENCIES

At last, we try to sum up the technical evidence to have an overview of the main tools evolution. The technical traditions associated to the elephant sites

are various, in terms of reduction sequence, types and nature of tools.

Concerning the large-tool and handaxes, these tools are poorly represented but very different in the initial phases (Borzatti et al., 1997; Piperno, 1999; Moncel et al., 2019) and began to be more important but not always present during OIS 10–9 (Nicoud, 2011; Peretto et al., 2016; Arnaud et al., 2017; Pereira et al., 2018) and were totally absent during the recent phase. This indicates the absence of link between large tools and elephant carcass exploitation.

The small tools with very varied cutting-edges are present all along the period on almost all sites (Peretto et al., 1994; Aureli et al., 2016; Villa et al., 2016; Arnaud et al., 2017; Rocca et al., 2018) with the exception of Campitello (Mazza et al., 2006). However, we can observe that the blank procurement modality has been changing through time. During the earliest phases the blanks were mostly based on the selection as in the latest site the small tools are made on flakes. We can notice that, some elephant sites yielded only small tools like at La Polledrara (Anzidei et al., 2012; Santucci et al., 2016), while no sites contain only handaxes. The unretouched sharp flakes were also present during all the period (Aureli et al., 2016; Santagata, 2016; Rocca et al., 2018).

The production modalities have evolved from additional systems (as at Ficoncella) to more integrated systems such as Levallois, from OIS 8 at Torre in Pietra and Monte delle Gioie in Lazio (Soriano and Villa, 2017). When this Levallois concept developed, both bifacial and small tools begin to disappear, and in parallel the hafting emerged as it was attested at Campitello (Mazza et al., 2006).

Finally, around elephant carcasses, bone tools are found at some sites. Even if the research on this aspect must continue, we can already observe that bone tools seem to be close to the stone tools: handaxes at Castel di Guido and Fontana Ranuccio (Boschian and Saccà, 2015), or small tools at Fontana Ranuccio and Polledrara (Anzidei et al., 2012; Marinelli et al., 2019). At Poggetti Vecchi, also wooden tools were found, interpreted as diggings sticks, during OIS 6 (Aranguren et al., 2018), providing a small window into the hidden technical complexity of these groups.

The current trend towards specialization can create methodological obstacles. This problem is obvious in the case of bone tools, mainly produced during the Lower Palaeolithic on elephant bone fragments. If the bone handaxes of central Italy were quite easily recognized as human artifacts (Boschian and Saccà, 2015) simple flakes and maybe small tools on the same raw material are more difficult to identify. The study of fauna is still too often exclusively carried out through an archaeozoological and not in technological prospect. The collaboration between experts of lithic and bone technology and archaeozoologists, and the revision of the collection may allow to have a fresh look at the use of elephant bone materials during the Lower Palaeolithic.

10.5 CONCLUSIONS

In short, we can wonder what tendency has emerged from this overview of the relationship between humans and elephants in Italy.

It is obvious that elephants in Italy were very important during the Middle Pleistocene, present almost in all sites where fauna is preserved, even if this presence can in part be explained by the dimensions of their bones that facilitate the site's discovery. First of all, concerning the evolution of lithic tools, we face a much more complex situation regarding the technical evolution. We have observed a great diversity of tools and reduction sequences. However, the same tendencies have been recorded in southwestern Europe in other sites without elephant remains. Therefore, there is no evidence of a specific tool kit linked to elephant site.

Secondly, elephants are never the only represented taxon, even in very well-preserved and short occupation contexts, and often with cut marks, indicating probably some more complex modalities of occupation than previously thought. Indeed,

the image of the opportunistic and casual exploitation on a very short time of a single carcass by human groups is not supported by data. This is also discernible in the lithic assemblages, that testify anticipating techno-economical strategy.

However, if clear evidence of elephant carcass exploitation is lacking, several weak indicators (transport of portion of the carcass, fracture on the bones, simple tool making) converge to indicate that elephants played an important role in the site, maybe like a mile-stone in the territory, or an attraction point.

This observation may indicate that in order to go further in the investigation of the relationships between humans and elephants we need to take into account other components (human and no human) of the associated environment. And that the human and elephant pair can rather be thought as a prism to understand the cultural and behavior variability.

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