doi: 10.13133/2280-6148/18150 *Journal of Mediterranean Earth Sciences 15 (2023), 187-193*

J M E S **Journal of Mediterranean Earth Sciences**

The oldest lithic industries of the Agro Pontino (Latium, central Italy)

Michelangelo La Rosa [1,*], Fabrizio Marra [2]

[1] *Antiquarium Comunale di Nettuno, Nettuno (RM*
[2] *Istituto Nazionale di Geofisica e Vulcanologia, Roma, Italy*
* *Corresponding author: miki.larosa@libero.it*

ABSTRACT - Recent chronostratigraphic and paleoclimatic investigations carried out in the Pontine Plain (Agro Pontino) have made it possible to better specify the chronological position of the oldest lithic industries found in the area. The terrains in which the rare bifaces and choppers were found in the localities of Le Ferriere-Torre del Giglio and Valloncello as well as the microlitic industry from an excavation essay carried out in Quarto delle Cinfonare, have been correlated with the MIS 9 aggradational succession (340-320 ka). These lithic artifacts hold the oldest testimonies (late Lower Paleolithic) of the anthropic population of the Pontine territory. In Campoverde, on the other hand, the complex succession of deposits containing the archeological materials, including the MIS 7.5 aggradational succession and younger colluvial deposits, made it possible to hypothesize the coexistence of two lithic technocomplexes. The oldest lithic industry, attributable to the early Middle Paleolithic, is mainly characterized by denticulates, borers, and choppers while the most recent set, with a strong presence of sidescrapers, has significant similarities with the Pontinian Mousterian.

Keywords: Pontine Plain; lithic industries; aggradational successions; late Lower Paleolithic; Middle Paleolithic.

Submitted: 16 April 2023 - Accepted: 12 July 2023

1. INTRODUCTION

Massive land excavations and agricultural works carried out in the 1980s in the Agro Pontino area (Pontine Plain) within the Astura river basin have brought to light a large amount of fossil remains and lithic artifacts referable to different periods of the middle-upper Pleistocene (La Rosa et al., 1989-90; La Rosa, 1998; Vianello et al., 1995). Currently, the materials are stored in the Antiquarium Comunale di Nettuno and partially exhibited in the Prehistoric and Paleontological section.

The age of the deposits that contain the lithic industries has recently been constrained through a combined methodological approach integrating $^{40}Ar/^{39}Ar$ dating on detrital sanidine (Marra et al., 2019a) with the sedimentary model of aggradational successions (Marra et al., 2008, 2016) which allows the correlation with the marine isotopic stages (MIS) (Marra et al., 2019b, 2023). The aim of the present work is to provide an updated and rigorous chronological framework for the oldest lithic industries of the Pontine region through a review of extant literature and previously unpublished data. The methodology of analysis is necessarily that adopted in previous studies and this paper is intended to establish the basis for future re-examination of the lithic industries following more current methodologies.

2. MATERIALS AND METHODS

At the moment Quarto delle Cinfonare (Latina) and Campoverde (Aprilia-LT) are the most important and best-known localities of the Agro Pontino region (southern Latium) which returned a large number of artifacts of the earliest Paleolithic. The excavation in 1994 at one of these sites, Quarto delle Cinfonare on the right bank of the Astura River (Peretto et al., 1997), resulted in the collection of an abundant lithic industry (about 1100 artifacts) which can be dated to the final phase of the Lower Paleolithic. The archeological level, in fact, lies below the top of the MIS 8.5 aggradational succession and is bound by two $^{40}Ar/^{39}Ar$ age dates obtained from the underlying Tufo Lionato (368±5 ka) and from a 288±4 ka old tephra encased in the succession (Fig. 1) (Marra et al., 2019b). However, the elevation at which the archeological layer occurs, immediately above the Tufo Lionato, suggests that it is embedded within sediments of the MIS 9 aggradational succession, rather than of MIS 8.5 succession, tying its age to the interval 335-325 ka.

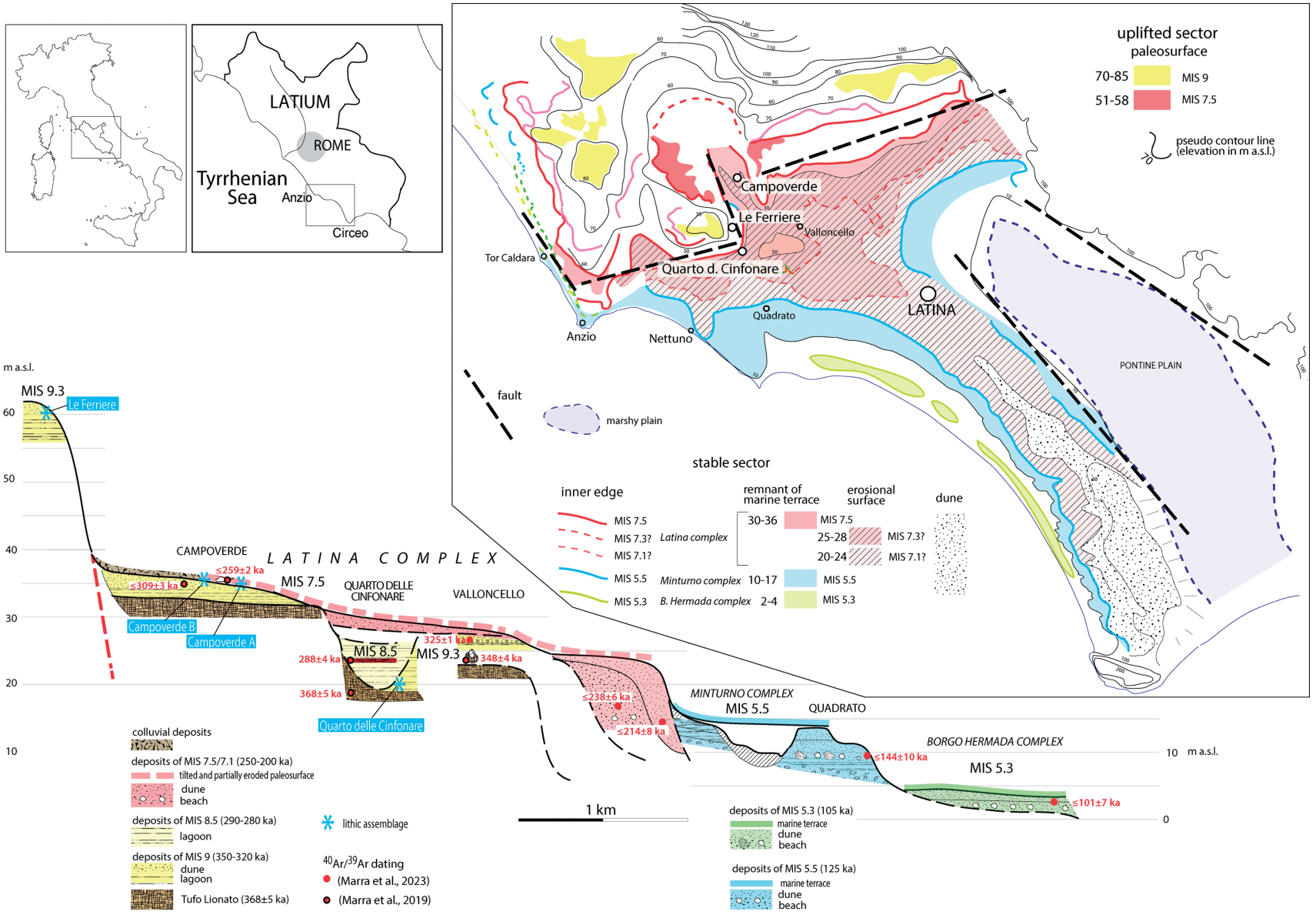

Fig. 1 - The archeological sites investigated in the present study are framed within the morpho-chrono-stratigraphic setting of the Pontine Plain, where a suite of four marine terraces has been correlated with the marine isotopic stages (MIS) 9, 7, 5.5 and 5.3 by means of $^{40}Ar/^{39}Ar$ age constraints (modified from Marra et al., 2023).

The lithic industry, which is made on very small flint pebbles of local provenance, can be as microlithic, since the average dimension of the artefacts ranges between one and three centimeters. Among the retouched tools, more than 60% is represented by denticulates (25.9%), sidescrapers (23.5%) and borers (14.8%), particularly characteristic are the micro-choppers with bifacial flake scars, obtained on flint pebbles, some even only a centimeter long, characterized by a cutting edge with a rather acute angle and often affected by small re-touching.

An analysis of technological attributes of the lithic assemblage, accompanied by a series of experiments (Milliken et al., 1998) enabled the hypothetical reconstruction of the reduction sequences followed by the hominins of Quarto delle Cinfonare to produce the lithic artifacts. The technique used seems to have been nearly always that of bipolar percussion on the anvil (Fig. 3, B), as it is very high the occurrence of flakes with dihedral ventral faces, spiked and flat bulbs, and other characteristic attributes produced by this technique. If the

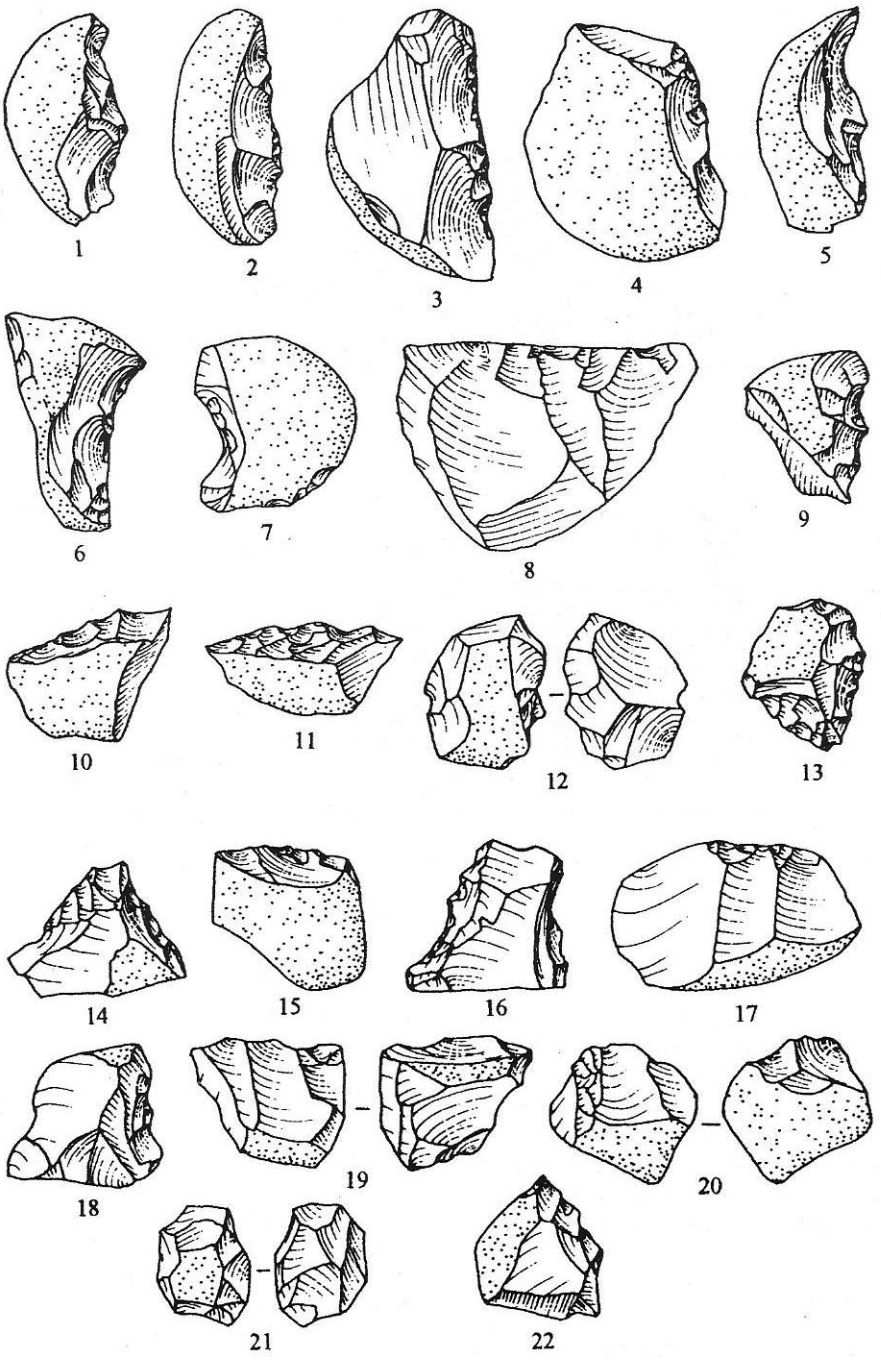

Fig. 2 - Quarto delle Cinfonare: lithic industry 1,9,12,16,18 denticulates; 2-3,6,10-11,13,15 sidescrapers; 4,14,17 endscrapers; 5,7 notches; 8 core; 19,21 residual cores; 20 micro-chopper; 22 borer (natural size).

pebble is large enough and/or elongated then it is possible to produce a series of blanks using direct percussion (Fig. 3, D) and typically these blanks are characterized by wide and very inclined platforms. However, in order to produce further series of blanks and therefore to exploit the pebble to the maximum, below a certain size (between one and two centimeters) it is necessary to change to bipolar percussion on the anvil, and the maximum reduction of pebble results in the formation of a residual core (Fig. 3, B3; Figs. 2, 19 and 21). The blanks were selected for retouching along a *continuum*, and not at a specific size or stage in the reduction sequence**;** therefore, there are both large and small cortical flakes and not-cortical retouched flakes. There also appears to have been no intention to produce a particular morphological category of artifact such as blanks with subparallel or convergent edges. Therefore, there is no evidence for technical choices having been oriented towards the production of morphologically and dimensionally characterized blanks; on the contrary pebble reduction seems to have been determined by the necessity to exploit the raw material to the maximum, or in other words to produce the largest number of blanks possible. It is clear how the hominins of Quarto delle Cinfonare were strongly limited in their technical choices by the size and morphology of the raw material; this could explain among other things the absence of bifaces which are present in other contemporary industries of the region (e.g., Torre in Pietra, level m) (Piperno and Biddittu, 1978).

The very rich Pleistocene deposit of Campoverde,

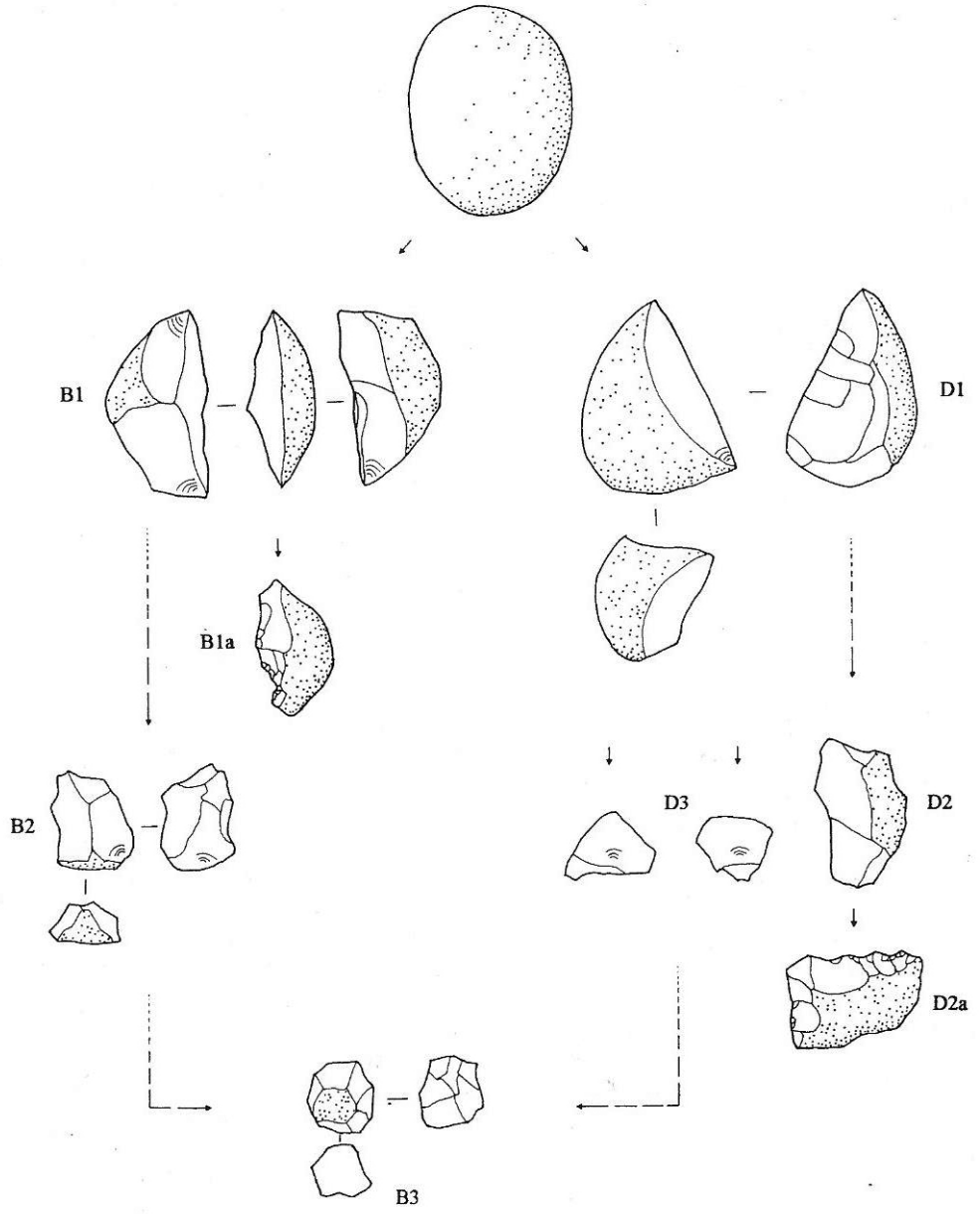

Fig. 3 - Quarto delle Cinfonare: hypothetical reconstruction of the reduction sequence (from Milliken et al., 1998).

which came to light following the rectification works of the Pane e Vino ditch, a tributary of the Astura River, has yielded a great amount of fossil bone fragments (Mazza et al., 1992), a deciduous tooth currently under study (at the Laboratorio di Antropologia of Firenze University) and lithic industry of Middle Paleolithic (La Rosa, 1998). Recent studies on the technological and typological aspects of the lithic materials together with taphonomic analyses (Marra et al., 2018) have allowed us to hypothesize the coexistence of two diachronous techno-complexes following one another.

The two assemblages (Campoverde A and B in figure 1) were found mixed within the excavated terrains. Chronostratigraphic investigations conducted by Marra et al. (2019b, 2023) have shown the occurrence of whitish carbonate muds of lagoon environment in the underground, for which two $^{40}Ar/^{39}Ar$ dates provide an age interval of 309±3-259±2 ka (late MIS 9-MIS 7.5), covered by younger colluvial deposits.

The oldest industry (244 finds) can be attributed to the early Middle Paleolithic based on its characteristics (Fig. 4): a high percentage of corticated blanks obtained from small pebbles, a strong predominance of the corticated and flat striking platform, the absence of the Levallois method, and the presence of bipolar and centripetal technology of cores are observed. Unretouched blanks are rare whilst carinated blanks are abundant. Retouched blanks (60,2% of total) are extremely small and are mainly composed of denticulates, often microlithic (42,9%), sidescrapers (21%), borers (8,8%), retouched flakes (7,5%), endscrapers (6,8%) and choppers (6,1%).

Notably, this assemblage displays diverse and interesting taphonomic evidence. A large number of artifacts exhibit a brownish polished patina (86%) while only a small percentage (14%) does not display a patina at all; sharp and rounded edges are present in both categories. Moreover, diffused ichnotraces and encrustations attributable to aquatic organisms, probably

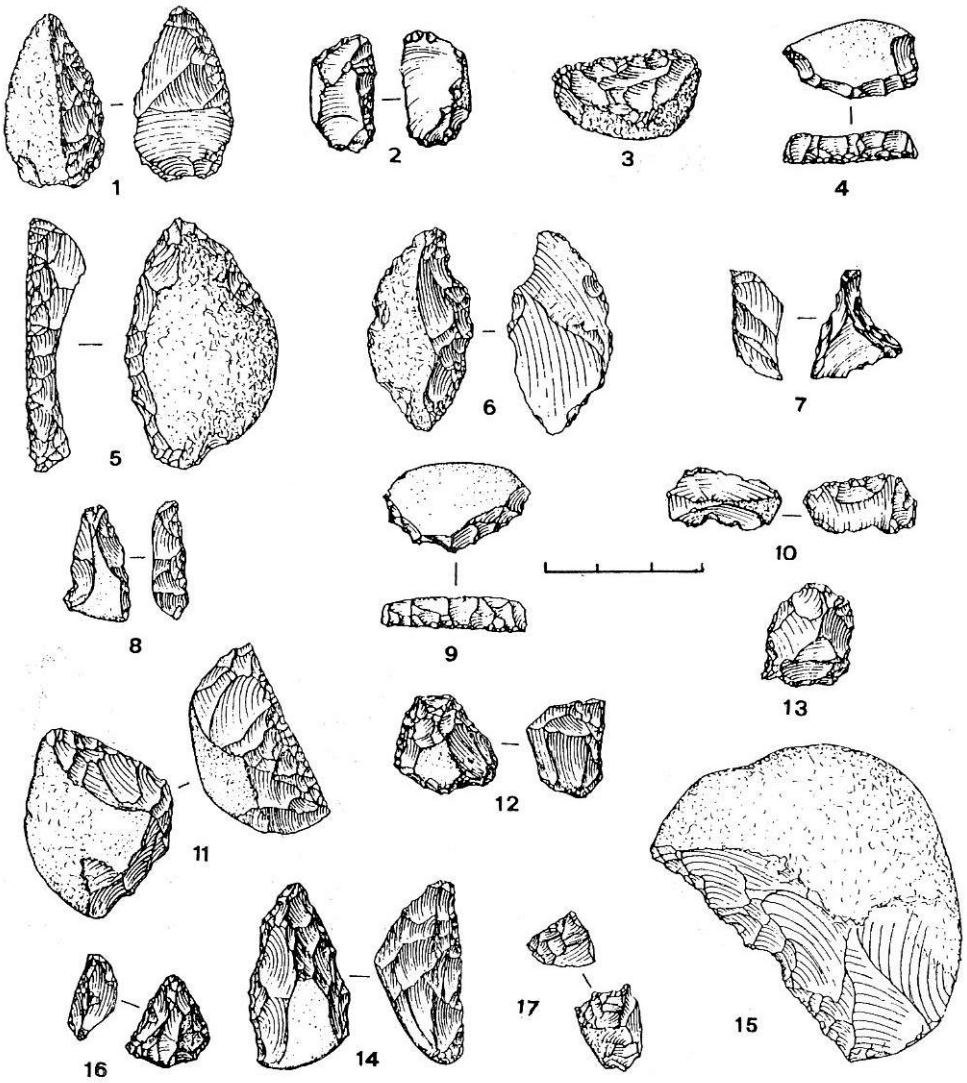

Fig. 4 - Campoverde: lithic industry 1-5, 14 sidescrapers; 6-10, 15 denticulates; 11, 12, 16 endscrapers; 13, 17 borers.

Vermitidae, suggest that the area experienced marine conditions after the lithics were discarded, highlighting the provenance from the lagoon sediments forming the geologic substrate.

In contrast, a more recent lithic ensemble, made up of 346 finds, can be recognized based on the occurrence among the retouched blanks (26% of the total) of a large predominance of scrapers (73.3%), followed by denticulates (15,6%), notches (6,7%) and borers (4,4%). The Levallois method is rarely observed (IL=3,3) and the butts are mostly natural (42.4%) or flat (33.3%); indeed the index of "facetage" is quite low (IF=25) albeit not negligible. Among the cores (n=34), more than a third are centripetal (23.5%) or with prepared striking platform (11.8%). There are no Levallois cores.

Notably, the second assemblage does not show patinas or encrustations of any type. Important artifacts have been recovered at Le Ferriere-Torre del Giglio (Aprilia-LT), among which a well-produced bifacial chopper with convex cutting and an amigdaloid biface with a preserved cortex base (Torre in Pietra type) (Fig. 5), both obtained on flint pebbles. Although the finds come from surface collection, the outcrop's elevation suggests correlation with the MIS 9 terrace (350-300 ka). Lastly, a partial biface made from limestone pebble (Fig. 6) and a chopper-like lithic tool embedded within a pyroclastic block dated 348±6 ka (Marra et al., 2019b) were found at Valloncello (Cisterna di Latina-LT) (Fig. 7).

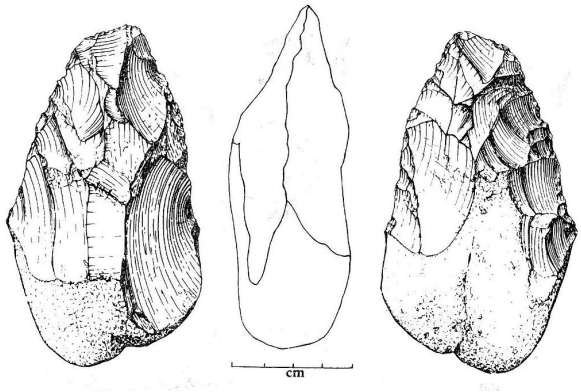

Fig. 5 - Le Ferriere-Torre del Giglio: Acheulean biface.

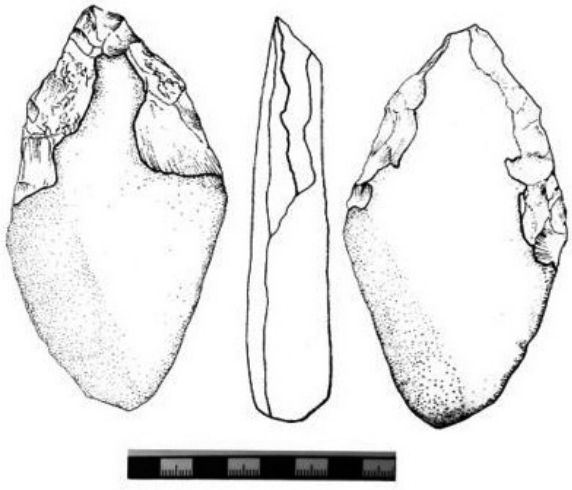

Fig. 6 - Valloncello: partial biface.

3. CONCLUSIONS

In the current state of knowledge, it can therefore be hypothesized that the first human settlement of the Agro Pontino occurred during the late Lower Paleolithic (MIS 9), as evidenced by the bifaces and choppers found at the sites of Le Ferriere and Valloncello, as well as the microlithic industry of Quarto delle Cinfonare. Subsequently, during MIS 7, the first Neanderthal groups probably arrived to craft the early Middle Paleolithic of Campoverde; conversely, the most recent industry of the same site dates back to MIS 5.5 and has characteristics similar to the Pontinian Mousterian that will later characterize the Neandertal production in the Pontine Plain (Blanc, 1939; Taschini, 1979).

Fig. 7 - Valloncello: artifact (chopper?) embedded within a pyroclastic block.

ACKNOWLEDGEMENTS - The authors would like to thank Marco Mancini and an anonymous reviewer for their careful reading of the manuscript and their comments and suggestions.

REFERENCES

Blanc A.C., 1939. Un giacimento aurignaziano medio nella grotta del Fossellone al Monte Circeo. Atti della XXVII Riunione Scientifica della Societa Italiana per il Progresso delle Scienze, Bologna 4-11 settembre 1938, 215-221.

La Rosa M., Mazza P., Rustioni M., Vianello F., 1989-90. Agro Pontino (Prov. di Latina e Roma). Rivista di Scienze

Preistoriche 42, 356-359.

La Rosa M., 1998. The earliest Paleolithic industries of the Agro Pontino (Latina, Central Italy. In: Pearce M., Tosi M. (Eds.), Papers from the European Association of Archaeologists Third Annual Meeting at Ravenna 1997, vol. I: Pre- and Protohistory, BAR International Series, 717, 6-10.

Marra F., Florindo F., Boschi E., 2008. History of glacial terminations from the Tiber River, Rome: Insights into glacial forcing mechanisms. Paleoceanography 23, 1-17.

Marra F., Rohling E.J., Florindo F., Jicha B., Nomade S., Pereira A., Renne P.R., 2016. Independent 40Ar/39Ar and 14C age constraints on the last five glacial terminations from the aggradational successions of the Tiber River, Rome (Italy). Earth and Planet Science Letters 449, 105-117.

Marra F., Petronio C., Ceruleo P., Di Stefano G., Florindo F., Gatta M., La Rosa M., Rolfo M.F., Salari L., 2018. The archeological ensemble from Campoverde (Agro Pontino, central Italy): new constraints on the Last Interglacial sea level markers. Scientific Reports, SREP-18-23649.

Marra F., Gaeta M., Jicha B.R., Nicosia C., Tolomei C., Ceruleo P., Florindo F., Gatta M., La Rosa M., Rolfo M.F., 2019a. MIS 9 to MIS 5 terraces along the Tyrrhenian Sea coast of Latium (central Italy): assessing interplay between oscillations and tectonic movements. Geomorphology 346, 106843.

Marra F., Bahain J.-J., Jicha B., Nomade S., Palladino D.M., Pereira A., Tolomei C., Voinchet P., Anzidei M., Aureli D., Ceruleo P., Falguères C., Florindo F., Gatta M., Ghaleb B., La Rosa M., Peretto C., Petronio C., Rocca R., Rolfo M.F., Salari L., Smedile A., Tombret O., 2019b. Reconstruction of the MIS 5.5, 5.3 and 5.1 coastal terraces in Latium (central Italy): a re-evaluation of the sea-level history in the Mediterranean Sea during the Last Interglacial. Quaternary International 525, 54-77.

Marra F., Sevink J., Tolomei C., Vannoli P., Florindo F., Jicha B.R., La Rosa M., 2023. New age constraints on the MIS 9 through MIS 5.3 marine terraces of the Pontine Plain (central Italy) and implications for global sea levels. Quaternary Science Reviews 300, 107866.

Mazza P., Moggi-Cecchi J., Rustioni M., 1992. Vertebrate remains from Campoverde, Latium, Central Italy. Antropologia Contemporanea 15, 65-83.

Milliken S., La Rosa M., Peretto C., 1998. An experimental approach to the reconstruction of the chaines opératoires in a Lower Paleolithic pebble industry from west-central Italy. Proceedings XIII International Congress of Prehistoric and Protohistoric Sciences, Forlì 8-14 September 1996, 6, 751-758.

Peretto C., La Rosa M., Liboni A., Milliken S., Sozzi M., Zarattini A., 1997. Le gisement de Quarto delle Cinfonare dans le cadre du Paléolithique inférieur de l'Italie ouest-centrale. L'Anthropologie 101, 597-615.

Piperno M., Biddittu I., 1978. Studio tipologico ed interpretazione della industria acheuleana e pre-musteriana dei livelli 'm' e 'd' di Torre in Pietra (Roma). Quaternaria 20, 441-536.

Taschini M., 1979. L'industrie lithique de Grotta Guattari au Mont Circé (Latium): definition culturelle, typologique et chronologique du pontinien. Quaternaria 12, 179-247.

Vianello F., La Rosa M., Mazza P., Moggi-Cecchi J., Rustioni M., 1995. Paleolithic from the volcanoclastic deposits of the Agro Pontino, Latium, Central Italy. Quaternaria Nova, 5, 7-22.