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HUNTERS BEFORE 'DIANA': EXAMINING PRE-PROTOHISTORIC LITHIC ARTIFACTS AT THE SANCTUARY OF 'DIANA NEMORENSIS' (LAKE NEMI, CENTRAL ITALY) AS AN INDICATOR OF HUMAN-ENVIRONMENTAL INTERACTION

Abstract: The excavations of the Temple of Diana at Nemi (Lake Nemi, central Italy) from 2009 to 2021 yielded pre-protohistoric lithic artifacts. This information, combined with available geoarchaeological and palaeoenvironmental data, enables a reconstruction of lake level changes as well as human socio-economic and cultural activities in the area from the end of the Pleistocene to the Mid-Late Holocene. The results suggest that Epigravettian hunters occasionally exploited the basin area during the Final Palaeolithic. In the Early-Middle Holocene, rising water levels, reaching approximately 360 m above sea level, potentially hindered human occupation. However, during the Mid-Late Holocene, decreasing water levels allowed late prehistoric and protohistoric groups to engage in diverse activities in the basin, leaving traces that may hold early symbolic significance. The geomorphological setting and early occupation dynamics influenced the palaeoen-

vironmental conditions and the patterns of human presence and utilization of the area during the Iron Age and historical times.

Keywords: Alban Hills, Latium, Pleistocene, Early Holocene, Environmental changes, Prehistoric archaeology, Lithic industry

Introduction

The Alban Hills are a mountainous relief of volcanic origin that formed during the Middle and Upper Pleistocene in the central part of the Latium region (Marra *et al*. 2009; Funiciello and Giordano 2010; Giordano *et al*. 2010), southeast of Rome, Italy (Pl. 1: 1). While this area is well known for its rich protohistoric, classical, and medieval archaeological evidence, the record for the early phases of human occupation between the Pleistocene and the Early to Middle Holocene is still poorly documented and often limited to chance finds and sporadic materials. Middle Palaeolithic open-air sites have been repeatedly found at the foot of the Alban Hills, reflecting a prolonged Neanderthal occupation of the low hills (<200 m above sea level), where palaeosoils developed above the volcanic products during the late Middle and Upper Pleistocene (Rolfo *et al*. 2007; Altamura and Rolfo 2019). Upper Palaeolithic traces are scarcer; material originates from the same foothill area, but sparse evidence has also been recorded from the inner part of the massif (>200 m above sea level). Notably, dozens of stone artifacts have been collected in several locations along the southern portion of the ancient caldera (the Artemisio mountain range, the Pratone del Vivaro plain, and Lake Nemi), suggesting the existence of a disturbed Palaeolithic deposit named the Pratone del Vivaro/Colle delle Vacche site (Rolfo *et al*. 2007; Rolfo 2009; Altamura and Rolfo 2019). Flint cores, retouched blades, backed points, and end-scrapers attributed to the Final Epigravettian (ca. 12-10 ka [kilo annum] BC) have been recovered both on the ground (chance finds and surface collections) and during archaeological excavations of Holocene sequences as residual finds. To date, however, primary or undisturbed Palaeolithic deposits have not been documented. Moreover, the same area yielded a few ochre-stained pebbles and tools, as well as two specimens of mobiliary art: a flint pebble painted with a linear and geometric pattern and a marly limestone pebble used as a retoucher-hammerstone, decorated with ochre and sets of engraved notches (Altamura and Mussi 2014; Catelli *et al*. 2015; Altamura *et al*. 2016; Altamura 2019; Botticelli *et al*. 2022; Mussi *et al*. 2023). Besides the artifacts with probable

artistic or symbolic value, the quantity and quality of the evidence suggest that the locality was occasionally visited and likely exploited for hunting at the end of the Pleistocene. The lithic raw materials used during the Palaeolithic, as well as in later pre-protohistoric contexts (e.g., flint, limestone), are unrelated to the volcanic substrate of the area; hence, the implements must have been sourced from a significant distance, typically from the Pontine Plain and outcrops in the Apennines.

Following the Epigravettian period, the earliest traces of human presence in the area during the Holocene consist of a handful of Neolithic pottery sherds and polished lithic tools discovered at the sites of Colle dei Cappuccini and Montagnano-Campoleone in Albano Laziale (Anzidei and Carboni 2009), as well as a single pottery fragment from Nemi (Bruni 2014). During the Metal Ages, there was a notable increase in stable and widespread human occupation within the Alban Hills region. This is supported by various archaeological findings, including sporadic artifacts, traces of settlements, and burial sites (Gierow 1964; Chiarucci 1978; Angle 2003; Angle and Guidi 2007; Belardelli *et al*. 2007; Anzidei and Carboni 2009; Alessandri 2013; Altamura *et al*. 2022).

With reference to the central-southern sectors of the Alban Hills, human occupation during the Eneolithic (ca. IV-III millennia BC) is attested by a burial found at Le Corti, near Velletri (Anzidei and Carboni 2009). An ochre-stained "vertebra" was initially interpreted as evidence of another Eneolithic burial from the Paluzzi area, close to Albano Laziale (Anzidei and Carboni 2009). However, a recent reevaluation of the material housed in the city's museum has revealed that the bone in question is actually an animal bone of indeterminate age. Sporadic traces are known from the Nemi basin (Moltesen 2010; Bruni 2014). A few kilometers from Nemi, an isolated copper axe, sporadic obsidian flaking debitage products, and three flint arrowheads were also found along the Artemisio mountain range (Angle 2003; Anzidei and Carboni 2009; Altamura and Rolfo 2016; Altamura and Scifoni 2021; Altamura *et al*. 2022).

In the central-southern region of the Alban Hills, the Early Bronze Age (2300-1700 BC) is represented only by sporadic finds, such as bronze axes discovered at Campi d'Annibale in Rocca di Papa and at I Cavallacci near Albano Laziale (Altamura *et al*. 2022). There are also indications that the early phases of the Villaggio delle Macine settlement, a pile-dwelling site on the northern shores of Lake Albano (Castel Gandolfo), and the Colle delle Grotticelle necropolis (Rocca di Papa) may date to this period (Angelini *et al*. 2006; Alessandri 2013). The Middle Bronze Age 1-2 (1700-1400 BC) is well documented, particularly by

the development of these two sites and especially by the rich, complex sequence found at Villaggio delle Macine along with its contemporary subsites along the basin shores (Angelini *et al.* 2006; Fischetti 2022). Additionally, sparse traces of settlements from this era have been identified at Lanuvio and Lariano (Alessandri 2013; Altamura *et al.* 2022). A hoard of bronze axes, similar to those found at Villaggio delle Macine and possibly unearthed near Lake Nemi, can also be attributed to this period (Altamura *et al.* 2022). Limited evidence suggests a Middle Bronze Age presence around the lake (Bruni 2014).

Archaeological research at the Sanctuary of Diana

Situated in the Il Giardino locality along the northern shores of Lake Nemi and designated since the Middle Ages for fields, gardens, and orchards, the area of the Roman Sanctuary has been yielding ancient materials since the 16th century. Although the imposing late-Republican substructures of the lower terrace have always remained visible, given their overall height of about 5 m and their good state of preservation, awareness of the site's spatial identification with Diana's sanctuary only emerged in the second half of the 19th century, when numerous excavation campaigns began (for a history of studies on the site and the results of recent and ongoing research see Diosono 2021; Diosono 2024). The Italian Ministry excavated the sanctuary, primarily in the area of the Roman theater, only in the early decades of the 20th century, coinciding with the significant effort to recover Caligula's ships, which involved lowering the waters of the lake by 23 m using the ancient Emissario and, later, constructing the Museo Nazionale delle Navi Romane. Throughout this phase of discoveries, earthworks, and excavations – both private and public – little attention was given to any pre-Roman phase, although materials mainly from the Archaic period emerged sporadically (many of which remain unpublished, with a few noted in Blagg 1983, 55-58, N650, and N713; 64, 553-559). In 1989, following the reopening of the Museo Nazionale delle Navi Romane after the fire of 1944 (Altamura and Paolucci 2023), the then official in charge of the former Soprintendenza Archeologica per il Lazio, Giuseppina Ghini, resumed studies and field activities at the sanctuary (e.g., Ghini 1995; Ghini 2000). She later involved the University of Perugia under the direction of Filippo Coarelli and the coordination of research by Francesca Diosono. Since 2014, the excavation has been conducted as a project by F. Diosono from the Ludwig Maximilian University of Munich in collaboration

with the Soprintendenza. From 2003 to 2009, the excavation campaigns focused on both the upper terrace – later identified as the site of the monumental nymphaeum – and the median terrace. The results have been published comprehensively, along with previous research conducted on the lower terrace (Braconi *et al*. 2014). Excavations in the middle terrace revealed what has been interpreted as Final Bronze Age terracing that included the presence of trees (Pl. 1: 2). Additionally, there is a hypothesis of a Recent and Final Bronze Age settlement, the remains of which were destroyed by later Roman structures, based on the significant occurrence of ceramic materials (Bruni 2009; Bruni 2014). It is also worth noting that sporadic materials representing traces of earlier occupations were found in the median terrace (for a summary of the studies on the possible relationship between this settlement and the mythological figure of the *rex nemorensis*, the King of the Forest, see Diosono 2014 and the references therein).

In 2009, excavation activities moved to the lower terrace, to the area around the temple of Diana – which constitutes the center of the Roman sanctuary from its origins to its greatest expansion in the late Roman Republican period, when it reached more than 3 hectares, organized on several levels (Pl. 2: 1). Initially, the worship of Diana, a deity of the Latins linked to nature, fertility, and status transitions throughout life, and for the Romans also associated with hunting (linking her to Artemis), took place in the woods (in Latin, *nemus*, from which the modern name of Nemi derives) and then in a sacred clearing dedicated to her around the end of the 6th century BC (for historical sources, see Diosono 2020). Between the 6th and the 5th century BC, the first proper temple was built, replaced by a larger building in the late 4th century BC when Rome defeated the Latins and took control of the sanctuary. A smaller temple was added to the east during the 3rd century BC. The final phase of the temple involved the destruction of all the preceding structures and its reconstruction in even greater proportions between 75 and 50 BC. All of these structures were built on a slight elevation formed by a silty layer identifiable as a portion of the bottom of the ancient lake, lying on yellowish tufa (from which the oldest temple is built) and scattered with basaltic boulders of different sizes, produced by slope debris deposits reworked and rounded by water along the ancient shore (Pl. 2: 2).

The podium from the second phase of temple construction, along with the even larger podium from the third phase, encompassed this lacustrine deposit, effectively preserving it. Toward the south, the elevation of the deposit decreased in line with the geomorphological profile of the substrate. Unfortunately, logistical issues hindered our ability to widen the excavation to the east and west of the

temple, preventing us from tracing the lateral extent of the layer. Nevertheless, the findings indicate that a Bronze Age settlement occupied the middle terrace (later modified by Roman-age substructions), while the entire lower terrace of the sanctuary was once submerged under lake water.

Besides the lithic industry described here, additional ceramic materials dating from the Neolithic to the Bronze Age were discovered at the Sanctuary of Diana during the 2009-2021 excavations. These finds are currently being studied by Dario Monti and Josif Atanasov, while Silvia Greggi is analyzing the pre-protohistoric materials from the area that were donated to the Pigorini Museum in 1904 (an inventory is available in Mangani 2004, 80). Both publications are in progress and are part of LMU's research project.

Geomorphology of the area

The volcanic activity of the Alban Hills began around 600 ka. The last eruptive phase of the volcanic complex, known as Via dei Laghi, is generally dated between 36 ka and 200 ka. This phase was marked by phreatomagmatic eruptions that created both monogenetic and polygenetic maars, including Albano, Nemi, Ariccia, Pantano Secco, Prata Porci, and Valle Marciana, collectively accumulating approximately 1 km^3 of tuffs and lithoid products. The Nemi maar is situated in the southwestern section of the main volcanic edifice (see Pl. 1: 1). It features a nearly 400 m deep crater, with its rim reaching 672 m above sea level on the northeastern edge. The crater has an 8-shaped configuration and a maximum diameter of 3 km. Its steep walls, typically with a gradient of 40 to 70%, were shaped by the Upper Pleistocene eruptions that cut through the substrate of the older Madonna degli Angeli and Rocca di Papa formations. By the end of the Pleistocene, after volcanic activity had ceased, the crater's bottom was filled by a shallow lake, sustained by rainfall and groundwater. Today, this lake is 32 m deep and covers an area of approximately 1.7 km^2 at an altitude of about 318 m above sea level (Ciccacci *et al.* 1987; D'Alessandro *et al.* 1987; Funiciello and Giordano 2010; Vigliotti *et al.* 2010). The rock walls and the northern portion of the basin – where a gently sloping plain is present at the crater's foot – are covered by soils and slope debris primarily formed during the Holocene (D'Alessandro *et al.* 1987; Arnoldus-Huyzendveld 1994; Giordano *et al.* 2010). In contrast, the submerged bottom developed a low-energy lacustrine sedimentation environment characterized by fine sand, clay, and silt (Ciccacci *et al.* 1987).

Stratigraphic sequences, dating, and palaeoenvironmental reconstruction

The Paliclas European Interdisciplinary Research Project

There is limited information about the Late Pleistocene to Holocene sequences in the area above the volcanic rock bed. In 1993, lacustrine sequences from Lake Nemi and nearby Lake Albano were sampled as part of the Paliclas European Interdisciplinary Research Project (Lami *et al*. 1996; Lami *et al*. 1997; Lowe *et al*. 1996). The core from Nemi PALB94-1B was drilled from the central part of the basin, 30 meters below the lake surface (Pl. 3). It is a 9.15-meter-long sequence formed by typical lacustrine sediments, including massive and laminated clayey-silty mud intercalated with diatom beds and laminae (Vigliotti *et al*. 2010). The sequence spans the entire Holocene and, at its base, extends down into the Younger Dryas at the end of the Pleistocene. The core was subdivided into three lithological units, and AMS radiocarbon dating was performed on organic materials within the sediments, yielding results of 11.3 ka, 6 ka, and 2 ka cal BP, starting almost at the base of the lowermost unit and proceeding upward to the upper unit. Within the section dated between the 6 and 2 ka cal BP, the Avellino tephra marker was also identified, providing another chronological reference at 4.1 ka BP (the Avellino tephra is currently dated to 1890 cal BC). The core was sampled for sedimentological, geochemical, biological, and palaeobotanical analyses, allowing for a detailed reconstruction of the local palaeoenvironmental conditions (e.g., Lami *et al*. 1996; Lami *et al*. 1997; Lowe *et al*. 1996; Guilizzoni *et al*. 2002; Mercuri *et al*. 2002; Magri and Celant 2009; Vigliotti *et al*. 2010). Palynology indicates that at the end of the Pleistocene (ca. 11.6-11.3 ka cal BP), the area was characterized by open, lightly wooded Late-glacial vegetation. This landscape was dominated by herbs, primarily sustained by *Artemisia* and Chenopodiaceae/Amaranthaceae, with occasional wooded areas featuring *Pinus*, *Juniperus*, and deciduous oaks. During the earlier phases of the Holocene (ca. 11.3-5.2 ka cal BP), the prevalence of *Artemisia* and Chenopodiaceae/Amaranthaceae grasslands decreased significantly, along with reductions in *Betula* and *Juniperus*. In contrast, trees and shrubs, particularly deciduous *Quercus*, along with *Corylus*, *Carpinus*, *Fagus*, and *Ulmus*, increased consistently as the climate improved. Pollens from *Olea*, *Castanea*, *Juglans*, and cereals, along with wild anthropogenic indicators, were low at the start of the Holocene, but their presence became more continuous between the seventh and fourth millennia

BC. Between ca. 5.2 and 2.9 ka cal BP, a period roughly corresponding to the transition from the Eneolithic to the end of the Bronze Age, trees and shrubs experienced a slight decline, yet domestic species of trees and cereals, along with wild anthropogenic indicators, continued to rise. At the threshold of the first millennium BC and up to present times, the record shows a clear expansion of domestic species due to the cultivation of *Olea*, *Castanea*, *Juglans*, *Cannabis*, and cereals, while the main deciduous trees progressively diminished (Avena *et al*. 1987; Mercuri *et al*. 2002; Magri and Celant 2009).

Pollen analysis, along with microbiological and sedimentological data, indicates the occurrence of at least nine episodes of woodland clearance within the PALB94-1B sequence. The earliest episodes occurred between the Pleistocene and the Early-Mid Holocene (respectively 10.2-9.9, 6.74, 5.5-5.04, and 4.9-4.1 ka BP) and were likely driven by natural climatic factors. The later episodes, correlated with the Bronze Age (3.89-3.5 and 3.24 ka BP) and the historical period (1.8, 0.64-0.57, and 0.16-0.11 ka BP), were clearly the result of anthropogenic deforestation, highlighting the significant impact of human disturbances in the basin's catchment (Guilizzoni *et al*. 2002; Mercuri *et al*. 2002; Vigliotti *et al*. 2010).

The stratigraphic sequence at the Museo delle Navi Romane di Nemi

In addition to the information from the submerged lacustrine sequence, limited data are available for the stratigraphy of the plain on the northern side of the caldera. In the 1930s, after the recovery of two famous ships from Caligula's era from the lake, a large museum was constructed on the northeastern shore of the basin at the locality of Pantane (Pl. 4: 1). Three cores were drilled for the building's foundation (Pl. 3), aligned north-south over a total distance of 120 m, spaced 40 m apart, starting at an altitude of 328.8 m above sea level. The drillings reached depths of 14, 16, and 18 m, from the northernmost to the southernmost, evidencing a stratigraphy generally sloping toward the lake. The first layer, with a variable thickness of 1 to 5 m, was a colluvial soil, likely developed in the Late Holocene or historical times; it covered a portion of the Roman paved road traditionally called Virbia. Below this layer, a 2 to 5 m-thick deposit of silty-clayey mud emerged, containing vegetal and peat remains related to lacustrine sedimentation. This was followed by a 6 to 1 m-thick accumulation of volcanic sands, which either overlaid or intercalated with massive clayey muds devoid of organic remains, forming banks of 0.5 to 3 m thickness. Only

in the northern core did the drillings possibly reach the volcanic substrate at the bottom of the sequence, at a depth of 13 m (i.e., 315.8 m above sea level) (Ucelli 1950, 100-101). Although the description of the 1930s stratigraphy is challenging to interpret, we can surmise that the sequence below the modern soil is indicative of lacustrine-type sedimentation, characterized by periods of water level transgression with low-energy sub-aerial deposition (peaty muds and massive muds) and episodes of regression, shore formation, and erosion (sands). The stratigraphy documented at Pantane suggests that the lake level in ancient times rose to at least 327.8 m above sea level (Ucelli 1950; see also Layer 1 in De Angelis D'Ossat 1943, 44-45). Fluctuations of the water body and episodes of high water levels are also recorded by microbiological indicators in the Paliclas core, especially during the Early Holocene (Guilizzoni *et al*. 2002). It is challenging to quantify the amount and duration of these transgressions, which likely resulted from both local seasonal conditions and broader climatic factors. Similar issues, however, were experienced in historical times by the Latins and Romans. In the 5th century BC, it became necessary to create the Emissario, an underground drainage channel connecting Lake Nemi (with a water level at that time of 323.8 m above sea level) to the Ariccia maar, located 1.65 km away (Ucelli 1950; Castellani and Dragoni 1991; Placidi 2013). Later, during the Roman imperial period, a complex system of palisades was also constructed to reinforce and stabilize the lake shores (Ucelli 1950).

Pre-protohistoric evidence in the Nemi basin

The discovery of pre-protohistoric remains in the Nemi basin was first documented in the second half of the 19th century (Pl. 4: 2) (Nardoni 1878; Nardoni 1880; Barnabei 1895). Starting in 1874, many farmers unearthed materials in the localities of Santa Maria, Il Giardino, Sonnemi, Terreno Pesoli, Il Porto, and La Valle, mostly in the northern half of the valley, though some recovery also occurred in the southern portion. Most of the material consisted of baked clay fishing and loom weights, a few personal ornaments such as necklace beads, and several types of pottery vessels. The vases and ceramic objects were generally made of "impasto", a coarse and poorly purified clay, or "bucchero", and included both miniature and full-sized pieces. Accordingly, they were probably associated with settlement sites, grave goods, or, as correctly noted by Gierow (1964, 361), to votive deposits in particular, dating between the late protohistoric period (Final Bronze Age/Iron Age) and the archaic and republican eras.

Among the finds, however, Leone Nardoni described several pieces of lithic industry that, in his opinion, represented traces of Palaeolithic and Neolithic lithic workshops (Nardoni 1878; Nardoni 1880). In 1874, on the southern shore near Genzano, some workers found three arrowheads in "focaia" (i.e., flint), one with a "shark tooth" shape (triangular) and the last two "almond" shaped (biconvex); 26 knapping residues, including cores, knapping waste, and broken arrowheads, were also recovered. In 1877, in the locality of Sonnemi, on the north-eastern shore of the lake, a crude "archeolithic" (the term then used for Palaeolithic) almond-shaped point and a triangular implement in "focaia", as well as 20 items – including cores, flakes, broken arrowheads, and knapping waste –were found. Between 1878 and 1879, the fields at La Valle yielded three more almond-shaped "archeolithic" arrowheads, two "slingshot stone projectiles", a squared "focaia" tool with very accurate retouching, and 30 pieces of arrowheads, knives, flakes, and "unfinished weapons".

Nowadays, all these lithic implements are apparently lost, and since they were not illustrated in Nardoni's studies, determining their precise characteristics and historical context poses a significant challenge. However, these concentrations of material, with dozens of finds for each locality, are atypical for the archaeological contexts of the inner portion of the Alban Hills, where lithic finds are usually scarce and isolated. Moreover, the discoveries reported by Nardoni seem to have always occurred in association with pottery fragments, raising further doubts about the reliability of the finds. It is likely that the "focaia" implements were indeed ancient tools, but we cannot rule out the possibility that the remaining "stone" fragments were geofacts, misinterpreted as anthropic products. The same issues affect the typological descriptions and the chronological attribution of many pieces to the "archeolithic". In the 1870s and 1880s, prehistoric research in Latium was still in its early stages. While lithic tools were often found in the Roman Campagna, including the Alban Hills (e.g., De Rossi 1867, 48-50), interpretive mistakes and fanciful attributions were common.

A limited yet more precise understanding of the pre-protohistoric human presence in the vicinity of the lake was acquired through excavations conducted by the Nordic Institutes between 1998 and 2002 at the Roman villa located in Santa Maria, situated on the southwestern shores of the lake, as well as through investigations carried out at the Sanctuary of Diana. The excavation at the villa yielded residual artifacts from the Roman sequence, including three Final Palaeolithic flint artifacts, a Neo-Eneolithic obsidian bladelet, and later protohistoric pottery fragments (Bruni 2010; Moltesen 2010; Altamura and Rolfo 2016). At the Sanctuary of Diana, a piece of Neolithic Cardium pottery dating back to the

sixth millennium BC was discovered in the median terrace below a large basaltic boulder that had collapsed from the northeastern ridge of the volcanic crater (Bruni 2014), along with another Neo-Eneolithic obsidian bladelet and some sherds tentatively attributed to the Eneolithic period (Bruni 2014). Additionally, pottery remains suggesting a Middle Bronze Age presence were found at this site (Bruni 2014). Nevertheless, all these findings consist of isolated or residual materials, lacking contemporaneous primary stratigraphic contexts. A radiocarbon dating result indicating a timeframe between 1690 and 1520 cal. BC, corresponding to the Middle Bronze Age, was obtained from charcoal remnants retrieved from a barren layer during excavations in 2005 at the Sanctuary of Diana (Bruni 2009), suggesting a potential nearby occupation.

Based on recent archaeological findings, a stable human occupation in the area of the Sanctuary and its environs has been identified only from the Final Bronze Age through the Iron Age (i.e., from the 12th century BC) (Bruni 2009; Bruni 2014; Alessandri 2013), persisting without interruption up to the present era. In this paper, we focus on the lithic industry and artifacts of the prehistoric and protohistoric periods unearthed during recent archaeological investigations of the Sanctuary dedicated to the goddess Diana. Examining these lithic objects provides a more comprehensive insight into early human presence in the lake basin for the first time, facilitating direct and indirect observations concerning the socio-economic and cultural aspects of pre-protohistoric communities and their influence on palaeoenvironmental conditions in the area from the end of the Upper Palaeolithic to the Middle Bronze Age.

Results

Lithic finds

We analyzed 18 lithic artifacts (Nos. 1-18, Pl. 5-8). They are primarily flint knapping products (13 finds), obtained through debitage (12) and façonnage (1), but manufacts obtained by stone polishing (1), manuports, tools on pebbles, and one engraving (4) are also present. All the raw materials used are not locally available in the Alban Hills area. The implements will be categorized chronologically based on their typo-technological characteristics, following the terminology established by Inizan et al. (1999) (refer to Appendix 1 for a detailed analysis of each artifact). The lithic finds come from only a few excavation trenches in the

temple area (Pl. 9), particularly those where it was possible to reach the lowest part of the stratigraphic sequence.

Lithic industry ascribed to the Upper Palaeolithic

Four flint artifacts from the Final Epigravettian period, ca. 12-10 ka BC, are identified in this study (Nos. 1-4, Pl. 5: 1-4). These artifacts consist of medial fragments of backed pieces produced through laminar debitage. They are characterized by their small size (maximum length of 23 mm) and are typically made on relatively thick bladelets measuring between 6 and 9 mm, featuring an abrupt back on one side and a truncation in one case (No. 3, cf. Pl. 5: 3). These tools bear a remarkable resemblance to those previously unearthed at the Pratone del Vivaro/Colle delle Vacche site (Rolfo *et al*. 2007; Rolfo 2009; Altamura and Rolfo 2019) as well as within the Nemi basin itself. Final Epigravettian lithic tools, including two small backed points, have been recorded during excavations conducted at the Roman villa in the Santa Maria locality, while a sporadic specimen was also documented on the eastern shore of the lake (Moltesen 2010; Altamura and Rolfo 2016). In the Latium region, backed points or bladelets have been identified at various sites dating back to the Evolved and Final Epigravettian periods, such as Palidoro, Grotta Jolanda, and Riparo Salvini (e.g., Palma di Cesnola 1984). Notably, a significant collection is attributed to the Final Epigravettian Grotta Polesini site near Tivoli, approximately 25 km north of Nemi. Here, backed pieces constitute a substantial portion ranging from 38.4% to 70.3% of all tools recovered in each excavation unit, amounting to almost half of the documented finds (15,173 out of 29,777) (Radmilli 1974). The technological characteristics and morpho-dimensional attributes of the backed bladelets found in Nemi exhibit striking similarities with those from the Polesini industry. This resemblance is observed both in artifacts collected during Radmilli's excavations in the 1950s (Radmilli 1974) and those retrieved more recently through re-investigations at the site (Rolfo *et al*. 2019).

The artifacts attributed to the end of the Pleistocene are residual and were discovered within the historical period sequence of the temple. Bladelet No. 1 (Pl. 5: 1) was recovered from the compact and relatively barren fill situated between the primary temple structure and a smaller eastern temple dating back to the mid-3rd century BC, which was constructed by partially disrupting and reusing a lacustrine deposit as infill (SU 8039, Trench C). Trench A focused on examining the western sector of the temple, extending from the exterior of the

podium's second phase to the interior of its third phase, which encompasses the former. The stratigraphy in this area remained exceptionally well preserved, as it had largely evaded disturbances from excavations carried out in the 19th century. An enclosing low wall delineated an external zone adjacent to the second-phase podium where offerings and ceremonies took place. Bladelet No. 4 (Pl. 5: 4), with a heavily rounded surface, originates from layer SU 8871, characterized by an abundance of ritually obliterated items and sacrifices that were already present before the construction of this enclosure wall. Bladelet No. 3 (Pl. 5: 3) (SU 8854) emerged from rich deposits associated with a leveling effort conducted during the Julio-Claudian period to elevate this specific section of the lower terrace and install new pavement. Lastly, Bladelet No. 2 (Pl. 5: 2) was retrieved from layer SU 9112, predating the second-phase construction of the temple, and positioned slightly above the lacustrine deposit.

Lithic finds ascribed to the Neo-Eneolithic and Bronze Age

Four finds are ascribed to the Late Prehistory and protohistoric period, c. from the sixth to the first half of the second millennium BC (Nos. 5-8, Pl. 6: 1-4). A small mid-distal fragment of a polished axe is typical of the productions of this phase (No. 5, Pl. 5: 1). It has a simple typology and lacks diagnostic features. The find has few comparisons in the Alban Hills dating from the Neo-Eneolithic to the Middle Bronze Age, notably from Albano Laziale (Chiarucci 1978; Anzidei and Carboni 2009), Rocca di Papa (De Rossi 1878), Tuscolo (Altamura 2014), Colonna (Angle *et al.* 2019, 293), and the Villaggio delle Macine at Castel Gandolfo (at least four specimens from the site are currently under study). A flint bladelet with a trapezoidal profile was probably obtained by an organic/soft hammer or by pressure flaking (No. 6, Pl. 5: 2). Its features are consistent with Neo-Eneolithic production, as indicated by similar sporadic finds from the Alban Hills (Chiarucci 1978; Altamura 2014; Altamura and Scifoni 2021), and especially by the bladelet debitage known from coeval settlements and burials in the Rome area (Anzidei and Carboni 2020, 399 ff.), and from the Pantano Borghese Eneolithic site at the northern feet of the Alban Hills (Angle *et al.* 2019). For this period, the existence of specialized lithic production within the sites or the circulation of finished products from outside has been suggested. A small triangular arrowhead, obtained through careful shaping and characterized by a rounded tang and lateral wings, could also date from the Neolithic to the Bronze Age (No. 7, Pl. 6: 3). Flint arrowheads are well-attested in the Alban Hills, both by isolated finds (e.g., De Rossi 1867, 49-50; Angle and

Guidi 1979; Chiarucci and Gizzi 1996, 63; Altamura 2014; Altamura and Rolfo 2016; Altamura and Scifoni 2021) and by discoveries in settlements (Angelini *et al*. 2006; Angle *et al*. 2009; Angle *et al*. 2017) or among the grave goods of burials (Anzidei and Carboni 2009). Due to the ample variability in the shapes and sizes documented among the known specimens, partly influenced by the raw material used and the features of the initial blank, it is hard to ascertain a more precise chronology for the Nemi arrowhead. The matter of attribution also arises in relation to a small engraved pebble (No. 8, Pl. 6: 4). The stone exhibits two deep, aligned, and curved engravings on one side that result in a clear schematic representation of eyes, giving the pebble the general outline of a face. This stone anthropomorphic "idol" is probably the most interesting piece among the lithic production recovered at Nemi and could be tentatively attributed to the Neo-Eneolithic period. The schematic representation recalls analogous figurations widely documented among the Neolithic anthropomorphic vases, especially from central-southern Italy, Eastern Europe, and the Levant (e.g., see the catalogue in Bersani 2019), and resembles other Italian schematic Neo-Eneolithic statuettes such as the idols of Gaban and Arnesano (e.g., Cocchi Genick 1994, with references therein; Leone 2000; Giannitrapani 2002; Grifoni Cremonesi and Pedrotti 2012), as well as very similar Levantine productions (e.g., Gopher and Orrelle 1996). To date, the closest comparison in Italy is a schematic idol engraved on a small pebble found in 2020 at Molfetta, in the Apulia region (Leone 2021).

These discoveries once more originate from layers that formed during historical periods. Axe No. 5 (Pl. 6: 1) was recovered in Trench A from SU 9163, the fill of a circular pit probably attributable to a 19th-century shaft, which was very rich in materials. Bladelet No. 6 (Pl. 6: 2) comes from a disturbed layer (SU 9018, Trench C) similar to the almost barren fill that reworked the underlying lacustrine deposit, where No. 1 was found. Arrowhead No. 7 (Pl. 6: 3) was retrieved from SU 9512, one of the fills from the Julio-Claudian age leveling that also yielded bladelet No. 3. Engraved pebble No. 8 (Pl. 6: 4), on the other hand, is from a post-antique tuff flake fill at the southwest corner of the third-phase podium (SU 9406, Trench K).

Lithic industry of uncertain chronological attribution

Most of the lithic pieces lack diagnostic features or belong to a generic pre-protohistoric substrate (Pl. 7: 1-9, 8). A small residual flake core shows multidi-

rectional exploitation and the presence of neopatina (No. 9, Pl. 7: 1), suggesting the reuse of an older Middle Palaeolithic/Pontinian core in later periods. A side-scraper on a blade and a retouched blade (Nos. 10-11, Pl. 7: 2-3) were obtained through laminar debitage and are accordingly related to nonspecific productions that occurred between the Upper Palaeolithic and the Bronze Age. The tools share some similarities with implements found during the excavations at Santa Maria (Moltesen 2010). Four flint flakes are very generic implements (Nos. 12-15, Pl. 7: 4-7). While one is patinated and thermally damaged (No. 14, Pl. 7: 6), suggesting at least an attribution to the pre-protohistoric period, the others (Nos. 12-13, Pl. 7: 4-5) show the formation of neopatina and pseudo-retouch that are consistent with their use or reuse as flint for manual fire-strikers in historical times. A small flint pebble and a broken stone are manuports of uncertain chronology (Nos. 16-17, Pl. 7: 8-9). A large limestone cobble shows use-wear traces consistent with its exploitation as a retoucher/percussor, probably associated with a laminar knapping method (No. 18, Pl. 8). A portion of the pebble seems ochre-stained, but since a reliable stratigraphic context and specific geo-chemical analysis are lacking, this is the most we can say at the moment. However, comparisons with other ochre-stained retouchers and percussors on pebbles from the area, such as the Upper Palaeolithic one from Monte Alto (Velletri) (Altamura 2019), are possible.

Three implements (Nos. 9, 10, 15, Pl. 7: 1-2, 7) come from extremely superficial and disturbed modern layers, one extending across the entire area in front of the temple (SU 8032, Trenches B, D, and K) and the other (SU 8214) located outside the east side of the temple's third-phase podium (Trench E). Flakes No. 12 and 13 (Pl. 7: 4-5) were unearthed within the infill of a Renaissance pit that cut through the compact fill of the first-phase temple podium, which incorporated the lacustrine deposit (SU 8457, Trench G1), and this is significantly consistent with their description. The utilized limestone pebble No. 18 (Pl. 8) also comes from the same fill of the first-phase temple podium (SU 9220, Trench G1). In the backfill of a Late Antique spoliation pit (SU 8319, Trench B), which undermines the Roman structures down to below their foundations, cutting through the lacustrine deposit, flint pebble No. 16 (Pl. 7: 8) was found.

In Trench A, pebble fragment No. 17 (Pl. 7: 9) was recovered from a sandy layer with small stones (SU 8705) leaning against the low wall that bordered an area outside the second phase, where No. 4 and No. 5 were also found. Flake No. 14 (Pl. 7: 6) comes from one of the Julio-Claudian age levelings (SU 9361), which also yielded bladelet No. 3 (Pl. 5: 3) and arrowhead No. 7 (Pl. 6: 3), con-

firming its possible early chronology. Blade No. 11 (Pl. 7: 3) comes from the filling of the ramp to the temple, supported by large blocks, which allowed for overcoming the difference in height of the natural slope (later artificially terraced); this filling is related to the destruction of structures and levels of the second phase for the construction of the third phase of the temple (SU 9253).

Discussion

Reports of pre-protohistoric finds in the area of Nemi are known as early as the 1800s (e.g., Nardoni 1878; Nardoni 1880), but they are often difficult to interpret. The human presence in the Nemi basin at the end of the Pleistocene is now confirmed by archaeological materials found at several sites in the area. Final Epigravettian lithic tools have been discovered at the Sanctuary of Diana (Pl. 5: 1-4), and they were already documented by the 1998-2002 excavations of the Roman villa in the locality of Santa Maria and by a chance find on the eastern side (Moltesen 2010; Altamura and Rolfo 2016). The Late Pleistocene evidence from the lake is consistent with the coeval, sparse archaeological record documented in the southern portion of the Alban Hills caldera. Most of the tools are backed points or bladelets, which are common products from sites of that period, also in Latium (see, e.g., Radmilli 1974). These tools were generally used as microlithic armatures (e.g., Ruta *et al*. 2022), and the specimens from Nemi also bear fractures and scars compatible with impact traces (e.g., No. 2, see also Altamura and Rolfo 2016, 141), suggesting that the area of the lake was frequented, albeit occasionally, for hunting trips. Debris and debitage products are almost lacking, indicating that the hunter groups arrived in the basin already equipped with the necessary lithic toolkit, which was partly lost or discarded on the spot (Altamura and Rolfo 2016; Altamura and Rolfo 2019). The lake's palaeoenvironments, an ecological niche featuring a water body surrounded by grasslands and sparse woodlands, were likely suitable for game. The basin's distinctive geomorphological features could have been exploited for specialized hunting strategies. Though the Late Pleistocene fauna of the Alban Hills is poorly documented, the area appears to have been home to large mammals like deer and boar, as evidenced by scarce fossil remains (e.g., Altamura 2023 and references therein). These animals were the favored prey at contemporary sites in central Latium, such as Grotta Polesini (Radmilli 1974) and Palidoro (Ruiu and Tagliacozzo 2016).

With the Holocene, an oak-dominated woodland developed, leading to the dense canopy that remains a characteristic feature of the area (Avena *et al*. 1987), which in ancient times provided the basis for the toponym Nemi (as mentioned, it comes from the Latin *nemus*) and for the myths surrounding the Sacred Grove of Diana. Human presence in the basin during the Holocene is attested to at least since the Neolithic (Bruni 2014). The lithic industry of the late prehistoric and early protohistoric periods (Pl. 6: 1-4) indicates that hunting practices were still carried out (flint arrowhead No. 7) and were likely an important economic resource, as seen in other sites in the area (e.g., Tagliacozzo *et al*. 2012; Angle *et al*. 2017), along with other specialized activities. The Nemi axe, for instance, may be related to wood cutting and forest clearance, an economic activity that strongly aligns with the Paliclas results, which point to significant episodes of deforestation, especially during the third millennium BC. Such tools could have also been used in woodworking for dwellings and boats (e.g., Gibaja *et al*. 2024). For example, two prehistoric monoxylous pirogues, 4 to 5 m long, were discovered in the lake's waters in the 1930s during the recovery of the Caligula ships (Ucelli 1950, 233). This extraordinary evidence, comparable to the Neolithic canoes from La Marmotta at Bracciano (Gibaja *et al*. 2024), was unfortunately lost in the fire that destroyed the Nemi museum in May 1944 (Altamura and Paolucci 2023).

For the late prehistoric and early protohistoric periods (Pl. 6-8), a generic differentiation of the lithic products is likely associated with the existence of more stable human settlements and diversified activities. The thermal damage noted on several pieces (Nos. 7, 11, 14) is linked to the presence of fireplaces and occupation surfaces, a situation that may be reflected in the charcoal residues found at the Sanctuary, dated to the Middle Bronze Age (Bruni 2009), a period when settlements were typically located in close proximity to permanent water bodies due to contemporary climate changes (e.g., Altamura *et al*. 2022). The human groups of Nemi were in contact with other contemporary communities, as evidenced by the Neolithic Cardial pottery and the discovery of two obsidian bladelets at the Sanctuary and at Santa Maria (Moltesen 2010; Bruni 2014), a raw material that was central to a complex system of trades and exchanges and is very rarely attested in the Alban Hills.

The engraved pebble (No. 8, Pl. 6: 4) provides further evidence of cultural contacts. The Nemi "idol" appears to be a symbolic artifact that predates the votive and religious activities around the lake by thousands of years. These activities possibly began at the end of the Bronze Age and certainly continued during the Iron Age, following a pattern similar to that observed at a few other

sites in *Latium Vetus* (e.g., Guidi 2016). In this context, it is interesting to point out a striking analogy with another stone "idol" that was recently discovered during the excavations of the Sanctuary of Jupiter Anxur on Monte Sant'Angelo at Terracina, in Southern Latium, led since 2019 by the Ludwig-Maximilians-Universität München (Diosono and Scheding 2022; Diosono et. al. in press). In the area of the famous sanctuary, many late prehistoric and protohistoric materials, such as pottery sherds and lithic artifacts, were also found (Diosono and Monti in press). From a reworked surface layer, a small cylindrical sculpture made of calcite (?) stone was discovered (Pl. 10: 1), bearing on one side another schematic anthropomorphic representation of a possible T-style face, likewise cautiously attributable to the same Neo-Eneolithic productions. Both the Nemi and the Terracina statuettes are quite atypical in the Italian record for the raw material used, which probably affected their iconographic output. Moreover, there are very few anthropomorphic figurines known from the Latium region to compare them with (i.e., Pastena, Rolfo *et al*. 2021; Poggio Nativo, Conati Barbaro 2022; Sasso di Furbara, Giannitrapani 2002).

An interesting consideration deals with the reuse of older prehistoric implements in later pre-protohistoric times and perhaps even in historical times, as suggested by the neopatinas that formed on specimens No. 9 and 12 (Pl. 7: 1, 4) due to the subsequent modification of older and already patinated pieces. While flakes No. 12 and 13 show use-wear or neopatina that are directly consistent with their use or reuse as flints for manual fire-strikers, presumably in historical times (as can also be inferred by their recovery in SU 8457 – i.e., the fill of a Renaissance pit), core No. 9 was probably a Mousterian piece recovered from an archaeological outcrop and reused in pre-protohistoric times as raw material for knapping a short series of flakes. This opportunistic behavior has already been documented in the Alban Hills and was likely provoked by the lack of raw materials on the volcanic complex, which certainly affected procurement needs (Altamura 2013). Moreover, generally speaking, the possible cultural reuse of ancient lithic artefacts (e.g., Cherici 1989) should always be taken into consideration for the late protohistoric and historical periods.

With regard to the relationships between the pre-protohistoric lithic implements and the stratigraphic sequence of the Sanctuary, the totality of the finds must be considered residual, that is, materials resulting from anthropic or natural disturbances (e.g., slope debris) of an original depositional context that, after their displacement, were accidentally included in layers from the Latin, Roman, and later periods. However, since the sediments and stones forming the lay-

ers, or used for infills and levelings, are all from local sources, we can presume that the deposits containing the lithic industry had the same provenance and formed in proximity to the recovery site or in the immediate surroundings of the temple. Accordingly, even if found in reworked contexts, the lithic material can be considered reliable and useful for an overall reconstruction of the pre-protohistoric archaeology of the area. The residual finds lack a clear pattern of association between their chronological attribution and their stratigraphic position in the sequence of the Sanctuary. The lithic material appears spatially and stratigraphically scattered from the surface reworked layers to the base of the sequence. Nevertheless, we have observed a connection between the deepest layers of the sequence and the oldest diagnostic tools. This suggests the potential presence of locally disrupted pre-protohistoric horizons, as evidenced by the recovery of two artifacts that exhibit a closer association with a prehistoric deposit, namely, Palaeolithic bladelet No. 1 and Neo-Eneolithic bladelet No. 6, both found in close proximity to the basal lacustrine layer. Moreover, artifacts from the Palaeolithic period were found only within the lower terrace of the Roman sanctuary, while they are completely absent from the middle and upper terraces. This absence could be explained by research issues or by chance, but most likely it denotes further geoarchaeological conditions (e.g., a phase of erosion or sliding of the Pleistocene deposits along the basin slopes or the covering of Pleistocene horizons by Holocene slope debris) that are not currently fully assessable (see, e.g., in Arnoldus-Huyzendveld 2009, 24, Fig. 9).

Further observations can be made regarding the lake level changes during the Upper Pleistocene and the Holocene, which presumably impacted both anthropic occupations and the geomorphological features of the basin, notably the formation of terraces, landslides (e.g., Bruni 2014), and slope deposits (Pl. 10: 2). The current level (around 318 m above sea level) exhibits variations due to seasonal precipitation, groundwater, and general climatic factors, which in the past could have occasionally caused significant fluctuations. The lake is indeed a fairly dynamic hydrographic system.

The present state of the lake is very concerning due to the alteration of its water balance equilibrium. Since the 1980s, the lake has gradually decreased by approximately 6 m. In recent years, the seasonal fluctuation (peaking in winter and reaching a low level in summer) has ranged around 0.6 m but is insufficient to offset the water loss (unpublished data from Ecoistituto Reseda, personal communication by Roberto Salustri). However, prior to the 1980s, the water level was relatively stable, and between 1952 and 1967, the seasonal changes

were within a range of 0.31 m (Ciccacci *et al.* 1987, 42-44), and the Emissario was still functioning. After the 1930s, when the recovery of the Roman ships required the lake to be artificially drained to a depth of approximately 10 m, it rapidly returned to its original level in 1944 (D'Alessandro *et al.* 1987, 14). In the 1820s, there are contemporaneous accounts of an unusual and significant drop in the water level (Lampe 1994). As early as the 5th century BC, fluctuations were likely recognized as a problem, leading to the necessity of excavating the underground Emissario channel to regulate the water, reclaim land, and facilitate irrigation. The tunnel's intake marked the water level at 323.8 m above sea level (Ucelli 1950). The stratigraphic sequence documented at Pantane during the construction of the museum shows that, before the drainage of the Emissario, the lake level reached at least 327.8 m above sea level (Pl. 3). The new archaeological data from the excavations of the temple of Diana has documented the presence of a silty layer that corresponds to an ancient lake bottom, probably close to the shore, along with rounded slope debris boulders shaped by the action of water. The surface of this layer, spared by the construction phases of the temple that began in the 6th century BC, lies at approximately 353 m above sea level and at a distance of about 400 m from the present-day shore. Accordingly, before the late Iron Age and the Archaic period, the water level reached a significant altitude, probably at least 355-360 m above sea level, roughly corresponding to the altitude leap that marks the lower terrace from the middle and upper ones. Judging from the geomorphology of the area, it is likely that these periods of high lake level shaped the natural terrace at 355-370 m above sea level (as noted also in Arnoldus-Huyzendveld 1994), which was used for settlement and agricultural purposes at the end of the Bronze Age and was later exploited and regularized through substructures for the construction of the terraced sanctuary in the Roman era.

The chronological limits of this high-water level period are difficult to define. The heavily rounded surface of the Epigravettian backed bladelet (No. 4, Pl. 5: 4) suggests that a lake level rise occurred after the Palaeolithic. Conversely, the Neo-Eneolithic bladelet (No. 6, Pl. 6: 2) found above the former lake bottom shows no signs of fluctuation, implying that the water had possibly receded by that time. This data suggests that a significant water level increase, potentially reaching up to 360 m asl (Pl. 10: 2), likely happened during the Early Holocene, after the Epigravettian but before the Neo-Eneolithic groups reoccupied the area freed from the water. The Paliclas results, which indicate episodes of high

lake levels during the Early-Mid Holocene, particularly between 5 and 9 ka BP (Guilizzoni *et al*. 2002; Vigliotti *et al*. 2010), support this interpretation.

Conclusions

The results from this study increase the body of knowledge on the earliest human presence in the Nemi basin between the Late Pleistocene and the Early-Late Holocene. They are consistent with the few pieces of information already reported in the literature. The new data fit and complement, from an archaeological perspective, the results of other interdisciplinary research, such as the Paliclas analysis. During the Final Palaeolithic, a grassland and poorly wooded area was repeatedly visited by hunter-gatherer groups. The human presence is missing in the Early-Middle Holocene, when a lake larger than the modern one extended into the now flatter northern part of the crater, with a level rising at least to ca. 360 m above sea level. Along the shores, the lake formed terraces and reworked the slope debris that slid downhill from the basin walls. In the Neo-Eneolithic, after a lake level drop, human communities resettled the area, facing a changed environment and new socio-economic needs that started to impact the environment. Human activities led to significant disturbances during the Bronze Age, when the discontinuous occupation gradually acquired stability throughout the Late Holocene. The Neo-Eneolithic groups of Nemi (No. 8, Pl. 6: 4) and possibly Terracina (Pl. 10: 1) produced symbolic artifacts, showing that the cultural connotation of these places was already deeply rooted in pre-prehistoric Latium communities, long before the religious beliefs that characterized the Nemi forest at the end of the protohistoric period, which later developed into the cult of Diana from at least the 6th century BC. It is a remarkable circumstance that two extraordinary landscapes of the *Latium Vetus*, such as Nemi and Terracina, made more majestic but also profoundly altered by Roman Republican terrace sanctuary monumentalization, already exhibited these cultural elements in such remote ages. While we cannot ascertain continuity or accidental convergence in this process, the development of these early behaviors will be crucial in the blooming of the classical world and in the history of archaeology.

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Appendix: Analytical description of the lithic finds from the Sanctuary of Diana at Nemi

Final Epigravettian

1. SU 8039. Backed bladelet, flint, 23 x 7 x 4 mm. Medial fragment of bladelet from laminar debitage, with an abrupt retouch on the left edge. Ancient transversal fracture at both extremities (Pl. 5: 1).

2. SU 9112. Backed bladelet, flint, 15 x 6 x 4 mm. Medial fragment of bladelet or backed point from laminar debitage, with an abrupt retouch on the right edge. Ancient transversal fracture at both extremities; the middle-proximal one has the detachment of a burin-like scar on the left side (Pl. 5: 2).

3. SU 8854. Backed and truncated bladelet, flint, 16 x 9 x 2 mm. Medial portion of a bladelet or geometrical microlith with abrupt retouch on the right edge and oblique truncation on the proximal one. Ancient transversal fracture at the distal extremity (Pl. 5: 3).

4. SU 8871. Backed bladelet, flint, 14 x 8 x 3 mm. Medial fragment of a bladelet with traces of an abrupt retouch on the right edge, heavily rounded by fluitation. Ancient fractures at both extremities (Pl. 5: 4).

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5. SU 9163. Polished stone axe, 28 x 28 x 11 mm. Mid-distal fragment of an axe made from an unidentified hard stone. Elliptical section, rounded sides and cutting edge, with little marginal use-wear. A transversal fracture removed the base of the axe; the fractured surface is without signs of reuse (Pl. 6: 1).

6. SU 9018. Bladelet, flint, 28 x 10 x 2 mm. Mid-distal fragment of a bladelet from unipolar laminar debitage, with a trapezoidal profile and cortex residues on the distal end. Obtained by organic/soft hammer or by pressure flaking (Pl. 6: 2).

7. SU 9512. Arrowhead, flint, 21 x 12 x 4 mm. Small triangular arrowhead with a rounded tang and lateral wings (one is broken). A biconvex profile was obtained with a bifacial invasive retouch. Surface shows signs of thermal damage (Pl. 6: 3).

8. SU 9406. Engraved pebble, 45 x 39 x 10 mm. Pebble of an unidentified hard stone with an elliptical shape and section, featuring an ancient small fracture on one side. A flat side of the pebble shows at least two curved, deep engravings, suggesting a schematic anthropomorphic representation of a face (Pl. 6: 4).

Lithic industry of uncertain chronological attribution

9. SU 8214. Flake core, flint, 26 x 29 x 38 mm. Flake core on corticated cobble with three patinated multidirectional flaking surfaces. One of the flaking surfaces was reused for the detachment of three small unidirectional flakes, causing the formation of neopatina on the negative scars. It is a probable reuse of an older Middle Palaeolithic/Pontinian core (Pl. 7: 1).

10. SU 8032. Sidescraper on blade, flint, 55 x 25 x 9 mm. Sidescraper and notches on a corticated blade by unipolar debitage. Semi-abrupt invasive direct retouch on the right side, with notches on the proximal and distal portions. Few direct retouches on the left proximal side. Butt and bulb removed by parasitical flakes (Pl. 7: 2).

11. SU 9253. Retouched blade, flint, 35 x 14 x 8 mm. Mid-distal fragment of blade, from the rejuvenation of a unipolar debitage bladelet core. Direct marginal retouch along the central portion of the right side and bifacial marginal retouch on the distal part. Possible thermal damage on the surfaces (Pl. 7: 3).

12. SU 8457. Notch on retouched flake, flint, 25 x 26 x 5 mm. Distal notch on transversal debitage flake. The notch is made by a bifacial retouch. The right side has a direct invasive retouch; the left shows fractures and chippings; on both sides, there is the formation of neopatina. Wide and slightly dihedral butt, with a pronounced bulb (Pl. 7: 4).

13. SU 8457. Notch on retouched flake, flint, 17 x 27 x 4 mm. Distal notch on transversal debitage flake. The notch is made by a bifacial retouch. The sides have bifacial retouch or pseudo-retouch. Flat and inclined butt. Possible use or reuse as flint for manual fire strikers (Pl. 7: 5).

14. SU 9361. Flake, flint, 31 x 32 x 6 mm. Transversal debitage flake, with cortical residues on the distal end. Narrow, flat butt. Possible inverse marginal retouch on the proximal right side. Heavy thermal damage to the surfaces, with distal fracture (Pl. 7: 6).

15. SU 8032. Flake, flint, 21 x 29 x 5 mm. Transversal debitage flake, hinged on the distal end. Dihedral butt (Pl. 7: 7).

16. SU 8319. Pebble, flint, 35 x 17 x 15 mm. Small natural pebble. Manuport (Pl. 7: 8).

17. SU 8705. Broken pebble, 48 x 24 x 15 mm. Fragment of lenticular plano-convex pebble made by an unidentified hard stone (serpentinite?). Possible use-wear from abrasion on the surfaces (lissoir?) (Pl. 7: 9).

18. SU 9220. Hardstone retoucher/percussor, limestone, 100 x 49 x 27 mm. Retoucher/percussor on a limestone elongated cobble. Five distinct areas show use-wear related to the use of the stone as a percussive and abrasive tool during flint knapping activity, with the formation of iso-oriented striations and pitting. On the distal extremity, a pitting area of 4 x 5 mm is present. On the proximal end, a 12 x 14 mm area of striations. On the convex face, there are two areas of 19 x 11 and 19 x 20 mm of striations, perpendicularly oriented to the cobble axis; on the convex face, light striations are preserved on a 20 x 10 mm surface. Reddish spots are visible on the mid-distal portion of the stone on the right side (Pl. 8).

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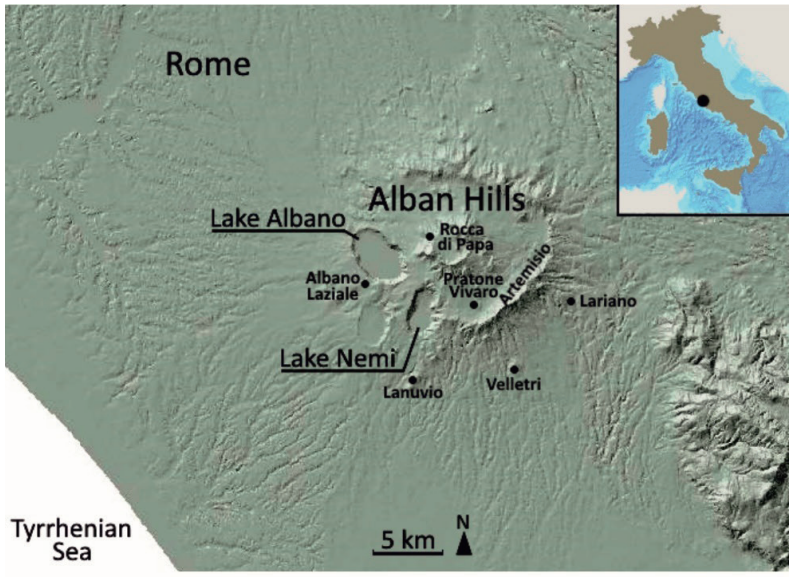
PLATE 1



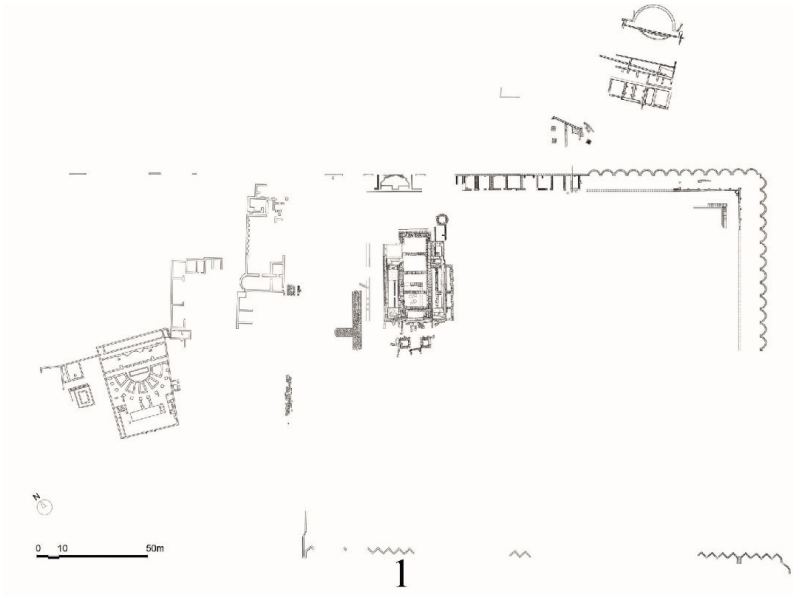
1

2

Pl. 1: 1 – Location of the Alban Hills on a DEM map of the Latium Region, with the position of the main localities mentioned in this study (Elab. F. Altamura)

Pl. 1: 2 – Bronze Age structures found on the median terrace of the Sanctuary during the 2007-2009 excavations (after Bruni 2014)

PLATE 2



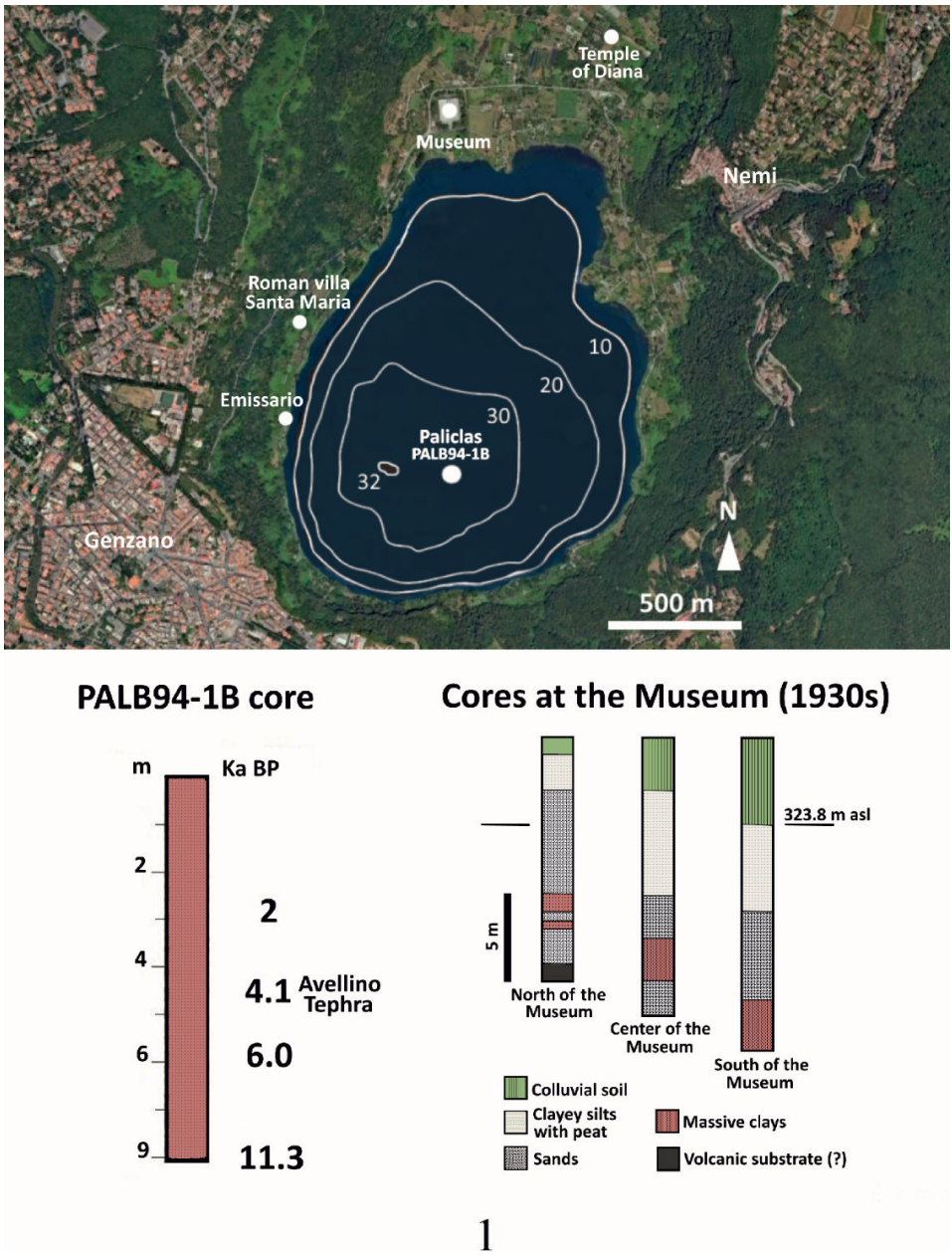
1

2

Pl. 2: 1 – Planimetry of the Sanctuary of Diana Nemorensis at its largest extent in the 1st century AD (after Diosono 2024)

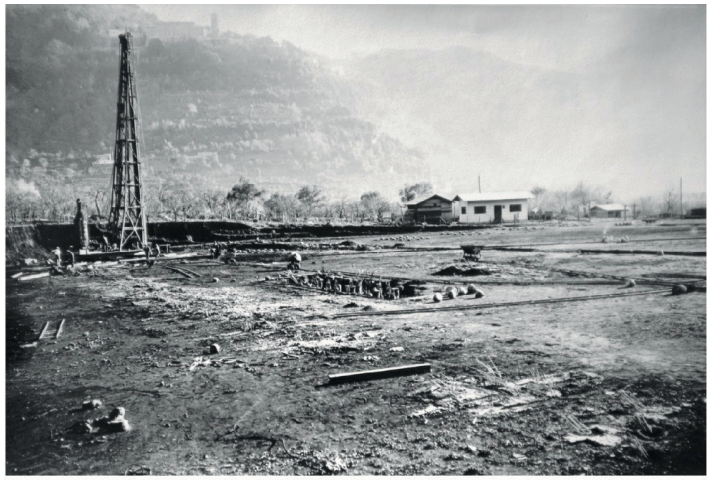
Pl. 2: 2 – The silty layer with rounded basalt boulders (lake bottom) on which the temple structures have been built during the 6th century BC (partly leaning and partly cutting it) while excavating the G2 trench in 2016, seen from the south (photo LMU)

PLATE 3

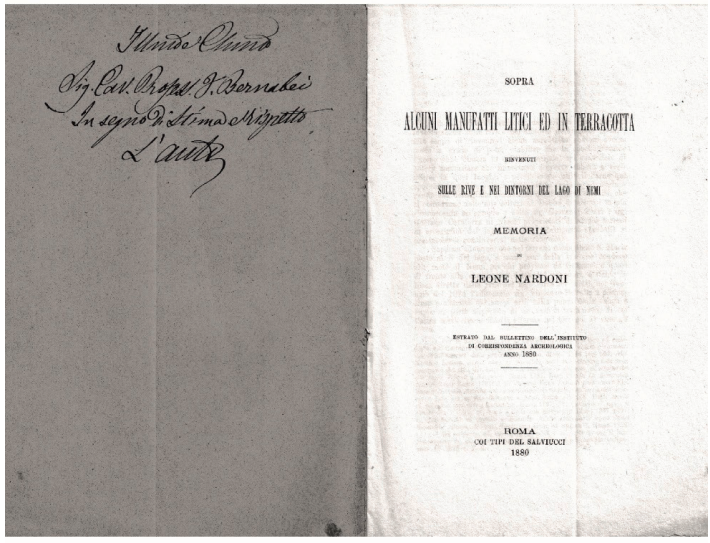


Pl. 3 – Above: satellite view of Lake Nemi, with bathymetric map, the position of the main localities and of the cores (modified after Vigliotti *et al.* 2010). Below: stratigraphic logs of the Paliclas core PALB94-1B (modified after Vigliotti *et al.* 2010) and of the cores documented during the construction of the museum in the 1930s (modified after Ucelli 1950). Elab. by F. Altamura

PLATE 4



1

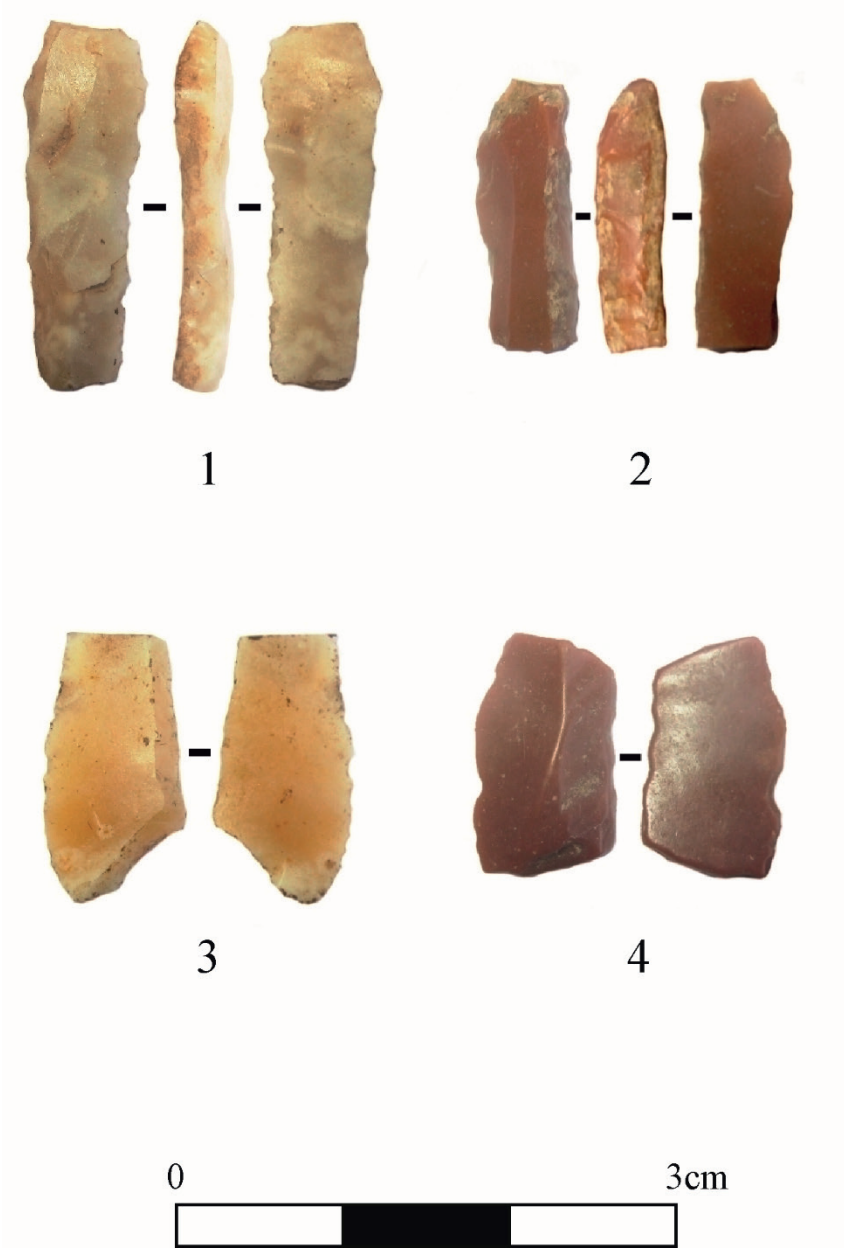


2

Pl. 4: 1 – Locality Pantane during the construction of the foundation pillars for the Museum of the Roman Ships of Nemi in the 1930s (after Altamura and Paolucci 2023)

Pl. 4: 2 – Excerpt of the paper on the antiquities of Nemi published in 1880 by Nardoni in the Bullettino dell'Instituto di corrispondenza archaeologica, with a dedication to the archaeologist and politician Felice Barnabei. Photo F. Altamura

PLATE 5

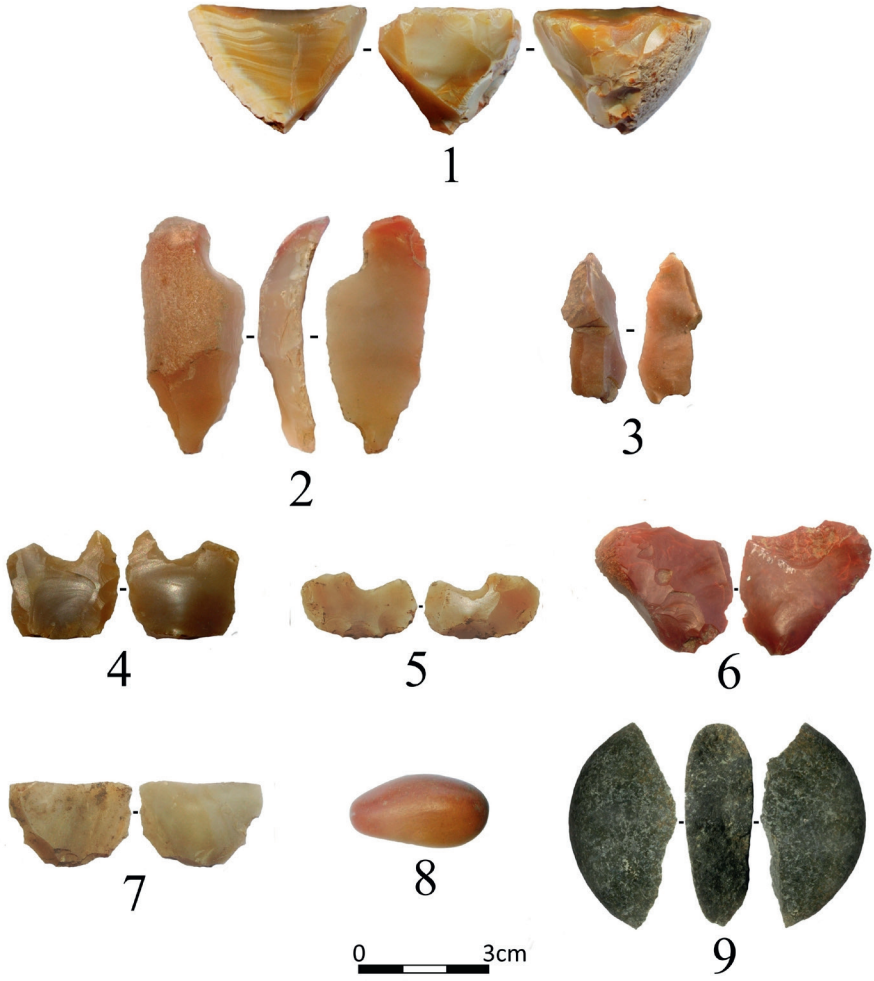


Pl. 5: 1-4 – Lithic industry ascribed to the Final Epigravettian. Photo F. Altamura

PLATE 6

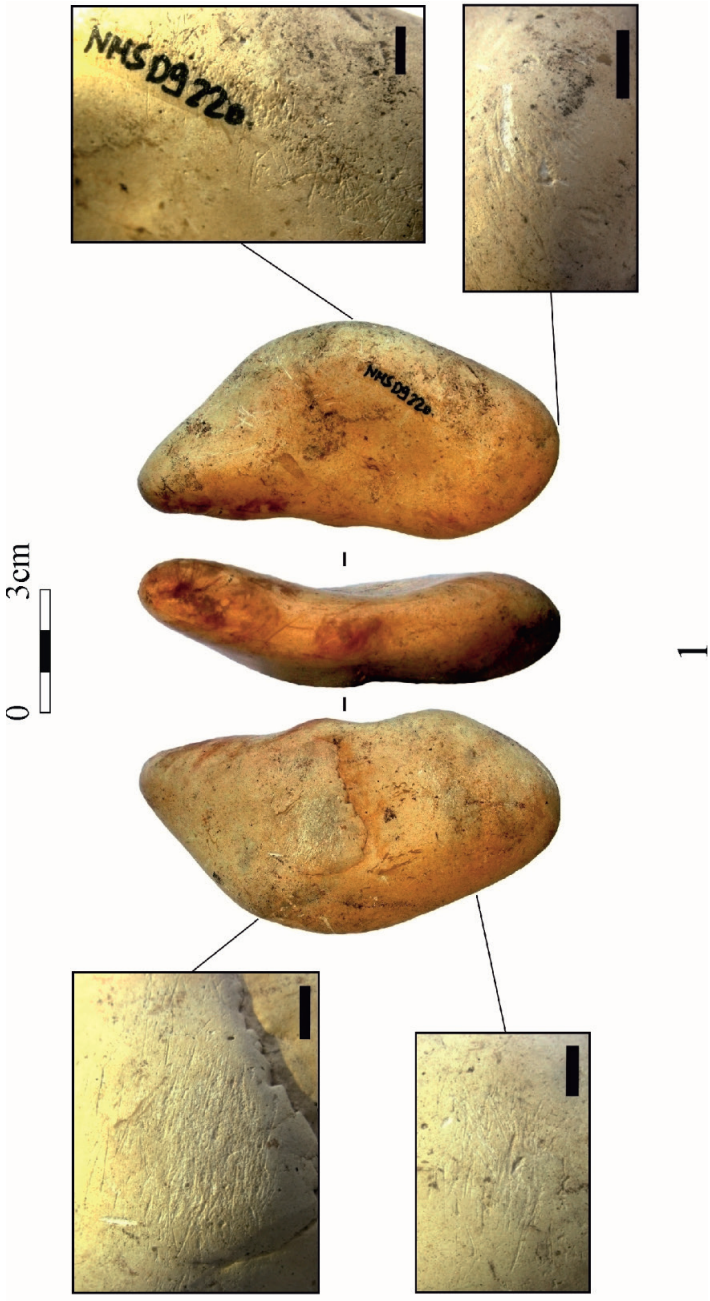
Pl. 6: 1-4 – Lithic finds ascribed to the Neo-Eneolithic and Bronze Age. Photo F. Altamura and F. Diosono

PLATE 7



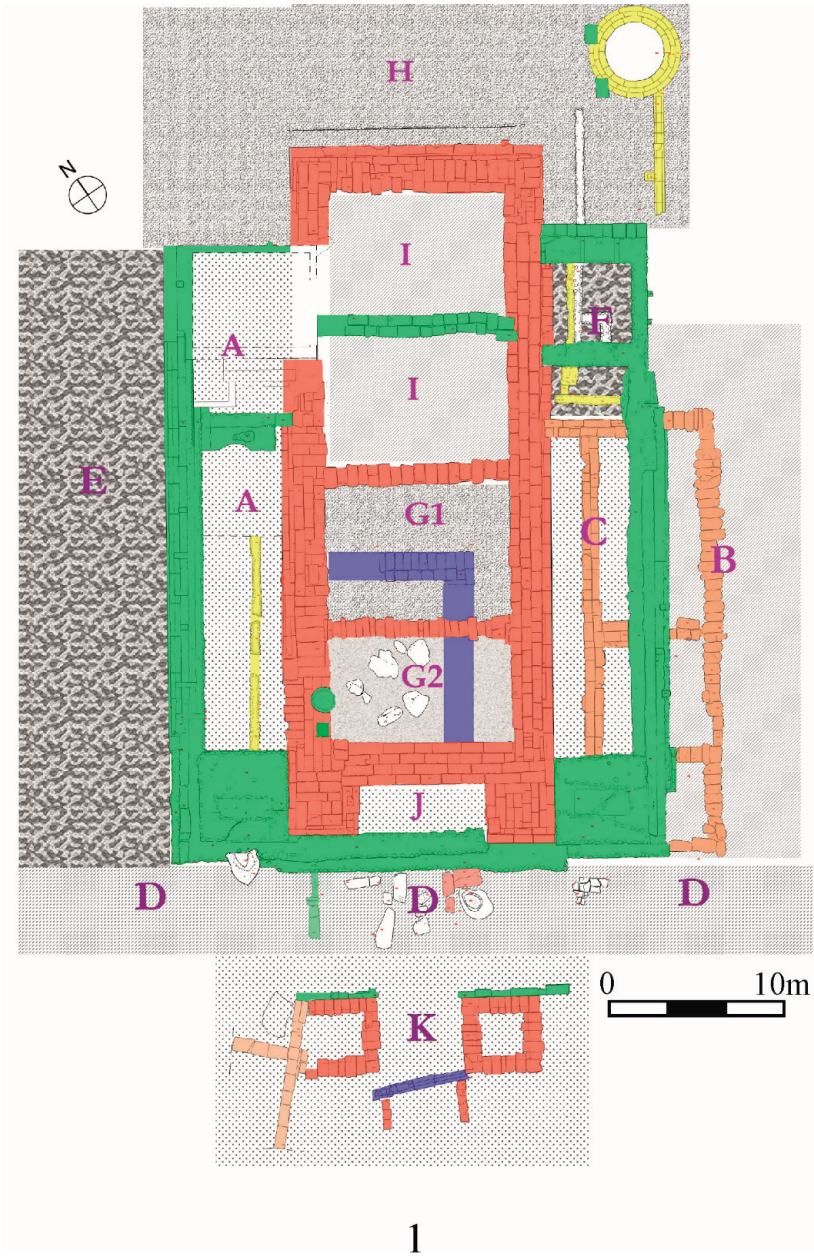
Pl. 7: 1-9 – Lithic industry generically ascribed to undetermined and pre-protohistoric periods. Photo F. Altamura

PLATE 8



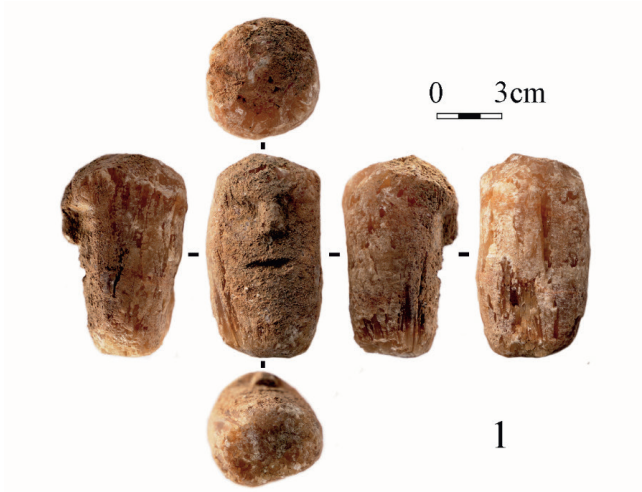
Pl. 8 – Retoucher/percussor on a limestone pebble of the pre-protohistoric period, with details of the use-wear in the inserts (scale bar 5 mm). Photo F. Altamura

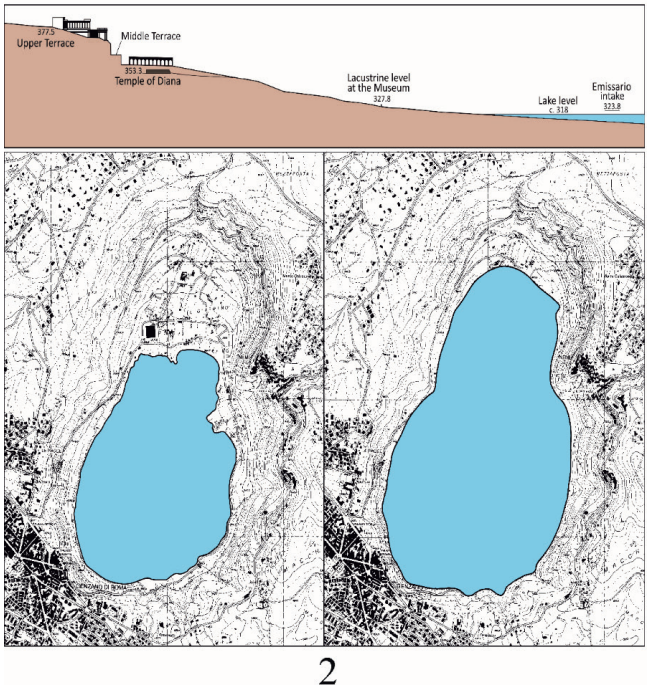
PLATE 9



Pl. 9 – The positioning of the 2009-2021 trench excavations around the temple of Diana, with an indication of the different architectural phases: in blue the first phase (6th-5th century BC); in red the second phase (late 4th-early 3rd century BC); in orange the small eastern temple and the access ramp added between 275 and 225 BC; in yellow structures around the temple built in the 2nd century BC; the third phase (75-50 BC) in green (graphics by F. Diosono on the basis of Diosono 2024)

PLATE 10





Pl. 10: 1 – Anthropomorphic statuette found at the Sanctuary of Jupiter Anxur, Monte Sant'Angelo, Terracina, tentatively ascribed to the Neo-Eneolithic (photo K. Ring – LMU).

Pl. 10: 2 – Above: Schematic profile with the representation and the altitudes (m above sea level) of the lake level, of the Emissario intake, of the lacustrine sediments at the Museum, of the podium from the temple of Diana, and of the middle and upper terraces of the sanctuary (modified after Diosono 2024); Below: present-day surface of the lake (left) and hypothetical extension of the lake with the water level at 360 m above sea level (right), elaborated on CTR cartography (F. Altamura)