Man and environment in Central, Southern and Insular Italy (Palaeolithic and Mesolithic)

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Lower Palaeolithic

The research followed two chief guidelines. Firstly, a detailed study was made of the Clactonian-Tayacian industrial artifacts recently discovered in the Sardinian province of Sassari. Of course, this study concentrates not only on the history of the island's oldest population settlement, but also on the important geological and paleographical question concerning links that may have existed between Sardinia and the mainland during the Lower-Middle Pleistocene. The stone complex lying in secondary location in the deposits in the *Riu Altana* valley floor has been the subject of special analysis (F. Martini and A. Palma di Cesnola, studies in progress).

Preliminary observations have ascertained that it is composed of:

- 1) an extremely floated ancient Clactonian industry, with some laminar elements reminiscent of the so-called proto-Valloisian industry in the Italian Adriatic area;
- 2) a later (less floated) industry, comparable to the Tayacian located in the overlying Rissian terrace, a partial account of which has already been given (MARTINI & PITZALIS, 1982).

The second sphere of investigation into the Lower Palaeolithic in centralsouthern Italy concerns the large quantity of *Acheulian* material in the Gargano that has been yielded following research work, most of which has been undertaken in the north-central part of the headland.

It has taken many years to carry out a typological, technological, morphometrical and structural analysis of the industries (using the methods of both F. Bordes and G. Laplace). These, amounting to over 1,200 pieces, were found at the Forchione (Ischitella) site, on a terrace overlooking the eastern shore of Lake Varano.

Details of the study will appear in the *Rivista di Scienze Preistoriche* in an article by M. Calattini, G. Cresti, A. Palma di Cesnola and outside contributors. Using a method of division into five physical series (the degree of abrasion on edges, the quantity of pseudo-retouch on edges and of surface striation, glazing, etc.), the study revealed the existence of three different Acheulian groups.

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The most abraded series (5) shows an archaic Acheulian with primitive bifaces, probably in its pure state, together with large flake tools, mostly of the carenoid type, which may be linked up with a small set of artifacts discovered some years ago in secondary context in the alluvial deposits forming the Rissian terrace of the Romandato stream. In the middle series (3) there is a late Acheulian in its almost pure state, with short, cordiform, oval and discoidal, rather flat bifaces, recalling the facies (which some authors may have incorrectly defined as final) of the Zanzaniello in the Venosa basin at Basilicata. The most recent series (undoubtedly in the pure state) shows a medium-sized final Acheulian with squat bifaces along with a Levallois-technique flaking industry. In the second and fourth series, materials are not homeogeneous.

All three Acheulian horizons listed may be regarded as virtually new for the Gargano, except for the few references, noted above, to several Romandato features.

Whilst the study of the Forchione material was under way, an analysis of the numerous Acheulian industries was conducted, using the same methods, at the sites of Macchito and Masseria Tiberio in the Carpino countryside, in the same north-central area of the headland.

The Macchito Acheulian (about which M. Calattini is shortly to publish details) clearly belonged to an «upper» horizon. It is characterised by lance-shaped bifaces, elongated cordiforms of excellent workmanship. It is combined with an extensive flake tool industry, with large, imbricated scapers, flake tools and numerous nuclei of Levallois technique. Illustration of the large Acheulian group at Macchito will help solve the question of the Upper Acheulian in the Gargano, a phase that has been dated for some time, albeit only on the grounds of scattered elements.

M. Calattini, G. Cresti, A. Palma di Cesnola and their assistants have recently undertaken a study of the rich material (roughly 2.000 pieces) coming from the Masseria Tiberio site, located on a terrace overlooking the eastern bank of Lake Varano.

Using the same method of division into physical series as was practised at Forchione, it has been possible to establish, if only on a preliminary basis, that two Acheulian horizons exist in this complex. The first, pertaining to the (especially prolific) material showing a higher degree of abrasion and stronger signs of solifluxion (striations, pseudo-retouch, etc.), tallies with the archaic Acheulian identified at Forchione - fifth series. The second, in a recent physical state, is partially comparable to the final state of the first Forchione series. Published information about the Masseria Tiberio complex will, in particular, supply a complete definition of the oldest phase of the Garganic Acheulian.

Earlier studies into the Garganic Lower Palaeolithic have already hinted at the presence of a wide number of different Acheulian trends on the headland. This suggests that diverse traditions may have successively converged here during the long period of the Lower Palaeolithic, which particularly affected this area. If the archaic Acheulian (Forchione, Tiberio, etc.) and the Upper Acheulian (Macchito) remind us, for example, of the middle Adriatic stretch (Abruzzo-Marches), the third series Acheulian at Forchione is especially comparable to the Venosino Basin at Basilicata. This makes recognition of chronological relationships between the various Acheulian horizons on the Gargano extremely complicated, since diachronic differences which are also visible are accompanied by possible synchronic variations (in the broad sense of the term).

Mousterian

In this field, the most noteworthy results have come from research carried out in Campania and especially along the Cilento coastline.

A. Ronchitelli has excavated (1984-86) the significant Mousterian series (over 10 metres thick) in the Molare Shelter near Scario.

Starting from the bottom, the Molare series begins (horizon I) with a marine conglomerate, ascribable to the Tyrrhenian, the roof of which is 5.5 metres above the present-day sea-level. Lying above the fossil beach (horizon II, 1.8 m. thick) is a red clay bed in which three concretionary levels are intercalated. Next is a 70 cm.-thick group (III) formed by seven concretionary levels; a 50 cm-thick bed of dark red clay (IV), with a rich iron-manganese coating; a 4.5 m. thick series (V) of red clay soil sediments, with alternating breccia and pyroclastic rock. At the top of the series (VI) breccia and pyroclastic rock appear to be plated against the far wall of the cavity, incorporated in a stalagmitic flow.

Most of the animal remains originate from the various levels of breccia mentioned above. From a preliminary investigation these animals would seem to be rhinoceros (restricted to horizon III), cervids and goats (most common) and rarer suidian bovidae. The combination of species suggests a relativelydamp climate and a partially forested environment, as does the type of sediment, which is often concretionary and rich in clay. The age of the deposit, within its Würm context, has yet to be established, but there is possibly sufficient evidence to place it between the oldest periods of the local Mousterian series (Pioggio Cave, where the deposit is attributed to the early Würm I age, if not to the pre-Würm epoch) and more recent ones (strata 10-9 of the Pioggio Shelter), belonging to the dry phase of Würm II.

Examples of stone industry have been taken from at least sixteen inhabited levels (some with hearths), distributed across almost all the horizons named above. From a preliminary examination, the largest group - that of horizon III - appears to belong to the typical non-Levallois technique Mousterian, with faceted heels, an average index of scrapers and moderate laminar index: rare, but persisting archaic elements, such as dihedral ventral-faced pieces (Quinson technique) may be observed. The industry found in the upper horizon (VI), details of which have not yet been published, may refer to a more evolved type of Mousterian.

In 1985, a fragment of a human mandible, belonging to a three or four yearold child, was discovered at the base of horizon III, incorporated in the highly concretionary breccia. The fragment consists of the right section plus part of the left of the mandible, together with a small piece of the upper right-hand section. The four deciduous molars are preserved.

The morphology of both mandible and teeth allows this find to be attributed to the Neanderthal type. Archaic features may be detected in particular in the symphysial area of the mandible. Initial remarks on the Mousterian layer at the Molare shelter and the Neanderthal remains found there will appear in an article by F. Mallegni and A. Ronchitelli in the Parisian journal *L'Anthropologie*.

During the same years, A. Ronchitelli has conducted and almost completed a study of the Mousterian deposit in the Grotta Grande cavern, also situated on the Cilento coastline near Scario. Here, lying above a marine conglomerate (probably Tyrrhenian), is a deposit formed mainly of red clay sediment, which marine erosion has reduced to cemented plaques against the rocky wall. It contains a hearth with relatively rich evidence of Mousterian industry. Animal remains, currently being examined at Florence University's Institute of Geology and Palaeontology, include cervids and goats, the latter being especially plentiful. Pollen analysis, which is also currently under way in the University of Bologna's Department of Botany, gives evidence of a sparsely wooded landscape. The stone industry discovered during A. Ronchitelli's 1979-81 excavations, which has been only partially examined, may be generally attributed to the Charentian Mousterian of the La Quina type. However, it seems more evolved than the La Quina Charentian in the Poggio Cave - bed 2.

L. Sarti subsequently conducted a series of excavations (1983-'84-'85) in the Mousterian deposit of Porto Infreschi. This deposit, which is approximately 7 m. thick, lies on a Spondili marine conglomerate that may be attributed to the Tyrrenhian. Moving upwards from the base, the debris is overlain by a series of fine angular breccia horizons in a clay matrix, the colour of which ranges from brick-red to yellow-red (A - approx. 2,8 m. thick). This series is sealed with a stalagmite and an overlying vellowish breccia (B - 25 cm. thick). There follows over a metre of reddish-coloured soil sediments, with a light calcareous skeleton of average size and with greatly deteriorated pumice stones (C); a fine angular breccia inside a bright red clay matrix (D - 50 cm. thick). The overlying horizon (E - 60 cm, thick) is formed by small and medium-sized boulders, sealed by a large stalagmitic flow. Higher up (F - roughly 1 m. overall thickness) are stalagmitic crusts of varying thickness, in which a red-brown clay level is inserted. These are covered by a further level of the same red-brown colour. The series is completed by four or five metres of extremely large fallen boulders (H), which lie directly under the surface humus.

Mousterian industry and relatively plentiful animal remains are particularly evident in the tiny angular breccia (A), in the part lying over the grey tuff, where there was also a hearth.

The higher levels, where the soils would seem to indicate genuine instances of colluvium, contain isolated animal and stone remains.

L. Sarti and his colleagues are now studying the Mousterian soils, animal remains and industries found in the various levels of the series. Their work will provide the basis for more in-depth research into this important deposit.

After five years of research into the Cilento Mousterian, the following observations may be made:

a) Several other horizons lie between the La Quina-type Charentian Mousterian of the early Würm I (which, according to some authors, actually dates to a pre-Würm era) in the Pioggio Cave and the base of the deposit of the Pioggio Shelter, and the typical Levallois-technique Mousterian in the higher levels of this Shelter (Würm II). These would seem to fill the wide gap that has existed up till now in the local series, most probably corresponding with the advanced phases of Würm I, the interstadial Würm period and the start of Würm II.

b) These horizons reveal an industry, whose placement in the Cilento Mousterian needs to be clarified, but whose technical-typological features seem to illustrate the transition from a La Quina Charentian appearance to one approaching the typical Mousterian style, with a gradual increase in Levallois-technique elements. The groups found at Grotta Grande, Molaro Shelter-Horizon III and the Infreschi Shelter may constitute several stages in this evolutionary process.

As regards research work in the Lecce area of the Salento, before studies could be made of the Grotta del Cavallo (a cavern in the Bay of Uluzzo, municipality of Nardo), it took several years to free the deposit from waste caused by unauthorised excavations. L. Sarti and F. Martini have just begun an excavation of the deposit lying immediately beneath the Uluzzian horizon (discussed in the next section); it also considers the level corresponding with stratum F1 of the stratigraphy established in the 1960s by A. Palma di Cesnola. This excavation is only the start of an operation to broaden the previous trench which we shall be working on for some years to come.

In Tuscany, in 1982, A. Galiberti carried out a research campaign into the outdoor Mousterian deposit (a subject he had been studying for some years) of Botro ai Marmi near Campiglia Marittima (Leghorn). During this campaign, a surface of two sq.m. was explored, the lowest part of the stratigraphic series, corresponding to an alluvial deposit of pebbles and brown sediment. This still contained animal remains (partly attributable to ox), fragments of burnt bone and an infrequent stone industry. Following the excavation, A. Galiberti began an analysis of the stone industry so far discovered in the deposit, which may be ascribed to a late stage of the Mousterian. A preliminary investigation suggests a series of small artifacts displaying very slight traces of the Levallois technique, moderate laminar content, and types belonging to the Upper Palaeolithic (including ridge elements).

Ancient Upper Palaeolithic (Uluzzian, proto-Aurignacian and Aurignacian)

Research carried out along the middle and lower stretch of the Tyrrhenian side revealed new deposits belonging to the oldest Italian Upper Palaeolithic. A set of stone artifacts at Salviano, province of Leghorn, have added to the number of late Uluzzian industries in Tuscany. On the basis of F. Martini's painstaking typological and structural investigation (1983), it has been linked with known groups in the Arno valley that are defined as «final» (Indicatore in the province of Arezzo, San Romano in the province of Pisa, etc.) and along the Grosseto coastal strip (Val Berretta).

A. Ronchitelli's study of the new Uluzzian site of Tornola in the province of Avellino, Campania (1982-83), instead reveals features that are more comparable to those of the evolved or middle Uluzzian, particularly in the heightened development seen in the group of ridges.

In the well-known deposit at Grotta del Cavallo, the excavations to shift the unauthorised waste (mentioned in the section on the Mousterian) made it possible to isolate a limb of the Uluzzian deposit which was still intact and which was related in particular to the archaic and evolved horizons. This limb contained enough carbon material to establish an absolute date for the Uluzzian horizons, using the Cl4 method. The dating of the Uluzzian deposit in the Grotta del Cavallo is of the utmost interest, since the series of this deposit, the only one of its kind in Italy, is essential to the study of Uluzzian evolution in this country.

In 1983, F. Martini and L. Sarti published a work entitled «Hypothesis for the Correlation of Uluzzian Stone Industries by Cluster Analysis», the first attempt to identify groups from the Italian Uluzzian using statistical methods. In this work, various structural features of classification are taken into account, based on the Laplace or related methods: modal structures, articulated modal (i.e. broken down according to internal parameters) and essential, elementary and detailed modal (in which techno-typological factors were shown). The data used relates to a large number of Uluzzian industries in central and southern Italy: Grotta del Cavallo and the Castelcivita and Fabbrica caves, together with the outdoor sites at San Pietro (Maida), Val Berretta, Indicatore, San Romano, Maroccone and Salviano.

The following has emerged from the groupings:

- a) The archaic and evolved Uluzzian of the Grotta del Cavallo do not appear to bear close affinities with other Italian groups;
- b) The transition phase between evolved and final Uluzzian in this cave seems to be chiefly linked to industries in the Castelcivita and Fabbrica caves;
- c) There are strong analogies between the final Uluzzian in the Grotta del Cavallo and surface sites in Tuscany and at San Pietro, Maida (Calabria).

These results partly confirm theories about the Italian Uluzzian that had already been advanced with the aid of more empirical and traditional methods.

Interesting facts about the tradition of several Uluzzian features belonging to the so-called non-Dufour proto-Aurignacian technique have emerged from the discovery and study of a new site at Punta Safo, Calabria (RONCHITELLI and collaborators, 1984). This confirms that proto-Aurignacian groups of epi-Uluzzian character - previously illustrated by a single example, the San Pietro, Maida site (also in Calabria) - spread down towards the Lower Tyrrhenian.

N. Gheser, R. Morandi and F. Martini have completed a structural study of all Italian proto-Aurignacian and Aurignacian complexes (to be published in *Preistoria Alpina*). This work, in which the authors also used specially processed statistical methods (cluster analysis), has made it possible to correlate individual stone industries and make an accurate comparison, based on detailed parameters, of industrial facies within the chronological scansion of the archaic Upper Palaeolithic. As well as confirming the definition of industrial **phyla** and their chronological order (already put forward by A. Palma di Cesnola), this study has indicated several working hypotheses: the affinities between the Fabbrica cave industry - beds 3 and 4 (Dufour lamellar proto-Aurignacian) - and that of Serino (proto-Aurignacian, with marginal ridges) suggest a structurally similar development of two separate facies (which are also geographically divided) that differ in specialisations related by parameters of detail to the end of the proto-Aurignacian cycle. Two distinct complexes have been identified within the non-Dufour proto-Aurignacian facies, the first represented by Vadossi and Caldanelle industries, the second by those of Punta Safo and Stroncoli, which seem to have different structural and stylistic parameters. An overall analysis of the complex has highlighted that at all structural levels examined, the greatest similarities exist between Aurignacian and proto-Aurignacian of non-Dufour facies.

Ancient Epigravettian in Southern Italy

During the past five years, research into the Paglicci Cave in the Rignano Garganico countryside has concentrated on the deposit containing ancient Epigravettian «crans» and foliate industries (corresponding to beds 14-17 in the first section of the cave). The excavations, conducted by A. Palma di Cesnola in collaboration with many scholars and students from Italian and foreign universities, have yielded interesting results (not all of which can as yet be evaluated) from various points of view:

- a) Beds 14 and 17 (as with 1 14), which had been regarded as homogeneous units during the Zorzi excavations in the Sixties, were sub-divided into a number of levels, some of them very fine. This internal division of the old stratigraphic units did not make use of artificial cuts but instead took all possible paleosurfaces or inhabited sites into account.
- b) Modern techniques applied during the excavations yielded a considerable amount of material of archaeological and paleoecological interest that had escaped attention in the Sixties. These ranged from stone microlithic objects and fragments to micromammalian and bird-bone remains, and carbon remains consisting of burnt bones and frustules of charcoal (collected both directly from the soil and by flotation).
- c) Exploration of the archaeological deposit was carried out by following the paleosurface. On more than one occasion, very simple structures such as hearths were identified, along with what may have been the hearth floors, chiefly formed of clay that was probably brought in from outside the cave (various examples of this type were found in bed 16 during the 1985-'86 excavations), soils covered with pulverised ochre or small ochre fragments.

Important results were obtained from the study of topographical alterations in human habitation of the cave during the filling-up phases. The end of the first chamber shows an evident change in the use of space, moving down from the high strata of the ancient Epigravettian horizon (14-15, sloping gently inwards) which was used for dumping bones, food remains, cinder from the hearth and rocky debris, towards the lower strata (17-16, almost completely horizontal), where the same area was used for making hearths and working flint.

In 1986 a large quantity of charcoal samples were sent to Gröningen laboratory to be dated according to the C14 method. These had been been collected at many levels, ranging from bed 12 to roof 18 (this last having just been discovered during the 1986 excavation). The dating of these levels will determine the complete and detailed chronology of the Upper Palaeolithic deposit in the first chamber (between the advanced Würm III and the Alleröd interstadial period), completing the series of dates already obtained at the base (c. 24,700 -20,200 BP: beds 21 - 18b) and the roof (c. 15,500 - 11,400 BP: beds 10 - 2).

At the same time work has begun to identify the flora of the whole series, through both pollen and anthracological analyses. With regard to palynological questions, analyses relating to levels between the end of the evolved Epigravettian and the early final Epigravettian (beds 8-7) have already been made (S. Satta's degree thesis, 1983-'84 academic year). These revealed the existence of numerous herbaceous plants (*Graminacee, Cyperacee*, etc.) typical of a steppe-meadowland environment, together with very sparse growth of tree species such as pines, ilex, etc.

One of the most remarkable discoveries in the study of Palaeolithic art was the fragment of a limestone slab on which the hind quarters of a running horse are painted. The style resembles that found in the Lascaux cave. The fragment probably came away from the vault, where the complete painting must have been, and was found in bed 14, corresponding to the lower level of the ancient Epigravettian with diminished *«crans»*. The age of this level (to be established by the Cl4 method) will set the *terminus ante quem* limit for the date of the painting.

Some horn tools (extremely rare objects in our Gravettian/Epigravettian Upper Palaeolithic) discovered in bed 17 during the last excavation should also be mentioned. These consist of a slender, elongated awl (measuring over 20 cm.), and a complete spindle-shaped spear that is rounded and has a slanting base.

Final Epigravettian and Mesolithic/Epipalaeolithic

F. Martini has completed a preliminary study (now published in *Studi e Materiali*) of the Epigravettian stone industry at the Pianali (Florence), yielded during the first excavation in 1982. The site in question was outdoors, located on the high ground along the lower Valdarno, where there was a short-lived settlement, a posthole of which has also been discovered. Through a detailed study at the level of secondary types, complexes were compared with the upper Tyrrhenian late glacial complexes, i.e., with the Ligurian Romanellian and diminishing Tuscan Romanellian which characterise the end of the Epigravettian in this area. The sub-stratum percentage, the low laminar content of several microlithic and hypermicrolithic backed elements evolved towards the Mesolithic and the presence of circular scapers are the main features that allow us to include the Pianali industry in the slightly Romanellian facies of Tuscany. However, we may assume its chronological position to be more advanced than that of Isola Santa - bed 5 and Grotta delle Campane, and probably closer to that of Arma dello Stefanin IV and Arma di Nasino, which can most likely be attributed to the early Holocene.

F. Martini and his colleagues have also completed the typological, typometrical and structural analysis of the important Sauveterre-type microlithic and hypermicrolithic industry, coming from an ancient terrace of the Arno in the Sammartina district near Fucecchio (excavations conducted in the 1970s). The industry was found in a yellow-coloured clay-sand level not more than 40 cm. thick, with a scant skeleton formed by small jasper pebbles. This level, directly covered by the surface humus, lay on a paleosoil of a reddish-yellow colour attributed to the Mindel-Riss Interglacial period.

The Sammartina Sauveterrian is characterised by the presence of numerous «frameworks». Particularly developed artifacts are the bilateral-backed points, or «Sauveterre points», double-backed and truncated microliths, geometrics, with circle segments and scalene and isosceles triangles with two or three sides retouched (the latter being of *«Montclus»* type).

Within the sphere of the Tuscan Mesolithic, comparisons set up (with regard to weapons in particular) with the aid of cluster analysis, link up the Sammartina group with the highest horizon (4a) of the Isola Santa on the Apuan Alps.

With reference to the north-east Italian Mesolithic series, the horizon with which Sammartina presents the closest affinities is the «recent» Sauveterrian of Romagnano III AC 2-1, although in certain respects (high content of truncated backed bladelets) the latter, like the Isola Santa, is comparable to Vatte di Zambana tt. 10 and 7. From a chronological point of view, the Sammartina industry would seem to correspond to an intermediate position between recent Sauveterrian and final Sauveterrian.

The excavation, conducted over a surface area of 56 sq.m., enabled identification of two areas containing large accumulations of material, both of which probably represent structures buried in the soil. The fact that various types of artifacts are scattered over the paleosurface does not seem to indicate that areas were differentiated and activities distributed across them.

The results of the excavations and study of material found at Sammartina appear in an extensive publication, edited by F. Martini and N. Gheser and issued by the *Rivista di Scienze Preistoriche*.

During M. Calattini's excavations of the Grotta delle Mura at Monopoli (Bari), the deposit of which had already been explored during the Sixties by O. Cornaggia Castiglioni, a horizon which may be defined as Mesolithic or Epipalaeolithic was identified. This constitutes bed 2 of the new stratigraphy established by Calattini, which is based on reddish-brown coloured sandy soil, 50-60 cm. deep, lying between an overlying bed of dark brown soil (bed 1), containing pottery with imprinted decorations, and an underlying yellowish-red sandy bed (3), scarcely affected by the excavation.

Bed 2 presented several more compact surfaces (possibly corresponding to trampling soils) alternating with levels of less compact soil. These compact surfaces, identified throughout the excavation area, did not display particular inhabited structures; only two light-coloured lenses of ash, amongst which it was possible to collect numerous charcoal frustules that sufficed to set an absolute date using the C14 method.

In bed 2, micromammalian animal remains largely consist of oxen, together with rarer horse. Terrestrial and marine malacofauna, which are especially plentiful in the high cuts, are predominated by the shells of rust-coloured limpets and cyclostomes.

The industry is characterised by extremely small artifacts (marked microlithism). A notable feature of the tools is the strong prevalence of geometrics, particularly in the form of triangles retouched on all three sides (Montclus type), to which several circle segments are added. The group of backed elements contains many blades, whereas points are rarer. The latter include bipoints of the classic Sauveterre type. Scrapers (some of which are circular) are infrequent, and burins are completely absent. Short scrapers, often displaying a marginal retouch, are prevalent in the sub-stratus (in the Laplace sense).

Another discovery was a limestone pebble bearing geometric engravings on one face. The motif consists of six bands painted with a series of short strokes. The other side of the pebble is marked with a few line engravings.

The discovery of the above-mentioned horizon in the Grotta della Mura opens up questions, above all regarding the existence and, secondly, about the origin of the oldest (Sauveterrian) Mesolithic in Adriatic-Ionian southern Italy. Only when excavations in the cave have been completed will it be possible to establish possible phylogenetic relationships between this industrial group - which had not been recognised during previous excavations - and the underlying Epiromanellian horizon.

In the Grotta della Serratura (Marina di Camerota - Salerno) a stratigraphic excavation began in 1984 and was continued in later years by F. Martini. A series of inhabited levels was discovered in two trenches in the cave (the first in the entrance, the second at the far end). Since the base of the stratigraphy has not yet been reached, the oldest period to which this may be provisionally ascribed is the final Epigravettian, with continued inhabitation during the Mesolithic and Neolithic.

The final Epigravettian found in the trench in the entrance seems to link up with the late Glacial facies of the Grotta della Cala, beds F-H, while the subsequent horizons, which for the moment have only been discovered in the trench at the back of the cave, represent new facies for this geographic area. Lying over a complex which is of the final Epigravettian type, but which probably dates to Holocene age (bed 8), are two beds (7-6) with clearly microlithic and hypermicrolithic industry (triangular forms) and segments of Mesolithic type. The Mesolithic complex nevertheless needs further investigation and broader sampling in order to obtain more in-depth knowledge about structure and style. Beds 5-4 yielded a completely different industry, drawn from larger-sized supports, which are often keel-shaped and roughly made, with a number of rough scrapers and denticulates, which is almost totally lacking in backed instruments. This early Holocene series is sealed with a stalagmitic crust, where the Neolithic series lies (beds 3-1).

Finally, F. Martini and L. Sarti have completed a study of Italian Mesolithic complexes, using the cluster analysis system. Their aim was to statistically ascertain structural affinities, in various degrees of complexity, of lithic groups, and to establish which structural parameters are significant in dividing these complexes into periods.

Their study has shown the parameters that are particularly susceptible to stylistic and structural evolution to be «frameworks», the elementary structure in the Laplace sense and the typometric layout. The fundamental structure, instead, and the so-called «common tools» are extremely standardized throughout the Mesolithic and do not constitute a conclusive diagnostic element in the division into periods. The results have also confirmed the Sauveterrian chronological scansion suggested by A. Broglio, which at times specifies similarities and/or differences between industries or groups of industries.

Although many of the results obtained in this delicate field of study have yet to be verified by further research, the discovery of new Epipalaeolithic and Mesolithic systems (largely of Sauveterroid character) in Tuscany, Campania and Apulia has aroused considerable interest.

The discovery of the Sammartina site, located on the low Tuscan hills at quite some distance from the Apennine, is extremely important, since it has revealed that nomadism on the Tyrrhenian side was on a broader scale than has so far been proved to have existed between the Apennine valley flat and ridge.

In Campania, the Grotta della Serratura series, with its two Epipalaeolithic horizons in stratigraphic succession (the first being Sauveterroid-type microlithic, the second containing scrapers and denticulate flake tools) definitively clarifies the cultural sequence of the early Holocene along the middle and lower Tyrrhenian, which had already been suggested in the Circeo (Riparo Blanc) and in Calabria (Grotta della Madonna at Praia a Mare).

The triangle-characterised Mesolithic in the Grotta delle Mura, Apulia, allows us to fill a gap which for a long time had been apparent, placing it between the late Epigravettian of Romanellian facies and early Neolithic imprinted pottery cultures.

These discoveries not only corroborate theories which have already been advanced. They also constitute the premise to a correct approach to the question of the origin of the Mesolithic and, more specifically, of philogenetic links that may exist between Mesolithic groups and the final Epigravettian groups preceding them, in such areas as Tuscany, Campania and Apulia.

Thorough knowledge about the Mesolithic, especially in southern Italy, will subsequently help solve the problem of connections between the Mesolithic and ancient Neolithic imprinted pottery (with respect to lithic features).

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