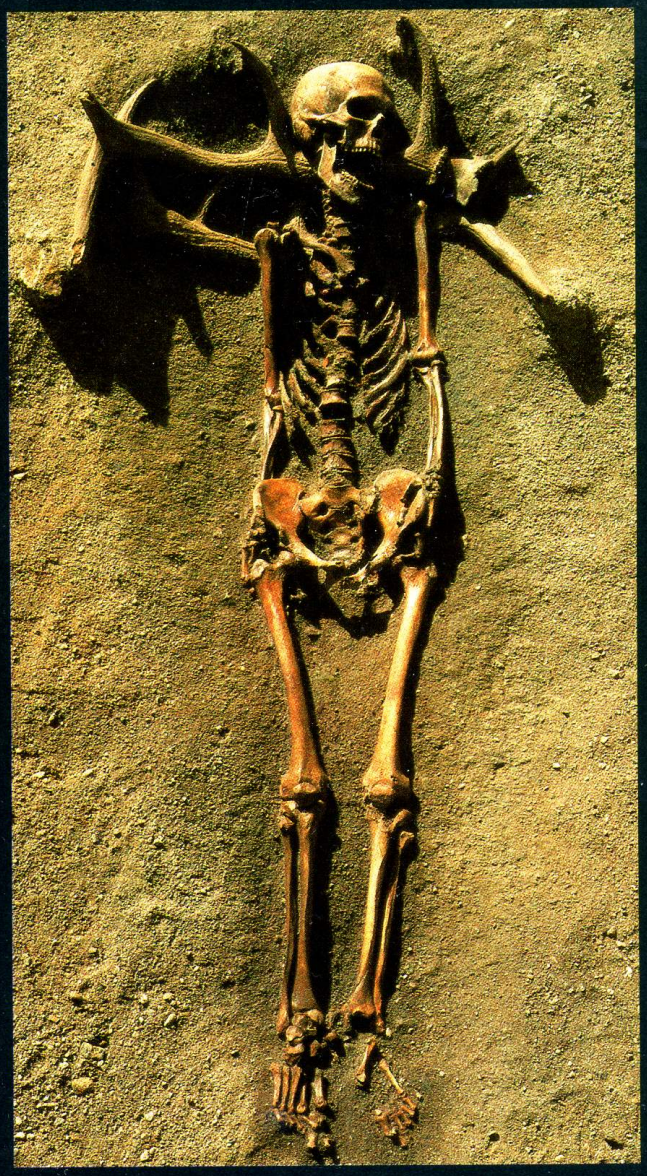
THE MESOLITHIC IN EUROPE

PAPERS PRESENTED AT THE THIRD INTERNATIONAL SYMPOSIUM



Edited by

Clive Bonsall

Liguria: 11,000–7000 BP

Paolo Biagi, Roberto Maggi and Renato Nisbet

Abstract

Research by local amateurs over the last two decades has led to the discovery of twelve Mesolithic sites in Liguria belonging both to the Sauveterrian and Castelnovian traditions. Most of them lie at high altitude in the eastern Apennine chain. Two of the Sauveterrian sites are very close to outcrops of dark red jasper, and have produced industries made largely from this local raw material. The Castelnovian encampments yielded assemblages made from both jasper and flint, the percentage of the latter increasing with distance from the jasper outcrops. In western Liguria the site of Pian del Re, close to a pass which connects the inner valleys with the sea, produced trapezes and notched blades almost exclusively chipped from a light-grey variety of quartzite available locally. No cave site has yet produced evidence of Mesolithic activity. Arma dello Stefanin and Arene Candide were both occupied during the final Epi-Gravettian and early Neolithic periods, but their stratigraphies show a gap in occupation corresponding to the Pre-Boreal, Boreal and early Atlantic climatic phases. The vegetational history of the region during the thirteenth to the seventh millennium BP is documented by a series of palynological cores and charcoal identifications, the most detailed of which are those from Arma dello Stefanin. Charcoal from the lowermost excavated layers of this cave is almost exclusively Scots Pine, while the layers above produced evidence of a marked increase in thermophilous vegetation culminating in the disappearance of the coniferae in the youngest final Epi-Gravettian layer. The stalagmite levels above should correspond to the entire Mesolithic period. A few charcoal fragments from these levels indicate more temperate climatic conditions with the first appearance of beech.

INTRODUCTION

In the beginning of the 1970s our knowledge of the Mesolithic of northern Italy was restricted to a few cave sites in the Trieste karst (Radmilli 1960). Some years later many sites were brought to light in the Adige valley (Broglio 1971) and in the north-eastern Alpine chain (Bagolini *et al.* 1983), as well as in the Tusco-Emilian Apennines (Biagi *et al.* 1980) and on the fluvial terraces of the central Po plain (Biagi 1981). The chronology of the north Italian Mesolithic is now well known thanks to a good number of radiocarbon dates (Alessio *et al.* 1983). The Ligurian Mesolithic sites of the eastern Apennines were discovered a few years ago (Baffico *et al.* 1983; Biagi and Maggi 1983).

Mesolithic cave occupation had already been described by Cardini (1947) at the Arene Candide cave; while on the basis of a few radiocarbon dates (Alessio *et al.* 1967) some authors suggested that there were late Epi-Gravettian hunters in the region until the end of the ninth millennium BP (Palma di Cesnola 1974, 1983; Broglio 1981) (*Fig. 6A*). The excavation in progress at the Arma dello Stefanin in the Pennavaira valley (Biagi *et al.* 1987) and the re-examination of data collected during previous research (Biagi and Nisbet 1986) demonstrate that no Ligurian cave known so far was inhabited during the whole of the Mesolithic period. On the contrary, cave sites frequently show evidence of final Epi-Gravettian and early Neolithic Impressed Ware layers, always separated by sterile and/or stalagmite levels (Baissas 1974; Biagi and Maggi 1983).

THE MESOLITHIC ASSEMBLAGES

Fig. 3 shows the tool types characteristic of Ligurian Mesolithic assemblages. They can be put into chronological order with the help of the finds from the well-known sequences of the Adige valley and the Tusco-Emilian Apennines (Broglio 1971; Biagi *et al.* 1980; Broglio and Kozłowski 1983). The assemblage from Punta della Mortola at Villa Hanbury includes hyper-microlithic isosceles triangles, notched blades and microburins, mostly made from a type of flint which outcrops *c.* 100 m to the north west of the site (*Fig. 2*, site 1). Excavations at Punta della Mortola have revealed that the deposit is thoroughly disturbed and that the Pre-Boreal assemblage was probably redeposited during the 1930s (Baroni and Biagi, in press).

On the eastern Apennines at an altitude of some 700 m, the site of Nido del Merlo and the nearby site of Passo della Camilla (*Fig. 1*, sites 1, 2) are very close to outcrops of dark red jasper. They both produced a poor assemblage including microlithic scalene triangles and circular end-scrapers. A similar collection was found at Ferrada 3 (*Fig. 1*, site 10) on the left bank of the Lavagna river at an altitude of some 100 metres.

Prato Mollo (*Fig. 1*, site 6) lies on the southern slopes of Monte Aiona, 600 m south east of Passo della Spingarda (1549 m) and some 200 m north east of a large peat bog basin (1492 m) which is currently being studied by G.M. Macphail (in press). The Mesolithic assemblage comprises material belonging

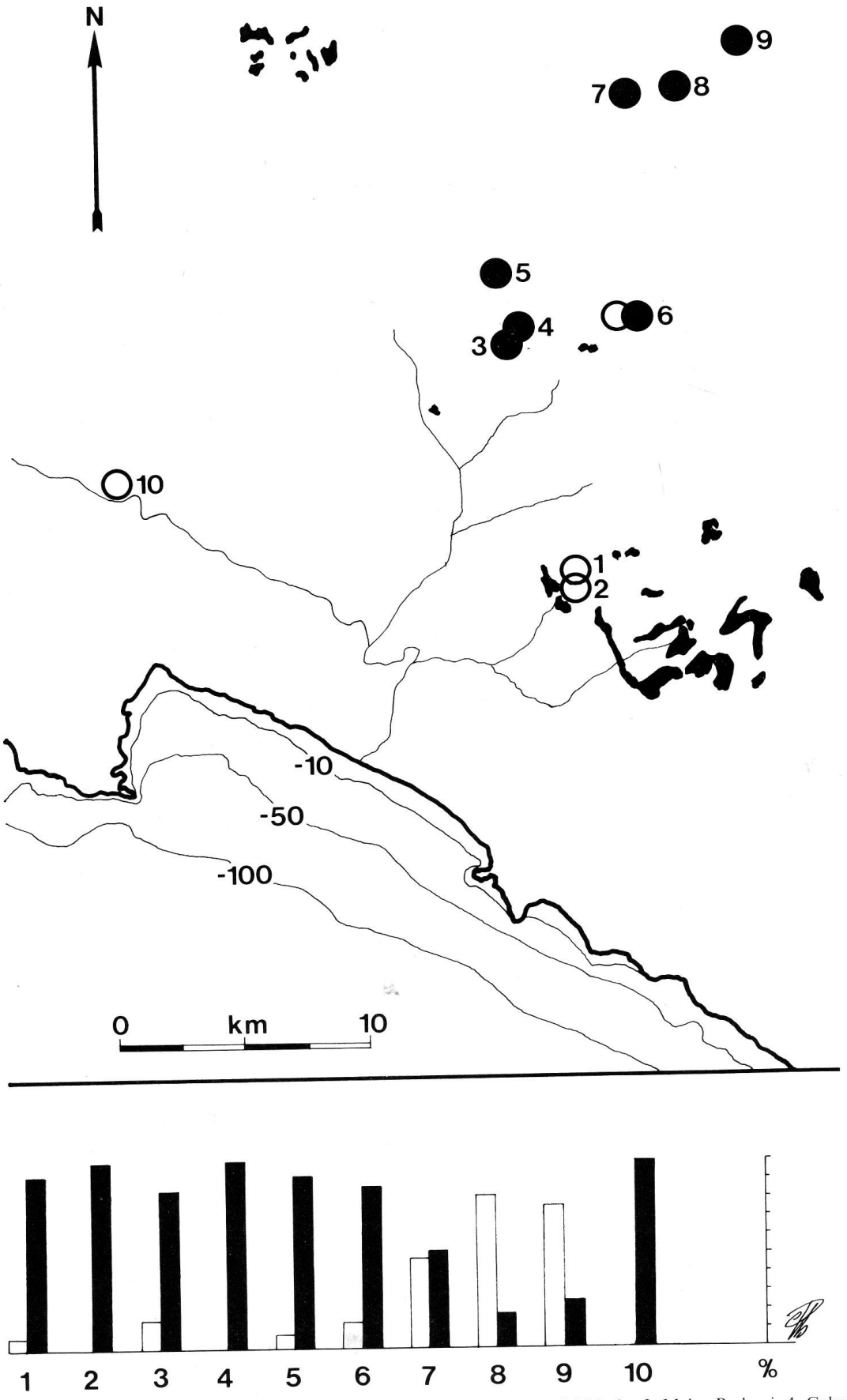


Figure 1 Mesolithic sites of eastern Liguria. *Key*: 1. Passo della Camilla; 2. Nido del Merlo; 3. Malga Perlezzi; 4. Colmo Rondio; 5. Bosco Lame; 6. Prato Mollo; 7. Groppo Rosso; 8. Prato della Cipolla; 9. Passo dello Zovallo; 10. Ferrada 3; areas shaded black indicate jasper outcrops. Histograms show the percentages of flint (unshaded) and jasper (shaded) for these sites. *Drawn by P. Biagi*

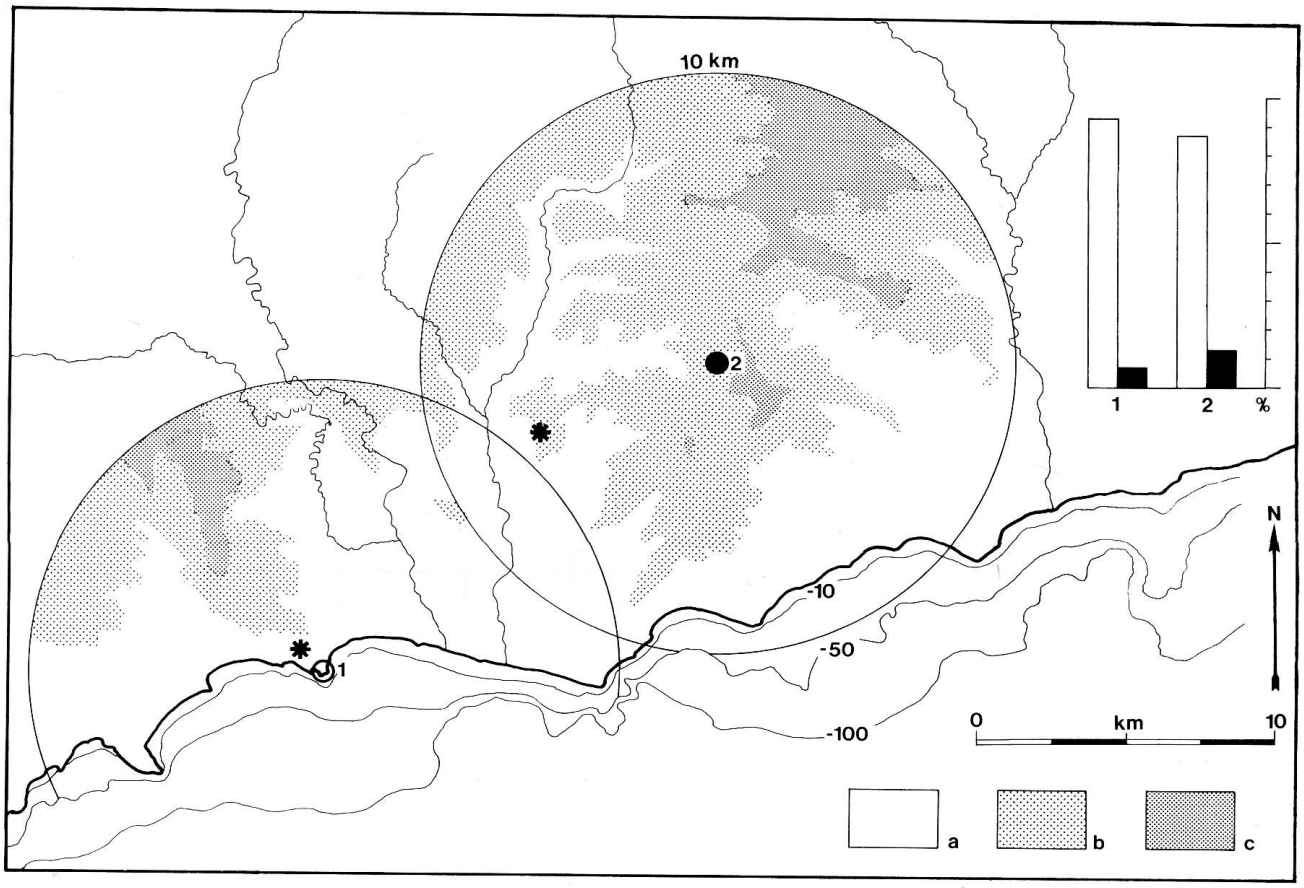


Figure 2 Mesolithic sites of western liguria. *Key*: 1. Punta della Mortola; 2. Pian del Re; *a*. land 0–500 m a.s.l.; *b*. land 500–1000 m a.s.l.; *c*. land over 1000 m a.s.l.; asterisks indicate raw material outcrops. Histograms show the percentages of locally available (unshaded) and imported (shaded) raw materials. *Drawn by P. Biagi*

both to the Sauveterrian and Castelnovian traditions.

Colmo Rondio (*Fig. 1*, site 4), in the Aiona mountains, produced surface finds with both microlithic bilaterally-backed points and trapezes and denticulated blades.

The industry from Malga Perlezzi (*Fig. 1*, site 3) is more difficult to define because of the scarcity of diagnostic implements.

All the other eastern Apennines sites can be attributed to the late Mesolithic Castelnovian culture (*Fig. 1*, sites 5, 7–9), including the western Apennine camp of Pian del Re at 850 m a.s.l. (*Fig. 2*, site 2). This site lies on the western slope of Monte Bignone, in an area of springs, very close to the pass of Colli Termini di Baiardo which connects the valleys of the interior to the Mediterranean sea, near Sanremo. The lithic assemblage is very specialized being composed of trapezes and notched blades, chipped from light-grey micro-crystalline quartzite, the nearest outcrop of which lies about 6.5 km west south west of the site.

THE VEGETATIONAL HISTORY

Data relating to the nature of the woodland cover of the Lateglacial and the beginning of the Holocene are very scarce and almost exclusively based on charcoal identifications (Vernet 1970, 1974; Fancelli Galletti 1972) (*Fig. 6D*).

In this context, the stratigraphic sequence recently brought to light at the Arma dello Stefanin (*Fig. 4*) is of particular importance and has produced new data covering almost six millennia. Together with the Arene Candide succession, it provides the most important stratigraphy for Ligurian prehistory for the Lateglacial and Postglacial periods.

As mentioned already, no cave has yet produced evidence of Mesolithic activity. There is a gap in our knowledge covering the Pre-Boreal, Boreal and very early Atlantic climatic periods. In the high Apennines, the final phase of the Boreal seems to have been characterized by an expansion of the silver fir, recorded at Lake Agoraie (1300 m a.s.l.) and especially at Lajone near Pianpaludo (985 m a.s.l.) (Montanari *et al.* 1979). The reasons why the caves were not occupied during the Mesolithic are still difficult to understand. Climatic change with increased internal percolation can be seen as one cause; but the exploitation of, and adaptation to, new forms of environment cannot be excluded as contributory factors (Biagi and Maggi 1983; Biagi and Nisbet 1986).

Charcoal identifications from the uppermost layers of Arma dello Stefanin, as well as those from

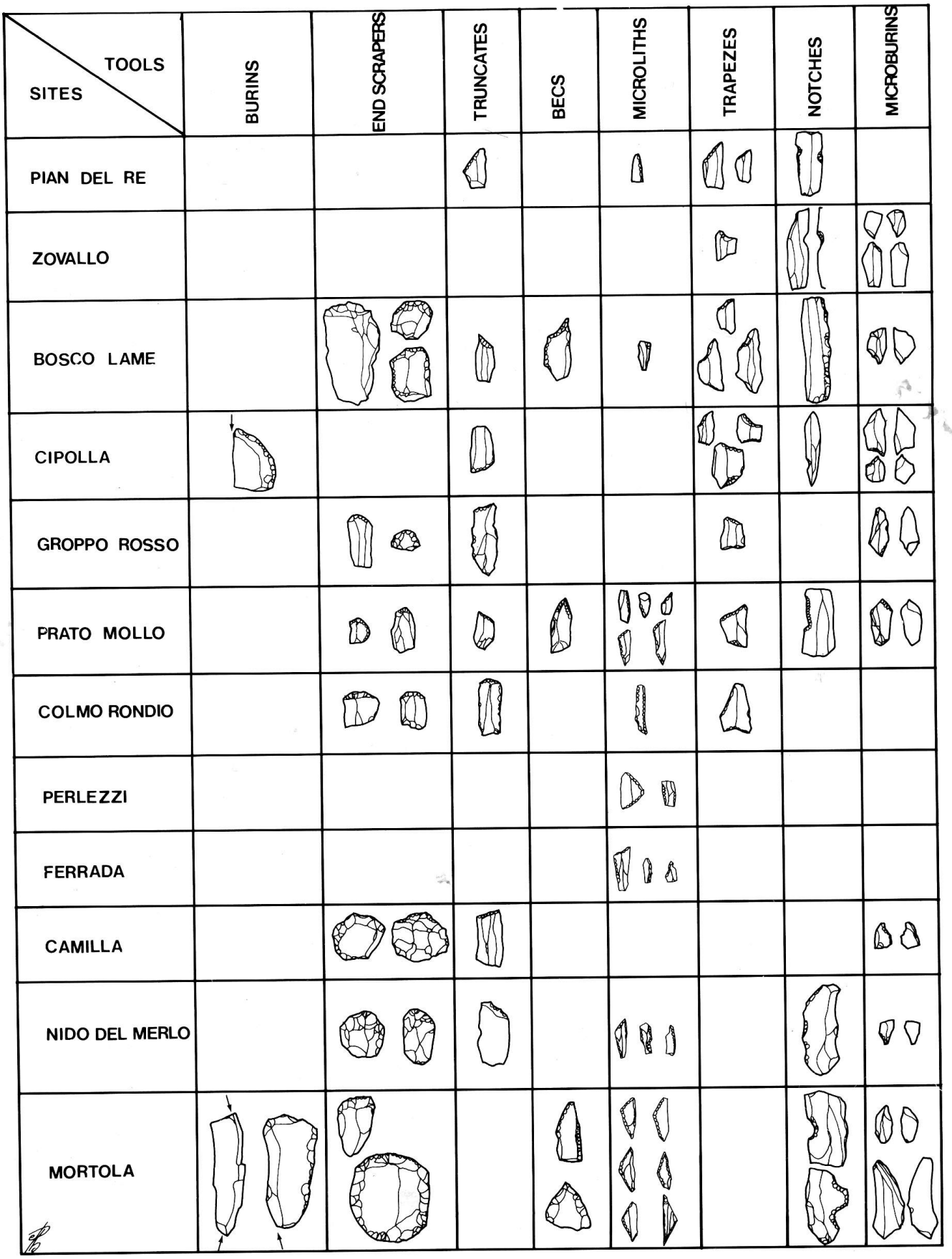


Figure 3 Typical chipped stone implements from Ligurian Mesolithic sites in chronological order (oldest site at the bottom). *Drawn by P. Biagi*

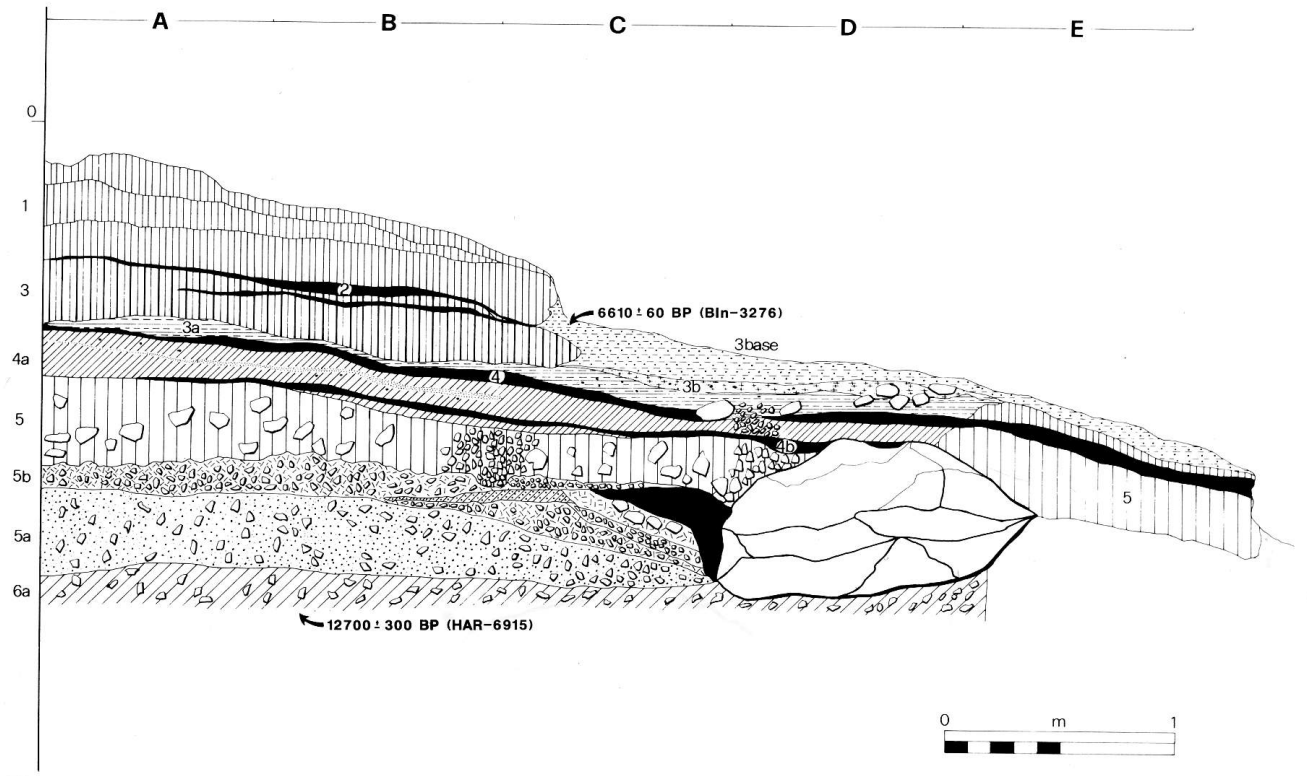


Figure 4 Stratigraphy of the Arma dello Stefanin (Pennavaria valley – Albenga). *Key*: 1. stalagmite; 2. early Neolithic; 3. stalagmite; 4. final Epi-Gravettian sequence. *Drawn by G. Marchesi*

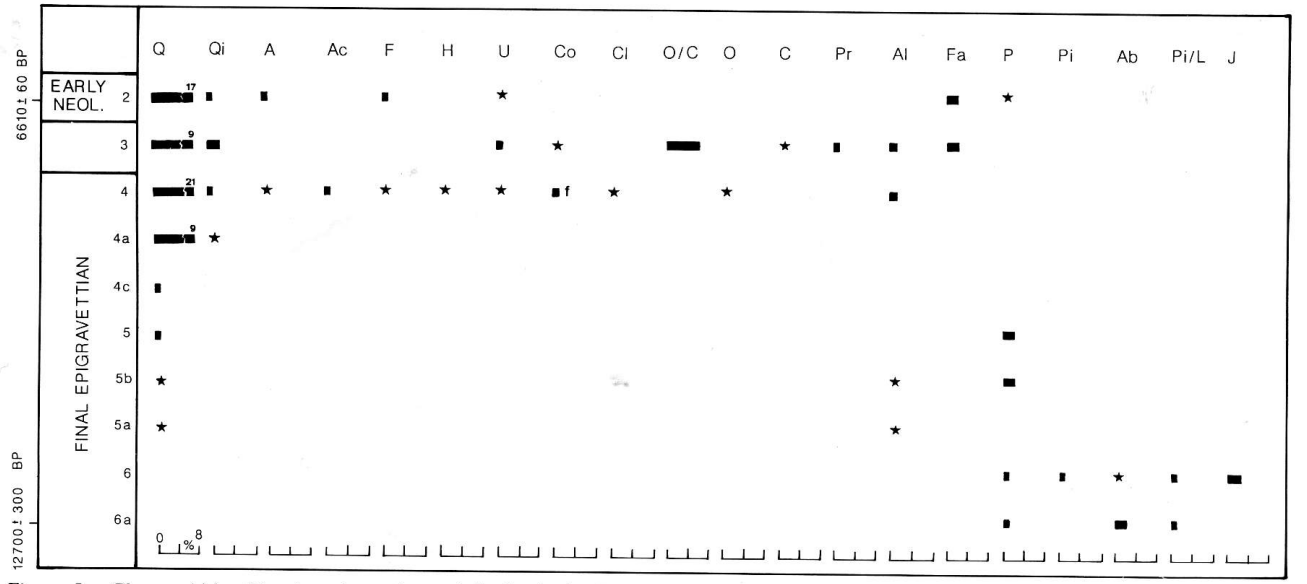


Figure 5 Charcoal identifications from Arma dello Stefanin. *Key*: Q – *Quercus pubescens*; Qi – *Quercus ilex*; A – *Acer pseudoplatanus*; Ac – *Acer campestre*; F – *Fraxinus*; H – *Hedera*; U – *Ulmus*; Co – *Corylus*; Cl – *Clematis*; O/C – *Ostrya* vel *Carpinus*; O – *Ostrya*; C – *Carpinus*; Pr – *Prunus*; Al – *Alnus*; Fa – *Fagus*; P – *Pinus sylvestris*; Pi – *Picea*; Ab – *Abies*; Pi/L – *Picea* vel *Larix*; J – *Juniperus*; * – less than 5%. *Drawn by R. Nisbet*

Arene Candide cave, show that the final Palaeolithic flourished in an environment subject to rapid changes and that some of the temperate oscillations of the Lateglacial considerably changed the characteristic Würmian woodland cover composed mostly of coniferae. At Stefanin the lowermost layers excavated so far (layers 6 and 6a) produced charcoal almost exclusively of *Pinus* sub-genus *Diploxylon* (*Pinus* cf. *sylvestris*/Scots Pine) and *Juniperus*. A similar situation is known from layers 5a–5, but with a gradual increase in thermophilous vegetation with deciduous oak (*Quercus pubescens*) and alder (*Alnus*). This association might indicate a humid temperate episode preceding layer 4 which produced the youngest final Epi-Gravettian assemblage of the cave. In layer 4, itself, a vegetation composed of various thermophilous species makes its appearance while the coniferae disappear (?Allerød). If this

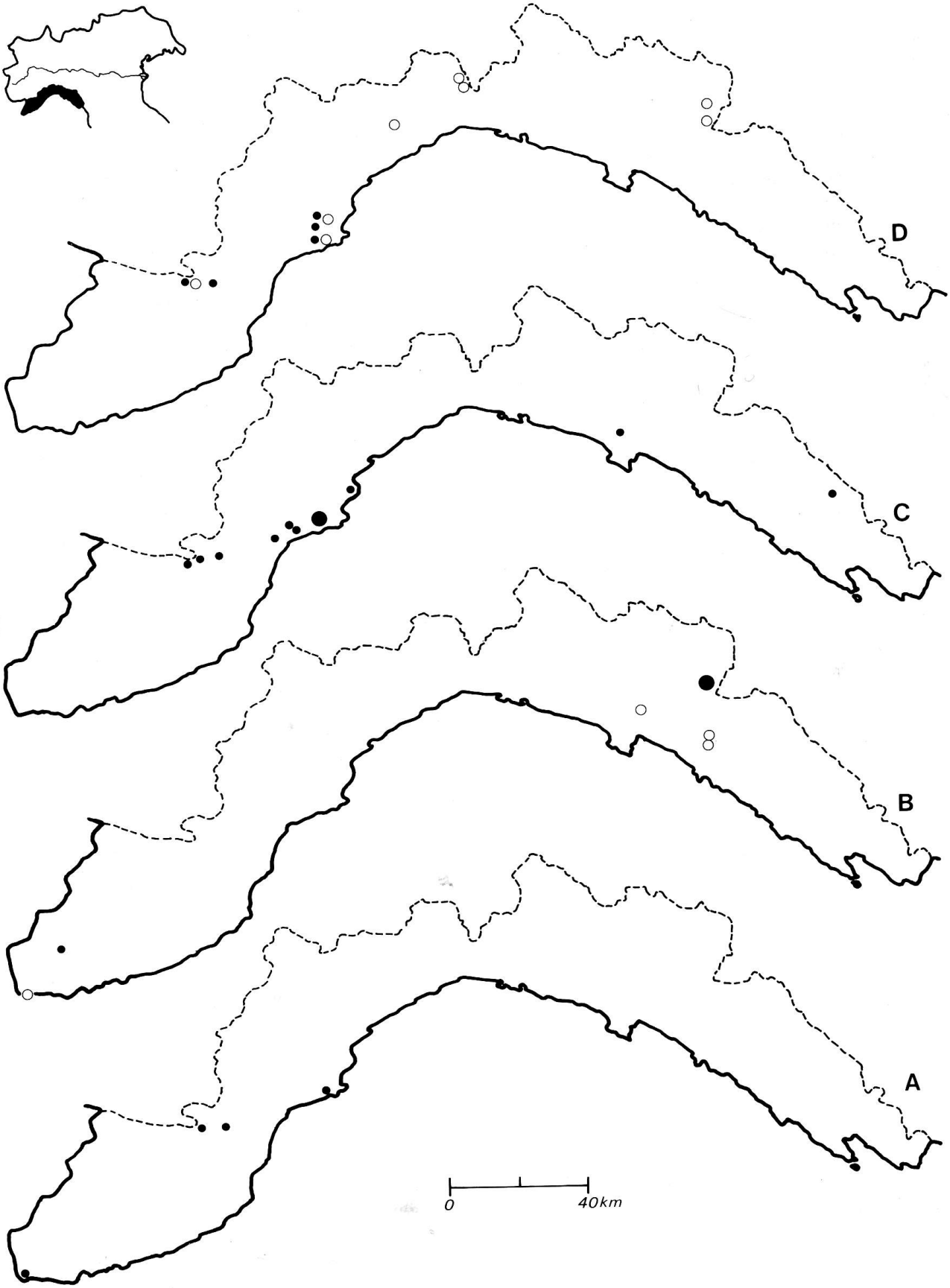


Figure 6 Liguria – site distributions: *A*. final Epi-Gravettian sites; *B*. Mesolithic Sauveterrian (circles) and Castelnovian (dots) sites; *C*. early Neolithic sites; *D*. sites with pollen (circles) and charcoal (dots) identifications. Large dots indicate concentrations of more than five sites. *Drawn by P. Biagi*

chronology is correct the thick stalagmite levels of layer 3 should belong to the Pre-Boreal and Boreal. It is interesting to observe that the charcoals from these levels indicate a temperate climate with pubescent oak (*Quercus* cf. *pubescens*) and hop-hornbeam (*Ostrya*) becomingly progressively humid with the first appearance of beech (*Fagus sylvatica*). At other caves like Arma dell'Aquila, a few kilometres from the sea, the late Palaeolithic layers are dominated by spruce/larch (*Picea/Larix*). Here, more than ten millennia later, the early and middle Neolithic occupations show evidence of maple (*Acer*), oak (*Quercus* cf. *pubescens*), juniper (*Juniperus*) and holm oak (*Quercus ilex*). The middle Atlantic is characterized by a forest with deciduous oak (*Quercus* cf. *pubescens*), ash (*Fraxinus*), hazel (*Corylus*) and alder (*Alnus*). Man's impact on the environment increased during this period with the first traces of agriculture at Arma dell'Aquila and the Arene Candide caves (Biagi and Nisbet 1986).

CONCLUSIONS

Liguria lies between two areas that are very important for their Mesolithic finds: the Tusco-Emilian Apennines to the east (Biagi *et al.* 1980; Tozzi 1980), and Provence to the west (Escalon de Fonton 1976*a*, 1976*b*). Significant differences can be observed in the site locations, tool types and supply of raw material for the three areas. The Sauveterrian encampments of eastern Liguria have produced assemblages made largely from dark red or pale green jasper from an outcrop very close to two of these sites. The Castelnovian stations have yielded collections with both jasper and flint artifacts. The percentage of flint tools seems to increase at those sites farther away from the jasper outcrops. An interesting phenomenon is the occurrence of many unretouched artifacts at several Castelnovian sites. At the very large site of Bosco delle Lame (*Fig. 1*, site 5), for instance, the collection comprises thousands of artifacts, mostly flakes, blades and some 200 cores to indicate that tools were produced locally. The two western sites of Punta della Mortola (*Fig. 2*, site 1) and Pian del Re (*Fig. 2*, site 2), located in a very different environment, have industries made largely from locally available material.

All the Ligurian Mesolithic camps are open-air sites, while in nearby Provence the best documented sequences are all from rock-shelters (Escalon de Fonton 1976*b*). A very different situation is that of the Tusco-Emilian Apennines where valley bottom 'base camps' have been excavated (Tozzi 1980). Many high altitude camps lying very close to passes have implements made of materials from various sources (Cremaschi 1978), mostly flint from the foot of the northern Apennines (Cremaschi *et al.* 1982).

It is still difficult to understand why no traces of Mesolithic activity are documented in the Ligurian caves, while both Provence and Languedoc are rich in rock-shelters showing evidence of continuous occupation from the Lateglacial to the Atlantic period (Escalon de Fonton 1976*b*, 1976*c*).

Unfortunately, no Ligurian Mesolithic camp has produced faunal remains. The few data available for the final Epi-Gravettian show that the ibex was the commonest animal killed for meat at Arma dello Stefanin (Leale Anfossi 1972). Red deer and boar bones are very abundant at Arene Candide, a cave actually lying at 89 m a.s.l. with a steep drop to the Mediterranean sea, where the gathering of marine molluscs also played an important role in final Epi-Gravettian times (Emiliani *et al.* 1963).

A very different picture emerges at the beginning of the early Neolithic Impressed Ware culture (Bernabò Brea 1946, 1956). All the sites of this culture are concentrated in a very restricted zone of the Ponente (west) (*Fig. 6C*). They are all caves or rock-shelters often opening rather far from the coast (Biagi and Nisbet 1986). The only exceptions are the Levante (eastern) open settlements of Uscio and Suvero possibly belonging to the late seventh millennium BP (Maggi 1980; Biagi *et al.* 1987). It is probable that most of the coastal sites were destroyed during the Postglacial sea-level rise (Aloisi *et al.* 1978; Bazile 1987), as already observed in southern France (Mills 1982; Geddes *et al.* 1983). Thus, the origins of the Neolithic cannot be understood only through the study of the cave finds. In addition to the first pottery production, these sites also have other Neolithic elements, such as new flint types consisting of trapezes with flat retouch (*flèches tranchantes*) and imported obsidian pieces (Williams Thorpe *et al.* 1979). The early Neolithic economy at Arene Candide was based mainly on stock raising (Rowley-Conwy, in press) at the end of the eighth millennium BP (UB-2423: 6980±115 BP). According to the radiocarbon dates, at about the same period the Adige valley, the Po plain, the Trieste karst and the Tusco-Emilian Apennines still had a late Castelnovian way of life (R-1148: 6870±50 BP; R-892: 6930±60 BP; R-1043: 7050±60 BP; Birm-830: 6960±130 BP; Bln-3277: 6810±70 BP – Alessio *et al.* 1983; Accorsi *et al.* 1986).

References

Accorsi, C.A., Bandini Mazzanti, M., Biagi, P., Castelletti, L., Cremaschi, M., Leoni, L. and Pavarani, M. (1986) Il sito mesolitico sopra Fienile Rossino sull'Altipiano di Cariàdeghe (Serle-Brescia). Aspetti pedostratigrafici, antracologici e palinologici. *Natura Bresciana*, 23: 239–292.

Alessio, M., Allegri, L., Bella, F., Broglio, A., Calderoni, G., Cortesi, C., Improta, S., Preite Martinez, M., Petrone, V. and Turi, B. (1983) ^{14}C datings of three Mesolithic series of Trento Basin in the Adige valley (Vatte di Zambana, Pradestel, Romagnano) and comparisons with Mesolithic series of other regions. In *Il*

Popolamento delle Alpi in Età Mesolitica: VIII–V Millennio a.C. (Preistoria Alpina, 19). Trento, Museo Tridentino di Scienze Naturali: 245–254.

ALESSIO, M., BELLA, F., BACHECHI, F. and CORTESI, C. (1967) University of Rome carbon 14 dates V. *Radiocarbon*, 9: 346–367.

ALOISI, J-C., MONACO, A., PLANCHAIS, N., THOMMERET, J. and THOMMERET, Y. (1978) The Holocene transgression in the Golfe du Lion, southwestern France: palaeogeographic and palaeobotanical evolution. *Géographie Physique du Quaternaire*, 32: 145–162.

BAFFICO, O., BIAGI, P. and MAGGI, R. (1983) Il Mesolitico. In *Preistoria della Liguria Orientale*. Chiavari, Siri: 33–44.

BAGOLINI, B., BROGLIO, A. and LUNZ, R. (1983) Le Mésolithique des Dolomites. In *Il Popolamento delle Alpi in Età Mesolitica: VIII–V Millennio a.C.* (Preistoria Alpina, 19). Trento, Museo Tridentino di Scienze Naturali: 15–36.

BAISSAS, P. (1974) Les conditions sédimentologiques du passage Würm final–Holocène d'après les données de la grotte des Arene Candide. *Atti XVI Riunione dell'Istituto Italiano di Preistoria e Protoistoria*: 111–120.

BARONI, C. and BIAGI, P. (in press) Le ricerche archeologiche alla Punta della Mortola (Giardini di Villa Hanbury, Imperia): campagne 1985 e 1987. *Rivista Ingauna e Intemelia*, Nuova Serie A, 40.

BAZILE, F. (1987) Les lignes de rivage holocènes en Languedoc méditerranéen. In J. Guilaine, J. Courtin, J. Roudil and J-L. Vernet (eds), *Premières Communautés Paysannes en Méditerranée Occidentale*. Paris, Centre National de la Recherche Scientifique: 47–51.

BERNABÒ BREA, L. (1946) *Gli scavi nella Caverna delle Arene Candide. Parte I. Gli strati con ceramiche, 1.* Bordighera, Istituto di Studi Liguri.

BERNABÒ BREA, L. (1956) *Gli scavi nella Caverna delle Arene Candide. Parte I. Gli strati con ceramiche, 2.* Bordighera, Istituto di Studi Liguri.

BIAGI, P. (1981) Introduzione al Mesolitico della Lombardia. In *Atti I Convegno Archeologico Regionale*. Brescia, Geroldi: 55–76.

BIAGI, P., CASTELLETTI, L., CREMASCHI, M., SALA, B. and TOZZI, C. (1980) Popolazione e territorio nell'Appennino Tosco-emiliano e nel tratto centrale del bacino del Po tra il IX e il V millennio a.C. *Emilia Preromana*, 8: 13–36.

BIAGI, P. and MAGGI, R. (1983) Aspects of the Mesolithic age in Liguria. In *Il Popolamento delle Alpi in Età Mesolitica: VIII–V Millennio a.C.* (Preistoria Alpina, 19). Trento, Museo Tridentino di Scienze Naturali: 159–168.

BIAGI, P., MAGGI, R. and NISBET, R. (1987) Excavations at Arma dello Stefanin (Val Pennavaira, Albenga, northern Italy): 1982–1984. *Mesolithic Miscellany*, 8(1): 10–11.

BIAGI, P. and NISBET, R. (1986) Popolazione e territorio in Liguria tra il XII ed il IV millennio bc. In E.A. Arslan (ed.), *Scritti in Ricordo di G. Massari e di U. Tocchetti Pollini*. Milano, ET: 19–26.

BROGLIO, A. (1971) Risultati preliminari delle ricerche sui complessi epipaleolitici della Valle dell'Adige. *Preistoria Alpina*, 7: 135–241.

BROGLIO, A. (1981) De la fin du Paléolithique au commencement du Néolithique au sud des Alpes. *Archaeologia Interregionalis*, 1: 9–41.

BROGLIO, A. and KOZŁOWSKI, S.K. (1983) Tipologia ed evoluzione delle industrie mesolitiche di Romagnano III. In *Il Popolamento delle Alpi in Età Mesolitica: VIII–V Millennio a.C.* (Preistoria Alpina, 19). Trento, Museo Tridentino di Scienze Naturali: 93–148.

CARDINI, L. (1947) Gli strati mesolitici e paleolitici della Caverna delle Arene Candide. *Rivista di Studi Liguri*, 12: 3–11.

CREMASCHI, M. (1978) The source of the flint artefacts for the central Po plain and Apennine sites between the 7th and the 2nd millennium BC. In F. Engelen (ed.), *Third International Symposium on Flint* (Staringia, 6). Heerlen, Nederlandse Geologische Vereniging: 139–142.

CREMASCHI, M., BIAGI, P., ACCORSI, C.A., BANDINI MAZZANTI, M., RODOLFI, G., CASTELLETTI, L. and LEONI, L. (1982) Il sito Mesolitico di Monte Bagioletto (Appennino Reggiano) nel quadro delle variazioni ambientali oloceniche dell' Appennino Tosco-emiliano. *Emilia Preromana*, 9/10: 11–46.

EMILIANI, C., CARDINI, L., MAYEDA, T., MCBURNEY, C.B.M. and TONGIORGI, E. (1963) Paleotemperature analysis of fossil shells of marine mollusks (food refuse) from the Arene Candide cave, Italy and the Haua Fteah cave, Cyrenaica. In H. Graig, S.L. Miller and G.J. Wasserberg (eds), *Isotopic and Cosmic Chemistry*. Amsterdam, North Holland Publishing Company: 133–156.

ESCALON DE FONTON, M. (1976*a*) La constitution de l'Epipaléolithique et du Mésolithique dans le Midi de la France. In S.K. Kozłowski (ed.), *Actes IX Congrès UISPP*, Colloque XIX. Paris, Centre National de la Recherche Scientifique: 53–70.

ESCALON DE FONTON, M. (1976*b*) Les civilisations de l'Epipaléolithique et du Mésolithique en Provence littorale. In H. de Lumley (ed.), *La Préhistoire Française*, tome 1. Paris, Centre National de la Recherche Scientifique: 1367–1378.

ESCALON DE FONTON, M. (1976*c*) Les civilisations de l'Epipaléolithique et du Mésolithique en Languedoc Oriental. In H. de Lumley (ed.), *La Préhistoire Française*, tome 1. Paris, Centre National de la Recherche Scientifique: 1382–1389.

FANCELLI GALLETTI, M.L. (1972) I carboni della Grotta delle Arene Candide e l'evoluzione forestale in Liguria dopo l'ultima glaciazione. *Atti della Società Toscana di Scienze Naturali*, Memorie, Serie A, 79: 206–211.

GEDDES, D.S., GUILAINE, J. and MONACO, A. (1983) Early Neolithic occupation on the submerged continental plateau of Roussillon (France). In P.M. Masters and N.C. Fleming (eds), *Quaternary Coastlines and Marine Archaeology*. London, Academic Press: 175–187.

GUERRI, M. (1976) Arene Candide. Livelli preceramici, scavo 1974. *Archeologia in Liguria*, 1: 157–158.

LEALE ANFOSSI, M. (1972) Il giacimento dell'Arma dello Stefanin (Val Pennavaira–Albenga). Scavi 1952–1962. *Rivista di Scienze Preistoriche*, 27(2): 249–322.

MACPHAIL, G.M. (in press) Palynological investigations in the Ligurian Apennines, northern Italy. *Archeologia in Liguria*, 3.

MAGGI, R. (1980) Appunti sulla preistoria della Riviera di Levante. *Annali del Museo Civico della Spezia*, 2 (1979–80): 169–191.

MILLS, N. (1982) The Neolithic of southern France. In C. Scarre (ed.), *Ancient France. Neolithic Societies and their Landscape 6000–2000 bc*. Edinburgh, University Press: 91–145.

MONTANARI, A., GUIDO, M. and BRAGGIO MORUCCHIO, G. (1979) Vicende paleoclimatiche del Postglaciale nell'Appennino ligure ricostruite attraverso l'esame dei diagrammi pollinici. In *Convegno di Meteorologia Appenninica*. Reggio Emilia, Amministrazione Provinciale: 1–9.

PALMA DI CESNOLA, A. (1974) Il Paleolitico superiore della Liguria alla luce delle recenti scoperte. *Atti XVI Riunione dell'Istituto Italiano di Preistoria e Protoistoria*: 23–36.

PALMA DI CESNOLA, A. (1983) L'Epigravettien évolué et final de la région haute-tyrrhénienne. *Rivista di Scienze Preistoriche*, 38: 301–318.

RADMILLI, A.M. (1960) Considerazioni sul Mesolitico Italiano. *Annali dell'Università di Ferrara*, NS, Sezione XV, 1: 133–141.

ROWLEY-CONWY, P.A. (in press) Faunal remains from Arene Candide. Preliminary report on the Neolithic and later material from the 1940–42 and 1948–50 excavations. *Archeologia in Liguria*, 3.

TOZZI, C. (1980) Il Mesolitico dell'Appennino Tosco-emiliano. In *La Toscana settentrionale dal Paleolitico all'Alto Medioevo*. Lucca, Nuova Grafica: 43–59.

VERNET, J-L. (1970) Analyse de charbon de bois de niveaux tardiglaciaires et postglaciaires de l'Arma du Stefanin (Savone, Italie). *Naturalia Monspelliensia*, 21: 243–246.

VERNET, J-L. (1974) Précisions sur l'évolution de la végétation dans la région méditerranéenne depuis le Tardiglaciaire d'après les charbon de bois de l'Arma du Nasino (Savone, Italie). *Bulletin de l'Association Française pour l'Etude du Quaternaire*, 39: 65–72.

WILLIAMS THORPE, O., WARREN, S.E. and BARFIELD, L.H. (1979) The sources and distribution of archaeological obsidian in northern Italy. *Preistoria Alpina*, 15: 73–92.