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Geoarchaeology of the Epigravettian site of Val Lastari (Veneto Prealps)

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ABSTRACT - ANGELUCCI D.E., PERESANI M., 2000 - Geoarchaeology of the Epigravettian site of Val Lastari (Veneto Prealps). [Geoarcheologia del sito epigravettiano di Val Lastari (Prealpi Venete)]. *Preistoria Alpina, vol. 31, pp. 13-21.*

The paper presents the geoarchaeological data from the southern Prealpine site of Val Lastari (northern Italy). Sedimentological, pedological and micromorphological data are presented and discussed in order to understand the site formation processes and the palaeoenvironmental evolution of the location from the last Glacial Maximum to the present.

PAROLE CHIAVE: *Geoarcheologia, Micromorfologia, Loess, Tardiglaciale, Altopiano dei Sette Comuni.*
KEY WORDS: *Geoarchaeology, Micromorphology, Loess, Lateglacial, Sette Comuni Plateau.*

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1. FOREWORD

The research at the Epigravettian site of Val Lastari, in the eastern Italian Prealps, has been conducted since 1990 and supplied abundant lithic artefacts which were found on a palaeoliving-floor and scattered in the soil (BROGLIO *et al.* 1995). The site (1060 m) is one of the mid-altitude open camps which were seasonally occupied by hunter-gatherer groups during the lateglacial temperate stages, when the first notable human settlement on the Alpine upland after the Last Glacial Maximum took place (BROGLIO 1992).

The geoarchaeological data from Val Lastari are presented here, in order to achieve information on site formation processes and the relations between humans and their environmental context. The palethnographic data are discussed elsewhere and not further described unless strictly necessary (see *e.g.* ANGELUCCI & PERESANI 1995; BROGLIO *et al.* 1995; PERESANI 1995).

2. THE PEDO-STRATIGRAPHIC RECORD

2.1. *Field data*

The site is set on the left of the wide bottom of Val Lastari, on the Sette Comuni (a.k.a. Asiago) plateau (fig. 1; other information on location may be found in BROGLIO *et al.* 1995). It is located next to a limestone wall on the margin of a karst depression. Four main field units were identified (fig. 2):

- units 1 and 2 are the topsoil;
- unit 3 is the silty loam soil which contains the artefacts. It was dug by means of six arbitrary levels (3A to 3F; the palaeosurface is found at 3E-3F, according to the distance from the wall); unit 3Z is found underneath 3F in a limited area and is devoid of artefacts;
- unit 4 is the coarser deposit at the bottom of the sequence and is further divided into three sub-units.

The reference profile has been described at short distance from the wall, as follows[1]:

O (2-0 cm, unit 1): partly decomposed organic matter, 10YR3/1, abrupt boundary to;

Ah (0-5 cm, unit 2): silty clay loam, 10YR3/2, many calcareous stones, fine granular moderately developed, abundant roots, high porosity, soft, abrupt wavy boundary to;

2A (5-20 cm, units 3A-3B): silty loam, 10YR4/3, few stones (fine angular chert fragments), fine blady moderately developed, common roots, medium porosity (mostly biogalleries), hard, few Fe-Mn oxide nodules, clear boundary to;

2E (20-30 cm, unit 3C): silty loam, 10YR4/4, very few gravel, subangular blocky poorly developed, few roots, medium porosity (biogalleries), slightly hard, common Fe-Mn nodules, clear boundary to;

2Bt (30-55 cm, units 3D-3E-3F): silty clay loam, 10YR3/4, very few gravel, medium angular blocky moderately developed, few roots, medium porosity (mostly biogalleries), hard, few Fe-Mn nodules, very few thin discontinuous coatings on ped faces, clear boundary to;

3BCt (55-55/70 cm, unit 3Z): clayey loam, 10YR3/4, with common large redox mottles (root gleying), few gravel, medium angular blocky fairly well developed, few roots, low porosity, hard, few Fe-Mn nodules, few almost continuos coatings on ped faces, sharp boundary to;

4C (55/70-140 cm, units 4I-4II): alternation of clayey loam layers, 9YR3/4, with variable amounts of gravel (many to abundant angular chert), whose average size increases downwards; lower boundary not reached.

The sequence exhibits a lateral variability to and from the wall (fig 1). The soil surface rests on unit 2, which contains both Epigravettian and occasional modern finds. The boundaries of unit 3 are bent and dip at high angle next to the wall, where an organic horizon with calcareous stones (unit 2A) outcrops at the top of the succession. The thickness of unit 3 is largest a few metres away from the wall and becomes uniform moving outwards, where the anthropic surface directly lies on unit 4.

The base of the sequence explored is formed of two bodies of weakly stratified deposits. Unit 4I-4II was defined near the wall, and its upper surface dips westwards; unit 4III is found outwards and dips to the wall. Both consist of fine matrix embedding chert fragments which are coarser in 4III. The pre-Quaternary bedrock is the Jurassic limestone which outcrops underneath unit 4III and whose upper limit sinks down near the wall, perhaps as the result of a sinkhole.

2.2. *Routine analyses*

The soil profile was sampled for routine analyses; the results are summarised in tab. 1. Notice the unimodal grain size distribution and the prevalence of silt in the specimens from 2 to 3F (fig. 3). The pH (1:1) range is between 6.6 and 8.3: its value is slightly alkaline at the top, decreases at 3C and rises up to 8.3 in unit 4. The variation in the organic C content shows an anomalous increase at 3E and a sudden decrease at 4. The whole profile is decalicified.

Tabl. 1 - Val Lastari. Analytical results

		texture [1]			pH H2O		org. C [2]	CaCO3
sample	horizon	sand	silt	clay	1:1	1:2.5		
2	Ah	5	70	25	7.4	8.2	6.8	0
3A	2A	8	78	14	7.3	7.9	5.4	0
3C	2E	9	85	6	6.6	6.8	2.3	0
3E	2Bt	9	81	10	7.2	7.7	3.2	0
3F (3Z)	3BCt	7	70	23	7.8	8.0	2.3	0
4I	4C1	7	64	29	8.3	8.5	0.43	0
4II	4C2	13	56	31	x	x	x	0

* Soil analyses were performed at the Soil Laboratories of the ITC, University of Ghent.
[1] Pipette method after dry sieving of the sand fraction.
[2] Wet oxidation and acid dichromate digestion.
x: not measured

3. MICROMORPHOLOGY

Two series of undisturbed samples were collected at Val Lastari, the former externally during the 1990 fieldwork (S1) and the latter near the wall in 1994 (S2, fig. 2)[2]. The results of the micromorphological observation are summarised in tab 2.

The first column reports the sample number, field unit provenance and corresponding horizon.

[1] The description follows the FAO (1990) guidelines, although shortened; the colours are reported in moist condition according to the Munsell notation system.

[2] Both the sets are composed of 5x8 cm^2 slides. S1 was cut at the ITC, University of Ghent, S2 at the laboratory "Servizi per la geologia" by Mr. Massimo Sbrana (Piombino, LI).

Tabl. 2 - Val Lastari. Main micromorphological features.

	microstructure		coarse material					pedofeatures				
	peds	voids	mineral comps	others	fine mat	b-fab	RlDP c/f	coats	pass	excr	disr coats	remarks
S1.1 3A 2A	pl > sbl < gr <	pl >> ch < cb <	mica > quartz < others +		y-br mot	grano cresc	ssp			++		F-M nods +++
S1.2 3B 2E	sbl > gr <	pl > cb < ch <<	mica > quartz < others +	char +	y-br mot	grano cresc	ssp		+	++		F-M nods ++
S1.3 3C-D 2Bt	gr < sbl <	cb >> ch < pl <<	mica > quartz < others +	fl +	y-br mot	grano poro cresc	ssp	A ++ B +	++	++	+	F-M nods + org impregn +
S1.4 3E 2Bt	gr >	cb < ch <	mica > quartz < others +	fl + char +	y-br mot	poro grano cresc	cdsp	A + B +	++	+	+	F-M nods +
S1.5 3F 3BCt	sbl > gr <	pl > cb <	mica > quartz < others +		br sp	poro grano cresc	cdsp	A+ B+	+	+	+	F-M nods +
S1.6 4 4C	gr >	ch > cb > cx <<	mica > quartz < chert <		g-br	grano	cdsp to gef	B + C +++				capping F-M nods +++
S2.1 2 Ah	gr >	ch > cb >	mica > quartz < others +		g-br.	undiff	op		++	++		F-M nods ++
S2.2 3B-C 2E	gr > sbl <	ch > cb > pl <	quartz > mica < others +	fl +	y-br:	poro	dsp		+	+		F-M nods +
S2.3 3E 2Bt	sbl >	pl > ch < cb <	mica > quartz < others +		y-br.	poro grano	dsp	A + B +	+	+	+	F-M nods +
S2.4 3E' 2Bt	sbl >	pl > ch < cb <	mica > quartz <	char +	y-br.	poro grano cresc	dsp	A ++ B ++	+	+	++	F-M nods +
S2.5 3F 3BCt	sbl >>	pl > ch <	mica > quartz > rocks <	fl > char +	y-br.	poro grano cresc.	dsp	A ++ B ++ D +				F-M nods + coats on flints

List of symbols:

General symbols representing (qualitatively) the amount of a certain feature: Related amount: >> largely predominant; > predominant; < subordinate; << largely subordinate. Absolute amount: +++ abundant; ++ common; + rare.
Peds: pedality (the main types of peds are indicated): gr: granular; pl: platy; sbl: subangular blocky. Voids (the main ones): ch: channels; cb: chambers; cx: complex packing voids; pl - planar voids. other components - fl: flints; char: charcoal fragments. Fine mat: fine material - br: brown; mot: mottled; sp: speckled; g-br.: greyish brown; y-br: yellowish brown; b-fab: b-fabric. RlDP c/f: related distribution pattern coarse/fine material: (c)dsp: (close) double spaced porphyric; gef: gefuric; ssp: single spaced porphyric; op: open porphyric. pedofeatures - coats: coatings - see text for explanation; pass - passage features; excr: excrements; disr coats: disrupted textural coatings; F-M nods: iron-manganese amorhpous nodules.

3.1 *The samples of the S1 group*

The soil material of the unit 3 samples is fairly homogeneous, silty loam with abundant silt, few fine sand and a variable amount of fine material (c/f limit at 5 µm). The coarse material displays a large predominance of mica and quartz grains and occasional flint and charcoal fragments. The fine material is on average yellowish brown with fine redox mottles; the b-fabric is moderately developed grano-crescent striated, porostriated in the lower units. The microstructure is always complex and, even if poorly developed, exhibits a gradient from platy-granular (3A) to blocky (3E-3F). The porosity is fairly high, except in 3A; channels, chambers and planes are the main types of voids. Two types of coating are found, both in planes and in channels of units 3C-3E: A) layered yellowish brown clayey silt alternating with brownish yellow silt, with very low birefringence, speckled, which lays over: B) weakly layered dusty clay, brownish to reddish yellow, highly birefringent, sharp extinction (figg. 4 and 5). These units also include disrupted coatings similar to type B, which are often located next to channels and only slightly disturbed. Amorphous Fe-Mn oxide nodules are common in the whole sequence and abundant at its top; excremental infillings and passage features show the same distribution.

The boundary between units 3 and 4 is abrupt and erosional, even if observed under the microscope. Unit 4 is composed of sand-size chert fragments, reworked Fe-Mn nodules, and silt-size mica and quartz grains; the fine fraction is greyish brown, organo-mineral and speckled. The microstructure is discontinuous microgranular. Silt cappings are common and one more type of coating - C), brownish grey impure clay with weak layering of dark brown organic material - was found (fig. 4).

3.2. *The samples of the S.2 group*

Unit 2A has almost the same composition as unit 3, but its micromass is darker - greyish brown - and the b-fabric is undifferentiated. The structure is biogenic and consists of crumbs and microgranular peds. Fine Fe-Mn nodules and impregnations are present; excrements and passage features are frequent.

Relating to S1, the slides from 3A to 3F do not show any major variation in the components. The microstructure is complex, incomplete, and exhibits a gradient from granular (at the top) to subangular blocky; the porosity is similar to the S1 samples. The most significant difference concerns the pedofeatures, namely the coating: the types A) and B) are still present, type C) is missing and one more type (D: unsorted silt/clay) lies over the previously described ones. Coatings, both in situ and disrupted, are slightly more common than in the corresponding horizons of S1.

4. THE NATURE OF THE PARENT MATERIAL AND SOIL DEVELOPMENT

4.1. *Origin of the parent material*

The data collected indicate that the components of the soil parent material come from aeolian inputs. Unit 3, even if affected by pedogenesis, has the typical features of loess: its texture, which fits in the cumulative curve of loess sediments (Cremaschi 1990a); its almost good sorting; and its composition, with minerals which are exotic to the local bedrock. Other data attest that its upper part (units 3A-3F) does not derive from recent redeposition, namely: the structure gradient; the in situ coating and infilling; the good preservation of the Epigravettian artefacts inside it; and the anthropic structure at its base, which would have been destroyed in the case of colluviation. The partial homogenisation, disturbance of coating, artefact and ecofact scatter, and occasional presence of residual chert fragments arise from bioturbation (Angelucci & Peresani, in press).

Unit 4 includes an aeolian input as well, but its features - the abundant gravel and sand, the reworked nodules, the sedimentary structures - imply its formation as slope waste deposit reworking earlier loess deposits and soil.

Unit 2A is arranged as a pocket along the wall; it probably derives from the continuous input of sediment and organic waste falling into the depression formed by the water movement along the wall, the presence of sinkholes and the concomitant higher decarbonation. Units 1 and 2 are due to the human action during the First World War.

4.2. *The pedogenic evolution of the profile*

The presence and juxtaposition of several characteristics of the soil allow its pedogenic evolution to be traced trough time and, from a pedostratigraphic perspective, for the different processes to be interrelated.

The remarkable features of the lowermost unit 4 are the microgranular structure, the abrupt upper boundary and the occurrence of capping and organic coatings, which denote that its top represents a buried A horizon. The biogenic microstructure and the organic matter content are probably due to isohumic (*cfr.* Chernozem) soil formation processes which occurred before the decarbonation of the profile; later its organic matter was dispersed and redeposited at a short distance, probably as an effect of profile desaturation and acidification. Before being desaturated, the horizon was submitted to erosion and to slight frost action.

After the erosional phase, the deposition of the lower part of the loess (unit 3Z), which contains no artefacts, took place in the shallow basin formed between units 4III and 4I/II; considering its shape, it can be deduced that it was laid down by redeposition on a slope. Its top was then pedogenised; the weak record of this soil formation - the presence of the living-floor and the anomalous value of organic matter content - is an effect of younger processes which have obliterated the earlier soil features.

This soil was buried under another loess cover (units 3A-3F) which was then submitted to clay translocation, presumably after decarbonation and acidification, if it is assumed that the loess was partly calcareous (Cremaschi 1990b). The events of clay translocation are represented by two different generations of coatings - dusty clay and laminated silt/silt-clay coatings - suggesting a change in the soil dynamics during its development. The former type of coating can be interpreted as the result of clay translocation under a forest cover in a temperate context, although it does not show the typical features of illuviation in forest soils. The latter could be related to a partial collapse of the soil structure; the literature indicate that this type of internal accumulation occurs in soils which develop in cold environments (Van Vliet-Lanoë 1985; Fedoroff & Goldberg 1982). The present day climate of the Sette Comuni plateau is subcontinental, with high rainfall (around 1600-1800 mm/a at Val Lastari), a marked seasonality and common snow precipitation in winter; the mean annual temperature is around 5°C and, considered on a monthly basis, it is below zero for three months a year (Donà 1955; Frigo 1982/83). Although no literature exists on soil formation in this area, it can be supposed that the present day translocation, owing to the high water input during spring and the expected slight freeze-thaw, leads to dusty clay coating formation, while coarser accumulation in the soil can be related to soil collapse. The modification of the material moving through the soil at Val Lastari may therefore indicate an environmental fluctuation which could have determined a change in the vegetation and the partial collapse of the soil.

The disturbance of the coating apparently concerned only the dusty clay coating; it probably affected the other types as well, but their texture did not enable their preservation after disturbance. The disruption of the coating is due to bioturbation (mainly faunalturbation) which has also produced passage and excremental features, crescent-striated b-fabric, and the channel/chamber microstructure masking the previous pedality. The high value of the organic C content in the profile upper part (units 3A-3F) and the sharp decrease at the 3/4 boundary may be a result of faunal activity.

Occasional coarse illuviation has acted next to the wall as the last process of translocation, producing the unsorted coatings and infillings of the S2 samples. They may be due to the important water input along the wall or, alternatively, to the soil collapse which was determined by man induced soil erosion. Other features are related to human impact: the platy pedality in sample S1/3B may be linked to the profile truncation during the First World War, which brought to the surface the former E horizon and determined the development of a pedality connected with the present freeze-thaw. Furthermore, this upper part is affected by a traffic pan, as the low porosity and high amount of Fe-Mn nodules suggest, which also enhances the development of such a structure.

4.3. *A framework for the evolution of the Val Lastari soil profile*

Taking into account the mentioned data, a sequence of events can be established; some of them can be located in a narrow time span and pedostratigraphic position, while others are more broadly defined. The profile records an alternation among aggradational and stable phases, the latter marked by soil formation. After the deposition of unit 4, which indicates bare ground and a cold climate, a soil with isohumic properties developed at its top. After a slight erosional phase, redeposited loess was laid down (unit 3Z) and partly pedogenised as an effect of a younger stable phase. The soil was then buried by a loess cover which has been affected by a long lasting pedogenesis (units 3A-3F).

The chronological location of these events is difficult to define; the only evidence is given by the archaeological finds and the dating, which attribute human occupation to the Allerød (Broglio *et al.* 1995). On a hypothetical basis, it could be assumed that the deposition of unit 4 happened during the Last Glacial Maximum and that the first phase of soil development occurred during an earlier lateglacial temperate stage (the Bølling?). The soil formation related to the living-floor can be clearly dated to the Allerød. Under this perspective, the deposition of units 3A-3F must be considered as having started in the Allerød. There is no *terminus ante quem* for the end of the deposition, although the absence of finds younger than the Epigravettian might suggest that the deposition of unit 3A-3F had stopped before the beginning of the Holocene. Taking into account the accepted chronostratigraphical framework it may be expected that the loess deposition partly occurred during the Younger Dryas, although there is no evidence which may prove it.

The pedogenesis affecting the sequence requires a fairly long phase under forest cover and a temperate climate and can be dated to the Holocene. The last phases of soil evolution are due to human impact: truncation, traffic pan formation, and perhaps soil structure collapse. It can be supposed, but not proved, that the bioturbation of the soil is related to forest clearance and pastoralism, which improved the activity of soil fauna: in this case it would be a recent human-related process.

5. CONCLUSIONS

The case of Val Lastari highlights the most common problems of prehistoric mountain sites, especially the ones in shallow soils, the study of which is often difficult because they are open systems submitted to soil formation and to a number of modification processes. This usually implies an important loss of archaeological information. The low sedimentation rate is often responsible for the formation of complex palimpsests which are not easily detected or solved. Therefore, the study of such sites has to take into account all the possible information sources and the general context, in order to try to reconstruct part of the archaeological information, at least on hypothetical grounds.

The sedimentary record at Val Lastari is mainly composed of loess sediments, which is seen as a significant environmental indicator for steppe environments (Cremaschi, 1990a; Cremaschi 1990b); moreover, one of the lateglacial pedogenetical phases recalls the isohumic formation processes, which are linked to dry cold climates. If the chronological scheme proposed is correct, it can be said that a steppe environment was predominant during the lateglacial at this location, with an alternation among unstable and stable phases. The buried living-floor corresponds to a gap in the sedimentation and is linked to pedogenesis which was later concealed by younger pedogenetic processes.

As far as the formation of the pedo-stratigraphical record is concerned, it was suggested that an important role has been played by recent human action, which induced the bioturbation responsible for the artefact and ecofact scatter; it can be proposed, considering the fact that Val Lastari site is a standard case for Late Upper Palaeolithic - Mesolithic sites in this region, that the loss in archaeological information is an indirect effect of human impact in historical times.

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POST SCRIPT

This paper was originally presented at the "Incontro Informale dei Geoarcheologi Italiani", which was held in Pisa on 1995, December 6th. Three years after the congress, its organiser and editor, Giovanni Boschian, has received only four papers out of the many ones which had been presented during the congress, and was sadly obliged to withdraw his role as editor of the proceedings. We are greatly indebted to our colleague and friend Giovanni for letting us publishing the paper elsewhere and would like to thank him for the efforts made in organising the meeting, which was the first conference among Italian geoarchaeologists even made.

New discoveries and papers appeared during the last four years; we have decided to publish the paper with no change, feeling indebted to the people who listened to our presentation in Pisa.

D.E.A. & M.P., april 1999.

SUMMARY - The geoarchaeology of the open site of Val Lastari is considered here, in order to reconstruct the soil genesis and evolution and the formation processes of the archaeological evidence. The field data, routine analyses and micromorphological study indicate that the archaeological sediment consists of a soil profile developed from a lateglacial loess cover which rests on slope deposits. Two phases of soil formation during the lateglacial, one of which is related to the anthropic palaeoliving-floor, are discernible. It is also pointed out that the artefact scattering is mainly due to bioturbation.

RIASSUNTO - Lo studio analizza gli aspetti geoarcheologici del sito epigravettiano all'aperto di Val Lastari, al fine di chiarire l'origine e evoluzione del suolo, nonchè i processi di formazione dell'evidenza archeologica. Si presentano i dati derivanti dalla descrizione di terreno, dalle analisi pedosedimentologiche di routine e dall'osservazione micromorfologica, che evidenziano come il deposito archeologico si componga di suolo evoluto a spese di un loess tardiglaciale poggiante su depositi di versante che derivano dal rimaneggiamento di precedenti coltri eoliche e coperture pedogenetiche. Sono state messe in luce due fasi pedogenetiche tardiglaciali, una delle quali correlata alla paleosuperficie antropica esistente nella coltre loessica. I dati confermano come la dispersione dei manufatti all'interno del profilo sia da attribuirsi prevalentemente a processi di bioturbazione e come la principale frequentazione antropica, attestata dalla paleosuperficie, sia conseguente ad una fase di biostasia.

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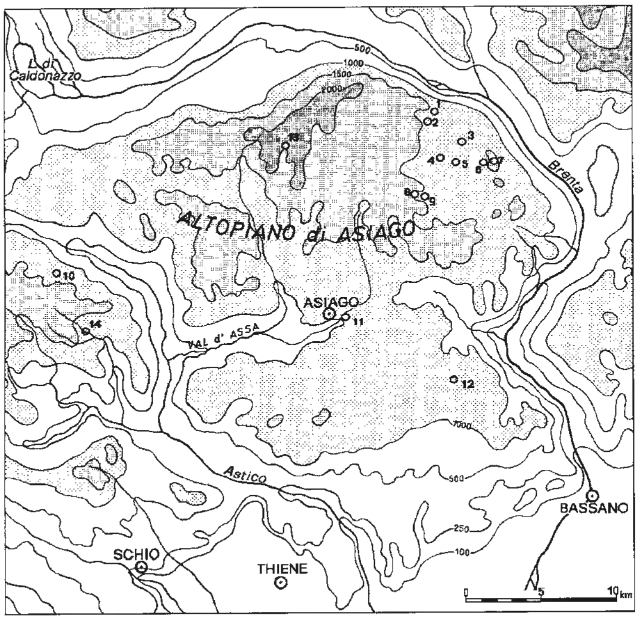

Fig. 1 - Geographic sketch map of the Vicenza district Prealpine plateaux. Late Upper Palaeolithic and Mesolithic sites are indicated by circles. Key: 1 Riparo Dalmeri; 2 Colle dei Colombi; 3 Val Coperte; 4 Palù san Lorenzo; 5 Fonte del Palo; 6 Malga Val Bella; 7 Grotta d'Ernesto; 8-9 Val Campomulo; 10 Alpe Fiorentini; 11 Riparo Battaglia; 12 Val Lastari; 13 Area a sud di Cima Dodici; 14 Val Campoluzzo.

Fig. 1 - Schizzo geografico delle Prealpi vicentine. I siti epigravettiani e mesolitici sono indicati da cerchi. Legenda: 1 Riparo Dalmeri; 2 Colle dei Colombi; 3 Val Coperte; 4 Palù san Lorenzo; 5 Fonte del Palo; 6 Malga Val Bella; 7 Grotta d'Ernesto; 8-9 Val Campomulo; 10 Alpe Fiorentini; 11 Riparo Battaglia; 12 Val Lastari; 13 Area a sud di Cima Dodici; 14 Val Campoluzzo.

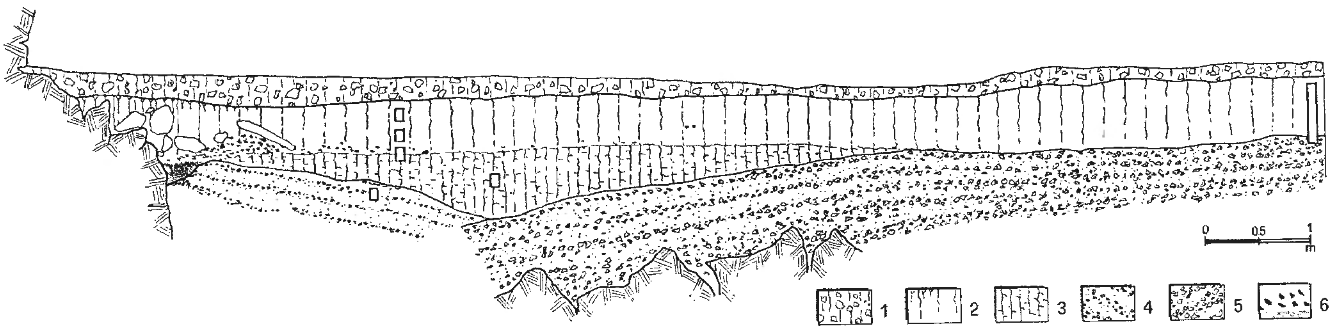

Fig. 2 - Val Lastari: cross section. List of symbols: 1 - units 1 and 2 (topsoil); 2 - units 3A-3F (silty to clayey loam with artefacts); 3 - unit 3Z (clayey loam); 4 - units 4I-4II (alternation of clayey loam layers with variable amounts of gravel); 5 - unit 4III (as unit 4, more adundant gravel); 6 - concentrations of lithic artefacts and (grey) anthropic structures (lithic workshops). The rectangles indicate the place of sample collection.

Fig. 2 - Val Lastari: sezione. Legenda; 1 - unità 1 e 2 (suolo attuale); 2 - unità 3A-3F (limi e limi argillosi con manufatti litici) ; 3 - unità 3Z (limi argillosi); 4 - unità 4I-4II (alternanze di strati argilloso-limosi con contenuto variabile di pietre); 5 - unità 4III (come 4, ma con pietre predominanti); 6 - concentrazioni di manufatti litici e (in grigio) strutture antropiche (officine litiche). I rettangoli indicano la posizione di raccolta dei campioni.

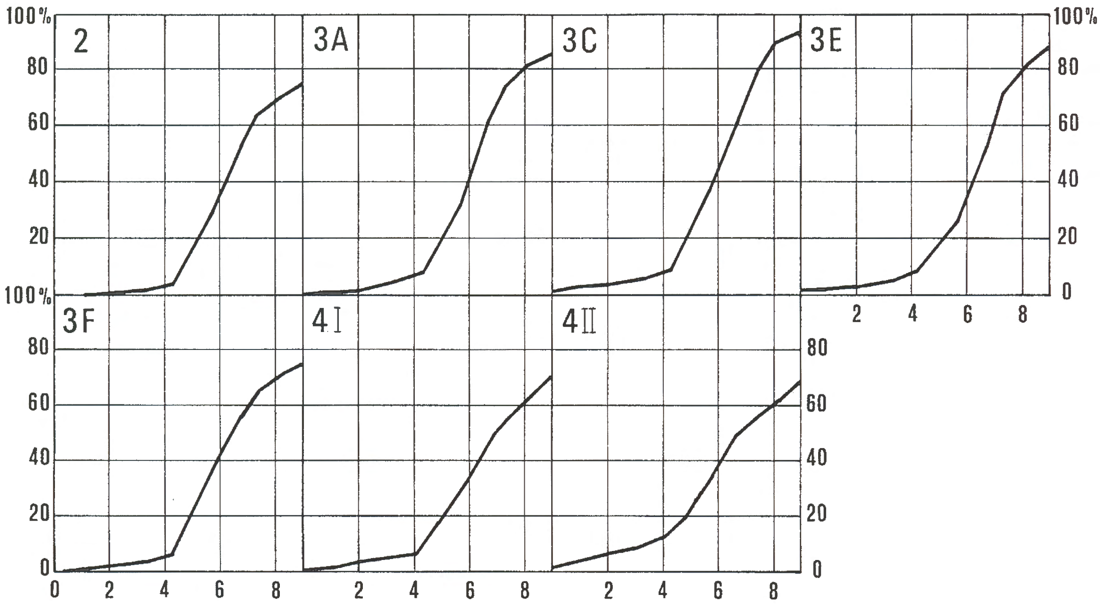

Fig. 3 - Val Lastari: cumulative curves of textural analyses.
Fig. 3 - Val Lastari: curve cumulative delle analisi granulometriche.

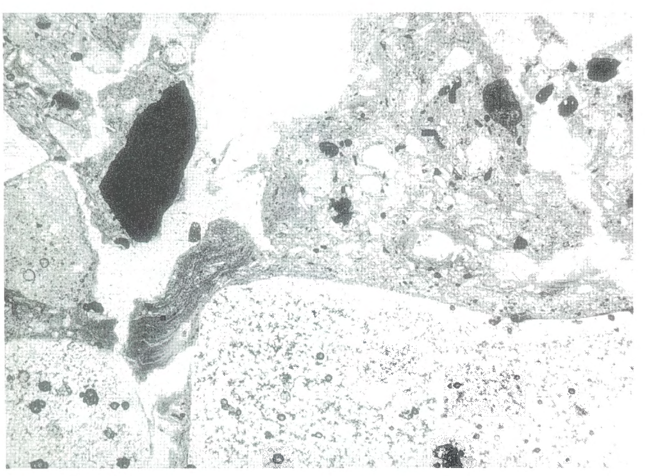

Fig. 4 - Val Lastari: micrograph taken from thin section S1.5, at the palaeosurface (corresponding here at the boundary between units 3 and 4). Notice the two generations of coatings in the void, which are respectively types A) and C); a thick capping is visible on the chert fragments of unit 4 (PPL, base lenght 3.6 mm)
Fig. 4 - Val Lastari: micrografia dalla sezione sottile S1.5, presso la paleosuperficie (qui corrispondente al limite tra le unità 3 e 4). Si notino le due generazioni di rivestimenti nel poro, che sono, rispettivamente, i tipi A) e C); uno spesso *capping* è riconoscibile su un frammento di selce dell'unità 4 (PPL, misura della base 3.6 mm)

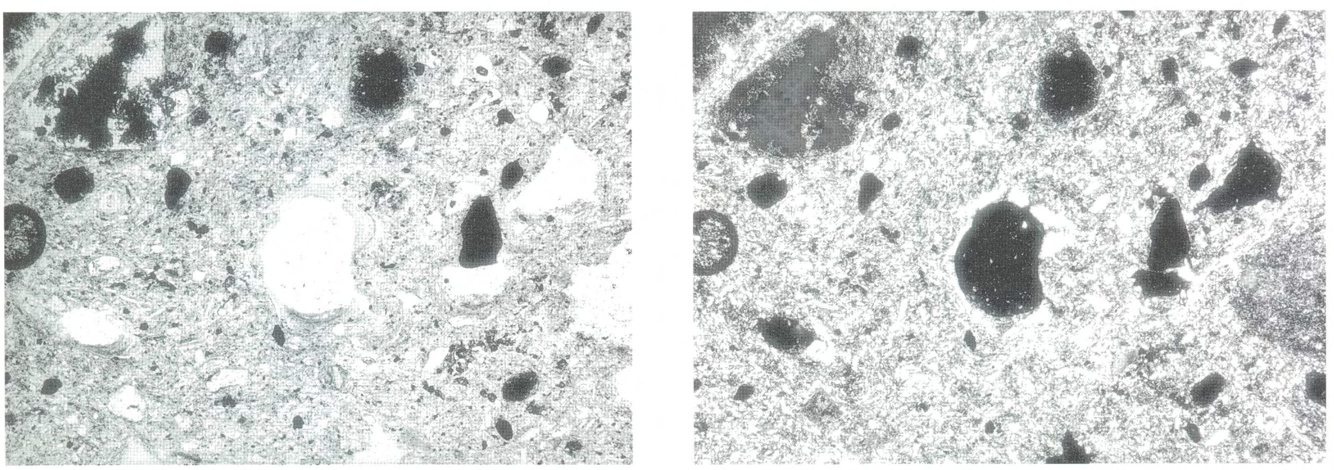

Fig. 5 - Val Lastari: micrograph taken from thin section S1.5, just above the palaeosurface, showing a channel with types A) (at the bottom of the void) and B) coatings; notice the sharp extinction of the latter type and the poro-granostriated b-fabric of the soil material. Base lenght 3.6 mm, PPL (fig. 5a) and XPL (fig. 5b).
Fig. 5 - Val Lastari: micrografia dalla sezione sottile S1.5, immediatamente al di sotto della paleosuperficie, illustrante un canale con rivestimenti del tipo A) e B); si noti l'estinzione netta del tipo B) e la *b-fabric* poro-granostriata. Misura della base 3.6 mm, PPL (fig. 5a) e XPL (fig. 5b).