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## Flint Exploitation at Epigravettian Sites in the Asiago Plateau (Venetian Prealps)

### ABSTRACT

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The paper describes the raw material provisioning at the open sites of Val Lastari and Battaglia Rockshelter. On-site chipping of local raw material is represented by entire or fragmented laminar products, cores at different stages of exploitation and preparation flakes. At Val Lastari, the presence of areas dedicated to working flint and the composition of the lithic assemblage testify that the principal activity performed on the site was the production of standardised laminar products, which were then exported from the site. The main characteristics of the lithic assemblage from Battaglia Rockshelter, 7 km away from Val Lastari (1050 m above sea level), are taken into account.

**Parole chiave:** selce, Paleolitico superiore, industria litica, Prealpi Venete.

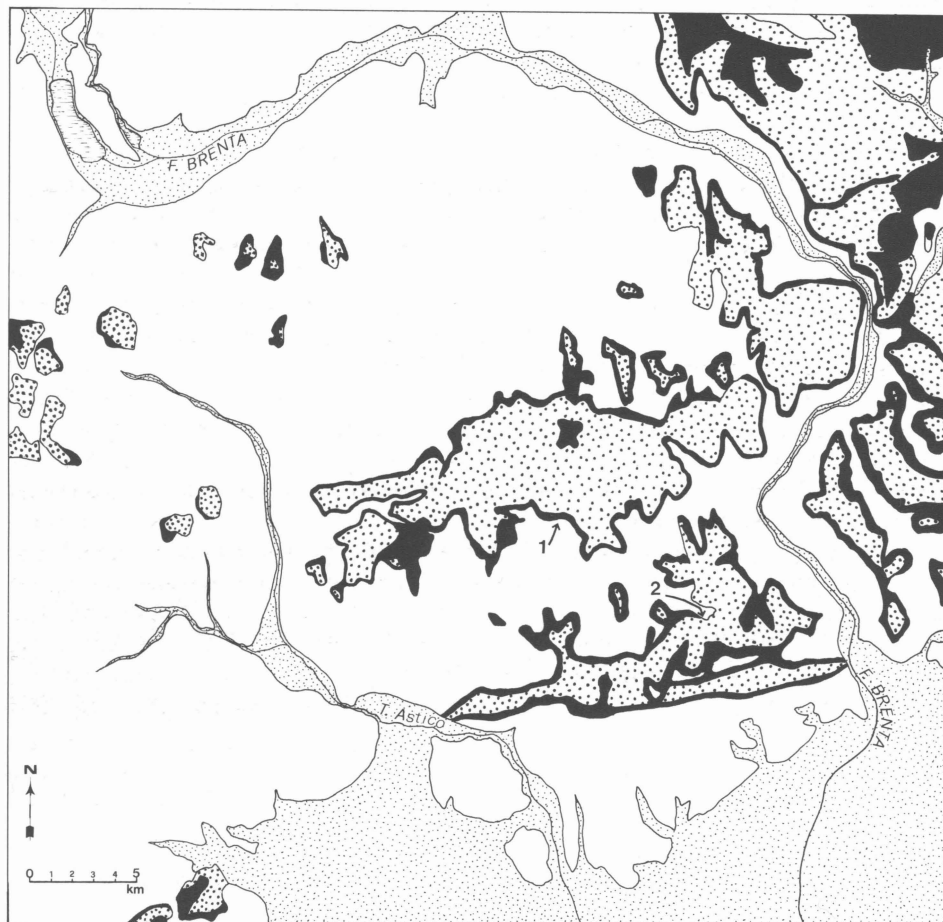
**Key words:** flint, Upper Palaeolithic, lithic assemblage, Venetian Prealps.

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### The flint in the Asiago Plateau

The Asiago plateau is a vast calcareous massif in the Venetian Prealps (Northern Italy) which extends for 600 square kilometers and is elevated at altitudes ranging between 1000 and 1600 meters. Among the different rocks constituting the plateau, there

are Mesozoic limestones which contain flint (fig. 1): Rosso Ammonitico Veronese (Late Jurassic) and Biancone (Early Cretaceous), which outcrop over a vast surface of 200 square kilometers; and Scaglia Rossa (Late Cretaceous) which outcrops in a central area of the plateau and in a band of circa 300 meters along its southern slope.



*Fig. 1 - Geological map of the limestones containing flint in the Asiago Plateau and surrounding area. 1 - Rosso Ammonitico Veronese; 2 - Biancone; 3 - Scaglia Rossa; 4 - rocks with no flint; 5 - main river valleys and alluvial plain. (Modified from: Carta Geologica d'Italia, Fogli Feltre, Schio, Trento; Carta Geologica delle Tre Venezie, Foglio Bassano del Grappa). The arrows indicate the sites: 1 - Battaglia Rockshelter; 2 - Val Lastari.*

*Fig. 1 - Carta geologica delle formazioni selcifere nell'Altopiano di Asiago e nel territorio circostante. 1 - Rosso Ammonitico Veronese; 2 - Biancone; 3 - Scaglia Rossa; 4 - rocce prive di selce; 5 - principali valli fluviali e pianura alluvionale (modificata dalla Carta Geologica d'Italia, Fogli Feltre, Schio, Trento e dalla Carta Geologica delle Tre Venezie, Foglio Bassano del Grappa). Le frecce indicano i siti Riparo Battaglia (1) e Val Lastari (2).*

In the Rosso Ammonitico Veronese, flint is particularly abundant in the siliceous stratified lithofacies (MARTIRE, 1989). It has a dark red colour which is slightly variegated and is deeply fractured. Concerning the Biancone, in the lower part of this formation there are large compact nodules and thin (circa 5 centimeters) beds of flint (GRANDESSO, 1977). The latter are deeply fractured. The colour of this flint is red and is variegated with light grey or light yellowish-brown mottles. The flint is rich in calcareous inclusions of around 1 centimeter in size. In the middle part of the Biancone the flint is light grey in colour; the nodules are smaller in size and fractures are less frequent. In the upper part the flint is slightly fractured and is dark grey and greyish-brown in colour; pointed calcareous inclusions are abundant.

In the Scaglia Rossa, flint is homogeneously reddish-brown in colour with abundant pointed calcareous inclusions. Fractures are scarce, and cortex is generally thick.

Large quantities of flint are abundant in the regoliths which are derived from the weathering of the limestones. These regoliths fill the valley-bottoms or cover the karst surfaces. Within them, there are abundant blocks of flint of around ten centimeters in size with cortex covered by a film of iron-manganese oxide. The surfaces of the fractures show whitish-yellow or reddish-brown coloured patinas. A great number of the blocks are deeply fractured. Those suitable for flaking are covered by cortex on more than half of their surface. As regards the frequencies of the different classes of flint it appears that the blocks of 10 to 15 centimeters in size are constituted mainly by grey and dark grey flint and to a lesser extent by variegated red flint. Owing to the high occurrence of fracturing, the flint of other classes is present in the form of flakes and blocks which are smaller in size.

The Asiago plateau is a vast area for the potential exploitation of raw material. The aim of this preliminary report is to describe the flint exploitation strategies during the Late Epigravettian, taking into account some data which stems from the research of two Epigravettian sites which are attributed to the Alleröd Interstadial: the open site of Val Lastari, where the research began in 1990 (BROGLIO *et alii*, in this volume), and the Battaglia rockshelter, where the research was carried out between 1962 and 1964 (BROGLIO, 1964).

## **The open site of Val Lastari**

### *The site*

The Epigravettian site of Val Lastari is situated at 1060 meters above sea level and close to a small limestone outcrop on the edge of a swallow-hole. The rich archaeological evidence allows us to reconstruct the flint exploitation strategy.

Val Lastari is an ancient valley presently inactive owing to karstic evolution. The valley is very rich in flint: on the slopes there are large outcrops of Biancone and the wide and irregular valley-bottom consists of a regolith which is rich in flint.

The site has been explored over a surface of 60 square meters. Near the calcareous outcrop the deposit is constituted at its base by a silty clay colluvium which covers the karstic rock substratum. At the same level five meters away from the calcareous outcrop there is a colluvium which has a rich skeleton and which lies on the regolith of the val-

ley-bottom which is rich in flint. These colluviums are covered by a loessic layer of variable thickness of between 0.6 meters and 1.6 meters, inside which a palaeo-living floor is intercalated. Three charcoal samples collected in the archaeological layer were dated by the AMS radiocarbon method to  $11,800 \pm 150$ ,  $11,390 \pm 110$  and  $11,010 \pm 90$  B.P. (more detailed informations on datings are presented by BROGLIO *et alii*, in this volume). The upper part of the deposit was reworked during the First World War.

### *The lithic assemblage*

Our research has allowed us to collect a high quantity of lithic artefacts and to bring to light anthropogenic structures and flint working areas. The faunal remains have been dissolved by pedogenetic processes. As regards the lithic assemblage, this is composed of elements representing all the flint working phases which were carried out *in situ*.

- Hammers, sometimes using old prismatic cores or sandstone pebbles.
- Blocks and nodules of flint which are around ten centimeters in size and which show traces of flaking tests.
- Pre-cores, represented either by blocks with a large flake removal lying perpendicular to the natural edge or by nodules with a plane of percussion perpendicular to a crest.
- Cores, mainly lamellar prismatic, subpyramidal, globular and discoidal.
- Flaking products. These show a low standardisation of shape and size. We found large flakes chipped from the raw block of flint; blades with a crest and blades with a natural edge; flakes chipped during the rejuvenation of the platforms; blades and bladelets designed for the production of tools and microliths. Moreover, there is a high number of hinged and plunged flakes and the products with cortex show an irregular shape and section. The distribution of the archaeometric values of width and length covers a wide area (correlation index: 0.383) (fig. 2). As regards the blades with regular shape and section, whose production is testified by a high number of cores (731), we suppose that these were also exported from the site as half-finished products, as well as having been used at the site for the production of tools and microliths. In fact, considering the number of tools and microliths made on blade and bladelet blanks (523 in total), and the number of unretouched blade and bladelet products with regular shapes and sections (1179 in total), the notable discrepancy in relation to the number of blade and bladelet cores is very evident.

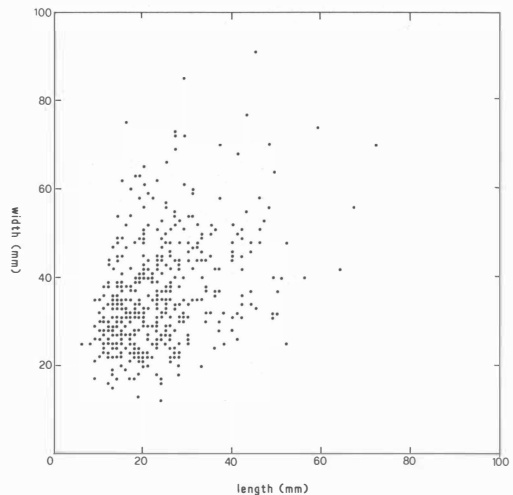


Fig. 2 - Val Lastari. Scatter-plot for the length and width variables of 466 unretouched artefacts.

Fig. 2 - Val Lastari. Diagramma di dispersione delle variabili lunghezza e larghezza di 466 manufatti non ritoccati.

### *The flint working areas*

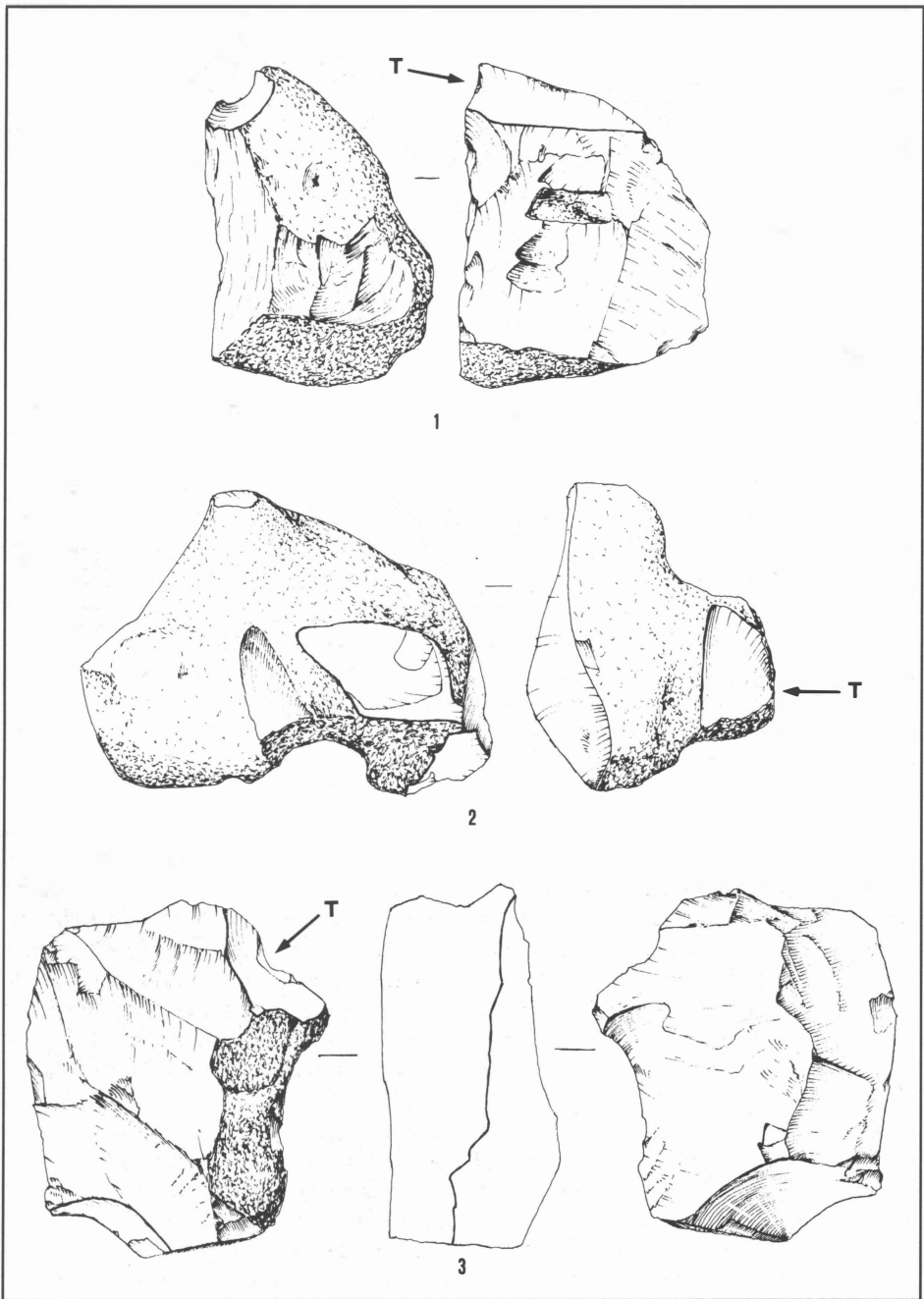
Flint working is also documented by the presence of structures situated near the calcareous outcrop.

*Structure I* (fig. 3). This is a pit excavated in the colluvium along the eastern wall of a *rundkarren*. The pit is 65 centimeters in length, 15 to 25 centimeters in width, and 30 to 35 centimeters deep. The infill is constituted by 56 blocks, plaquettes or nodules, three small flakes and one flint core. Apart from the latter, the other flints show similar characteristics. They weigh between 100 and 200 grams, and measure between 55 and 90 millimeters in length; the natural surfaces show whitish-yellowish or reddish patinas, and a film of iron-manganese. In the lithic assemblage, 40 flints show traces of breaking, and 37 show one, two or sometimes three flake removals which appear to be tests for flaking suitability (fig. 4).



*Fig. 3 - Val Lastari. Structure I.*

*Fig. 3 - Val Lastari. Struttura I.*



*Fig. 4 - Val Lastari. Struttura I. Blocchi di selce con test per flaking suitability (indicated by the arrow) (2/3 natural size; drawn by G. Almerigogna & A. Paolillo).*

*Fig. 4 - Val Lastari. Struttura I. Blocchi di selce con test di idoneità alla scheggiatura (indicated dalla freccia) (2/3 grand. nat.) (dis. G. Almerigogna & A. Paolillo).*

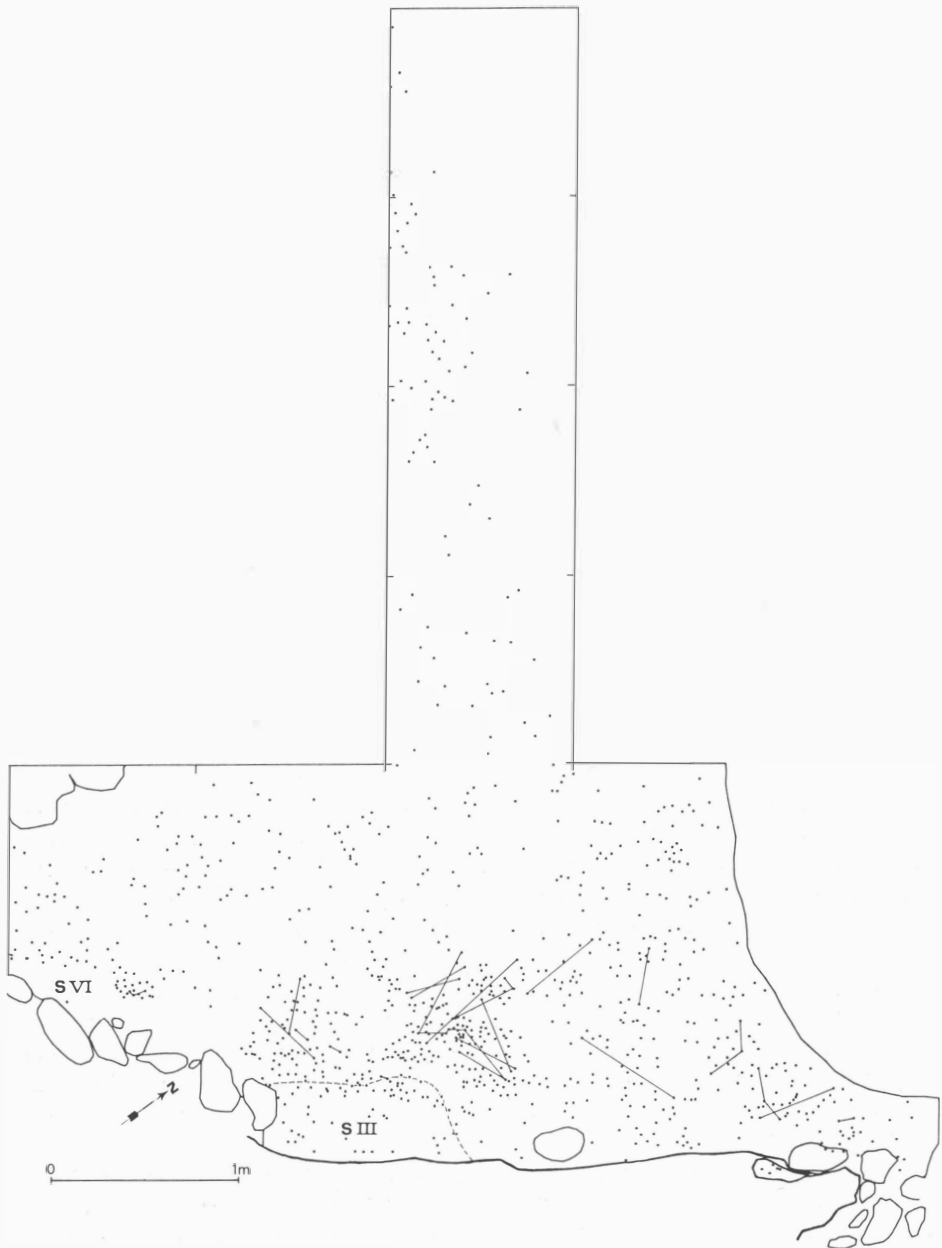


*Fig. 5 - Val Lastari. Structure II. The area delimited by the rock wall and a few boulders (the allochthonous limestone slab is indicated by the arrow).*

*Fig. 5 - Val Lastari. Struttura II. L'area delimitata dalla paretina rocciosa e da alcuni massi calcarei (la lastra calcarea alloctona è indicata dalla freccia).*

*Structure II.* It is an assemblage of 974 flints heterogeneously distributed over an area of 12 square meters; 657 of these flints are concentrated in a rectangular area one meter in length delimited by the rock wall and a few large calcareous stones, among which there is an allochthonous limestone slab (fig. 5). Beyond these stones the frequency of the flints decreases dramatically. The flints are represented by: blocks with or without tests for the suitability of flaking, by shatter derived from the fracturing of the largest blocks and nodules, by pre-cores, by cores, by large cortical flakes, by flakes and blades, by hammer stones and by some tools. Most of them are concentrated in four areas located one next to the other at the same distance from the rock wall. The refitting of some of the artifacts confirms the existence of these areas (fig. 6). A fifth area, named structure VI, is located beyond the stones, and is characterized by a linear arrangement of the flints, which reflects the presence of a previous structural boundary.

*Structure III.* This is a pit, located in the same area as structure II, which is rectangular in shape (100 by 40 centimeters) located next to the rock outcrop, and which seems to extend into an area which has not yet been excavated (fig. 6). The maximum depth, which lies in contact with the rock wall, measures 25 centimeters. The refill is constituted by 2 raw blocks of flint, by 49 cores, by 3 pre-cores, by 783 flaking products and by 966 fragments, part of which were also produced from the cores of structure II. These finds, among which were charcoal and strongly weathered bones, suggest that structure III was used as a waste pit.



*Fig. 6 - Val Lastari. The distribution of the artefacts in the structures II and VI; the continuous lines indicate refitted artefacts. The dotted line indicates the position of structure III.*

*Fig. 6 - Val Lastari. La distribuzione dei reperti nelle strutture II e VI; sono indicati i rimontaggi. La linea punteggiata indica la posizione della struttura III.*



### *Raw material provisioning*

The flint used at the site of Val Lastari is of various different kinds, but it can be traced to two principal provisioning sources.

As regards the raw material, the frequency of dark grey flint from the Biancone is dominant over the other classes (91.1%), followed by the red variegated flint from the nodules at the base of the Biancone (6.0%), the reddish-brown flint from the Scaglia Rossa (2.0%), the light grey flint from the Biancone (0.6%), and finally the red flint from the Rosso Ammonitico Veronese (0.3%).

From the macroscopic examination of the blocks, pre-cores and cores, we can confirm that the provisioning of raw material principally took place from the residual detritus of the valley-bottom and along the valley slopes. As regards the 56 blocks of structure I, these also derive from the valley-bottom. Other provisioning sources, which were however little exploited, were the outcrops of Rosso Ammonitico and Scaglia Rossa and the fluvial deposits situated at a large distance away from the site.

As regards the organization of the site, the presence of structures and the contents of the lithic assemblage show that in the area adjacent to the rock wall activities related to flint flaking were carried out. In fact, the concentrations observed inside structure II seem to be the result of the accumulation of products derived from the fracturing of nodules and large blocks of which the flaking suitability had already been tested, by the preparation of cores and by their exploitation. The presence of structure I suggests the practice of the conservation of flint with a view to future exploitation.

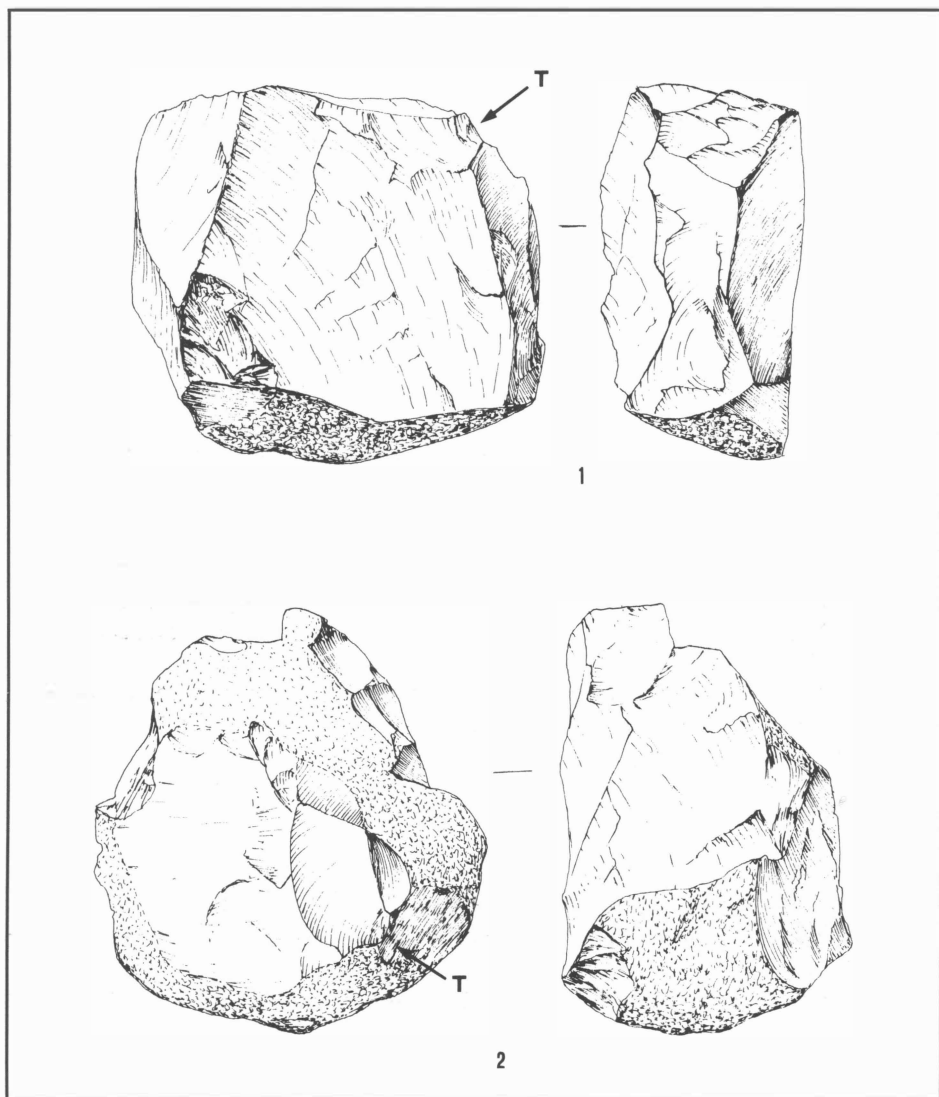
### **The Battaglia Rockshelter**

The Battaglia Rockshelter, which lies at an altitude of 1050 meters, is located at a distance of some hundred meters from the nearest raw material sources, which are in this case represented by outcrops of Biancone and Rosso Ammonitico Veronese, and by residual detrital deposits which cover the karstic calcareous rock.

The lithic assemblage is constituted by a large concentration of artefacts which provide evidence for the *in situ* working of flint. According to the classification presented by A. Broglio (1964) the blade cores, which are very abundant, are above all represented by prismatic forms with one plane of percussion. The other types of core, which are less frequent, are prismatic with two planes of percussion, subdiscoidal and subpyramidal, globular and flake cores. The flaking products are represented by flakes, blades and bladelets, of which only a small part have been used for the production of tools and microliths.

The study of the raw material provisioning systems at this site is at present limited to a preliminary observation of the types of flint and of the characteristics of their surfaces. From these first impressions, we suggest that the flint was collected close to the site both from the residual detritus and from the limestone outcrops, and that it was tested before it was brought onto the site (fig. 7).

These initial observations on the finds from the Battaglia Rockshelter highlight the similarities with the system of raw material provisioning that was adopted at Val Lastari.



*Fig. 7 - Battaglia Rockshelter. Blocks of flint with tests for flaking suitability (indicated by the arrow) (2/3 natural size; drawn by G. Almerigogna).*

*Fig. 7 - Riparo Battaglia. Blocchi di selce con test di idoneità alla scheggiatura (indicato dalla freccia) (2/3 grand. nat.) (dis. G. Almerigogna).*

## Considerations

From the point of view of their topographic positions, the sites of Val Lastari and Battaglia Rockshelter share a settlement model which is also common to many Epi-gravettian sites situated in the open on the lower-middle mountain slopes, at altitudes of

between 1000 and 1600 meters and close to small lakes or springs (BROGLIO, 1984; BROGLIO & LANZINGER, 1990). At these open sites the lithic material has a chaotic distribution of great thickness, which is due to the actions of cryoturbation and bioturbation, and which therefore makes it difficult to recognize different activity zones within the sites. In those sites where various distinct concentrations of lithic artefacts have been found, it is possible to hypothesize the presence of various habitation units, without however being able to clarify their temporal relationships. If one hypothesizes a reoccupation of these sites in successive seasons, it would not be possible to recognize these different phases of habitation which took place over such a short span of time, because of the presence of these powerful mechanisms of disturbance.

From this point of view, the presence of an organized distribution of lithic artefacts within a site is of great interest for the study of settlement modalities in mountain areas. In the case of the sites of Val Lastari and Battaglia Rockshelter, the easy acquisition of abundant raw material presumably constituted an important factor for the Palaeolithic occupation of the Plateau. In fact, given the large quantity of flaked flint, one could ask whether the flaking products and the prepared cores weren't in fact completely exploited in other sites where flint was more scarce. However, the preliminary results presented in this report show that during the course of the Epigravettian, precise strategies of raw material provisioning were adopted on the Asiago plateau, and that these strategies, which were developed only as a result of a profound knowledge of the territory and of its resources, were systematically adopted in the sites close to the abundant sources of raw material. The presence of a precise flint provisioning strategy is, in the present state of research in the Epigravettian sites in mountain environments, a new discovery, which so far has been recognized only in lowland sites (SQUINTANI, 1991-92; BARTOLOMEI *et alii*, 1992).

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### SUMMARY

The Asiago plateau is a large calcareous massif which, due to its particular wealth of flint, was important for supplying hunters during the Epigravettian. There is an abundance of flint in some Mesozoic carbonate formations and in the terrigenous deposits derived from their weathering.

The results of research performed at two Recent Epigravettian sites (Val Lastari at 1060 m above sea level and Battaglia Rockshelter at 1050 m above sea level) have revealed a specific strategy used for exploiting the flint. Both sites share the same physiographic environment: the same altitude, lithological substrate, the proximity of a wet environment, and the presence of significant deposits of flint just a short distance away.

As regards the open site at Val Lastari (dated by AMS to  $11,800 \pm 150$  B.P.,  $11,390 \pm 110$  B.P. and  $11,010 \pm 90$  B.P.), the composition of the lithic assemblage and the presence of areas dedicated to flint working demonstrate that:

- supply was taken a) from outcrops of carbonate rock providing large blocks and cores and b) from loose terrigenous deposits rich in blocks ten centimeters in size showing a strong patina; both are located a short distance from the site;
- the larger blocks and cores were brought to the site and then broken up;
- the blocks taken from the terrigenous deposits were collected and in some cases broken up at the same place; then, after testing for quality, they were brought to the site and kept in pits, ready for future exploitation;
- the production of blades was preceded by the preparation of a core;
- of the blades produced, a part was reworked by retouch and a part was removed from the site.

As regards Battaglia Rockshelter, the composition of the lithic assemblage makes it possible to assert that also in this case the flint gathered in the terrigenous deposits was brought to the site after having been tested. This site does not present any evident area dedicated to flint working.

At the present state of research in the Epigravettian of the Pre-Alps, the presence of clear anthropogenic structures and of a specific strategy for obtaining flint are new elements in the understanding of man's adaptation to mountain environments.

## RIASSUNTO

L'Altopiano di Asiago è un ampio massiccio calcareo, che per la sua particolare ricchezza di selce ha costituito una importante area di approvvigionamento per i cacciatori epigravettiani. La selce abbonda in alcune delle formazioni carbonatiche mesozoiche e nei depositi terrigeni derivati dalla loro alterazione.

Le ricerche su due siti dell'Epigravettiano recente (Val Lastari, a 1.060 m slm, Riparo Battaglia, a 1.050 m slm) hanno messo in evidenza una precisa strategia nello sfruttamento della selce. Entrambi i siti condividono il medesimo ambiente fisiografico: quota, substrato litologico, vicinanza di ambienti umidi, presenza a breve distanza di importanti giacimenti di selce.

Per quanto riguarda il sito all'aperto di Val Lastari (datato in SMA a  $11.800 \pm 150$  B.P.,  $11.390 \pm 110$  B.P. e  $11.010 \pm 90$  B.P.), la composizione dell'insieme litico e la presenza di aree deputate alla lavorazione della selce mostrano che:

- l'approvvigionamento avveniva in corrispondenza di affioramenti di rocce carbonatiche che fornivano grossi noduli e blocchi, e di depositi terrigeni sciolti ricchi di blocchi decimetrici fortemente patinati, entrambi esistenti a breve distanza dal sito;
- i blocchi e i noduli più grossi venivano portati sul sito e lì frantumati;
- i blocchi dei depositi terrigeni venivano raccolti, in qualche caso frantumati e successivamente, dopo averne saggiato la qualità mediante test di scheggiatura, venivano introdotti nel sito e lì conservati all'interno di buche in vista di un loro prossimo sfruttamento;
- la produzione di lame era preceduta da una preparazione dei nuclei;
- delle lame, parte veniva rielaborata mediante ritocco, parte asportata dal sito.

Per quanto riguarda il Riparo Battaglia, la composizione dell'insieme litico permette di affermare che anche in questo caso la selce raccolta nei depositi terrigeni veniva introdotta nel sito dopo essere stata testata. Non sono presenti in questo sito strutture evidenti legate alla lavorazione della selce.

Allo stato attuale delle ricerche nei siti prealpini dell'Epigravettiano, la presenza di strutture antropiche evidenti e di una precisa strategia nell'approvvigionamento di selce rappresentano nuovi elementi per la comprensione dell'adattamento umano agli ambienti montani.

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