Recent data on the Late Epigravettian occupation at Riparo Tagliente, Monti Lessini (Grezzana, Verona): a multidisciplinary perspective

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SUMMARY - Recent data on the Late Epigravettian occupation at Riparo Tagliente, Monti Lessini (Grezzana, Verona): a multidisciplinary perspective - This paper reports some new results of the multidisciplinary studies carried out at Riparo Tagliente (Tagliente Rockshelter, Stallavena di Grezzana, Verona, Italy), an Upper Pleistocene key-site located in northern Italy. Particularly the results presented concern the evidence which comes from the Late Epigravettian levels explored over the northern sector of the site in the last 30 years and confirm the importance of this deposit for the reconstruction of re-occupation dynamics in the southern slope of the Alps after the Last Glacial Maximum. After a brief review of the site stratigraphy, the paper examines data concerning the spatial organisation of this area. A recurrent pattern of use has been observed with differences between the inner and the outer zones of the shelter. Special attention is then given to the analysis of some accumulations mainly composed of lithic waste products located in the outer zone. Results concerning the zooarchaeological study of the whole collection of faunal remains so far recovered from investigated levels is also presented, along with the main information deriving from analytical studies on animal hard tissue artefacts, marine shell ornamental objects and ochre nodules, which are very abundant in the site.

Key words: Tagliente Rockshelter, Monti Lessini, Late Epigravettian, multidisciplinary studies

1. INTRODUCTION

The site of Riparo Tagliente (Tagliente Rockshelter, Stallavena di Grezzana, Verona, Italy) is located at the base of Monte Tregnago under a rockshelter formed by oolitic limestone; it lies on the left slope of Valpantena, one of the main valley-bottoms of the pre-alpine massif of Monti Lessini, at an altitude of 250 m above sea level (Fig. 1). The rockshelter occupies a strategic position, about half way both from the plain and the top of the...
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limestone plateau, and at the cross-way between different topographic situations: the plain, the valley-bottom, the rocky slopes and the top of the massif. Such a variety of situations matches with a rich mosaic of landscapes with different faunal and vegetal resources, which varied in distribution along time. The limestone nature of the massif brings also about the presence of several karst cavities and a richness in lithic and mineral resources, particularly flint outcrops and some deposits of ochres which were intensively exploited by the Palaeolithic groups.

Discovered in 1958 by Francesco Tagliente, the site was initially investigated, from 1962 to 1964, by the Museo Civico di Storia Naturale di Verona. In 1967 excavations were resumed by the University of Ferrara and are still in progress. Up to the mid-seventies research focused on the excavation of a long trench running transversally to the shelter and a smaller one located in the most internal area. This allowed a long stratigraphic series, over 4.50 m deep, to be brought to light formed by two main deposits separated by a river erosion: a lower deposit with Mousterian and Aurignacian industries and an upper one characterised by a Late Epigravettian record.

Starting from the late ’70s, excavations in the Late Epigravettian deposit were extended over the northern area of the site in the aim of gaining insights into the patterns of resource exploitation and organisation of the living space in a dynamic spatial and functional perspective during the different occupation phases. As field investigations are progressing, a new program of interdisciplinary studies has been established, some main results of which are here presented.

2. THE LATE EPIGRAVETTIAN OCCUPATION

The Late Epigravettian deposit has an irregular width, being thinner in the internal part of the shelter (about 50 cm) and thicker in the external one (over 2 metres). This situation is due to two main factors: the presence of the river escarpment which separates the upper deposit from the lower one leaning steeply outside the shelter and the different use of the two areas by the Epigravettian groups, namely the cleaning of inner zones and the consequent accumulation of waste products in the outer ones. Last but not least excavation works carried out in the Medieval period have led to the destruction of most part of the inner stratigraphical series, only allowing the preservation – in some areas – of the lowermost part of the deposits.

The lower Epigravettian sequence (levels 18-15) is constituted by a coarse breccia in a loess matrix; sediments, pollen, malacofauna, micro- and macrofaunal remains indicate a steppe environment with cold and arid climate conditions. Then there follow deposits formed by clasts in a loess matrix (14-5), which have yielded a very rich evidence of human occupation. The vegetation and the fauna are that of a temperate climate, characterised by a grassland wooded with conifers and deciduous trees. A recent systematic survey of the whole faunal assemblage from so far excavated layers confirms the framework which was first reconstructed after multidisciplinary analyses in the Eighties (Bartolomei et al. 1982, 1984) (see § 4).

Taking into account the radiocarbon dates, which range from 13,430±180, 14,600-13,280 cal BC (levels 15-16) to 12,040±170 BP, 12,520-11,500 cal BC (layers 10-8), the Epigravettian series of Riparo Tagliente formed between the Ancient Dryas and the beginning of the Allerød interstadial. Therefore the site represents the most ancient known deposit of the Southern slope of the Alps to be reoccupied by human groups after the last glacial maximum and its stratigraphic series is one of the most complete for the Late Epigravettian of Northern Italy.

Of great importance is also a group of mobile art objects, mostly engraved with both geometric and figurative representations and a burial which was brought to light in the Seventies in the southern sector of the site (Bartolomei et al. 1974, 1984; Guerreschi & Veronese 2002) and
recently dated to 13190±180, 14092-13280 cal BC.

Extensive investigations carried out in the two last decades over the northern sector, covering a surface of about 80 m², have shown the presence of a recurrent pattern of organisation of living floors. Thus, in the area protected by the overhang of the shelter some dwelling structures were identified, while outside several concentrations of various categories of waste were found. Particularly, in the zone of the drip-line chaotic accumulations of remains lie in an ash rich matrix, while the area immediately outside, where some large collapsed blocks are present, is characterised by huge débitage by-products concentrations (see § 3). Finally, the outermost zone seems to constitute an area for the unloading of the most cumbersome categories of materials, such as bone remains and the largest size lithic waste products: cores, tested nodules, shaping products (Guerreschi 1983; Fontana et al. 2002; Peretto et al. 2004).

3. THE DEBITAGE ACCUMULATIONS: SU 10A, B AND C, 11 AND 411

All Epigravettian layers are rich in lithic industry and characterised by considerable masses of products and debris, documenting intense knapping activities and transformation of blanks in the site. Due to this great abundance, only a small part of the amount of the assemblage which was collected during about 50 years of research has been so far the object of detailed studies. In the Eighties typological analyses were carried out over the assemblage retrieved in the “trench” area (Bartolomei et al. 1982), while studies aimed at reconstructing reduction sequences have only developed in the latest years, allowing to recognize an evolution of technical traditions along the series (Montoya in Bertola et al. 2007).

Other detailed analyses have been recently undertaken on the lithic accumulations that come from the outer area of the site, within and around the large lime-dertaken on the lithic accumulations that come from the 2007). Montoya in Bertola et al. 2004; Liagre 2005; Fontana et al. 2007a, 2007b; Fontana et al. in Bertola et al. 2007). All these layers are composed of more than 80% lithic artefacts – about 20,000 pieces each – and, to a lesser extent, of other categories of finds (bone fragments, nodules of ochre, charcoal and burned artefacts). Even a smaller accumulation located in the outermost zone of the shelter (SU 411) has been recently the object of an analytical study (Cremona & Fontana 2007).

In the outermost area SU 411 was located within a small depression delimited by some limestone blocks; it consisted of a smaller accumulation (about 1 m²) mainly composed of lithic by-products associated to two limestone pebbles probably used as hammer-stones (Cremona & Fontana 2007) within an area composed of chaotic and varied remains (Fig. 2). No retouched elements were present in this accumulation, made up of a total amount of 1167 lithic artefacts (not considering items smaller than 1 cm) and mostly composed of débitage by-products, including a discrete number of cores (3.9%). Most artefacts (90.6%) were obtained from the same flint variety (Biancone formation, grey and dark grey colour). Some main results are meaningful for interpreting this assemblage: a. the relative high number of refitting composed of elements coming from the whole unit, vertically developed over a width of about 18 cm; b. the apparent extraneous nature of most cores to the assemblage; c. the identification of refitting with elements from another unit located nearby (US 412).

As a whole, these data allow to assume that US 411 represents essentially the result of some short-term knapping episodes. Nonetheless some elements, especially cores, do not appear to be related to these episodes, but to probably derive from a longer term accumulation. The fact that they have been found as part of the same assemblage is probably a consequence of post-depositional
4. THE FAUNAL ASSEMBLAGE

Some results of the archaeozoological study, which was recently carried out on the entire collection of remains recovered in the southern sector of the site, are here presented for the first time. These data up-date those available for the area of the “trench”, which were published in the ’80s (Bartolomei et al. 1982). They also consider recently published preliminary results concerned with some portions of the faunal assemblage from the site (Cilli & Guerreschi 2000; Rocci Ris et al. 2005; Bertola et al. 2007).

More than 695,000 remains were examined; 8620 of them were determined at the anatomic and taxonomic level (Number of Identified Specimens, NISp). The remains were characterized by a high level of fragmentation; 91% was smaller than 2 cm. The high degree of fragmentation can be attributed to several factors, mainly pre-depositional, both anthropic (i.e. intense exploitation of animal carcasses, use of animal hard tissues for artefact manufacture, possible use of bones as fuel, human trampling and accidental contact with fire) and non-anthropic (carnivore gnawing, trampling and weathering). Post-depositional phenomena may also have been involved in these processes.

Red deer is the most represented species (NISp= 4522) with 52.5% identified specimens. It is documented, from the bottom to the top, starting from layer 15, but it becomes abundant in the upper layers reaching 71.5% of determined specimens in layer 8. A selection of sub-adult and adult individuals is documented. The second best represented species is roe deer (NISp= 1118), already present in layer 14 and becoming more frequent in the upper part of the series, with a maximum of 18.9% of identified remains in layers 7 and 4. Ibex (NISp= 832) is very abundant at the bottom of the sequence, especially in layers 16 and 17 with about 58% of determined specimens. Starting from layer 12, it diminishes rapidly and disappears in layer 5. Most remains represent adult individuals.

Other ungulates include wild boar (NISp= 463), bison/aurochs (NISp= 253) and chamois (NISp= 219). The presence of both the elk (NISp= 79) and Equus hydruntinus (NISp= 2) is documented.

An important role in the subsistence of the Epigravettian hunters was also played by small mammals, which are present in all the layers: the marmot (NISp= 463) and the hare (NISp= 163) (*Lepus europaeus* and *Lepus timidus*). Most marmot remains come from the lower layers (layers 12-14); they are very abundant in layer 13 (28.6% of determined specimens). The beaver (NISp= 15) was also sporadically exploited, probably both for fur and fat.

The distribution of ungulates and marmots along the sequence confirms that the lower part of the deposit (layers 17-14) is characterised by a faunal association adapted to a cold environment, while in the upper layers (12-5) temperate species, which were totally absent in the lower layers, dominate (Fig. 3); in layer 13 the two faunal association are equivalent.

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**Fig. 3 - Tagliente Rockshelter. Frequency of ungulate taxa indicative of cold and temperate environments (layers 4 to 17).**

**Fig. 3 - Riparo Tagliente. Frequenza dei taxa di ungulati indicativi di ambienti freddi e temperati (livelli da 4 a 17).**
Exploitation of animal carcasses as a food resource
is documented by the presence of frequent butchering
marks, almost exclusively observed on ungulate remains,
particularly on hindlimb bones. Some cutmarks were also
identified on carnivore remains (wolf, wolverine, lion, lynx
and marten).

Hypotheses on the seasonality of occupation of the
site can be proposed on the basis of data obtained from the
study of the remains of foetal and new-born individuals, as
well as from the study of ungulate teeth eruption. It seems
that the site was occupied all the year long, even if the evi-
dence concentrates during spring and summer time.

Concerning the spatial distribution of remains,
within the outer area (layers 10-12), some recurrent con-
centrations of finds have been observed, especially in the
north-western sector, allowing this area to be considered as
a privileged zone for either the processing of animal car-
casses or the evacuation of this category of remains.

5. THE ANIMAL HARD TISSUE ARTEFACTS

The animal hard tissue artefacts of Riparo Tagliente
represent the most important complex of tools and orna-
mental objects of the Italian Late Epigravettian for which
both typological and technological studies are available
(Cilli et al. 2006). This rich collection confirms the high
technical ability and good knowledge of animal hard tis-
sues’ characteristics by the late Epigravettian group that
inhabited this site.

Concerning bone and antler tools, the most frequent
typological classes are represented by points (including
double projectile points) and awls. These are followed by
spatulas and tools with a distal biseau. Unfortunately most
of these artefacts are broken. A further category is repre-
sented by ornamental elements and a group of undetermined
objects, which do not find any parallel in the literature.

Among projectile points, five have a double point
and are obtained from cervids’ antler. Their distal extremi-
ties have sub-circular and elliptical cross-sections; in some
cases they are fractured, probably as a consequence of
use. Their proximal ends, which were probably hafted to
a wooden stick, have either an elliptical or a plano-convex
cross-section. Their length varies between 113 and 72 mm.

Among the objects which find no parallel in the lit-
erature, one is represented by an ibex left metacarpal frac
tured near the distal epiphysis, where a large elliptical hole,
interrupted by the fracture, had been produced. Use-wear
observation of the hole margins suggests an use as projec-
tile points rectifier.

The collection of ornamental objects is mainly
composed of perforated mammal teeth, in particular red
deer atrophic canines. A detailed analysis aimed at iden-
tifying the chaines opératoires and techniques of per-
foration was carried out. This analysis was based on a
sample of 96 red deer athrophic canines, including 74
teeth showing no technological traces. Canines show-
ing traces of anthropic actions are represented by 7 teeth
with an incipient hole preparatory to perforation and by 15
classified as warm affine, disappears from the Medi-
terranean at the end of the Pliocene and settles on the north
African coast where it is still present. As a whole, 29 taxa have been recognised, belonging to the fol-
lowing classes: Gastropoda (24 taxa), Bivalvia (3 taxa) and
Scaphopoda (2 taxa) (Cilli et al. 2006; Gurioli 2006) (Fig. 5).
Two undeterminable fragments can be added.

Gastropods are represented by 4 fragments which
have only been classified at a class level and by 23 spe-
cies. Bivalves are represented by 3 species and scaphopods
by two species (Tab. 1). Almost all determined species are
widely diffused in the Mediterranean Sea, with the excep-
tion of Nassarius circumcinctus, which is only present in the
Levantine area and Buccinum undatum, the presence of
which in the Mediterranean basin is uncertain. Only one
specimen classified as Aspa marginata is fossil; this spe-
cies, considered as warm affine, disappears from the Medi-
terranean at the end of the Pliocene and settles on the north

AFRICA coast where it is still present. In the area of Monti
Lessini only one Pliocene age deposit is known, near Salò,
in the Garda Lake area. Some Pliocene deposits have also
been identified in the Veneto region, near Cornuda, Anzano
di Vittorio Veneto and Bassano.

The assemblage is clearly the result of human se-
lection: 638 items, corresponding to about 90% of the
entire collection, belong to the genus Cyclope which
therefore represents the main object either of collection
or acquisition of the Epigravettian groups. Only one en-

Fig. 4 - Riparo Tagliente. Perforated red deer atrophic canines.
Fig. 4 - Riparo Tagliente. Canini atrofici di cervo forati.
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A high quantity of ochre nodules and fragments has been collected in the site amounting to a total of 8015.4 grams: 4675 have been classified as red ochre and 3340.4 as yellow ochre. Almost all the stratigraphic units explored have yielded varying amounts of these minerals. Both qualities, red and yellow, outcrop on the Monti Lessini where different deposits have been located (Zorzin 2005). Nonetheless, as shown by experimentation, most ochre used at Riparo Tagliente seems to derive from the transformation of yellow into red ochre, through the process of calcination (heat exposure under low temperatures). After this operation, the product undergoes a colour change and a light weigh increase, but it does not acquire any other particular property that may differentiate it from the initial one.

The results of spatial analysis in the site have shown that yellow ochre, which is almost absent in the inner area of the shelter, was heaped up in the external zone, especially among the large collapsed blocks. It was then brought inside the shelter where it was probably grinded and modified by heat exposure. In fact, in the inner area red ochre is very abundant, namely around the fireplaces, even if no real stocking zone was identified. After transformation red ochre was used for several purposes, which probably took place both in the inner and in the outer area of the site as suggested by its spatial distribution. Most available evidence in the site concerns its artistic use (especially the red type, of which traces have been found on several engraved object), but it could possibly be intensively exploited also for other, mostly practical, purposes (abrasives, mastics etc.).

8. CONCLUSIONS AND FUTURE PERSPECTIVES OF RESEARCH

Results of new researches confirm the importance of the site of Riparo Tagliente for the reconstruction of the dynamics connected to the first re-occupation of the Southern Alps in the Late Glacial, allowing some general considerations to be traced, which can be considered as both lines of investigation and new challenges for future studies.

The favourable position of the site at the crossway between different echotones and its location along the corridor of the Valpantena giving access the Lessini Plateau and the inner Alps have certainly favoured its intense occupation along time by Late Epigravettian groups, starting...
**Tab. 1 - Riparo Tagliente. Complete list of marine shells found until 2005. Specimens with at least one perforation are indicated between brackets.**

**Tab. 1 - Riparo Tagliente. Elenco delle conchiglie marine ritrovate fino alla campagna di scavo dell’anno 2005. Tra parentesi sono indicati gli esemplari che presentano almeno un foro.**

<table>
<thead>
<tr>
<th>Taxa</th>
<th>NR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GASTROPODA</strong></td>
<td></td>
</tr>
<tr>
<td>Gastropoda indet.</td>
<td>4</td>
</tr>
<tr>
<td><em>Clanculus cf. corallinus</em> (Gmelin, 1791)</td>
<td>1</td>
</tr>
<tr>
<td><em>Homalopoma sanguineum</em> (Linnaeus, 1758)</td>
<td>12 (9)</td>
</tr>
<tr>
<td><em>Cerithium vulgatum</em> (Bruguière, 1792)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><em>Cerithium cf. vulgatum</em> (Bruguière, 1792)</td>
<td>3 (2)</td>
</tr>
<tr>
<td><em>Aporrhais pespelecani</em> (Linnaeus, 1758)</td>
<td>3 (3)</td>
</tr>
<tr>
<td><em>Luria cf. lurida</em> (Linnaeus, 1758)</td>
<td>1</td>
</tr>
<tr>
<td><em>Cf. Neverita josephinia</em> (Risso, 1826)</td>
<td>1</td>
</tr>
<tr>
<td><em>Buccinum undatum</em> (Linnaeus, 1758)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><em>Aspa (Bufonaria) marginata</em> (Gmelin, 1791)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><em>Nassarius incrassatus</em> (Stroem, 1768)</td>
<td>2 (2)</td>
</tr>
<tr>
<td><em>Nassarius cf. pygmeus</em> (Lamarck, 1822)</td>
<td>2 (2)</td>
</tr>
<tr>
<td><em>Nassarius mutabilis</em> (Linnaeus, 1758)</td>
<td>2 (1)</td>
</tr>
<tr>
<td><em>Nassarius costulatus cuvierii</em> (Payraudeau, 1826)</td>
<td>1</td>
</tr>
<tr>
<td><em>Nassarius cf. costulatus cuvierii</em> (Payraudeau, 1826)</td>
<td>1</td>
</tr>
<tr>
<td><em>Nassarius cf. circumcinctus</em> (Adams A., 1852)</td>
<td>7 (3)</td>
</tr>
<tr>
<td><em>Nassarius cf. corniculus</em> (Olivi, 1792)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><em>Nassarius sp.</em></td>
<td>2 (2)</td>
</tr>
<tr>
<td><em>Cyclope neritea</em> (Linnaeus, 1758)</td>
<td>428 (169)</td>
</tr>
<tr>
<td><em>Cyclope cf. neritea</em> (Linnaeus, 1758)</td>
<td>79 (32)</td>
</tr>
<tr>
<td><em>Cyclope pellucida</em> (Risso, 1826)</td>
<td>57 (3)</td>
</tr>
<tr>
<td><em>Cyclope cf. pellucida</em> (Risso, 1826)</td>
<td>17 (4)</td>
</tr>
<tr>
<td><em>Cyclope sp.</em></td>
<td>57</td>
</tr>
<tr>
<td><em>Columbella rustica</em> (Linnaeus, 1758)</td>
<td>16 (12)</td>
</tr>
<tr>
<td><strong>BIVALVIA</strong></td>
<td></td>
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<tr>
<td><em>Glycymeris sp.</em></td>
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</tr>
<tr>
<td><em>Pecten jacobaeus</em> (Linnaeus, 1758)</td>
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</tr>
<tr>
<td><em>Anomia ephippium</em> (Linnaeus, 1758)</td>
<td>1 (1)</td>
</tr>
<tr>
<td><strong>SCAPHOPODA</strong></td>
<td></td>
</tr>
<tr>
<td><em>Dentalium inaequicostatum</em> (Dautzemberg, 1891)</td>
<td>3</td>
</tr>
<tr>
<td><em>Dentalium cf. inaequicostatum</em> (Dautzemberg, 1891)</td>
<td>7</td>
</tr>
<tr>
<td><strong>Undetermine</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>728 (256)</td>
</tr>
</tbody>
</table>
from the first part of the Late Glacial, and their potential permanence over most part of the year although with an emphasis in the period between the beginning of spring and the end of summer. The recent revision of the whole set of available faunal remains has confirmed that the site was occupied during two main different climatic phases, one with colder and drier conditions, the other one characterised by an increase in temperature and humidity. During each of these phases hunting was respectively ibex and red deer specialised, but the range of other exploited species appears varied, reflecting accessibility to different echotones.

Raw materials exploitation strategies, especially considering flint and ochre residues, point to a strictly local dimension. Actually, the definition of the provenance of these materials indicates the provisioning area minimum range, but does not necessarily reflect the total territory covered by the groups. Particularly the presence of a considerable number of marine shells used as ornaments suggests both a much higher mobility of the groups and possible contacts with the neighbouring communities.

The identification of a recurrent pattern of spatial organisation based on the recognition of dwelling structures and of impressive concentrations of variably structured accumulations of waste products confirms the role of this site as a residential camp. Moreover structural and technological analyses carried out on some of the concentrations identified seem to underline the importance of knapping activities with implications for both possible exportation of prepared cores and the presence of different levels of craft specialisation, probably reflecting apprenticeship practises.

To conclude data are still missing concerning some possible changes of site use across time. This aspect has not been faced so far due to the complexity to establish stratigraphical correlations between the inner and outer deposits. The prosecution of investigations in the transition zone, along with detailed structural and functional studies of the layers located in the inner zone and new radiocarbon dates will probably help to shed new light on these aspects.

ACKNOWLEDGEMENTS

Archaeological investigations in the site of Riparo Tagliente, which allowed the recovery of the evidence discussed in this paper, were carried out with the financial support of Fondazione Cariverona and Regione Veneto.

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