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Shaping a periglacial land into a pastoral landscape: a case study from Val di Sole (Trento, Italy)

DIEGO E. ANGELUCCI*°
FRANCESCO CARRER^
FABIO CAVULLI*

* Dipartimento di Lettere e Filosofia, Università degli Studi di Trento, Italy.
^ Department of Archaeology, University of York, UK.
° corresponding author: *diego.angelucci@unitn.it*

Long-lasting human action has transformed high-altitude Alpine environments into productive landscapes, mainly through the action of herders and hay-makers. In this paper, we present a case of modification of periglacial-like land into human-mitigated landscape: the Val Molinac and Val Poré, two upland valleys tributaries of Val di Sole (Trento, Italy). Research undertaken in the area shows the existence of a well-preserved pastoral system that dates from at least the 15th century AD and was still in use until recent years, whose main purpose was the exploitation of such marginal mountain environment.
Keywords: Val di Sole, Alps, pastoralism, upland, enclosures

L'intervento antropico a lungo termine ha trasformato gli ambienti alpini di alta quota in paesaggi antropici produttivi, grazie soprattutto all'azione della pastorizia e della fienagione. In questo contributo si presenta un caso di modificazione di un ambiente di tipo periglaciale in un paesaggio antropico: la Val Molinac e la Val Poré, due valli montane tributarie della Val di Sole (Trento, Italia). Le ricerche in quest'area hanno evidenziato la presenza di un sistema pastorale ben conservato, risalente almeno al XV secolo d.C. e ancora in uso fino ad anni recenti, finalizzato allo sfruttamento di questo ambiente marginale alpino.
***Parole chiave**: Val di Sole, Alpi, pastorizia, ambienti d'alta quota, recinti*

1. Introduction

Alpine uplands – as other mountain regions around the world – include areas where several abiotic or biotic constraints restrict land use and management. The constraining factors may be due to altitude, hydrology, geomorphology (extension of rock outcrops, energy of relief, presence of active forms…), climate (mean annual temperature, extension and duration of snow cover or rainfall and their seasonal distribution, frost action…) soil or vegetation, and are responsible for the current designation

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of these environments as 'unproductive' or 'marginal', as far as the availability and exploitation of natural resources are concerned.

Despite that, humans have been exploiting high altitude environments for distinct purposes for a long time. The Alpine chain bears evidence of widespread human presence from the lateglacial and the early Holocene; after the retreat of Pleistocene glaciers, late Upper Paleolithic and Mesolithic human groups extensively exploited mountain environments during the summer, presumably for hunting and gathering food (see, e.g., Dalmeri, Pedrotti 1993 or Grimaldi 2013, as well as Angelucci, Bassetti 2009 for landscape evolution). The impact they left on land system, soils and vegetation was negligible at a large scale. A significant change in the relationships between human groups and upland took place with the introduction of pastoralism, which included the systematic exploitation of mountain areas as a place where herds could be grazed during the summer (Barker 1999). The earliest evidence of pastoral upland exploitation is given by the lowering of timberline caused by slash-and-burn activities aimed at extending pastures, which is dated from the 6th millennium BC in the Alps (Moe *et al.* 2007; Wick 1994). Since the second half of the 3rd millennium BC, shepherds started building facilities in the uplands: paths, enclosures, huts and shelters that enabled them to take possession of these extreme environments (Walsh, Mocci 2011). This process might be related to the so-called secondary product revolution (namely the exploitation of milk, wool and traction from livestock) that is supposed to spread into Europe from the Near East during the 4th millennium BC (Sherrat 1983, see also Greenfield 2010). Such patterns of anthropization have continued through time, even if with variable intensity and temporary interruptions or regressions, and have produced distinct upland human landscapes that are still detected in the areas where environmental conditions and the absence of biases have enhanced their preservation. This is especially true in those areas where the use and management of the uplands have been intense and recurrent.

In this paper, we present such a case: an upland, human-mitigated, landscape whose appearance and maintenance were guaranteed by long-lasting action of shepherds and hay-makers, and whose exploitation as such is still alive in the tradition of local communities. The case study corresponds to the territory of Ortisé and Menas, two hamlets at ca. 1500 m altitude whose inhabitants own, both as private and as common land, two upland valleys (Val Molinac and Val Poré, fig. 1). The data collected from archaeological survey and excavations show that the valleys are located in a periglacial-like context and were shaped into a pastoral landscape by long-lasting patterns of land exploitation, thus creating a constellation of 'sites' (enclosures, huts, shelters and other structures)

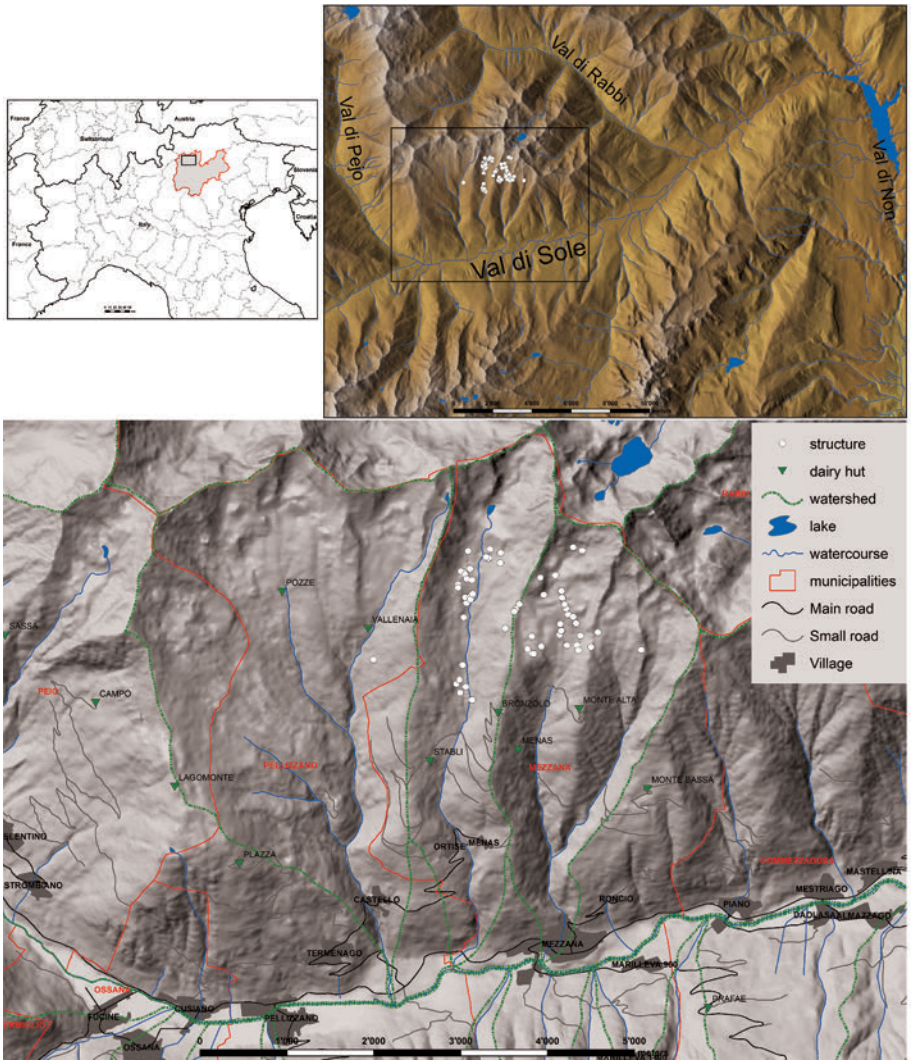

Fig. 1. Location of the study area (Val Molinac and Val Poré) and context: northern Italy and Trentino (top left; the square corresponds to the area depicted in the map on the right); digital elevation model of Val di Sole (top right; the square corresponds to the area depicted in the map below); shaded relief map of the northern slope of central Val di Sole (bottom), with location of archaeological structures (white circles).

whose spatial distribution depends on a specific locational strategy and on environmental features. This system has been in use, at least, in the second half of last millennium and has remained nearly unchanged until recent times (mid 20th century).

The data presented in this paper are part of a recent research project named "ALPES" (*Alpine Landscapes: Pastoralism and Environment of Val di Sole*), which is focused on the study of the traces left by pastoral exploitation in the uplands of Val di Sole (Trento, Italy), in terms of proper archaeological evidence and of human-induced modification of the environment (Tzortzis, Delestre 2010). Similar data have been provided by excavations and surveys in France (Walsh *et al.* 2007), Austria (Hebert, Mandl 2009; Reitmaier 2012) and Slovenia (Horvat 1999), while the application of this approach is still limited in the Italian Alps (Sauro *et al.* 2013).

2. Study area

2.1. Location and geographic facts

Val di Sole is an Alpine valley whose main axis is oriented ca. WSW-ENE (*i.e.*, almost parallel to the main Alpine watershed, fig. 1). In its mid reach, traditional land use was arranged on a 'vertical' basis. Permanent villages are set along valley bottom, between ca. 800-1000 m altitude, and on natural terraces of the northern —south-facing— valley slope, up to ca. 1500 m altitude (among them the hamlets of Ortisé and Menàs, respectively at 1477 m and 1517 m altitude). Above this level, there are only seasonal dwellings called *malghe*, exploited by herders for livestock grazing and cheese production.

The area examined in this study corresponds to the upper part of two valleys, Val Molinac and Val Poré, which belong to the municipality of Mezzana (Trento, Italy). They are located along the left, south-facing, slope of Val di Sole (fig. 1), south of the Cima Mezzana massif, and were surveyed between ca. 2000 and 2700 m altitude. Both valleys are approximately north-to-south-oriented and are tributaries of the river Noce, the main watercourse flowing through Val di Sole.

Geographically, the surveyed area corresponds to the sectors of the valleys above the slope break of the Würm glacial through, which reaches an altitude between ca. 1700 and 1800 m (see Dal Piaz *et al.* 2007 for details). The heads of the valleys exhibit periglacial features, while valley bottoms are relatively broad and gently sloping, and occupied by extensive grassland (figs. 2, 3). The contrast between the harsh periglacial environment and the gentle meadows / pastures that are found in both Val Molinac and Val Poré is noteworthy; the analysis of its origin and the role played by human factors in shaping the natural milieu will be one of the main points of this paper.

2.2. Climate and vegetation

Due to its remote location, there are no direct data on climate parameters for the examined area. Nonetheless, the elaboration of data available for Val di Sole can give a general overview of the climatic situation of Val Molinac and Val Poré.

The climate of the area (Colombo *et al.* 2001, p. 75) can be described as a highland climate. According to temperature gradients evaluated on surface measurements, average annual temperatures can be estimated as follows: average annual minimum temperature between ca. –4 and 0 °C; average annual mean temperature between ca. – 1 and 3 °C; and average annual maximum temperature between ca. 3 and 7 °C (values according to local altitude and parameters – see Colombo *et al.* 2001, p. 76 and fig. 9). The highest sectors of the examined area are probably located above the 0 °C isotherm. At the weather station of Passo del Tonale A, the 0 °C average annual isotherm is estimated at an altitude of 2507 m, while the –2 °C isotherm is located at 2846 m (Baroni *et al.* 2004, p. 252) – active rock-glaciers in the Alps are found in areas where average annual mean temperature is lower than –2 °C (see Seppi 1999 and references therein).

Concerning precipitation regimes, the measurements at the weather stations of Peio (1574 m altitude) and Lake Careser (2600 m) can be a reference for the area under study. Average annual precipitation are respectively 875 mm and 901 mm at the stations, while the average annual number of days of rain at the same locations are respectively 93 and 115 days (Colombo *et al.* 2001, p. 77, table 2). Snow usually covers the ground surface from November to April, with an average maximum thickness of snow cover ranging between ca. 60 cm and 200 cm (data from Passo del Tonale, 1880 m altitude; see Colombo *et al.* 2001, p. 86 and fig. 29).

The values of average annual frost and ice days (which respectively means the days with minimum temperature below zero and the days with maximum temperature below zero) at the weather stations of Peio and Lake Careser are respectively 143 and 244 frost days per year and 17 and 129 ice days per year (data from www.meteotrentino.it, 1961-1990 time series; download on 21 July 2013).

In a nutshell – and despite the absence of direct data – the present climate in Val Poré and Val Molinac can be described as mountain cold climate, with amounts of annual precipitation of about 1000 mm/a and no periods of hydrological deficit throughout the year (Colombo *et al.* 2001, p. 82). There are several days of frost during the year (about a half of the annual cycle) and a relevant number of days during which the

temperature remains below zero (about one hundred days during the years); during a half of the annual cycle the ground surface is covered with snow. As a matter of fact, the climate of the study area is largely dominated by ice and snow, at least from early autumn to late springtime, whereas flowing waters are abundant during the rest of the year, in particular during late springtime and early summer as a result of snow melting and during autumn because of rainfalls. Small springs and surface waters are widespread in the land as a result of the lithological and hydrological characteristics of pre-Quaternary bedrock, which is insoluble and poorly permeable (Dal Piaz *et al.* 2007, p. 122 – see also below).

As far as vegetation is concerned, the study area is presently located above the timberline ("Alpine grassland" in the map of vegetation types, see Aberegg *et al.* 2009). Most of the area is occupied by grassland – meadows and pastures indirectly controlled by human intervention – with local presence of larches and spots of Alpine shrubs (see also Aberegg et al. 2009; fig. 2). Downslope, larch and Swiss pine woods are present and become denser if one moves to lower altitude, while in the highest part of the area (above 2300-2400 m according to slope orientation) grassland progressively decreases and stoniness increases; above 2500 m vegetation is rare and scattered.

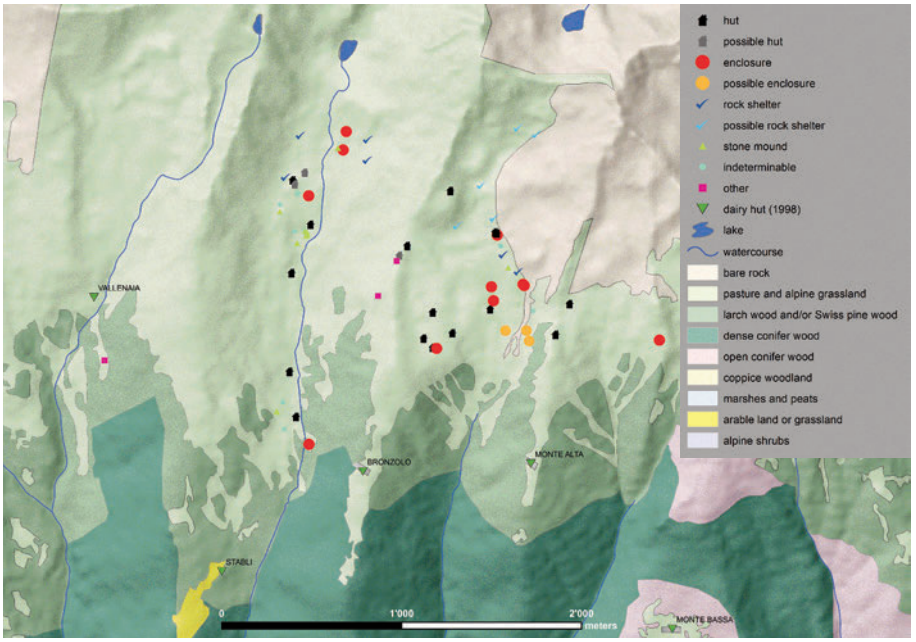

Fig. 2. Spatial distribution of archaeological structures and land use in the study area.

2.3. Geology

Although the broader region shows extreme complexity under the geological and structural points of view, as one of the main tectonic lines of the Alps (the so-called Insubric line) runs along Val di Sole, the area under study exhibits quite a monotonous layout. Geologically, metamorphic rocks belonging to the Austroalpine domain prevail all around Val Molinac and Val Poré. The main type of rock that outcrops in the valleys is middle-grained paragneiss (featuring micas, kyanite and garnets), which embeds large masses of mid- to grain-sized orthogneiss (with quartz, feldspars and micas), as well as thin bodies of quartzite, amphibolites and peridotites (Dal Piaz *et al.* 2007, see also Angelucci *et al.* 2013, fig. 3). All rock types are siliceous and have influenced the development of soils in the examined area (see below and Aberegg *et al.* 2009).

2.4. Geomorphology and soil

Few data are available on the landscape evolution of the area during the Holocene; data on soil evolution and the dating of charcoal fragments within soil profiles show that the area was deglaciated at the onset of the mid-Holocene climatic optimum and that the "earliest human interference" is probably recorded during the Bronze Age (Favilli 2012, pp. 42-43; see also Angelucci, Bassetti 2009 for the regional framework of late Pleistocene and Holocene landscape evolution).

Despite slight differences in length and overall aspect, Val Molinac and Val Poré are quite similar as far as their orientation, altitude, setting, geomorphology, hydrology and present surface dynamics are concerned – this is also reflected in the patterns of anthropization, as will be discussed later. As far as the general aspect of the valleys is concerned, four sectors can be distinguished in their relief (taking into account the area under study, which is situated at a higher altitude with respect to the glacial slope-break): (1) watersheds; (2) valleys heads; (3) areas with sub-active or relict periglacial forms; (4) grassland (fig. 3).

2.4.1. Watersheds

All watersheds surrounding the valleys (as well as others in neighboring drainage basins) roughly exhibit the same shape. Below the altitude of ca. 2300-2350 m (point 1 in fig. 3), the watersheds are wide, rounded or almost flat. They are directly modeled into bedrock, even if metamorphic rocks seldom outcrop and surface stoniness is very low – as a matter of fact, watersheds appear as smooth grassland areas. Some of

Fig. 3. Panoramic view of Val Molinac (above) and Val Poré (below). Both pictures were taken from the same point (the so-called "Om de la Steffena", a cairn located at 2558 along the crest between the two valleys) and depict the valleys from the slope break of the glacial through (ca. 2100 m in Val Molinac and ca. 2200 m in Val Poré) to the lowest point for crossing the divide at valley head (PT – Passo Tremenesca, 2700 m, in Val Molinac; PV – Passo Valletta, 2704 m, in Val Poré). Key: MZ001S, MZ002S and MZ003S – position of corresponding enclosures; MZ005S – projected position of the site; LO – Lago Ortisé; 1 – position of morphological change of watersheds; 2 – threshold of Lago Ortisé glacial cirque; 3 – Val Poré intact rock-glacier; 4 – relict rock-glaciers; 5 – grassland; N – approximate north direction. See text for details.

are residues of ancient paleosurfaces dating to early Quaternary or pre-Quaternary erosion events – while locally they exhibit double ridges (see below). Above the altitude of ca. 2300-2350 m (point 1 in fig. 3), the watersheds are modeled as acute ridges cut in bedrock surrounded by steep rocky slopes (often sub-vertical rock walls) at the base of which talus screes are often present – this set of morphologies it typical of highland periglacial environment. Soil varies accordingly: below ca. 2300-2350 m soil profiles are similar to those found in the grassland (see below), while above this altitude soils are poorly-developed or even absent (see also Aberegg *et al.* 2009, p. 47, fig. 6).

2.4.2. Valley heads

Both valley heads are shaped as glacial cirques surrounded by steep rocky slopes.

The head of Val Molinac is filled with surface sediments, in particular coarse talus material and a little intact 'active' rock-glacier (for the termi-

nology on rock-glaciers, see Scotti *et al.* 2013 and references therein), which occupies the east hillslope of the valley; minimum altitude of the rock-glacier front is at ca. 2500 m. The lowest point at which to cross the water divide at the head of Val Molinac is Passo Tremenesca, at 2700 m altitude (PT in fig. 3). Another glacial cirque is found at lower elevation; the cirque, whose drainage is restricted by a rock threshold modeled as a roche moutonnée by past glacial erosion (point 2 in fig. 3), is today occupied by a lake (Lago Ortisé, LO in fig. 3) and a large peat basin.

The head of Val Poré is narrower than that of Val Molinac and filled with surface sediments of the same type – a small 'active' rock-glacier is found along its eastern slope (minimum altitude of the rock-glacier front is ca. 2550 m). The lowest point of the water divide at the head of the valley is Passo Valletta, at 2704 m altitude (PV in fig. 3).

Soils are poorly developed at these positions (or even absent) and they are usually represented by thin podzols or rankers / leptosols (see Aberegg *et al.* 2009 for details).

2.4.3. Areas with sub-active or relict periglacial forms

Both valleys feature morphologies and sediments due to glacial and slope processes (both active and inactive), but the most obvious forms in the area are those related to periglacial morphogenesis. Among them, rock-glaciers are apparent at the first glance, even if their development does not reach the same degree as in nearby Alpine areas (see, among others: Baroni, Carton 1996; Baroni *et al.* 2004; Scotti *et al.* 2013).

Several rock-glaciers are found in the Val Molinac and Val Poré as well as in the surrounding valley; their size, shape and state of activity varies. Without taking into account the features in the valley heads – most of which active – the most obvious rock-glacier is found along the east slope of Val Poré. The rock-glacier covers an approximate surface of 1 km^2, is formed of a chaotic mass of debris (large gneiss boulders, most of them in dynamic equilibrium), and can be catalogued as an intact inactive tongue-shaped debris rock-glacier (even if inputs from talus screes are present), according to the classification proposed by Scotti *et al.* (2013). This rock-glacier reaches its lowest height at ca. 2350 m, exhibits an almost flattened body, a steep frontal ramp covered by vegetation, and little or no vegetation in its central part, where surface stoniness is virtually 100% (fig. 4). The chronology of the last phases of activity of this rock-glacier is unclear (compare the data published by Martin *et al.* 2001 and Dal Piaz *et al.* 2007), however the rock-glacier itself is a clear feature and landmark in Val Poré

Fig. 4. View of Val Poré from Passo Valletta (approx. from north). Notice the rock-glacier along the left slope of the valley, the extensive grassland and the abrupt boundary between the rock-glacier and the grassland.

(fig. 4), and its presence has also influenced the pattern of distribution of pastoral features in the valley, as will be shown later.

Other rock-glaciers whose features match the characteristics of relict rock-glaciers as defined in the neighboring Adamello-Presanella massif (Baroni *et al.* 2004, p. 251) are also found in both Val Molinac and Val Poré. The fronts of these rock-glaciers reach an altitude slightly lower than 2300 m (see point 4 in fig. 3). In Val Molinac, a relict protalus rampart is found along the west slope, while a relict talus-lobate rock-glaciers occupies its eastern hillslope; in Val Poré, a relict talus lobate rock-glacier is also present and is partly deformed by deep-seated gravitational slope deformations (see below). The activity of the relict rock-glaciers is broadly dated, as a whole, to a time lapse included between the lateglacial and the Holocene (Baroni *et al.* 2004; Dal Piaz *et al.* 2007).

Other surface morphologies and features related to periglacial-like processes as block streams, frost creep lobes or ploughing boulders are found in the study area.

2.4.4. Grassland

The area defined here as grassland corresponds to the meadows / pastures occupying the western slopes and central sectors of both Val Molinac and Val Poré, as well as the lower part of the ridges mentioned above (point 5 in fig. 3). The surface stoniness of the grassland is very low, regardless of its location on metamorphic bedrock or on relict rock-glaciers, glacial sediment forming lateral moraines and rounded gentle ridges alternating to shallow little valleys often filled with tractive sediment. All these features are often affected by deformations related to surface slope dynamics as creep or frost-creep and even by more massive processes, such as deep-seated gravitational slope deformations. Even if a systematic study of these deformations has not been yet undertaken, a number of features clearly show that relevant portions of both valleys have been affected by deep-seated slope deformations. They are well-visible in Val Poré, whose eastern watershed forms a double ridge and whose central sector is characterized by a scarp accompanied by minor trenches delimiting a staircase of sub-horizontal steps, uphill facing slopes and a rather articulated relief at the meso-scale – all these features being scattered over slightly sloping surfaces (fig. 5). Deep-seated gravitational slope deformations are rather common in the area and deeply affect metamorphic bedrock, as well as Quaternary surface sediments (Dal Piaz *et al.* 2007). The relevance of such fea-

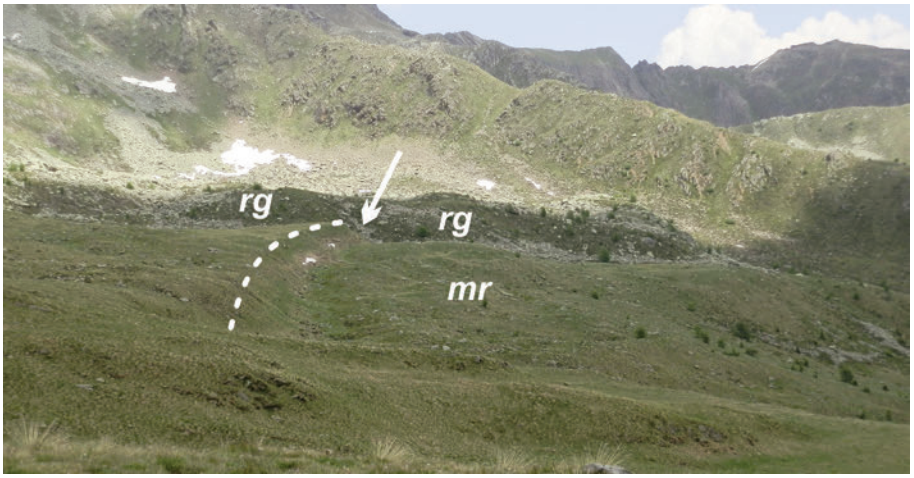

Fig. 5. Deep-seated gravitational slope deformation in Val Poré. Its main features are the scarp, whose approximate height is 15 m (dashed line), and the area downslope with articulated micro-relief (mr). The deformation also affects the Val Poré rock-glacier (rg), in the point indicated by the arrow.

tures for human settlement, even if for much older phases than those reported here, was already emphasized in a recent paper (Forno *et al.* 2013).

Soils in the grassland are better developed than in other sectors of the valleys. Logs obtained by hand-augering has confirmed the overall distribution of soil profiles obtained by the soil type modeling proposed by Aberegg *et al.* (2009): podzolic soils and cambisols / brown soils, with *solum* thickness between 25 and 40 cm, were found in the meadows of Val Poré (see also the soil profile detected at MZ005S site, Angelucci *et al.* 2013). Preliminary radiocarbon measurements after treatment of soil organic matter obtained in the neighboring Val di Rabbi suggest that soils from similar environmental situations have started their evolution in ancient times, in some cases during the lateglacial or the early Holocene (Favilli *et al.* 2009). Preliminary data from soil survey in the grassland indicate that soil often exhibit thick well-developed A horizons, sometimes with superposition of A-2Ab *sequa* (as at MZ005S site, see Angelucci *et al.* 2013), and that poorly to moderately developed Bw horizon can be found in the lowest part of the study area below ca. 2200-2250 m altitude.

3. Archaeological evidence

The upland territories of Val Molinac and Val Poré bear several signs of diachronic human action in form of dry stone structures and other facilities as paths or water canals (Carrer *et al.* 2013).

Archaeological fieldwork in the area has started in the summer of 2010 and included the survey of the two valleys above 2000 m elevation (Carrer *et al.* 2013; Angelucci *et al.* 2013), as well as stratigraphic excavation at site MZ005S and hand-augering at other sites. Each archaeological evidence detected in the study area was recorded and positioned through a hand-held GPS and coded by an alphanumeric identifier (ID). Until now, over eighty locations were recorded, measured, described and photographed. Eventually, a GIS platform was created in order to manage the collected spatial and attribute data.

Dry-stone structures are the most relevant archaeological features recorded in the study area. A first analysis of their morphological, functional and locational characteristics has enabled to divide them into three main categories (Foradori 2009-2010; Carrer *et al.* 2013):

enclosures – they are single or multiple dry-stone wall perimeters, usually large (more than 50 m^2), used as pens for livestock (fig. 6);

huts – they are isolated dry-stone wall perimeters smaller than the enclosures (less than 50 m^2), and were interpreted as the foundation of small seasonal dwellings (fig. 7);

rock-shelters — they are small provisional refuges or storage spaces sheltered under boulders and confined by more or less ephemeral dry-stone walls (fig. 8).

The analysis of the locational patterns of the three categories reveals that each of them responds to a specific pattern of spatial organization (fig. 9), and it has been suggested that distinct locational strategies may depend on the different functions of sites (Foradori 2009-2010; Carrer 2013). The enclosures are usually placed in gently sloping areas close to valley bottoms, in order to be protected against storms and lightening and to be situated near streams (as is the case of MZ001S and MZ0014S, see fig. 6), or even set against rock-glacier ramps (as is the

Fig. 6. Enclosures MZ001S (above) and MZ002S (below), both located in Val Molinac.

Fig. 7. Hut MZ048S is located in Val Poré, a few meters from enclosure MZ005S (scale: 0.60 m).

Fig. 8. Rock-shelter MZ075S, in Val Molinac.

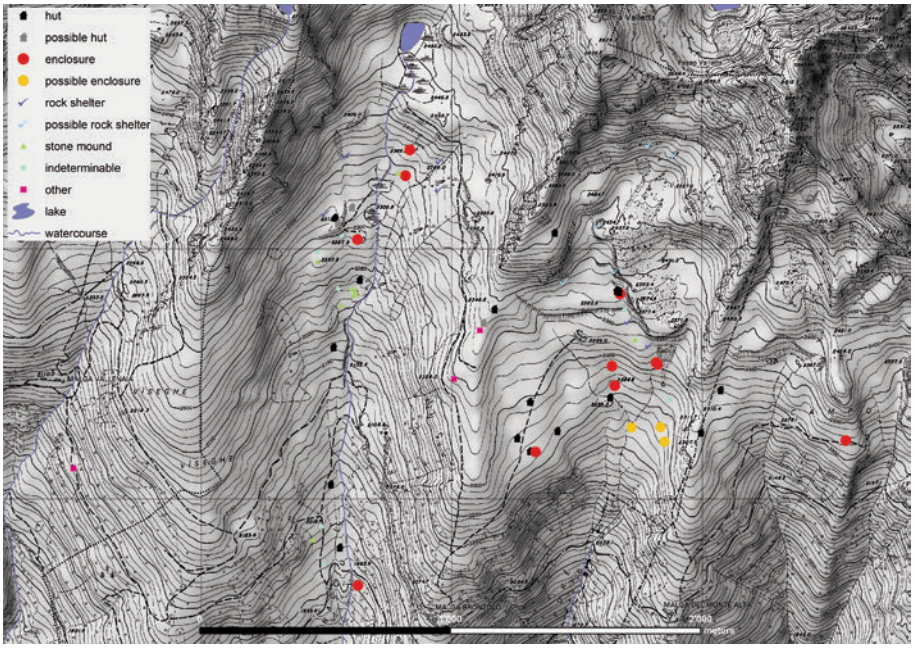

Fig. 9. Spatial distribution of archaeological structures in the study area (Carta Tecnica Provinciale del Trentino 1:10.000 overlaying shaded relief; equidistance of contour lines is 10 m).

case of the highest enclosures like MZ002S and MZ003S, see fig. 10). These locations are particularly suited for stabling dairying animals and are also selected by current herders of dairying stocks in other valleys of the Trento province. According to these analogical data, it has been assumed that the enclosures were exploited for stabling and milking dairying livestock (Carrer 2013). The isolated huts are often located far from water sources and in exposed areas, therefore suggesting a different function than the enclosures. According to oral testimonies, to cadastre maps and to historical aerial photographs, it has been highlighted that many of the recorded huts were used in the past as seasonal dwelling of hay-makers and that some of them were not directly related to pastoral exploitation of the land. The rock-shelters, instead, are close to ridges and peaks and are often placed on steep slopes; this suggests that they were used as provisional structures for sheltering or storing products. The rock-shelters are thus supposed to be used for other activities like hunting or transhumant pastoralism of non-dairying animals.

The data collected until now show a clear relationship between structure categories / functions and locational patterns. Elevation range is the first

Fig. 10. Location of site MZ003S (black arrow). Notice the abrupt boundary between the rock-glacier (rg) and the grassland (gl), as well as the sharp change of surface stoniness.

	Enclosures	*Huts*	*Rock-shelters*
Min.	1960	1983	2318
Max.	2373	2501	2535
Mean	2259	2281	2404
Median	2280	2303	2393
1st Quartile	2244	2251	2360
3rd Quartile	2306	2373	2425

Tab. 1. Descriptive statistics of the altitudinal distribution of enclosures (13 items), huts (17 items) and rock-shelters (11 items) in Val Molinac and Val Poré (figures are in meters).

factor varying among distinct structure categories. As previously mentioned, the altitude range of the survey is comprised between 2000 and 2700 m, and all the recorded dry-stone structures lay within this range. The measures of central tendency and dispersion of altitudinal distribution for each structure category have been analyzed (see tab. 1), and Student's *t*-test (for its application in archaeology see Fletcher, Lock 1991, p. 76) suggests that the huts and the enclosures have the same statistical altitudinal range, whereas the rock-shelters are usually placed at superior height. According to this analysis, it might be suggested that a factor controlling the location of the structures is surface stoniness. On the one hand, the rock-shelters are located in the highest part of the valleys, between ca. 2400-2500 m altitude, at places where periglacial forms are dominant and surface stoniness is high. On the other hand, the huts and the enclosures are located in lower sectors of the valleys (below ca. 2400 m altitude), in which grassland dominates and surface stoniness is low. The highest huts

and enclosures are set at the boundary between periglacial features and the grassland, that is between two different ecosystems.

Large and compound enclosures are the most relevant features in the study area. They are usually composed of several single dry-stone perimeter walls and are often associated with huts or situated next to them (see fig. 6 and data from MZ005S after Angelucci *et al.* 2013). The construction of these enclosures follows a clear pattern as far as building technique and the selection of raw material are concerned: perimeter walls are made up of medium-sized (few tens of centimeters wide) elongated slabs of paragneiss, which are oriented with their major axis perpendicular to the direction of the wall, while larger orthogneiss boulders are placed at the bends as sort of cornerstones (see Angelucci *et al.* 2013 for the technique used at MZ005S).

The distribution of the enclosures seems to track a precise route to access valleys heads, with a rough linear distribution that runs parallel to valley axes (that is, more or less north-south, see figures 3 and 9). The access to both Val Molinac and Val Poré is made from two *malghe* (dairy huts with permanent constructions for stabling livestock and housing shepherds as well as for processing the milk and making cheese), respectively Malga Stabli (1814 m altitude) and Malga Bronzolo (2084 m), which are both located along watersheds. The approach to Val Molinac is made through a historical path that departs from Malga Stabli and climbs towards the talweg until reaching a lower large enclosure at 1960 m altitude (site MZ037S). From this point, the path follows upstream roughly parallel to the watercourse and touches the huge MZ001S composite enclosure (ca. 2285 m), which is located over a relatively broad flat surface with marshy areas scattered nearby. The highest structure in Val Molinac is the composite enclosure MZ002S, which is set at 2374 m altitude, against a huge talus scree formed of large boulders and in front of the grassland. The route to enter Val Poré is similar to that of Val Molinac. From Malga Bronzolo, the path converges to a poorly preserved enclosure (MZ012S, at ca. 2275 m altitude) and then reaches the basin where MZ005S and MZ004S are found, respectively at 2257 m and 2290 m altitude. The highest enclosure is MZ003S (2373 m, fig. 10), which is located at a position very similar as that of MZ002S in Val Molinac, that is, against the stony talus rampart of the Val Poré rock-glacier and in front of the pastures. Despite the difference of altitude, which is related to slight geomorphological variations, the distribution of the large enclosures in Val Molinac and Val Poré is roughly the same and the enclosures MZ002S and MZ003S are a sort of advanced structures marking the higher limit of the area that can be exploited by shepherds, at the boundary between bare-rock periglacial morphologies and fat grassy pastures.

4. First data about archaeological chronology

The data on the chronology of the archaeological and architectural evidence observed in Val Molinac and Val Poré are scarce until now. The structures – in particular the enclosures and the huts – form a coherent system within the study area: they were placed according to specific identifiable parameters (landmarks?) and linked among them by a dense network of paths, often poorly recognizable, and water canals. The degree of preservation of the structures is often similar to one another, as well as similar are other markers that can be used as a first, rough, estimate of relative chronology such as: the incorporation of stone elements within topsoil; the presence of lichens on stones; and the degree of deformational phenomena along the slopes where gravitational processes are active. These preliminary observations suggest that the distribution of structures in the study area is a cumulative palimpsest (see Bailey 2007), even if it can be also suggested that most structures were probably in use during the same time span. It is worth noting that no finds – both inside the structures and as stray finds – have ever been discovered during the survey in the study area, except for occasional items related to the most recent phase of pastoral use of the land. The only archaeological artifacts and ecofacts identified so far are those coming from the excavation campaigns at the MZ005S site; at the same time, no surface finds were ever observed at the site. In our view, this could mean that: (a) the study area was probably outside the *ecumene* of Mesolithic hunter-gatherers, who left common evidence in many sectors of the eastern Alps (see Cavulli *et al.* 2011 or Grimaldi 2013 and references cited therein), and whose archaeological record is easily detected in upland areas located above the timberline; (b) archaeological objects only occur within the archaeological structures (enclosures and huts) and no relevant off-site record exists on the land; (c) the artifacts and ecofacts preserved within the structures are embedded within soil horizons – which also means that they experienced a slow process of incorporation into topsoil and that they are not related to a recent phase of land exploitation by humans. These hypotheses may suggest that the archaeological and chronological data collected at the MZ005S site can be representative of the overall archaeological situation of the study area.

A 1-m^2-test sounding (called T1) was opened at MZ005S in 2011. The archaeological assemblage collected at the test pit is dated to the 16th-17th century AD, but occasional finds – in particular few flint flakes – may also suggest an earlier, possibly prehistoric, phase of occupation. Radiocarbon dating on charcoal fragments collected from the test pit gave two distinct measurements, one dating to the 20th century AD, which refers to the last phases of exploitation of the site, and another

between the 14th-15th century AD, slightly earlier than the chronology of the collected archaeological assemblage. A third radiocarbon sample obtained by another test pit (sounding T2) gave a 7th-8th century AD date (see Angelucci *et al.* 2013 for details). It is worth noticing that the two oldest dates are similar to those provided by charcoal samples from soil profiles of the nearby Val di Peio and Val di Rabbi, whose presence is explained as a result of the practice of clearing woods in the uplands (1800-2200 m) from the late 8th-9th century AD, and at mid altitude (1500-1800 m) from the 15th century AD (Favilli *et al.* 2010).

In 2013, excavation was resumed and enlarged at MZ005S, reaching an excavated surface of more than 4 m^2. The results of this second campaign – even if preliminary, as the archaeological assemblage is still under study – fully confirm the data collected in 2011.

The data from MZ005S and the preliminary assessments exposed above indicate that Val Molinac and Val Poré have been subjected to long-lasting human intervention, both direct (as the construction of the enclosures and the huts) and indirect (through the intensive exploitation of pastures by herds and flocks), whose duration can be evaluated from few centuries to few millennia.

5. Discussion

The area examined until now by the ALPES project, the heads of Val Molinac and Val Poré, is a typical upland area. It is subjected to highland climate which determines harsh environmental conditions attested by the occurrence of glacial and periglacial-like morphologies. These, in turn, are associated with other land features that are often detected in high-altitude regions and that are controlled by climatic or geomorphological factors (as steep slopes, high surface stoniness, the occurrence of marshes and peats and so forth). The main soil type expected in most of the two examined valleys falls within the Leptosols reference group (Aberegg *et al.* 2009), which are described as "unattractive soils for arable cropping; limited potential for tree crop production or extensive grazing" (Driessen, Deckers 2001, p. 125). As a matter of fact, the examined area matches the characteristics of marginal environments, that is, land where productive practices are strongly biased by climatic and environmental constraints.

Despite this environmental scenario, archaeological research has shown that the examined area hosts a well-developed system that was in use until the half of the 20th century and that was aimed at the economic exploitation of the land on a seasonal basis, mainly through summer grazing and hay making. Today, cattle are still taken to the area during

summer months, while sheep may occasionally come to Val Molinac or Val Poré from neighbouring valleys. Archaeological data prove that this exploitation system date at least from the 15th century AD, whereas the evidence of older pastoral land use is also present but not yet conclusive.

Pastoral structures (enclosures and huts) are mainly situated in the grassland that occupies the altitudinal range between ca. 2000 and 2400 m of the valley basins and watersheds. According to oral information, historical photographs and cadastral maps, the grassland was mostly used for intensive grazing, while hay making took place in the lowest parts of the surveyed area. In particular, the south-western portion of Val Molinac (named Vìseghe, which is the local denomination for *Carex* sp. grassy plants such as sedges) was exploited for hay production and was privately owned and managed, while the sectors of the valleys devoted to herding and grazing were owned and managed as communal property by the communities of Ortisé and Menas. The location of the hay making sector at Val Molinac depends on its easier access from the two hamlets, even if environmental factors (as soil type) or land use practices (as irrigation) may have improved local land suitability to hay production.

Besides hay production, human and animal exploitation occurred all around the valleys: intense grazing took place mainly in the grassland, but was also carried out beyond its altitudinal limit, as sheep can climb steep talus slopes to feed themselves on the sparse grass growing on them (fig. 11).

These preliminary data suggest that the grassland of Val Molinac and Val Poré could be an anthropically-mitigated environment. The lower limit of the grassland, which corresponds to the timberline, is rather irregular in plan view and its altitude is very low along watersheds (almost 1800 m). At the same time, soil profiles with poorly to moderately developed B horizons showing evidence of cambic or spodic properties were detected in the lower portions of both valleys up to 2200-2250 m altitude. This evidence and the current information about treeline oscillations in the Alps (Tinner, Vescovi 2007) suggest that present grassland is partly derived from the clearance of woodland, as it is also indicated by the analysis of the distribution and age of charcoal fragments within soils in other sectors of Val di Sole (Favilli *et al.* 2010). Concerning the upper limit of the grassland, it is very sharp and in direct contact with periglacial features. The sharpness of this boundary is striking and does not seem to be simply related to the variations of natural environment; present grassland is developed on skeleton-rich glacial and periglacial sediments, which are often detected at low-depth below soil A and B horizons. Even if it is hard to assess at this stage of research, it can be assumed that such an abrupt boundary between upland geomorphological features and the pas-

Fig. 11. Sheep grazing at the head of Val Molinac, near Passo Tremenesca, at ca. 2600 m altitude. Sheep came from Val di Rabbi, crossing the watershed between the two valleys.

tures is the result of human impact on specific land units (as the grassland) through long-term inputs of organic matter, phosphate and other soil nutrients, mainly from animal dung, that may have enhanced soil formation in the areas where grazing was more intense.

Archaeological survey shows that the position of archaeological sites and structures was carefully chosen by decision-making procedures based on the physical and environmental parameters of the land. The large compound enclosures (that may be seen as reference features in the examined area) are located along the routes to access the valleys and close to watercourses (fig. 9). The highest enclosures (such as MZ002S in Val Molinac and MZ003S in Val Poré, both at almost 2400 m altitude – see figures 6 and 10) are specifically situated at the border between natural periglacial features and the grassland. This locational pattern can be explained with the necessity of saving the pastures at lower altitude while at the same time manuring the land located at highest, less productive, sectors of the valleys, thus enabling the expansion of areas suitable for grazing towards the uplands.

The compound enclosures such as MZ005S or MZ001S are the most interesting sites detected until now in the two valleys under study. The first archaeological data collected suggest that they are palimpsest structures built and used through multiple phases. Their selected position fitted the needs of pastoral groups through different historical periods and even if

no data on the synchronicity of the observed pastoral landscape are available so far, it can be suggested that some of these structures were exploited during the same chronological periods. Present-day aspect of the structures is probably related to the main phase of intensification and use of the land, which seems to have occurred between the 15th-16th centuries AD, that is, during the first phases of the climate 'worsening' of the Little Ice Age. A similar trend was identified in other alpine areas (see Walsh *et al.* in press) and interpreted as a reaction to the decreased productivity of lowland alpine agriculture (Walsh 2005).

Even if data are still preliminary, it is clear that the area under study is shaped as a human-mitigated landscape that is related to pastoral land use during summer months. This landscape is the result of the transformation of high-altitude periglacial-like environments by means of long-lasting human and animal exploitation (at least since the 15th century AD) that have acted through direct dynamics such as deforestation and indirect dynamics such as the amelioration of soil quality by means of repeated input of substances into the soil by herds.

The reflections provided in this paper open novel research perspectives for the southern slope of the eastern Alps, a region where the study of pastoral landscapes under an archaeological point of view is still at its early stage. In the future, environmental analyses will be needed to understand the evolution of human action in the environment of the Val Molinac and Val Porè, and more chronological data on the upland structures are required, in order to correlate the environmental dynamics with the construction of pastoral seasonal facilities. All these data will be acquired in the next field campaigns of the ALPES project and will enable to contribute to the ongoing debate on human-environment interactions in the high altitudes during the Holocene (Moe *et al.* 2007; Walsh *et al.* 2006).

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References

I. Aberegg, M. Egli, G. Sartori, R. Purves 2009, *Modelling spatial distribution of soil types and characteristics in a high Alpine valley (Val di Sole, Trentino, Italy),* "Studi Trentini di Scienze Naturali", 85, pp. 39-50.

D.E. Angelucci, M. Bassetti 2009, *Humans and their landscape from the Alpine Last Glacial Maximum to the Middle Holocene in Trentino: geoarchaeological considerations*, "Preistoria Alpina", 44, pp. 59-78.

D.E. Angelucci, F. Carrer, F. Cavulli, A. Delpero, G. Foradori, T. Medici, A. Pedrotti, D. Pisoni, M. Rottoli 2013, *Primi dati archeologici da una struttura pastorale d'alta quota in Val di Sole: il sito MZ005S (Mezzana, Trento),* in Angelucci, Casagrande, Colecchia, Rottoli 2013, pp. 141-162.

D.E. Angelucci, L. Casagrande, A. Colecchia, M. Rottoli (eds) 2013, *APSAT 2. Paesaggi d'altura del Trentino. Evoluzione naturale e aspetti culturali*, Mantova.

G. Bailey 2007, *Time perspectives, palimpsests and the archaeology of time*, "Journal of Anthropological Archaeology", 26, pp. 198-223.

G. Barker 1999, *Hunting and farming in prehistoric Italy: changing perspective on landscape and society*, "Papers of the British School at Rome", 67, pp. 1-36.

C. Baroni, A. Carton 1996, *Geomorfologia dell'alta Val di Genova (Gruppo dell'Adamello, Alpi Centrali),* "Geografia Fisica e Dinamica Quaternaria", 19, pp. 3-17.

C. Baroni, A. Carton, R. Seppi 2004, *Distribution and Behaviour of Rock Glaciers in the Adamello–Presanella Massif (Italian Alps*), "Permafrost and Periglacial Processes", 15, pp. 243-259.

F. Carrer 2013, *An ethnoarchaeological inductive model for predicting archaeological site location: a case-study of pastoral settlement patterns in the Val di Fiemme and Val di Sole (Trentino, Italian Alps)*, "Journal of Anthropological Archaeology", 32, pp. 54-62.

F, Carrer, D.E. Angelucci, A. Pedrotti 2013, *Montagna e pastorizia: stato dell'arte e prospettive di ricerca*. in Angelucci, Casagrande, Colecchia, Rottoli 2013, pp. 125-139.

F. Cavulli, S. Grimaldi, A. Pedrotti, D.E. Angelucci 2011, *Toward a comprehension of archaeological visibility: the case study of the Trentino region (southern Alps).* in M. Van Leusen, G. Pizziolo, L. Sarti (eds), *Hidden Landscapes of Mediterranean Europe. Cultural and Methodological Biases in pre- and protohistoric Landscape Studies,* BAR IS 2320, Oxford, pp. 83-94.

M. Colombo, V. Portolan, G. Toller, R. Zampedri, E. Eccel 2001, *Il clima delle valle del Noce in Trentino,* "Studi Trentini di Scienze Naturali, Acta Geologica", 76 (1999), pp. 71-88.

G. Dalmeri, A. Pedrotti 1993, *Distribuzione topografica dei siti del Paleolitico superiore finale e del Mesolitico in Trentino,* "Preistoria Alpina", 28(2) (1992), pp. 247-267.

G.V. Dal Piaz, A. Castellarin, S. Martin, L. Selli, A. Carton, G.B. Pellegrini, E. Casolari, F. Daminato, L. Montresor, V. Picotti, G. Prosser, E. Santuliana, L. Cantelli (eds) 2007, *Carta Geologica d'Italia alla scala 1:50.000. Foglio 042. Malè + Note illustrative della Carta Geologica d'Italia alla scala 1:50.000. Foglio 042. Malè*, Trento-Roma.

P. Driessen, J. Deckers (eds) 2001, *Lecture Notes on the major Soils of the World,* Roma.

F. Favilli 2012, *Alpine Landscape Evolution in Val di Sole (Trentino, Italy). Reconstructing Alpine Landscape History through the Implementation of Relative and Absolute Dating Techniques,* Saarbrücken.

F. Favilli, M. Egli, G. Sartori, P. Cherubini, D. Brandova, W. Haeberli 2009, *Application of relative and absolute dating techniques in the Alpine environment,* "Studi Trentini di Scienze Naturali", 85, pp. 93-108.

F. Favilli, P. Cherubini, M. Collenberg, M. Egli, G. Sartori, W. Schoch, W. Haeberli 2010, *Charcoal fragments of Alpine soils as an indicator of landscape evolution during the Holocene in Val di Sole (Trentino, Italy),* "The Holocene", 20(1), pp. 67-79.

M. Fletcher, G.R. Lock 1991, *Digging Numbers. Elementary Statistics for Archaeologists,* Oxford.

G. Foradori 2009-2010, *L'utilizzo delle alte quote a scopo pastorale. Primi dati archeologici dai pascoli di Ortisé e Menàs (Val di Sole, TN),* Tesi di Laurea in Beni Culturali (rel. Prof. D.E. Angelucci), Università di Trento.

M.G. Forno, M. Gattiglio, F. Gianotti, A. Guerreschi, L. Raiteri 2013, *Deep-seated gravitational slope deformations as possible suitable locations for prehistoric human settlements: An example from the Italian Western Alps*, "Quaternary International", 303, pp. 180-190.

H.J. Greenfield 2010*, The Secondary Products Revolution: the past, the present and the future,* "World Archaeology", 42(1), pp. 29-54.

S. Grimaldi 2013, *Il territorio dei cacciatori-raccoglitori in Trentino durante il Paleolitico e il Mesolitico,* in Angelucci, Casagrande, Colecchia, Rottoli 2013, pp. 75-90.

B. Hebert, F. Mandl (eds) 2009, *Almen im Visier. Dachsteingebirge, Totes Gebirge, Silvretta*, Haus im Ennstal.

J. Horvat 1999, *Colonizzazione preistorica e romana sulle Alpi di Kamnik (Slovenia),* in S. Santoro Bianchi (ed), *Studio e conservazione degli insediamenti minori romani in area alpina*, Atti dell'incontro di studi, (Forgaria del Friuli, 20 settembre 1997), Bologna, pp. 63-69.

S. Martin, S. Cocco, G.V. Dal Piaz, F. Daminato, D. Gaspari, L. Montresor, G.B. Pellegrini, G. Prosser, N. Surian, G. Tommasi, G. Zambotti 2001, *Carta geologica in scala 1:25.000. Tavola 42 IV. Peio,* Trento.

D. Moe, F.G. Fedele, A. Engan Maude, M. Kvamme 2007, *Vegetational changes and human presence in the low-alpine and subalpine zone in Val Febbraro, upper Valle Spluga (Italian central Alps), from the Neolithic to the Roman period.* "Vegetation History and Archaeobothany", 16, pp. 431-451.

T. Reitmaier (ed) 2012, *Letzte Jäger, Erste Hirten. Hochalpine Archäologie in der Silvretta*, Chur.

U. Sauro, M. Migliavacca, V. Pavan, F. Saggioro, D. Azzetti (eds) 2013, *Tracce di antichi pastori negli Alti Lessini,* Vago di Lavagno.

R. Scotti, F. Brardinoni, S. Alberti, P. Frattini, G.B. Crosta 2013, *A regional inventory of rock glaciers and protalus ramparts in the central Italian Alps,* "Geomorphology", 186, pp. 136-149.

R. Seppi 2001, *Geomorfologia dell'Alta Valle di Saent (Valle di Rabbi, Gruppo Ortles Cevedale),* "Studi Trentini di Scienze Naturali, Acta Geologica", 76 (1999), pp. 17-31.

A. Sherratt 1983*, The Secondary Exploitation of Animals in the Old World,* "World Archaeology", 15(1), pp. 90-104.

W. Tinner, E. Vescovi 2007, *Ecologia e oscillazioni del limite degli alberi nelle Alpi dal Pleniglaciale al presente,* "Studi Trentini di Scienze Naturali, Acta Geologica", 82 (2005), pp. 7-15.

S. Tzortzis, X. Delestre 2010, *Archéologie de la montagne européenne,* Actes de la table ronde international (Gap, 29 septembre-1 octobre 2008), Aix en Provence.

K. Walsh 2005, *Risk and marginality at high altitudes: new interpretations from fieldwork on the Faravel Plateau, Hautes-Alpes,* "Antiquity", 79, pp. 289-305.

K. Walsh, F. Mocci 2011, *Mobility in the mountains: late third and second millennia Alpine societies' engagements with high-altitude zones in the Southern French Alps,* "European Journal of Archaeology", 14, pp. 88-115.

K. Walsh, S. Richer, J.-L. de Beaulieu 2006, *Attitudes to altitude: changing meanings and perceptions within a 'marginal' Alpine landscape: the Integration of palaeocological and archaeological data in a high-altitude landscape in the French Alps,* "World Archaeology", 38, pp. 436-454.

K. Walsh, F. Mocci, J. Palet-Martines 2007, *Nine thousand years of human/landscape dynamics in a high altitude zone in the southern French Alps*, in Ph. Della Casa, K. Walsh (eds), *Interpretation of Sites and Material Culture from Mid-High Altitude Mountain Environments*, Proceedings of the 10th annual meeting of the EAA, 2004, "Preistoria Alpina", 42, pp. 9-22.

K. Walsh, M. Court-Picon, J.-L. de Beaulieu, F. Guiter, F. Mocci, S. Richer, R. Sinet. B. Talon, S. Tzortzis in press, *A historical ecology of the Ecrins (Southern French Alps): archaeology and palaeoecology of the Mesolithic to the Medieval period*, "Quaternary International", (2013), DOI: 10.1016/j.quaint.2013.08.060.

L. Wick 1994, *Vegetation development and human impact at the forest limit: Palaeocological studies in the Splügen Pass area (north Itay),* in P. Biagi, J. Nandris (eds), *Highland Zone Exploitation in Southern Europe*, Brescia, pp. 123-132.

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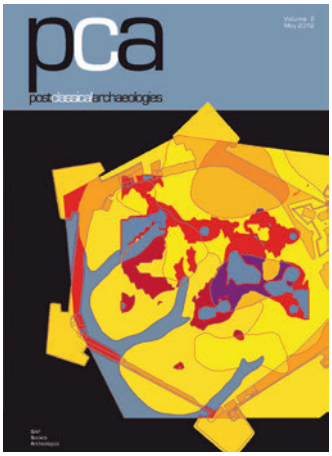

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