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Archeologia delle aree montane
europee: metodi, problemi e casi di
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*Archaeology of Europe's mountain
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a cura di Umberto Moscatelli e Anna Maria Stagno

Saggi

How to identify pastoralism in Prehistory? Some hints from recent studies in Veneto and Friuli Venezia Giulia

Mara Migliavacca*, Chiara Boscarol**, Manuela Montagnari Kokelj***

Abstract

The comparison of experiences carried out in different areas of Northern Italy has allowed to evaluate potentialities and limits of direct and indirect indicators of pastoralism. In the Trieste Karst prehistoric pastoralism was focused on in the late '90s by geo-archaeological studies of cave deposits, based on sedimentological and soil micromorphological analyses of samples collected in previous excavations; further evidence was then found essentially by reviewing old data. In the eastern and north-eastern part of Friuli Venezia Giulia, a

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similar situation of absence of new fieldwork suggested the adoption of a similar approach, integrated by a specific attention to ethnography, through interviews to the few shepherds still active in the area. Ethnography has played an even more important role in the interdisciplinary field investigations carried out since the '80s in Veneto, in particular in the Lessini highlands, where hundreds of abandoned pastoral buildings were detected, and in the Po lowland where the last shepherds were interviewed. Soil chemistry has also proved to be effective in the Veneto experience.

Il confronto fra le esperienze maturate in due aree distinte del Nord Italia ha permesso di considerare potenzialità e limiti degli indicatori diretti e indiretti delle attività pastorali. Per il Carso triestino gli studi sulla pastorizia preistorica sono iniziati sul finire degli anni '90, con un approccio geoarcheologico basato su analisi sedimentologiche e micromorfologiche di campioni di suolo prelevati durante lo scavo di alcune grotte. Ulteriori indicatori sono stati dedotti principalmente da dati pregressi. Nella parte orientale e nordorientale del Friuli Venezia Giulia, una situazione simile di mancanza di scavi in anni recenti, ha spinto verso l'adozione di un approccio simile, integrando anche i dati etnografici, tramite le interviste ai pochi pastori ancora attivi nell'area. L'etnografia ha giocato un ruolo ancor più importante nelle indagini di campo interdisciplinari condotte in Veneto a partire dagli anni '80, specialmente negli alti pascoli dei Lessini, dove sono state individuate centinaia di strutture pastorali abbandonate, e nella bassa pianura padana, dove sono stati intervistati gli ultimi pastori di ovini. Anche l'analisi chimica dei suoli si è dimostrata efficace nell'esperienza veneta.

1. *The archaeology of pastoralism: a short theoretical introduction*

Theoretical essays and applied studies on the archaeology of pastoralism have increased over the last 30-40 years. Many of them put the accent on two interconnected, basic points: the importance of giving a clear definition of the various forms assumed by the relationship between human and animal populations; the difficulty of gathering sufficient reliable data to support the identification of these behaviours in the archaeological record.

The headings of the main chapters of volumes such as *Archeologia della pastorizia nell'Europa meridionale*¹ and *Transhumant pastoralism in southern Europe*² – archaeology, history, ethnoarchaeology, ethnology, plus archaeozoological and palaeoenvironmental aspects – are immediately indicative of the research fields involved. Physics and chemistry play an important role too (to analyse soil, animal bones and artefacts). At a closer, comparative analysis, not all these fields are equally valid to support the identification of a pastoral economy (*sensu lato*). Faunal evidence, palaeo-environmental evidence

¹ Maggi *et al.* 1992.

² Bartosiewicz, Greenfield 1999.

(that often includes geo-sedimentology) and ethno-historical data are usually considered to offer more conclusive proofs than traditional archaeological ones.

Archaeozoology has probably given the principal contribution to understand the relationships between man and herd animals, but it has also limitations in the possibility of effectively interpreting faunal remains. As Chang and Koster indicate in their critical review of c. 30 years ago, still valid and often quoted later, the main problems concern, on the one hand, the nature itself of the sample, that reflects the past situation only in a partial and distorted way, due to the wide range of natural and cultural processes affecting the animal assemblages which archaeologists actually recover; on the other hand, the confusion between patterns of human *consumption* and patterns of animal *exploitation* that often occurs in the interpretation³. Chang and Koster warn also against the possible underestimation of the strict relationship between the nature of the sample and the nature of the site of recovery: «Because of the strong tendency for pastoralists to depend upon physically dispersed and seasonally available resources, it is to be anticipated that such economic activity will make the broadest spatial use of the environment»⁴. An extended area implies a high variability in the typology of sites, characterized by different activities that tend to leave different natural and cultural remains: a direct comparison of data from sites playing different roles within a broader system would clearly be misleading. But it must be reminded that the first problems may concern the interpretation itself of a site and the identification of a network, i.e., in our case, of a pastoral system.

Palaeo-environmental studies can cover both the macro- and micro-level of the territorial dimension of pastoralism⁵. Off-site, secondary evidence of pastoralism can occur through soil changes when the soil cover is transformed from a forest type to grassland: pollen analyses have been used preferentially to detect such large-scale soil alterations. On-site, animal stabling deposits represent primary evidence of pastoralism, and their identification is made possible by sedimentology and soil micromorphology; other traces preserved in archaeological soils and sediments, resulting from animal passage and trampling as well as manure and different uses of dung, can be inferred by the same method and by phosphate measurements.

At present the identification and characterisation of stabling sites through soil micromorphology is probably the best indicator of on-site animal husbandry and, potentially, in combination with other techniques, also at a larger territorial scale. But it was only c. 35 years ago that Brochier found direct evidence of stabling in some French caves: by using SEM techniques he identified

³ Chang, Koster 1986, pp. 107-110; see also Giannichedda, Mannoni in Maggi *et al.* 1992, pp. 298-299, 307-308.

⁴ Chang, Koster 1986, pp. 111 ff. (quotation p. 112).

⁵ General and specific contributions on these studies can be found in Maggi *et al.* 1992; in particular, the main concepts summarized here shortly are presented in much more detail by Courty, Macphail & Watzet.

large quantities of calcium oxalate crystals – spherulites – in ash deposits, and suggested that these were burned coprolite levels related to keeping sheep and goats in the cavities. Since then soil micromorphological analyses have been carried out initially in other French and Italian caves (Arene Candide in Liguria is one of the best known examples), then in other countries too (Croatia being the most relevant for the area under study, see § 4).

Data derived from fields such as history, ethnoarchaeology and ethnology have often been used as indirect indicators of continuity through time, but a critical discussion of the relationship between these data and those recovered archaeologically seems much less common. In our opinion Nandris and Efstratiou have given important contributions to such a discussion. Nandris, for example, underlines the remarkable ethnography possessed by south-east Europe, where much of the traditional behaviour and material culture of peasant societies still present when he writes in the highland zone was formerly more widespread in Europe: but he cautions against taking these aspects back to prehistory, because «what is ‘traditional’ is not inevitably ‘ancient’». He continues by distinguishing among three different «economic families: 1. Market economies 2. Command economies 3. Embedded economies ... [a term that] usually refers to traditional societies in which economic functions are intimately bound up with social relationships ... [i.e.] culturally-transmitted behaviour (along with the associated artefacts, beliefs and practices)»⁶. But, as Efstratiou points out, «time may conceal and transform the variables of an archaeological phenomenon ... [to the point that] ‘archaic’ elements [may] survive for a long period of time on the margins of fundamental social changes, such as the change of the dominant mode of production». Moreover, «on purely anthropological grounds, the appropriation of nature in the two models [of cultivation and herding] follows completely different courses (in terms of access, control, use, transfer or transition of property...) with consequences in the economic and social structure of the community. Archaeologically, however... it is not possible to draw a line between the two models, since the archaeological remains which could define a site as agricultural or pastoral are ambiguous»⁷.

Doorn and Bommeljé underline other correlated problems: «We have not been able to trace archaeological evidence of transhumance in Aetolia. In fact, we hold it for virtually impossible to distinguish the artefacts of sedentary shepherds from those of transhumant shepherds, especially because the different agro-pastoral exploitation strategies that we recorded appeared to be part of the same continuum»⁸. Once more, artefacts *vs.* socio-economic strategies: objects such as spindle-whorls, loom-weights, bobbins and strainers are usually connected with pastoral activities, but the context of recovery can be either a

⁶ Nandris in Maggi *et al.* 1992, pp. 99-100.

⁷ Efstratiou in Bartosiewicz, Greenfield 1999, pp. 145, 155.

⁸ Doorn e Bommeljé in Maggi *et al.* 1992, p. 94.

site or an area where stock rearing actually takes place, a processing site or a market place: objects alone are insufficient to detect the socio-economic nature of the context, and other indicators, other methodologies of enquiry must be added⁹.

2. *The archaeology of pastoralism in action: the Veneto experience*

2.1 *A regional approach*

The studies about archaeology of pastoralism in the Veneto region date back to the '80s of the last century, when the phenomenon was studied in the western Veneto during the Bronze and Iron age¹⁰. The archaeological reconstruction was preceded by careful ethnographic, geographic and historical studies. The first helped in recognizing different forms of pastoral activities, ranging from the sedentary shepherds to the mobile ones: in western Veneto the pastoral movements take place between the winter pastures in the lowlands or in the bottom of the valleys, and the summer grazing areas in the mountains, as it usually happens in the Mediterranean basin¹¹(fig. 1). The geographic study showed that the geomorphology of the region is particularly various and apt to pastoral activities, changing from the wetlands of the Po plain to the drier extents of flat grounds north to the water springs line, up to the subalpine hill zone and finally to the highlands of the Prealps, achieving 2000 m above sea level. To these different geomorphological units correspond different grass grounds, the most productive being *Trisetetum*, from 800 to 1400 m above sea level, and the swampy lowlands. Historical data though showed that all the vegetation belts were being exploited, according to different historical conditions, by a series of different pastoral movements since IX century a.D. continuously until the present. They variously combined the resources offered by the environment, exploiting five different grazing areas, the wetland of the low Po plain, the drier pastures of the high Po plain, the *Brometum* of the hillzone, the *Trisetetum* of the prealpine zone up to the summer *Seslerieto-Semperviretum* of the calcareous highlands. Among the summer pastures of the highlands and the winter pastures in the lowlands, intermediate grazing (variously named as *stavoli*, *masi*, *tede*,..) areas were exploited. Tight links especially and continuously connected through time the water spring winter grassland in the Verona and Mantua lowlands with the summer pastures in the highlands of Monte Baldo and Lessini; and the Padua lowlands together with

⁹ Giannichedda e Mannoni in Maggi *et al.* 1992, pp. 300-301.

¹⁰ Migliavacca 1985.

¹¹ Blache 1934, pp. 524-531.

the Vicenza high Po plain with the Asiago plateau high pastures.

The archaeological study considered not only archaeozoological and palaeoenvironmental data, artefacts connected with milk and wool working and with wood and meadows management, but also data related to the geomorphology, to the water sources, to the buildings present in the site in order to gain information about its possible seasonality.

It was possible to suppose a significant development of ovine rearing in the Middle-Final Bronze ages, when a demographic boom took place. The archaeozoological data suggest the specialization of husbandry in the exploitation of the secondary products¹², helped also by the cooling of climate and corresponding expansion of *Trisetetum*. The lowland agricultural settlements were involved in pastoral movements to the highlands, where the first defended sites seasonally controlled the grassland key areas.

During the VIII-VII centuries b.C. the mountain and hill zones are heavily abandoned, while in the plain the newly born Venetic cities developed a complex economy, in which stock raising, practiced in the high plain, had an important place also in connection with handicraft development. From the end of the VI century b.C. important settlements developed in the mountains: the available data suggest that some of them were permanently inhabited by Raeti with a mostly pastoral economy, others were probably seasonally exploited by pastoral groups coming from the Venetic cities.

2.2 *From modern shepherds to archaeological traces of pastoralism in the Po lowlands*

Afterwards the research focused on the low Po plain wetlands, exploited during the Middle-Final Bronze ages by the inhabitants of many embankment sites. They were connected in a wide network of relationships, among which the ceramic fragments referred to the Apennine culture (and later ones) in central Italy are particularly significant. Within the AMPBV project an ethnographic and ethnoarchaeological study was undertaken in order to prove the presence of shepherds in the now mostly agricultural plain, and detect their behaviour¹³. The last shepherds were interviewed and followed in their activities (fig. 2). Four different pastoral groups were recognised. Sedentary shepherds lived in villages where small flocks (about 150 animals) were moved from stables to grass 3-6 km away from the village in rest-places. They were exploited both for meat and milk; the reproduction was not controlled. Few male shepherds came from the eastern Veneto mountains, from a distance of about 120 km: they wintered in the wetlands without any permanent shelter, exploiting the grass

¹² For the Berici zone, see Jarman 1976.

¹³ Migliavacca 2004.

surviving along the river banks, or buying hay from the farmers for their large herds (up to 1500 head). The animals were exploited for meat production; their reproduction was controlled, and they were slaughtered when very young. Quite surprisingly, a group of shepherds came from the Apennines, from a distance of about 120 km: whole families undertook the transhumance to winter in houses rented in the plain villages, around which they moved their small flocks (max. 200 head) to grass 3-6 km away in rest-places, thus reproducing in the plain the movements of the sedentary shepherds. The reproduction was timed, and the animals, slaughtered when young, were exploited for meat and milk. The last group of shepherds was transhumant, grazing their large flocks (up to 1500 head) in Lessini highlands in the summer, and wintering in the wetlands of the Po plain where the flocks were fed with hay in stables. The goal of the activity was milk production, so the reproduction was timed and animals slaughtered when old.

2.3 From modern shepherds to archaeological traces of pastoralism in the Lessini high pastures

Since 2005 an ethnoarchaeological research project¹⁴ was undertaken by an interdisciplinary team in the Lessini highlands, aimed at the identification and study of the traces left in the past by the summer grazing of sheep, once the prevalent animals in the upper part of Monti Lessini, while today the whole area of the high pastures is used to graze cattle. The upper plateau has always been accessible from the plains along the natural pathways following the main valleys, called *vaj*; the grazing area, covering about 80 km² in total, lies between 1300 and 1800 m of altitude. Here the ridges are wide and rounded, spaced out by smooth basins and easy to be crossed in east-west direction. The geology of the plateau consists of a series of tectonic blocks made up by limestone formations. The Holocene climax vegetation of the high Lessini was characterised by a beech forest, fading to shrubs in some summit areas. Since Protohistory man has been gradually clearing the forest to expand the grazing areas¹⁵.

Very little is known about the exploitation of the high pastures in Roman times and before, although a series of significant fortified hilltop settlements occupied during the Iron age the southern fringe of the high plateau. Roman soldiers occupied some of them, and it is difficult to think that the Romans living in Verona area were not interested in controlling this mountain area. To gain more information about the ancient exploitation of the high pastures, a systematic field survey covered the whole Lessini highlands. In this way more

¹⁴ Sauro *et al.* 2013.

¹⁵ The archaeological evidence is collected in Sauro *et al.* 2013.

or less 600 pastoral structures were discovered and recognized as different from other structures left by other activities performed in the plateau. They were registered in databases collecting their geomorphological location and architectural features, and also put on a map thanks to GPS technology. A GIS was realized using ArcView GIS 9.0 software. A typology of the buildings was proposed dividing them into three main types: sheep folders, shepherds' shelters and breeders' houses. All of them show a strong connection with the geology of the high plateau, that is especially persuasive for the shepherds' shelters: 90% of them are in the Rosso Ammonitico outcrops, and generally the construction use the most suitable available calcareous stone.

The most simple natural shelters (fig. 3) initially used by shepherds are the few caves and the many natural rocky overhangs. More recent shelters are those made up by stone slabs, probably realized starting from the XV and XVI centuries, when the stonecutters began to open quarries in the summer grazing areas and to build limestone structures. Most of the natural shelters are situated within the outcrops of the limestone formation of R. A. They are usually very low and only a few square meters in surface, adequate for one or two persons lying down.

Most of the used shelters were at sight of a sheepfold, to control the flock also during the night. Dairy and general farm-products was carried out elsewhere, not by the shepherds. In the historical past, the dairy structures were large wood huts called *cason*, now substituted by stone buildings called *baito*. Another type of building, the *casara*, was the storage place for butter and cheese.

A huge number of sheepfolds was detected in the plateau. A sheepfold is a closed structure bounded by a natural barrier or by a fence, normally situated in a natural niche. To improve or complete the closures of a fold, beside the natural obstacles, such as the small cliffs of the R.A. blocks, the shepherds were able to construct wood fences; starting from the XV century the stonecutters, interacting with the shepherds, built many new fences made of dry stones and slabs walls. It was important to keep the flock together both to prevent the loss of sheep, and to defend them against attacks by bandits or wild animals; but a fold was also useful to gather the flock for daily milking and wool shear. Some folds are divided into multiple compartments in which the animals were separated by sex and age. In the Lessini Mountain, over the centuries the sheep grazing was gradually moved to the edges of the finest and continuous pastures, such as those on the chalk type limestone, to improve the grazing of the more productive dairy cattle. So the sheep were secluded in the slopes rich of rocky outcrops. The folds identified are very different in size: the average is around 1500 m², but the variability is very high also according to the restraints of some natural niches.

A third type of evidence consists of a large number of simple stone alignments on the ground, which we called breeders' houses. A first distinction was made looking at the dimensions, as the length of these structures is bi-modal, with a group around 3 m long and another around 12 m long. The second group consists of about 50 large buildings, from 9 to 17 m. long and 5-6 m large:

they surely are the remains of *casoni*, devoted to cattle husbandry since the XV century, substituted by the *malghe* built in stone during the XIX century: a stone basement supported the wooden blockbau structure. A second significant group has a very small area (from 4 to 11 m²), repeating the dimensions found in the shelters and suggesting an analogous function of simple refuge: they were connected with sheep farming (fig. 4). It is interesting that only in few cases they are settled on the limestone formation of R.A., on which the natural shelters have been utilized. In most cases, the traces of these small buildings are hollows lightly buried in the soil, sometimes with remains of stone walls that supported a wooden elevation. In other cases these small buildings were completely realized in stone and worked out with ability, probably by the stonecutters who appeared in the high pastures in the XVI century. They carried out the most impressive of the buildings in the Lessini pastoral economy, the cheese store-houses (*casello/ cassinal/ casera*), the first stone built buildings in the highlands. These buildings have an area ranging from 10 to 40 m² and are settled in situations open to winds in order to keep the cheese fresh. The same preoccupation explains the high, thick, often double courtained stone walls and sometimes the half-buried foundation. Therefore the ethnoarchaeological work was able to distinguish the traces of the modern buildings devoted to cattle husbandry and the traces of the still undated structures connected with sheep rearing, both proved in the Lessini highlands by ethnography and historical sources.

Only preliminary excavation were organized, so it is possible to date only very few of these buildings, although most of them surely date to historical times (XV-XVI centuries). Some of the simplest shelters can be very old. The Lessini survey demonstrated that seasonal pastoral activities leave on the ground failing traces, difficult to recognize. The best built buildings were devoted to cheese maintenance, thus suggesting the importance of the presence/ absence of cheese production for the typology of the left structural traces ; cattle husbandry leaves traces more recognizable than sheep husbandry. The project also helped in detecting the pastures more used in time: they are both not interrupted by rock outcrops and easy to reach from the plain or valley bottoms thanks to routes still used for pastoral movements in historical times. It is significant that these good pastures were controlled by the proto-historic defended mountain sites, as demonstrated by cost analysis and Thiessen Polygon analysis (fig. 5).

2.4 Analytical approaches: soil chemistry

The difficulty in detecting sure traces of past pastoral activities led to the application of studies of soil chemistry to possible pastoral sites. The first researches successfully proved the possibility of detecting ancient sites¹⁶ and

¹⁶ Migliavacca 1991; 1992.

ancient ploughsoil in the Po lowlands¹⁷: the last was possible through the cooperation with the soil scientist Serenella Nardi. In 2004 and 2005 an experimental study was carried out on the floor of two *malghe* in the Asiago plateau, commune of Pedemonte (TN) (fig. 6), one used in XVII century and then abandoned, the other still in use¹⁸. The analysis of phosphorous, both organic and inorganic, demonstrated a high P content corresponding to the pastoral site and significantly improved the interpretation of the function of the inner structures of the abandoned hut, leading to explain as areas devoted to animals those in which a high content (around 60% of total P) of organic P was detected. Micro-morphological analysis was also applied to the *malga* still in use, discovering spherulites and a platy structure of the soil at a depth of 15 cm from the soil surface, due to animal trampling; in these layers organic P was again high (60% of total P).

From 2000 to 2010 a multidisciplinary team carried out joint investigation at Cà Tron (Venice, Italy), where Roman farms exploited the countryside from the 1st to the 5th century BP¹⁹. Two rural settlements were analysed, the first being a farm with several outbuildings, the second being specialized in breeding sheep, with a large rectangular building, interpretable as a sheepfold on the basis of comparison with the Roman *bergeries* investigated in the Crau of Arles (Provence)²⁰. The faunal remains were studied and supported the interpretation of the two rural complexes. Analyses of the phosphorus (P), carbon (C) and nitrogen (N) content of the soil, together with elemental ratios, were applied²¹. The results of chemical analyses support the archaeological interpretation of the remains of the two sites, and suggest that some buildings were stables to breed cattle, showing that the site is particularly rich with P and organic matter deriving from animal faeces and not of vegetal origin.

A recent, still in press study demonstrates that soil chemistry can help in detecting a Bronze age embankment road devoted to the passage of herd, localized among three great *terremare* (Fondo Paviani, Castello del Tartaro and Fabbri dei Soci) in the Po lowland²².

¹⁷ Leonardi *et al.* 1999.

¹⁸ Migliavacca, Nicosia 2011.

¹⁹ Busana *et al.* 2010.

²⁰ Badan *et al.* 1995.

²¹ Migliavacca *et al.* 2005.

²² The study was conducted by Cavarzan, Migliavacca, Nardi and Pizzeghello; about the road, see Balista *et al.* 2005.

3. *The archaeology of pastoralism in action: the Friuli Venezia Giulia experience*

Studies specifically aimed at identifying pastoralism in prehistory started later than in Veneto, first in the Trieste Karst, then in the NE part of the region (fig. 7).

3.1 *Trieste Karst*

The Trieste Karst (Venezia Giulia, NE Italy) occupies the SW part of the Classical Karst, a limestone plateau of low rounded hills and low mountains ranging from 100-200 to 800-900 m a.s.l. (but just a few peaks reach the maximum height), crossed by two flysch belts (marl and sandstone formations), a dozen km wide. Extensive rock outcrops are typical of the limestone area, while heavy clayish soils (*terra rossa*) are concentrated in randomly scattered dolines, which are the principal places where non-intensive cultivation (horticulture) has been traditionally practiced²³. A nearly continuous soil cover is present in the flysch areas, but is sometimes rather heavy due to a high percentage of clay, never very thick and limited in extension (always less than a few km) along the few perennial springs, watercourses and small lakes, or along the coast. Due to these characteristics, and to a general scarcity of water, this territory is basically unsuitable for cultivation and more appropriate for animal grazing, though this activity would not offer sufficient means of maintenance throughout the year²⁴.

More than 3,100 natural caves are present in the limestone area, c. 180 of which bear evidence of the human presence from early prehistory onwards. Speleologists and professional archaeologists have been the main authors of the discoveries made, discontinuously, since the last decades of the 19th century onwards. The period of most intensive, often joint field research covered c. the '50s-early '80s: after that, there was an almost complete stop of official investigations (with few exceptions, notably Edera cave), and the beginning of systematic revisions of unpublished materials, that brought about the creation of C.R.I.G.A – *Catasto Ragionato Informativo delle Grotte Archeologiche*²⁵, and of studies aimed at specific topics, including pastoralism.

In 1997 Boschian published the first study of a Karst deposit carried out by using sedimentological and soil micromorphological analyses of cores preserved from the 1969-75 excavations in Edera cave. Cores from previous investigations in Azzurra, Caterina, and Lonza caves were examined later, and the analyses

²³ Boschian, Montagnari Kokelj 2000, 334. Dolines can be even more suitable for gathering animals rather than for cultivation (Cucchi, personal communication).

²⁴ Montagnari Kokelj 2003.

²⁵ <<http://www.units.it/criga>>.

were combined with the re-examination of the contextual cultural materials²⁶. *Fumier* layers of two types – *facies* 3: layered heaps of ashes and charcoal; *facies* 4: homogeneous brownish deposits – were identified in post-Mesolithic deposits of these sites and, indirectly, of some others: all are coprogenic, i.e. are made up of thoroughly disaggregated and burned herbivore droppings, mostly of sheep or goat (Fig. 8). On these grounds it was inferred that caves were used with more (*facies* 3) or less (*facies* 4) frequency by groups of shepherds to stable their flocks: the scarcity of artefacts would further support the interpretation of caves as *grottes-bergeries*, according to the Brochier's model (see § 1). Faunal remains were available only for Azzurra, but are consistent with those from other caves, and confirm the same reconstruction of the subsistence from the *Vlaška* (Early) Middle Neolithic (*facies* 3) to at least the Early Bronze Age (*facies* 4).

The relevance of historical and ethnographic data was already hinted at in this study, but it was further developed in a later one that focused on the indicators normally used to detect pastoralism in the past, from the discussion of theoretical bases to the research of evidence in the *Caput Adriae*, and addressed for the first time the connection between pastoralism and salt²⁷. Much space was dedicated to historical and ethnographic data – the latter obtained also from direct sources, i.e. modern shepherds – in more recent works too, dealing with the N and NE part of the region (figg. 9-10).

3.2 NE part of FVG

The Gorizia Karst is a territory of limited extension (just over 50 sq. km) to the W of the Trieste Karst, with similar features and with c. 300 caves (200 of which are shaft caves). Karst phenomena are present also in the Julian pre-Alps, limited by the Resia Valley to the N, the course of the Tagliamento river to the W, that of the Isonzo river to the E and the Gorizia Karst to the S. Within this area, that shows differences in geological morphogenesis and physical characters, the Natisone Valleys, formed by a non-homogeneous hydrographic system, have resulted to be the most suited to human exploitation in prehistoric and historic periods. The mountainous area of the region is composed of four main elements, the Carnic, Tolmezzine and Julian Alps and the Carnic pre-Alps. The Carnic Alps, the oldest rocks in the region, pre-Palaeozoic in age, develop from NW to SE, from the Avanza mountain to Tarvisio, including the Monte Croce di Comelico and Pramollo passes and the Camporosso saddle, with an average altitude higher than 2000 m. The Tolmezzine and Julian Alps, Triassic in age, develop almost parallel to the Carnic ones with a series of limestone and dolomite chains. The Carnic pre-Alps represent a morphological unit covering

²⁶ Boschian, Montagnari Kokelj 2000.

²⁷ Montagnari Kokelj 2003.

ca. ¼ of the mountainous area of the region, and extending till the higher limit of the Tagliamento river: they are composed mainly of limestone, sandstone and dolostone, Triassic to Cretaceous in age.

The archaeological research in these areas started in the late XIX century, but has been discontinuous and prevalently non-systematic. In recent years surveys carried out in the eastern alpine area down to the Natisone valleys discovered a Mesolithic camp at Passo Pramollo (c. 1,500 m a.s.l.), and surface lithic scatters in other high altitude sites. Lithic artefacts, pottery and charcoal were found on Monte Cuarnàn (c. 1,300 m a.s.l. to the north of Gemona) in plain areas, passes, near water sources: according to the authors of the discoveries, these findings would not indicate permanent settlements, but repeated episodes of use of the areas perhaps connected with stock rearing and pastoralism, from the Late Neolithic to the Bronze Age.

A similar hypothesis has been made for other alpine and pre-alpine areas, not on the basis of fieldwork but of revisions of old archaeological data and of ethno-historical ones. These were part of two recent studies, an Interreg IIIA Italia-Slovenia 2000-2006 project²⁸, and a PhD thesis²⁹. In particular, the careful reading of the description of the excavations made at the beginning of the XIX century in the cave known as Velika Jama³⁰ allowed to assume – after the Karst evidence – that the presence of stratified layers of ashes and bones of sheep and goats could indicate the stabling of animals inside the cave: a structure interpreted as a fireplace and pottery could indicate a contemporary presence of animals and man. Some pottery fragments are particularly interesting, as they show analogies with Copper Age-Early Bronze Age materials of the Trieste Karst, the Ljubljana pile dwellings and Austrian-Hungarian sites of the Wieselburg-Gata culture³¹: these analogies hint at medium- to long-distance contacts that could result from shepherds' movements. The presence of other exotic materials found in the macro-area under study has been also hypothetically attributed to “transhumant” shepherds' movements: an example is given by the Neolithic *rhyta* (four legged pots with oblique opening and high handle, often decorated) distributed all along the Adriatic eastern coast, from Greece to the Trieste Karst; in the case of other exotica – such as the polished stone axes of allochthonous origin, datable from the Neolithic to the beginning of the Bronze Age, object of a long-lasting project of archaeometrical analyses and studies –, the attribution is plausible but not always straightforward. Although the *status* of an object can vary in the course of its biography, on the one hand, and the site of recovery cannot be interpreted beyond doubt as the site of loss, discard or intentional deposition of the object, on the other hand, its position on a distribution map, and in

²⁸ Chiabà *et al.* 2007.

²⁹ Boscarol 2007-2008.

³⁰ Musoni 1905, p. 89 (quoted in Boscarol 2007-2008).

³¹ Bressan 1985, p. 126 (quoted in Boscarol 2007-2008, who mentions also the findings in the Karst caves Tartaruga, dei Ciclami, Teresiana and Gigante).

particular on a geomorphologic map should not be meaningless³². Boscarol kept geomorphology always in the background of her parallel study of pastoralism and of path and road systems, both approached as long-term processes and carried out from the present backwards. Allowing for socio-economic and cultural specificities due to different chronological periods, this study identified preferential routes (largely conditioned by natural physiographical features) and distinguished between primary paths / roads, the most accessible and used, and secondary ones, often dedicated to specific purposes, such as pastoralism (Fig. 11). The distribution of sporadic artefacts at medium to high altitudes – also in the Slovene territory, often close to modern *malghe* – would support the identification of traces of similar activities in the late prehistory, though the sporadic artefacts recovered so far are not specific to pastoral activities. On the contrary, clay spoons found in Karst caves have been directly connected with goat milk processing, on the basis first of indications given by modern shepherds – field ethnographical research was a fundamental part of the study –, then of the results of experimental chemical analyses³³ (fig. 12).

4. *Considerations on the validity of different indicators and methodological approaches to pastoralism*

The comparison of the studies on pastoralism carried out in the two regions stresses the multidimensional character of pastoralism, that needs interdisciplinary, site- and time-specific approaches.

On- and off-site research is present in these studies, that confirm the more reliability of the former, but show also the potentialities of the latter. Sedimentology and soil micromorphology have been fundamental for the identification of some Karst caves as stables: here the revision of associated artefacts supported the hypotheses on the (dis)continuity of use, while faunal remains were less indicative, also because collected in old investigations. However, the prevalence of caprines has been confirmed by the new excavations at Edera (Karst) and Pupičina (Istria, Croatia) caves: at Pupičina, in particular, the integration of geoarchaeological and archaeozoological analyses proved highly rewarding³⁴. From prehistory to Roman times, and in a different context, i.e. the two farms of Cà Tron (Veneto), a similar integration of methodologies resulted successful once again. Moreover, soil chemistry is giving good results also off-site, as demonstrated by the recent study of the Bronze Age embankment road devoted to the passage of herd localized in the Po lowland. This case

³² For all the previous data see Montagnari Kokelj 2003.

³³ Boscarol 2007-2008; Montagnari Kokelj *et al.* 2012.

³⁴ Boschian, Miracle 2007.

study shows that ancient paths and roads and pastoral movements can be overlapping: in the reconstruction of both, physiographic features – particularly in mountain regions – play an undeniable role (though geographic determinism is a risk to be avoided), together with historical and ethnographic data. The studies presented here used regional ethno-historical data, combined with field ethnographic and ethno-archaeological research: though “what is ‘traditional’ is not inevitably ‘ancient’” (see § 1), our experiences indicate that data derived from the studied area – rather than from contemporary primitive societies, or even from mythology – are useful to identify general trends and in particular to recognize specific sites and structures. What still remain evanescent are the various forms of the relationship shepherds-territories and shepherds-other socio-economical entities in a specific time as well as diachronically.

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Appendix

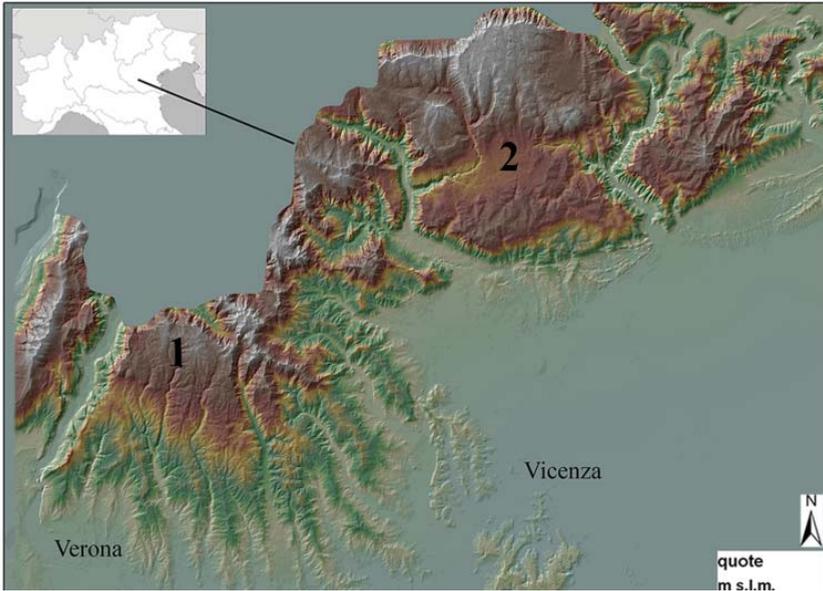


Fig. 1 L'area di studio nel Veneto, con indicati gli Alti Lessini (1) e l'Altopiano di Asiago (2)

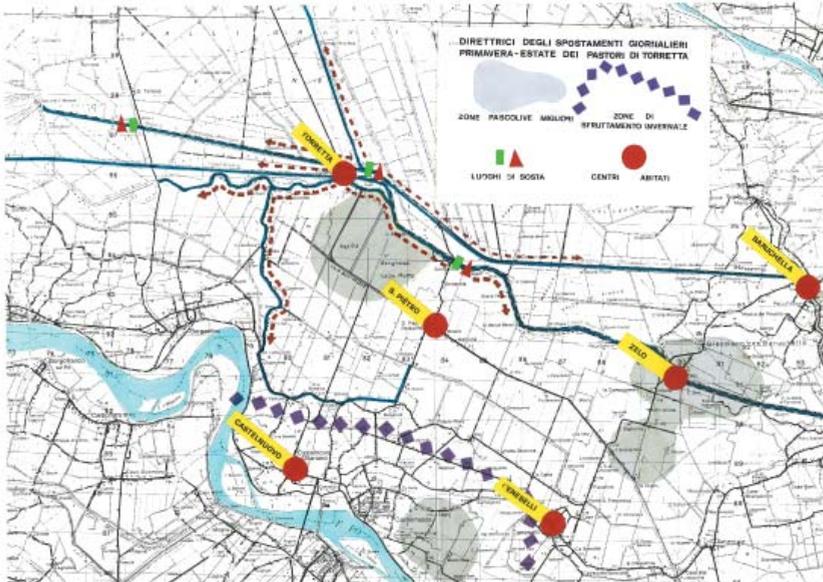


Fig. 2 Progetto Alto Medio Polesine – Bassa Veronese: Gli spostamenti attuali dei pastori sedentari che vivono a Torretta di Legnago (CTR 1:10.000; from Migliavacca 1991, fig. 7)



Fig. 3. I resti di un riparo di pastori a Costeggioli, negli Alti Lessini (foto Mara Migliavacca)



Fig. 4. Capanna per pastori presso Malga Bagorno, negli Alti Lessini (Foto Ugo Sauro)

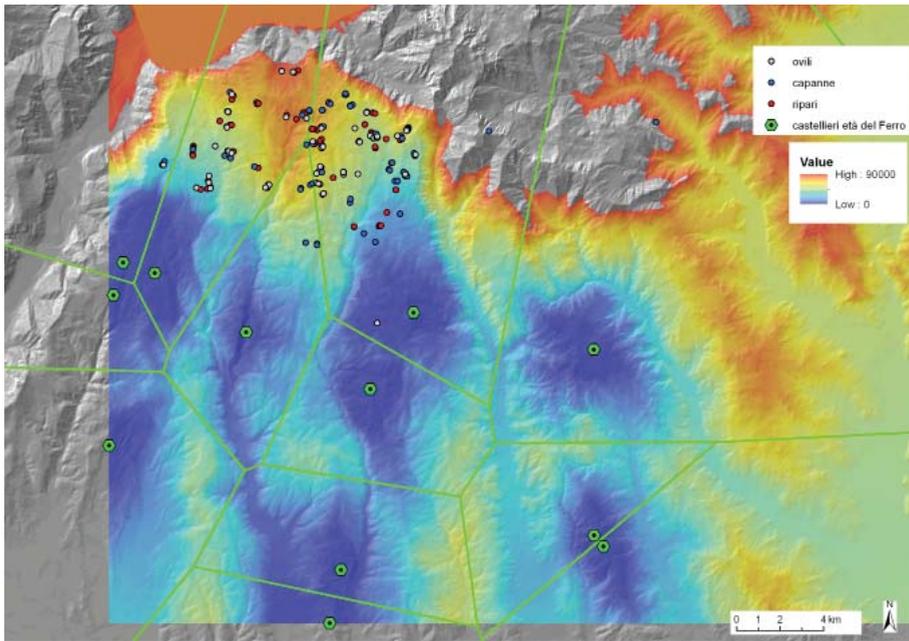


Fig. 5. L'applicazione ai castellieri dell'età del Ferro dell'analisi dei costi di spostamento basata sia sul fattore distanza sia sul fattore pendenza e dei poligoni di Thiessen evidenzia il controllo sulle alte quote esercitato dai due insediamenti di Monte Loffa e Monte Purga (Alti Lessini; da Migliavacca 2013, fig. 12)

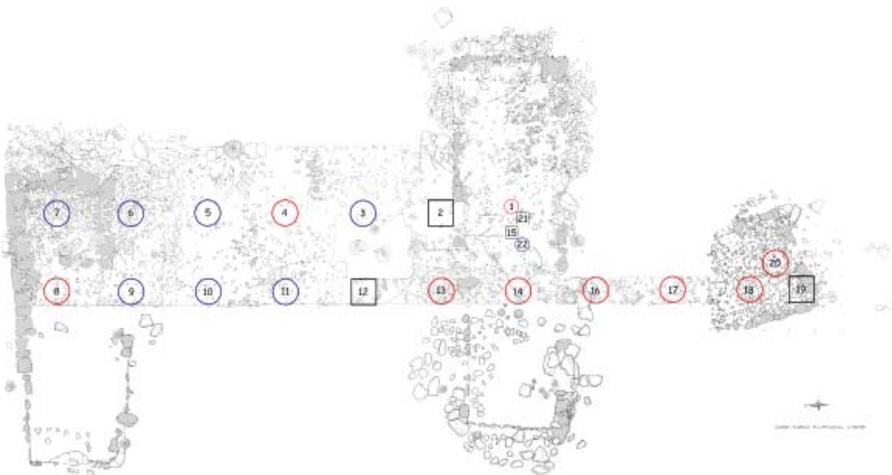


Fig. 6. Ex Malga Croiere (Altopiano d'Asiago): mappa dei campioni prelevati con alto contenuto in fosforo organico (in rosso) ed inorganico (in blu) (disegno di G. de Angeli, da Migliavacca, Nicosia 2011)

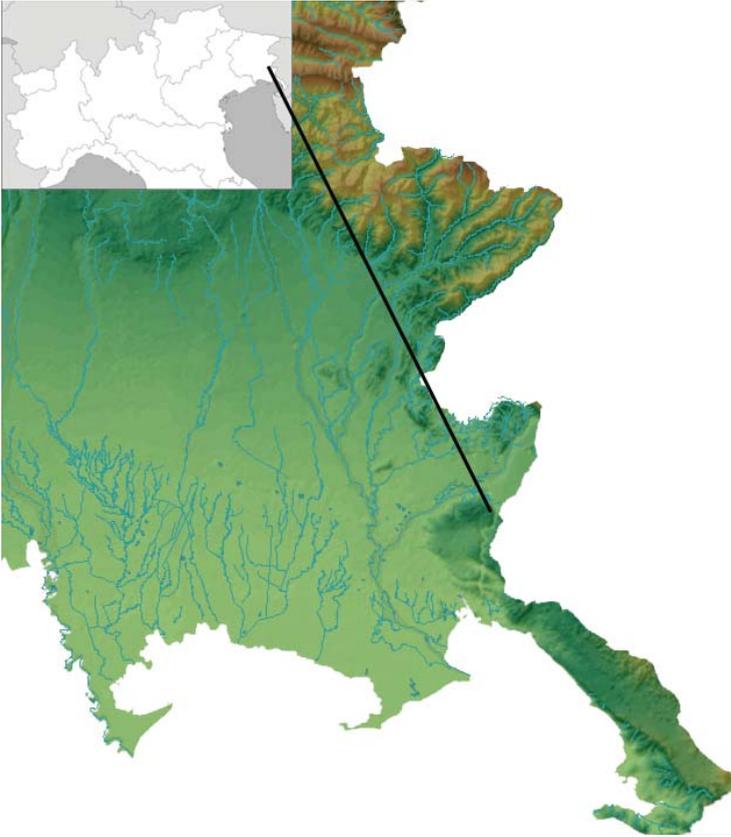


Fig. 7. L'area di studio nella parte nord-orientale del Friuli Venezia Giulia

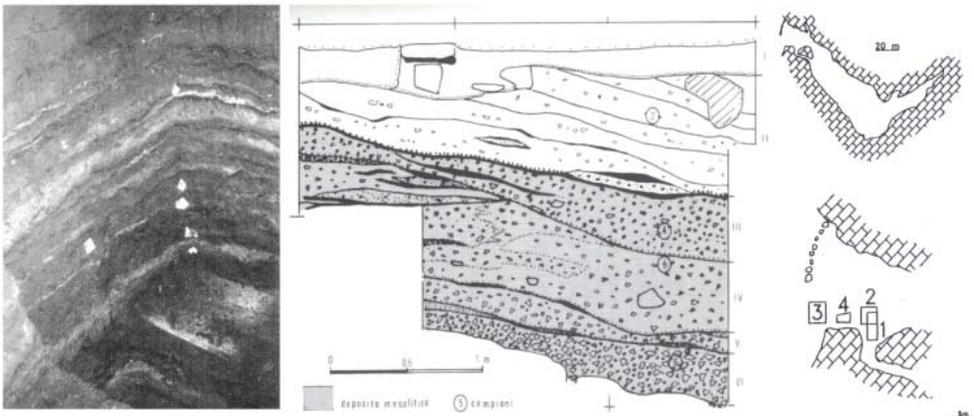


Fig. 8. I livelli a *fumier* dei depositi della grotte Cotariova (foto) e Azzurra, nel Carso triestino



Fig. 9. Metodo tradizionale di stabulazione delle greggi sull'altipiano carsico



Fig. 10. Capre che si auto-provvigionano di sale marino durante gli spostamenti

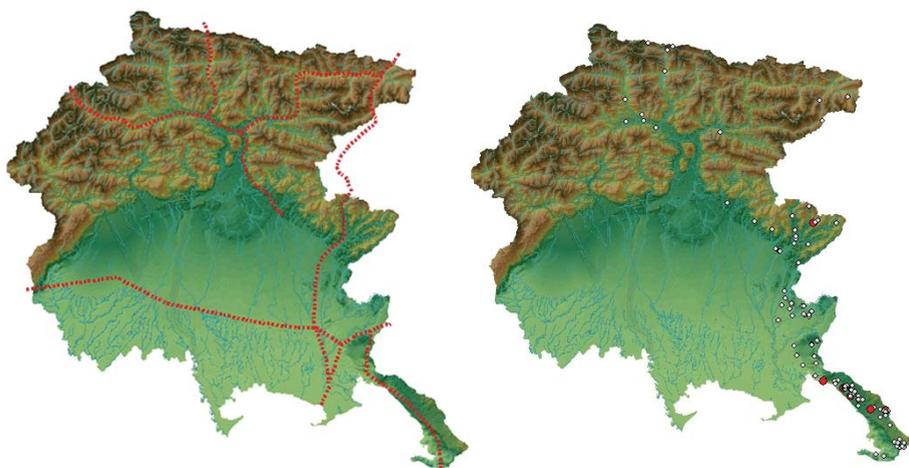


Fig. 11. Ricostruzione ipotetica della viabilità protostorica messa a confronto con i siti di ritrovamento dei materiali Wieselburg-Gata nella parte nord-orientale del Friuli Venezia Giulia



Fig. 12. SDS-PAGE e *western-blot* analisi effettuate su uno dei cucchiai ceramici rinvenuti in alcune grotte del Carso

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