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Changing Subsistence Structures and the Origins of Mining in the Ligurian Apennine Mountains

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Introduction

Recently there has been an increase in data concerning the chronology of the origins of metal use, metal working and ore extraction in Italy: for example we now have good evidence for metal use in the 5th and 4th millennia cal BC, in later Neolithic Italy (Pearce, 2007: 37-51), whilst the earliest copper mining is documented in the mid 4th millennium cal BC in Liguria, north-west Italy at Libiola (Sestri Levante - GE) and Monte Loreto (Castiglione Chiavarese - GE) (Maggi & Pearce, 2005). It thus seems that in Italy a long period of metal use preceded actual copper working and mining.

Less progress has been made in explaining why copper use, working and mining were adopted, and why they were adopted when they were adopted. This does not seem to be simply a matter of availability, as copper mining began in the Balkans long before the Italian peninsula and the evidence from Brixlegg in the Austrian Tyrol seems to suggest that the smelting of fahlores began at 3960-3650 cal BC (OxA-7696, 5000±80 BP) and perhaps even earlier, in the later fifth millennium cal BC (Höppner et al., 2005; but contra Gleirscher, 2007). In this paper we shall try to answer the question, ‘why did copper mining begin when it did in north-western Italy?’.

In an influential paper, Andrew Sherratt (1981) argued that the late Neolithic sees a ‘secondary products revolution’ at least as important as the introduction of farming. He argued that the beginning of use of the secondary products of animal husbandry – milk and wool, traction and riding – was associated with a number of other economic changes, such as the adoption of plough agriculture and wheeled vehicles, and that this led to a major intensification of agricultural production, and thus paved the way for more complex Bronze Age societies. A basic feature of the secondary products revolution was an increased investment in animal husbandry and the exploitation of new land, not available to traditional cultivation, by mobile pastoralism. Sherratt’s ideas have been widely criticised but the consensus seems to be that the economic changes he identified were indeed of great importance, but that they do not seem to have all taken place at the same time, as he had suggested.

Early 4th Millennium Liguria

The late 5th/early 4th millennium cal BC Chassey culture, which spreads from the west (modern France), sees a number of changes in the subsistence base (Maggi, 1998), such as new larger domesticated animals (Rowley-Conwy, 1997) and the stabling of animals in caves situated along routes to potential upland summer pastures (Barker et al., 1990; Maggi, 1996). At the same time, the pollen evidence from the Apennines shows the first human impact on the upland vegetation, with the clearing of areas by fire for pasture (De Pascale et al., 2006).

We also know that these late Neolithic Chassey groups used copper: copper awls have been found at the Arene Candide cave (Finale Ligure - SV), at Alba (CN) and at Sant'Andrea di Travo (PC) (Pearce, 2007: 46-51).

The new economic emphasis on pastoralism thus sees the intensive exploitation of new territories, the uplands, for short-range, summer transhumance, and this is contemporary with the exploitation of other mountain resources: chert for stone tools and copper ore.

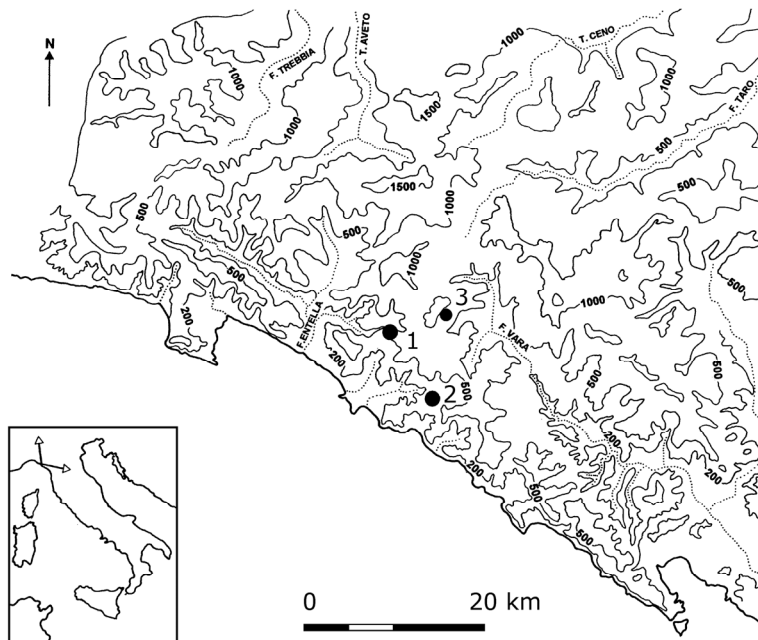


Fig.1: Location of Libiola (1), Monte Loreto (2) and Valle Lagorara (3) in Liguria, northwest Italy (from Pearce, 2007: fig.4.1).

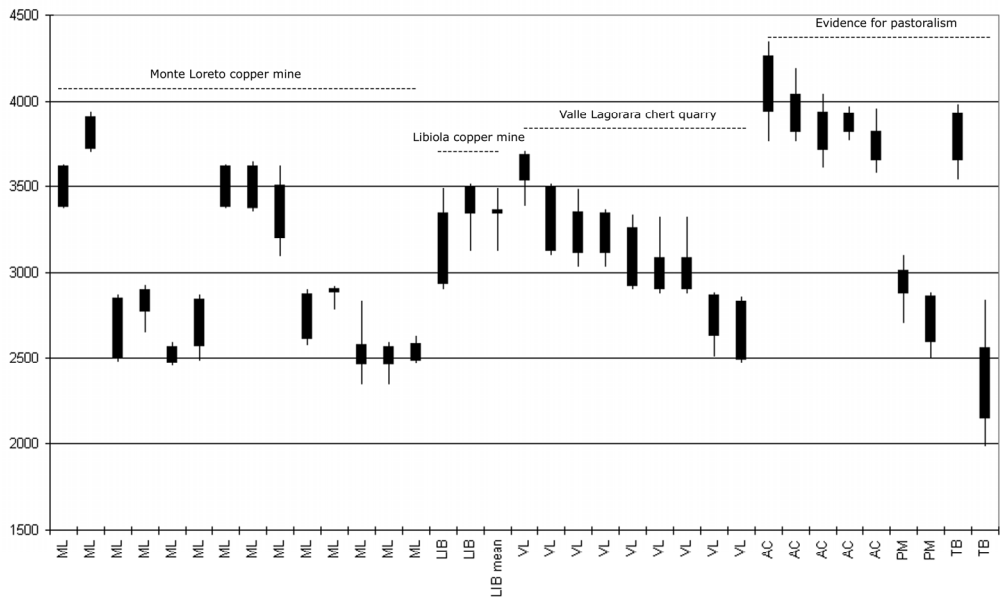


Fig.2: 1-sigma (boxes) and 2-sigma (whisker plots) calibrations of ^{14}C dates for copper mining at Monte Loreto and Libiola, chert quarrying at Valle Lagorara and evidence for pastoralism. Key: ML = Monte Loreto, LIB = Libiola, VL = Valle Lagorara, AC = Arene Candide, PM = Prato Molle, TB = Tana della Barletta.

Libiola

The prehistoric copper mine at Libiola was discovered in the 19th century; finds included wooden wedges, a shovel, an oak pick-handle and stone hammers found in a narrow, artificial, gallery (Issel, 1879: 349). The pick-handle dates to the second half of the 4th millennium cal BC, 3490-3120 cal BC (3490-2905 cal BC, GIF-7213, 4490±90 BP; 3510-3120 cal BC, Bln-3367, 4610±50 BP; Maggi & Del Lucchese 1988: 336-338).

Monte Loreto

Early mining was also reported in the 19th century at Monte Loreto (Issel, 1879: 348-349); recent excavations provide evidence for large-scale mining and ore processing (Maggi & Pearce, 2005; Campana et al., 2006). The radiocarbon determinations obtained at Monte Loreto seem to suggest that there were two phases of activity: the first, around the middle of the 4th

millennium, is at present the earliest known copper mining in Italy; the second phase is datable to the first half of the 3rd millennium.

Valle Lagorara

Red chert was quarried for stone tools in the nearby Valle Lagorara (Maissana – SP) (Campana & Maggi (eds.), 2002); the main period of activity is radiocarbon dated to between the mid 4th and the mid 3rd millennium cal BC, which is comparable in date to copper mining at Libiola and Monte Loreto. Interestingly, the presence of a 19th century copper mine, and a sample identified as chalcopyrite-working slag found at the site in layers dated to 3365-3045 cal BC (Beta-100729, 4530±50 BP) (Cortesogno & Gaggero, 2002: 48-51) suggests that there may also have been 4th millennium cal BC copper mining at Valle Lagorara contemporary to that at Monte Loreto and Libiola.

Conclusions

It thus seems that the opening up of the uplands and their use for transhumant summer pastoralism led to the discovery of new mineral resources. It might be added, following Sherratt's original 1981 model, that more intensive agricultural production, based on secondary products, may have allowed the 4th millennium societies of north western Italy to move beyond a purely subsistence-based economy to one based on the exploitation of mineral resources, copper and chert. Thus although minerals were potentially available to the inhabitants of Neolithic Liguria, it was only in the 4th millennium cal BC that a more widespread and intensive use of the landscape led to their discovery and exploitation.

The link between metallurgy and pastoralists has long been a topos of the archaeological literature, but Gordon Childe's (1958) classic model may in fact offer an explanation for the beginnings of metal ore extraction, at least in Liguria.

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