



The neolithic axe workshops of eclogites and jadeitites in the french Alps and Prealps and their role in the network of exchanges in the Rhône basin

ERIC THIRAULT

Associated Member UMR 5594 du CNRS, Centre d'Archéologie Préhistorique de Valence, 4, place des Ormeaux, 26000 Valence-sur-Rhône, France, e-mail : cap.valence@wanadoo.fr

Presentation

Most of the studies loaded on the axe blades in western Europe consist essentially in petrographic characterizations and the research of the stone sources; but the social consequences of the diffusions revealed by this methods are still poorly studied (Ricq-de Bouard 1996 ; Le Roux 1999). With an archaeological point of view, this basic stage of work (petrography) have to be overtaken if we want to understand the relationships between the diffusions of goods (i.e. axe blades) and the social operations of the neolithic communities. For this, we have to integrate the whole archaeological informations, from the production processes to the contextual facts (Bradley et Edmonds 1993 ; Jeudy *et al.* 1995). We've done such a work in a doctoral thesis just finished at the University of Lyon II in France, with the case of the western Alps and the Rhône basin¹ (Thirault 2001).

The alpine (in the geological meaning) metamorphic stones, wich are shown to the surface in the western Alps and in the Voltri Group in Liguria, present a very important stock of tenacious rocks broadly used during the Neolithic. This has been demonstrated by the studies realised in Provence, Languedoc and Piedmont by M. Ricq-de Bouard (Compagnoni *et al.* 1995; Ricq-de Bouard 1996), and in North Italy by Cl. D'Amico (D'Amico *et al.* 1995, 1998). The highly used stones are the high metamorphic metabasites (high pression/low temperature) and not or not much retromorphosed: glaucophanites, jadeitites and most frequent, the eclogites and other pyroxenites. The eclogites are broadly diffused in North Italy and in Provence but the production modalities are still not well known.

In the french Alps and in the Rhône basin, the first researches have been driven by us since 1996, in close collaboration with Danielle Santallier, pétrograph et Ruben Véra, cristallograph (University Lyon I). The main result is the demonstration of the supremacy of the alpine eclogites until the river Rhône : 75 % minimum of the axe blades (Thirault *et al.* 1999). Here, we'll gather together under the single word of "alpine eclogites" not only the true eclogites (sodic pyroxene + garnet) but also the pyroxenites (onfacitites and jadeitites) wich sometimes contain few garnets (Thirault *et al.* 1999; Thirault to publish).

The eclogite axe blades are manufactured and diffused from precise workshops. Inside and around the ligurian and piedmontese Appenines, important productions are known on the sites of Monte Savino at Sasselo (Garibaldi *et al.* 1996b), Brignano Frascata (D'Amico et Starnini 1996; Zamagni 1996b), Rivanazzano (Mannoni *et al.* 1996) and Alba (Venturino Gambari et Zamagni 1996). In the western Alps, workshops are known in Piedmont (Rocca di Cavour near the Val Pellice; Zamagni 1996a), and other are still unpublished at this date. We would like to present here the whole list of this particular sites and then try to explain shortly their role in the diffusion system of the eclogite axe blades on the west side of the Alps.

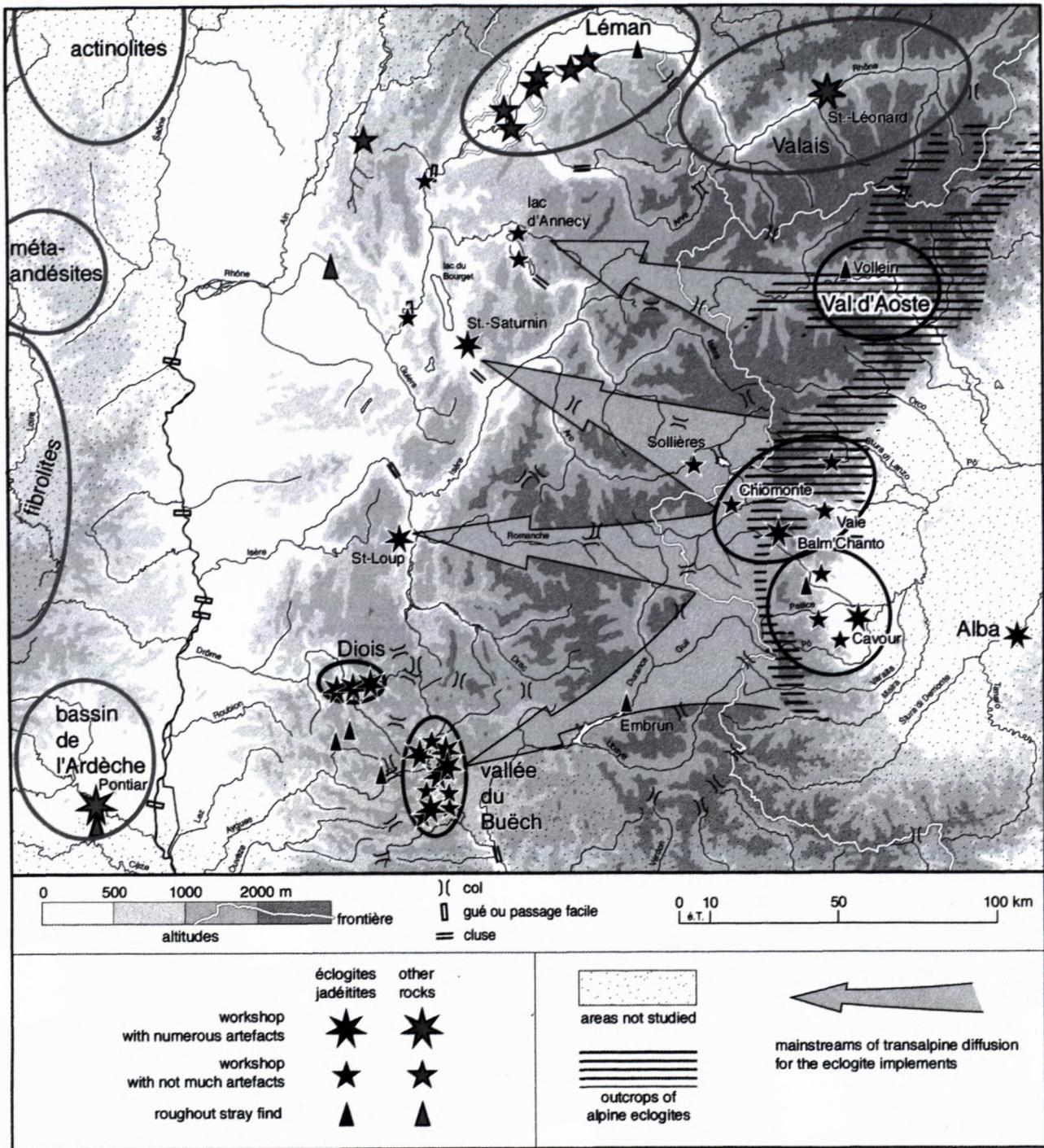
The eclogites axe blades workshops in the western Alps

For the archaeological characterization of this sites, we have taken care to all the technical artefacts linked to the production of an axe blade: roughouts more or less elaborated, broken or not during flaking, pecking or polishing ; flakes, whetstones, hammers. Then we've mapped the sites and the stray finds where this artefacts are attested, with care to the petrography of the implements. Then a strong spatial structuration of the production appears (map).

Our subject, the alpine eclogites, are manufactured on several sites, but the production areas are concentrated in three regions.

- In the westen Alps, a number of neolithic sites and stray finds more or less known, are established in front of the valleys (Rocca di Cavour: Zamagni 1996a), in the lower valleys (riparo Rumiano at Vaie: Bertone and Fozzati 1998) or in the mountains (Balm'Chanto at Roreto: Nisbet and Biagi dir. 1987), where the eclogites are worked. But all this sites are not immediately located on the outcrops. There is then a rock carrying on variable distances, not more than 30 km from the outcrops. The extraction sites are still unknown at this date, as we know, but the location of some old-known sites near by the outcrops permit to think that the raw materials are taken on the outcrops or on great morainic blocks.

- In the internal french Alps, the general documentation about the Neolithic remains poor but the few sites



excavated in Savoie show that eclogite roughouts circulate through the mountains: Les Balmes at Sollières in Haute-Maurienne, and Les Moulins-Chenêts de Pierre at Bozel in Tarentaise (excavation and study in progress).

• In the Prealps, we have revealed the existence of numerous eclogite workshops located as far as 100 to 140 km from the piedmontese stone sources. This fact seems to be unique. The artefacts yet preserved in the old collections or collected by private people demonstrates on the sites the manufacturing of the alpine eclogites: sometimes flaking but essentially pecking and polishing. This sites are located in precise areas and form sometimes groups. From south to north, we have recognized:

- an important group in the Bu'ch valley (river tributary to the Durance) and in the next lower small valleys (département des Hautes-Alpes). There is yet 16 sites and 12 points of stray finds identified with sometimes numerous polished artefacts, and anyway, proof the the manufacturing, on the districts of Sigottier (Le Forest, La Plaine), Le Bersac (Serre-Muret), Savournon, Orpierre (Tarrin, Ladrech), Sainte-Colombe and Trescléoux. The main rocks worked are the eclogites but some roughouts on glaucophanite pebbles coming from the Durance deposits are also identified.

- the confluence plain between the rivers Drôme and Bez, near by Die (département de la Drôme). Three main

sites can be distinguished: Les Terres Blanches at Men- glon, known from the beginning of the XXth century, and two others recently discovered on Recoubeau: Les Cla- piers and Vallieu.

- at the south of Grenoble (Isère), the site of Saint-Loup at Vif on a top-mountain is also an eclogite workshop.

- near by Chambéry and the Bourget lake, the great site of Saint-Saturnin at Saint-Alban-Laysse as given num- erous polished artefacts in eclogites. Some of them are certainly roughouts and hammers.

Datation and interpretation

We have seen that the manufacturing of the axe blades in eclogites is realised only on precise areas, without respect with the outcrops. In Piedmont as well as in Liguria, the location of workshops near by the eclogites sources isn't a surprise. But in the french internal Alps and in the Prealps, the presence of numerous workshops is more surprising, and demonstrate that roughouts sometimes not much elaborated are diffused. The concentrations of sites, especially in the Diois and the Buëch valley, indicates that this roughouts diffusions and generally speaking the whole axe production in eclogite is strongly controlled and cannot be realised anywhere. The precise location of them, on visual or physical controll position of the strik- ing points of the landscape (top-hills, confluences be- tween rivers, passages between high reliefs, ...), indicate also the importance of the long-way itineraries through the western Alps. There is really, for the alpine eclogites, a wish of structuration of the production and the diffusion of the roughouts and the axe blades. This structuration is developed on more than 150 km through the mountains and the valleys.

The datation of this workshops isn't always easy, es- pecially for the old collections and the surface gatherings. We have partially resolved this problem by seriations and by technological examination on the artefacts. At least, the oldest workshops are not located in the Alps but linked to the Voltri Group. The oldest sites for the western Alps could be dated from the initial phases of the *Neolitico medio*, linked to the *Vasi a Bocca Quadratta Culture* es- tablishments in the piedmontese valleys and in Val d'A- oste. At this time, we don't have yet the proof of eclogites axe productions on the french Alps, although the diffu- sions of eclogite axes are known. On the opposite, during the more recent stages of the Neolithic (*Néolithique moyen II/Neolitico recente*), many sites linked to the *Chasséen Culture* are occupied in the Bu'ch valley and the Diois. Some of this prealpine workshops are still ac- tive during the *Néolithique final/Chalcolithique*.

If we oversimplify the problem, we can recognize a break between the old and recent stages of the *Néo- lithique moyen*, according to the french terminology. During the *Néolithique moyen II*, the areas of eclogite manufacturing extend broadly in the western side of the Alps. This expansion is still hard to explain, but is in continuity with the long-time transalpine exchanges. Anyway, it is also linked to the great diffusions of

eclogite axe blades west to the Rhône basin: the departure point of the finished artefacts, during the *Néolithique moyen II*, isn't the Piedmont or Liguria but the french Pre- alps. At this time, the western Alps in the whole are con- cerned by the manufacturing of the eclogite axe blades. The long-distances diffusions identified in Burgundy, Central Massif and Languedoc are linked to this topple of the workshops from the east to the west side of the west- ern Alps.

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