

Mesolithic hunter-gatherers in western Switzerland: economy and mobility

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ABSTRACT – Using four reference sites located in various geographical sectors of western Switzerland, this paper broadly outlines the economy and mobility of the mesolithic groups of this area, using the main data available on the animal resource exploitation and the supply of siliceous raw materials.

Key words: Mesolithic; Western Switzerland; Hunting economy; Flint supply; Territorial mobility

Parole chiave: Mesolitico; Svizzera occidentale; Economia di caccia; Approvvigionamento di selce; Mobilità territoriale.

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1. INTRODUCTION

In spite of its limited size, western Switzerland is characterized by three main geographic zones: the Jura, the Plateau and the Alps. This territory presents a large variety of climatic conditions, in which altitudes play a decisive role, determining contrasting landscapes. The various geographical areas are occupied during the Mesolithic and we dispose of reference sites in each one: the *Mollendruz* rock shelter (Mont-la-Ville, VD, 1088m) in the Jura (PIGNAT & WINIGER, 1998, 1999), *La Baume d'Ogens* (Ogens, VD, 672m) on the Plateau (EGLOFF, 1965), the *Vionnaz*, or *Châble-Croix*, rock shelter (Collombey-Muraz, VS, 388m) in the Rhone valley (PIGNAT, 2002), and the *Château-d'Œx* block shelter (Château-d'Œx, VD, 1180m), in the Alps, or more precisely in the Prealps (CROTTI, 2002) (Fig. 1-2). The four sites have stratified occupations, including preserved faunal remains. In order to tackle the question of the mobility of mesolithic hunter-gatherers in western Switzerland, following a brief chronological introduction, we will summarize the available data on the occupation and function of the sites, including the issues affecting lithic assemblages, the exploitation of animal resources and seasonality. Finally, we will stress the importance of the supply of flint mate-

rials, mainly using the data from Mollendruz and Ogens.

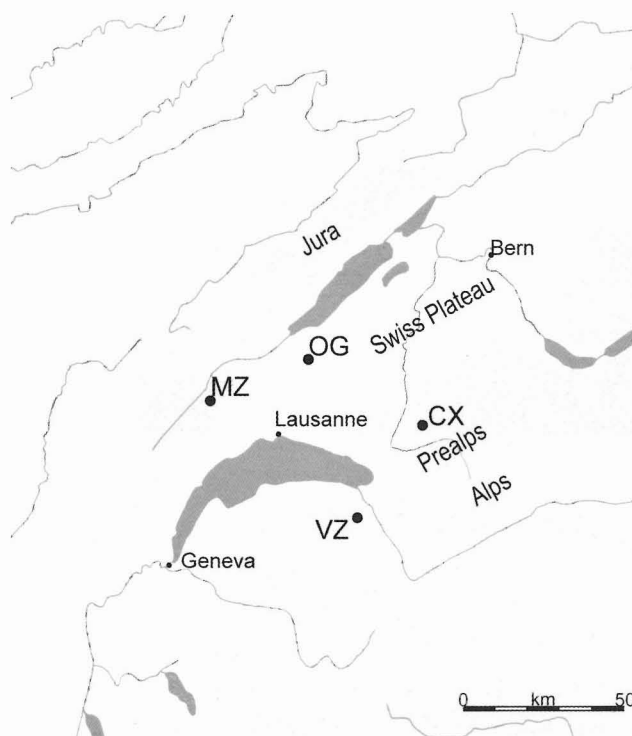


Fig. 1 - Geographical positions of the four presented sites. MZ: Mollendruz rock shelter; OG: La Baume d'Ogens; VZ: Vionnaz or Châble-Croix rock shelter; CX: Château-d'Œx block shelter.

2. CHRONOLOGICAL OUTLINE

As a preamble, we will broadly outline the chronological background of the Western Switzerland Mesolithic, although this aspect is not discussed in the framework of the issues chosen here. Many radiocarbon dates are available for the Western Switzerland Mesolithic which make it possible to distinguish three main phases (Fig. 3): the Early Mesolithic or Early Mesolithic I (9th millennium BCcal approximately), the Middle Mesolithic or Early Mesolithic II/III (8th millennium and beginning of 7th millennium) and the Late Mesolithic, from which the transition from the Middle Mesolithic is not precisely dated insofar as the dates for this late phase are relatively recent and concen-

trate around 6000 BCcal. The beginning of the Neolithic takes place within the second half of 6th millennium.

3. FUNCTIONS OF THE SITES AND ECONOMY

3.1. *Mollendruz*

The detailed study of the occupations of Mollendruz (PIGNAT & WINIGER, 1998), show a continuity in the use of the site and in the strategies of subsistence between the three phases of the Mesolithic, in spite of the environmental changes which develop during



Fig. 2 - Views of the four presented sites. 1: Mollendruz rock shelter (Mont-la-Ville, VD, 1088m) in the Jura. 2: La Baume d'Ogens (Ogens, VD, 672m) on the Plateau. 3: Vionnaz or Châble-Croix rock shelter (Collombey-Muraz, VS, 388m) in the Rhone valley. 4: Château-d'Œx block shelter (Château-d'Œx, VD, 1180m), in the Prealps.

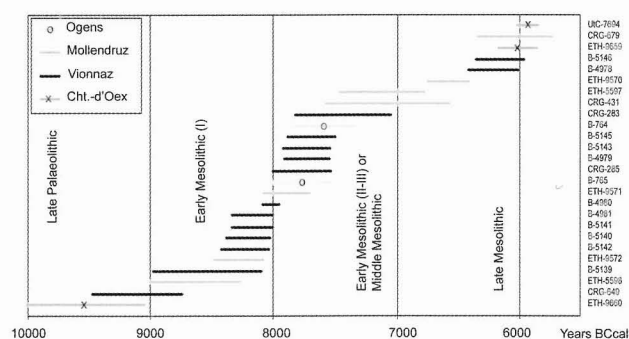


Fig. 3 - Calibrated radiocarbon datings (2 sigmas) and Western Switzerland Mesolithic chronological phases.

the Preboreal, the Boreal and the Early Atlantic. The study of the occupation levels made it possible to highlight two modes of occupation of the site : sporadic halts during the Early and Late Mesolithic, and a much more repeated and/or long-term occupations during the Middle Mesolithic period, with more diversified activities, including the working of red deer antlers and the preparation of pelts. The lithic assemblage is evenly balanced, with an armatures/ tools rate between 53-61% for the Early and Middle Mesolithic (Fig. 4). The relatively high proportion as well as the range of tools indicates the diversity of the activities practised on the site and its surroundings, particularly during the Middle Mesolithic. Although the conservation of the faunal remains is poor, the archaeozoological results (CHAIX & FISCHER, 1998) reveal a broad exploitation of animal resources (red deer, wild boar, roe-deer, bear) which also includes small game for pelts (badger, marten, fox). No specialisation in the hunting strategy is detectable. The few elements available on seasonality, based upon the fauna, indicate summer (between July and September), or spring occupations (between mid-February and mid-April). If one considers the presence of numerous carbonised hazelnut shells as a reliable seasonal indicator, one can accept the hypothesis of mesolithic occupations during most of the year, except the winter months.

3.2. Ogens

The molassic rock shelter of La Baume d'Ogens, excavated in the 1960's, revealed occupations during the first half of the Middle Mesolithic dated to around 8000-7400 BCcal. Although the current data on the spatial and stratigraphic distribution of the artefacts is not easily usable for a fine analysis, it seems that one can identify two modes of occupations of the site : repeated and/or of a certain duration for layer 4, sporadic for the other levels. The lithic assemblage shows an armatures/tools rate of 53%, which is very similar to Mollendruz (Fig. 4). The composition of the tools,

comparable with that of the Middle Mesolithic of Mollendruz, is dominated by *pièces à enlèvements irréguliers* (>60%) and scrapers. Analysis of fauna shows, on the one hand, an exploitation of large game (red deer, wild boar, roe deer) and on the other, a very high proportion of small carnivore remains (marten and wildcat) (Fig. 5) (BRIDAULT & CHIQUET, 2000). Although evidence of seasonality are scarce, it seems that big game hunting was practised in spring and summer, and smaller game in winter. The hypothesis of regular visits to the shelter at different seasons for distinct hunting activities may be considered although it is difficult to prove.

3.3. Vionnaz

The Vionnaz rock shelter offers a very comparable image with those fore-mentioned, with a balanced lithic assemblage and a broad exploitation of ani-

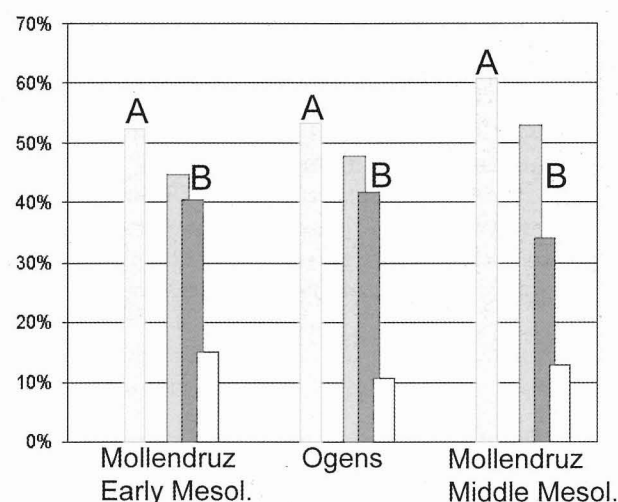


Fig. 4 - Mollendruz and Ogens. Lithic assemblage structure. A: armatures/tools rates; B: armatures, tools & nucleus proportions.

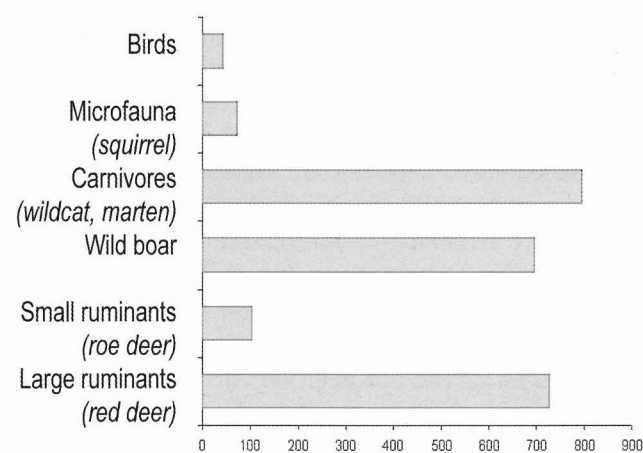


Fig. 5 - Ogens. Faunal assemblage (number of remains by species or species group).

mal resources (BRIDAULT & CHAIX, 1999). Here also, the sequence includes both sporadic and more intensive/repeated or long-term occupations. Generally speaking, Vionnaz can be considered as a site with diverse activities, a broad exploitation of the surrounding biotopes and lacking a focussed exploitation of a particular resource (CROTTI & PIGNAT, 1992). However, microwear analysis of this assemblage shows a relatively low range of technical activities on site, the majority of short duration, suggesting more a hunting camp, as is the case for other sauveterrian layers, which contrasts with the archaeological analysis, where one perceives a wider range of activities (PIGNAT & PLISSON, 2000).

3.4. *Château-d'Œx*

In *Château-d'Œx*, nothing in the current available data allows us to contrast this series of occupations of middle mountain in the Prealps with those mentioned above from an economic or functional point of view (CROTTI, 2002b). The results available for the Late Mesolithic levels show a diversified exploitation of animal resources dominated by red deer. The composition of the lithic assemblage argues in favour of a residential site status, in this case as well.

4. ORIGIN OF SILICEOUS RAW MATERIALS AND SUPPLY TERRITORIES

The study of raw materials is clearly fundamental when tackling the question of defining the territories of prehistoric populations and by consequence, their mobility.

4.1. *Mollendruz*

For *Mollendruz*, detailed studies on the petrography (AFFOLTER, 1998) and the flint economy (PIGNAT & WINIGER, 1998) are already published. Petrographical study includes 2083 artefacts. The majority of the sample (2050 pieces: 112 cores, 301 tools, 432 microlithic armatures and 1205 unmodified debitage products) can be unequivocally attributed to each of the three chronological phases: Early Mesolithic (603), Middle Mesolithic (1409) and Late Mesolithic (38). 82% of the sample has been identified, and grouped into 17 types of raw materials.

Three types of raw materials predominate clearly and constitute 84% of the identified sample: type 319 represents 59%, type 412 15% and type 403 10%.

Type 319 is a flint of the Late Cretaceous collected from an Eocene formation. On the basis of the study of resource management, this flint would have probably been available in the immediate perimeter of the site, even if the only source identified formally by Jehanne Affolter is located approximately 40 km from the shelter (Lac de l'Abbaye) (Fig. 6). She specifies however that the precise outcrop of this type of flint would have to be found in the immediate surroundings of the site, in old lapiez, currently concealed by tertiary and quaternary formations, and consequently difficult to localise. In her interpretation of the flint economy, Gervaise Pignat accepts the hypothesis of the local provenance of type 319. Type 412 was found in an outcrop about 15 km away to the north, on the Valanginien of Métabief (Fig. 6). The source of type 403 remains for the moment unknown. The other petrographical types present very minor frequencies lower than 3%. The majority of these flints were collected in secondary formations (alluvia or moraines of the Swiss Plateau), which renders uncertain the precise location of the supply. Three other types point to a frequentation of the western slopes of the Jura: the 414 of Crotenay, the 223 of Ivory, approximately 50 km to the west of the site and the 325 of Glamondans, 70 km to the north west (Fig. 6).

The range of raw materials used varies very little between the different occupations. In the same way,

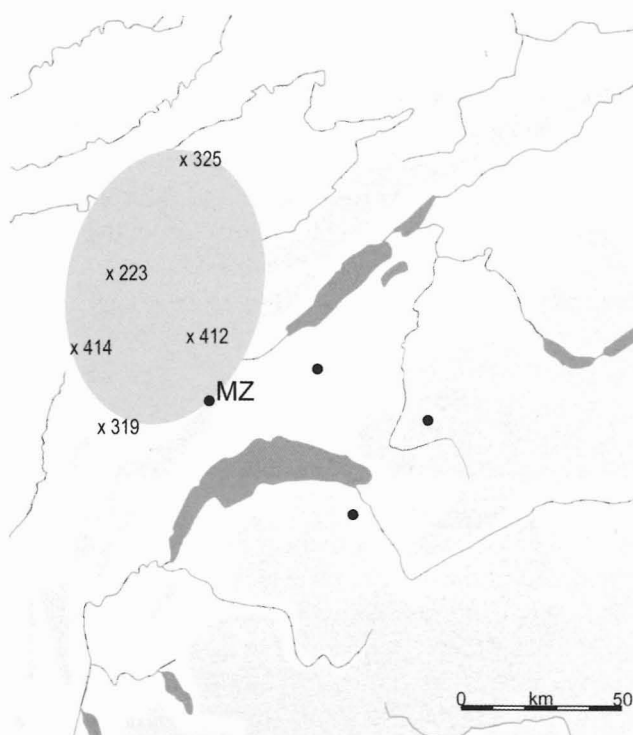


Fig. 6 - Mollendruz. Siliceous raw materials sources and supply territory. Type 412: Métabief; Type 414: Crotenay; Type 223: Ivory; Type 325: Glamondans; Type 319: Lac de l'Abbaye (this flint was probably also available at a short distance of the site).

distinct modes of occupations do not seem to have a noticeable influence on the mode of supply of raw material. Technological changes during the mesolithic sequence did not involve significant modifications in the selection criteria of raw materials. Supply strategies are characterized primarily by a wide diversity of materials and exploited sources. Moreover, one notes the absence of systematic exploration of the territory or search for the most accessible siliceous resources. A review of the regional flint outcrops shows that sources close to the shelter are neglected, whereas others more remote provide raw material. This point reinforces the idea that flint supply is not a priority but, on the contrary, raw material collecting is perfectly integrated within other activities of subsistence of the group and its movements. This strategy corresponds to the “embedded procurement”, as defined by L. R. BINFORD (1979).

If, on the basis of the flint sources, we seek to reconstruct the economic territory of groups which have frequented Mollendruz, we observe that it is centred on the Jura massif, a 70 by 40 km area, which extends to the north and west of Mollendruz. The ties with the Swiss Plateau and the Lemanic area, in terms of flint supply, seem curiously scarcely affected.

4.2. Ogens

In Ogens, the petrographical study has been also carried out by Jehanne Affolter. Given the forthcoming publication of the detailed results¹, only some general topics will be presented. The studied sample (561) is composed of all the cores (56), tools (223) and micro-lithic armatures (256). Only a small number (26) of unmodified debitage products have yet been analysed (Fig. 7). For this reason, in this paper, we will exclude the debitage products and concentrate on the 535 remaining artefacts. 87.5 % of this sample (468) have

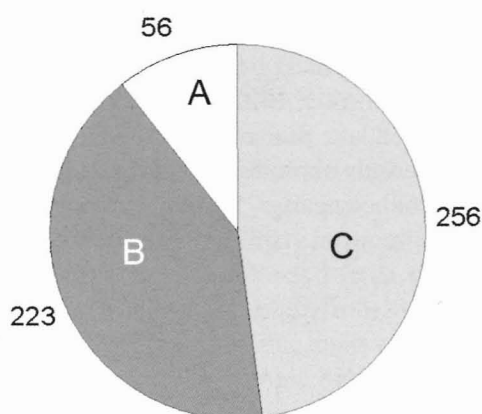


Fig. 7 - Ogens. Petrographical analysis. Studied sample (561): A: Cores; B: Tools; C: Armatures. Without the unretouched debitage products (26).

been identified. 22 flint groups have been distinguished of which the majority of the sources (19) have been located. In all, the sources of 436 of the 535 flints are known, that is 81.5%.

On the basis of the 19 sources defined by Jehanne Affolter, it is possible to group the different types of raw materials into five zones of supply (Fig. 8):

- 1) Local flints (accessible in a radius of 20 km: area of Yverdon and moraines);
- 2) Prealps flints² (south-eastern direction, 40 km);
- 3) Haute-Savoie & Ain flints, Bellegarde-Seyssel sector (south-western direction, 80 km);
- 4) Jura flints (western direction, 60-70 km);
- 5) Region of Olten flints (north-eastern direction, 110 km).

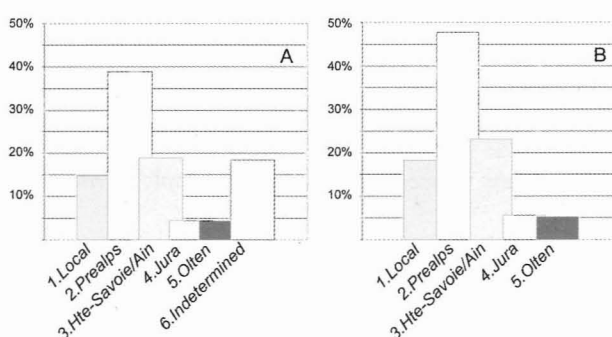


Fig. 8 - Ogens. Raw materials sources. 1: Local (<20 km); 2: Prealps (south-eastern direction, 40km); 3: Haute-Savoie & Ain, Bellegarde-Seyssel sector (south-western direction, 80km); 4: Jura (western direction, 60-70km); 5: Region of Olten (north-eastern direction, 110 km); 6: Indetermined sources. Percentages with (A) and without (B) the indetermined sources.

In Ogens, the most striking detail is the low proportion of strictly local resources, accessible in a radius of 20 km (only 18% of the artefacts whose sources were identified). One can note that the nearest available flint deposit, near Yverdon (less than 15 km from site), only represents a little less than 5%. The Prealps flints clearly dominate the lithic series (48%) and thus indicate the importance of this mountain sector in the economic territories of the groups, which occupied La Baume d'Ogens. In addition, it is interesting to note the high proportion (23%) of Bellegarde-Seyssel flints, from deposits to the south-west of Lake Geneva, at a relatively long distance, and indicating a relation with the Rhone region. The flints from the western slopes of the Jura, like those of the Olten area, are less well represented (approximately 5% each one).

The second detail is that when considering all the flint sources, one is surprised by the size of the territory, that is to say, a surface of 200 by 100 km, in a north-east to south-west orientation, of which Ogens marks the centre (Fig. 9).

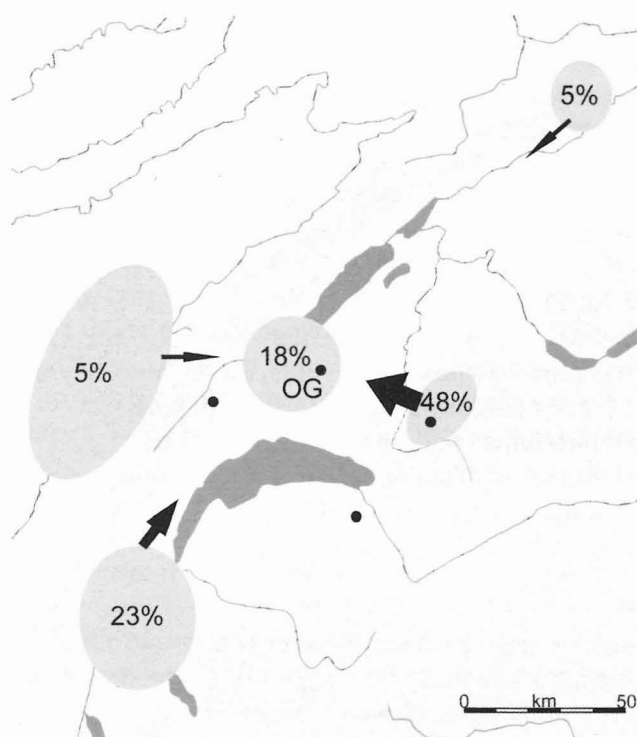


Fig. 9 - Ogens. Siliceous raw materials supply territory.

By comparing these results with those of Mollendruz, one notes that the range of the raw materials is more substantial in Ogens (22 against 17), in spite of a smaller, but probably representative sample. In addition, the territory containing the flint sources is larger in the case of Ogens, a site that appears to represent a crossroads, towards which converge supply routes in opposite directions. Furthermore, one notes hardly any overlapping between the supply sources of the two sites, though they are only 28 km apart. Indeed, in the Jura flints, even if three types are common to both sites, all three are rare in Ogens (frequencies definitely lower than 1%), including type 319, yet highly dominant in Mollendruz (nearly 60%). In the same way, the Prealps and Bellegarde-Seyssel sectors, which constitute the majority of materials used in Ogens, are very rarely or not at all represented among the supply sources identified at Mollendruz. More generally, one even notes a certain exclusion between the supply territories of the two sites. Chronological factors, we remember, not being included in this paper.

By examining the Ogens lithic assemblages in terms of their supply area, one notes many divergences (Fig. 10). The local group is characterised by a balanced armatures/tools proportion and a high ratio of nucleus, which seems to indicate that a significant amount of locally produced retouched artefacts were exported and «consumed» elsewhere. In contrast, the prealpine group is characterized by a very high ratio of microlithic armatures and a clear lack of nucleus³. This observation confirms, in our opinion, the non-

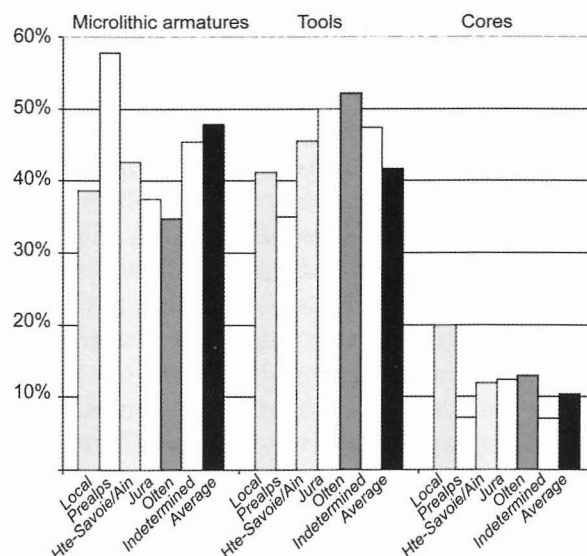


Fig. 10 - Ogens. Lithic assemblage and raw materials sources.

local character of the Prealps flints and in particular type 616, as the petrographic interpretation of Jehanne Affolter suggests⁴, which would have directly come from primary outcrops and not secondary deposits, such as moraines, closer to Ogens. The flints from the south-west reveal a “balanced” composition and thus do not present a sensitive variation from the average. The Jura and Olten groups show a relatively low ratio of armatures (between 40 and 43%).

4.3. Vionnaz and Château-d'Œx

In the absence of the final results of the petrographic analysis for these two sites, we shall limit ourselves to general remarks. In Vionnaz, local resources dominate, with first of all a coarse grain flint outcropping less than 5 km from the site, as well as other pre-alpine materials available in a radius of 20-30 km, collected either in outcrops or in secondary formations. The rock crystal, which accounts for 26% of the total, indicates movements of a few km upstream in the valley. One notes, as in Ogens, the presence of flint of the Late Cretaceous, originating from the south-west of Geneva (CROTTI & PIGNAT, 1992). In the case of Château-d'Œx, the abundant flint resources available near the site were intensely exploited. Indeed, local sources were used to produce nearly 75% of the retouched artefacts.

5. CONSIDERATIONS

In order to integrate the data briefly presented above into a more general discussion on the mobility

of prehistoric populations in the alpine world, the Round Table discussion theme, here are some aspects, which deserve to be discussed.

When considering at first the function of the sites in terms of economy, one notices a certain uniformity between the various sites, which all appear to be residential sites, based on an unspecialised exploitation of the resources available and characterized by diversified technical activities. However one should be cautious about this overall impression as it certainly masks a much more complex prehistoric reality as is suggested by some indicators. In the case of Ogens, for example, despite the lack of detailed spatial and stratigraphic data which doesn't allow us to be categorical, a more contrasted image is offered. Indeed, one can imagine a succession of distinct seasonal occupations, based on a diversified exploitation : big game during spring and summer, and concentrating more on small game during the winter. Should these seasonal occupations be attributed to the same groups or, on the contrary, to distinct groups?

Examination of the flint supply territories presents two very contrasting cases. The first case is well illustrated by Mollendruz, in which the exploited resources are mainly local, based in the Jura. The size of the supply area seems compatible with what one readily imagines as the territory traversed annually by a group of hunter-gatherers, and where flint collecting is integrated into the different activities of the group.

The second case of Ogens is notably different, with few options of local resources and a very large supply area, in which the site appears to be situated at the crossroads of travel movements of a relatively great scale in opposite directions. What can be deduced in terms of the mobility of the mesolithic groups? Here there also arises the question of the frequentation of the site by distinct groups.

Finally, the strong presence of prealpine materials in the lithic assemblage at Ogens, with a very high ratio of armatures, obviously indicates frequent movements in these mountain sectors from the Plateau. This evidence of mobility in the direction of the Prealps, as the Château-d'Œx block shelter discovery has already suggested, was confirmed by the recent localisation of open-air sites, on the shores of small lakes and near passes, at mid-range altitudes (about 1500m) during field surveys carried out in 2000-2001 (CROTTI & BULLINGER, 2001, in press). A lower number of artefacts (17) collected from sites located on Jaunpass (BE) (Fig. 11), 16km from the Château-d'Œx block shelter, have been also analysed by Jehanne Affolter. First of all this sample highlights an important recourse to local resources (15); however two flints may originate from moraines in the north of the Swiss Plateau, in the area of Lucerne, a distance of approx. 100 km in the north-eastern direction. An index which



Fig. 11 - Jaunpass open air site (about 1500m), in the bernese Prealps.

moreover confirms, on the one hand, the strong mobility of the mesolithic groups of the Swiss Plateau, and on the other, the integration of sectors of mid-range mountain in their economic territories, and in particular the Prealps of western Switzerland.

NOTES

1 – The Baume d'Ogens set of data has been re-examined, as part of a Research Project financed by the *Fonds national de la recherche scientifique*. The publication of the entirety of the site is in preparation (Jehanne Affolter, Anne Bridault, Patricia Chiquet, Eva David, Rym Khedaier, Gervaise Pignat & Pierre Crotti).

2 – Flint type 616, which represents 80% of the Prealps raw materials, may have been collected from primary deposits in outcrops in the Château-d'Œx & Rougemont area, but also in secondary deposits, in the moraines of the southern part of the Swiss Plateau. However, according to Jehanne Affolter, it is probable, that in the case of Ogens, we are dealing with direct supplying from primary deposit outcrops. We will see further how the study of the lithic assemblage structure reinforces this assumption.

3 – It would be useful to complete the petrographical analyse with the unretouched debitage products, in order to confirm the fact that type 616 is rarely knapped on the site itself.

4 – See note 2.

ACKNOWLEDGEMENTS

We would like to warmly thank Dean Quinn who found the opportunity, between World Cup football matches and his own work, to revise the english translation of the conference presented in Trento and Wendy Parramore who most kindly contributed to the final proof-reading.

SUMMARY – Western Switzerland presents a large variety of geo-climatic conditions, in which altitudes play a decisive role, determining contrasting landscapes. Four reference sites, frequently occupied during the Mesolithic, are known for each geographical area. On the basis of the available data concerning the function of the sites and the flint supply, this paper broadly outlines the economy and mobility of these mesolithic groups. Firstly, when considering their function, a certain uniformity emerges between the various sites: they all appear to be residential sites associated with an unspecialised exploitation of the animal resources. However, in the case of Ogens, situated on the Swiss Plateau, a more complex pattern arises, suggesting a diversified animal exploitation: based on big game during spring and summer, and concentrating more on small game during winter. Secondly, the study of the flint supply presents two contrasting examples. The first, illustrated by Mollendruz in the Jura, is characterised by an exploitation of mainly local resources and a relatively limited supply territory (70 x 40 km). The second example, Ogens, is notably different, with few options on local raw materials and a very large supply area (200 x 100 km). Thirdly, the strong presence of prealpine flints in the lithic assemblage at Ogens (with a very high ratio of armatures), clearly indicates frequent movements towards these mountain sectors from the Plateau. This index of mobility in the direction of the Prealps was recently confirmed by the discovery of open-air sites at mid-range altitudes (approx. 1500m) during field surveys. In conclusion, the current data highlights the high mobility of the mesolithic groups of the Swiss Plateau and the integration of mountain sectors into their economic territories and in particular the Prealps.

RIASSUNTO – La Svizzera occidentale presenta una notevole varietà di condizioni geo-climatiche, influenzate particolarmente dall'altitudine, e che determinano paesaggi contrastanti. Per ciascuna area geografica si conoscono quattro siti di riferimento, frequentemente occupati durante il Mesolitico. Sulla base di quanto noto sulla funzionalità dei siti e sulle fonti di materia prima, il presente lavoro vuole descrivere l'economia e la mobilità di questi gruppi mesolitici. Se si considera la loro funzione, emerge tra i vari siti una certa uniformità: sembrano tutti siti residenziali associati ad uno sfruttamento non specializzato delle risorse animali. Comunque, nel caso del sito di Ogens, situato sull'altipiano, appare un modello più complesso che suggerisce uno sfruttamento animale diversificato che si basa su animali di grande taglia in primavera-estate e che si concentra sulla piccola selvaggina in inverno. Lo studio delle fonti di selce presenta due esempi contrastanti. Il primo, il sito di Mollendruz (Giura), è principalmente caratterizzato da uno sfruttamento delle risorse locali e da un territorio relativamente limitato (70x40 km). Al contrario, Ogens è notevolmente differente: scarso interesse verso le materie prime locali e un territorio di approvvigionamento molto esteso (200x100 km). La forte presenza di selce prealpina nell'industria litica di Ogens (con percentuali di armature molto alte) indica chiaramente dei movimenti frequenti dall'altipiano verso questi settori montani. Questo indice di mobilità verso le Prealpi è stato recentemente confermato dalla scoperta di siti all'aperto a quote medie (circa 1500 m) effettuata nel corso di un programma di prospezioni. In conclusione, i dati attuali sottolineano l'alta mobilità dei gruppi mesolitici dell'altipiano svizzero e l'integrazione dei settori montani, in particolare le Prealpi, nei loro territori economici.

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