Human exploitation of Southwest Norwegian mountains during the Mesolithic (ca. 9800 - 5700 y.BP): research history, trends, challenges

Sveinung BANG-ANDERSEN

Museum of Archaeology, University of Stavanger, 4036 Stavanger, Norway
Corresponding author e-mail: sveinung.bang-andersen@uis.no

SUMMARY - Human exploitation of Southwest Norwegian mountains during the Mesolithic (ca. 9800 - 5700 y.BP): research history, trends, challenges - This paper focus is on the development and use of elevated interior areas in SW Norway during the first four thousand years after the last deglaciation related to environmental and human factors. Two groups of lake-side positioned Mesolithic sites are presented and discussed: The Myrvatnet/Fløyrlivatnet Complex in the Lysefjord mountains dating back to 9800 - 9000 radiocarbon y.BP, representing the earliest traces of human activity in the interior of the Scandinavian peninsula, and the Storvatnet/Gyvatnet Group in the Setesdal mountains with earliest dates between 7000 and 5700 y.BP. Both consist of find-poor, small sized open air palimpsests or clean sites used infrequently by logistic-mobile groups, evidently for bow hunting wild reindeer during short stays in the early autumn. Despite a number of common features unchanged through millennia, also clear differences can be noted. The lowland counterpart for the seasonal utilization of the two areas is interpreted to have been base settlements on the southwestern sea coast or in outer fjord areas connected with the mountains by linear, east-west oriented main courses of rivers and lakes permitting short but steep accesses. Central issues still remain unsolved owing to lack of faunal material in the sites, and only sporadic investigations performed in the intermediate zone.

INTRODUCTION

For a number of reasons the southwestern corner of Norway is of high relevance to ongoing discussions of the pioneer settlement and the further lines of cultural development during the Mesolithic in North Europe:
- The dichotomy between an early deglaciation of the outer coast and a rather late retreat of the ice cap from the mountain areas.
- Its geographical association to marginal parts of the European plain which were colonized as early as the Late Allerød: Denmark and the northern coasts of the former dry North Sea Continent - ”Doggerland” (Coles 1998).
- A strategic position on the 3000 km long Norwegian coastline from Lindesnes to North Cape, which has always acted as a main line of communication and cultural connections.
- The complex, resource-rich natural environment of Southwest Norway with open and sheltered sea coasts, combined with narrow fjords and steep valleys providing short access to inland and mountain areas.

In addition to favorable natural conditions, a more than 100-year long tradition of scientific investigation of the early prehistory of the region has been carried out by Stavanger Museum and later by the Archaeological Museum and the University of Stavanger. Until about 1980 the field work and later analyses were to a large extent initiated by plans for extensive hydro-electrical power development projects in the mountains. During the last thirty years establishment of North Sea related oil industry land bases and
engraphic zones are used according to the conventional Nordic norm (Mangerud et al. 1974) and radiocarbon dates will be stated uncalibrated in $^{14}$C-years (y.BP).

2. THE STUDY AREA AND METHODS OF INVESTIGATION

The south Norwegian highlands, forming a northern part of the Caledonian chain, constitute a range of mountain landscapes and high-plateaus reaching from Trollheimen in the north to the Ryfylke/Setesdal mountains in southwest. Fig. 1. Most of the central areas are elevated between 1000 and 1400 m a.s.l. with the highest peaks protruding above 2600 m. Westwards the mountains together with the Harangervidda plateau end abruptly at the sea, where deep glacial valleys and fjords penetrate the landmass from the coast. Great differences exist compared with the elevated parts of Central and South Europe, as for instance the Alps. The closest parallels to this this fjord- and mountain landscape seems to be West Geenland, or on a wider geographical scale Patagonia and other parts of South America.

Situated half way between the east-west oriented Ryfylke fjords and the upper part of the north-south extending river valley of Setesdal, the altitude of the mountains of Southwest Norway varies from only 600 to about 1600 m a.s.l. Fig. 2. The central massif, diverse and dissected, is characterized by a multitude of lakes drained by five main watercourses. While the western parts of the area, the Ryfylke mountains, are dominated by bare rock surfaces with little soil cover and moderate vegetation, the eastern Setesdal mountains exhibit more till deposits and wider feeding areas for animal species. Wild reindeer (Rangifer tarandus) constitute the only large game of economic importance today, as probably also through all or most of the Mesolithic and later periods.

Until about fifty years ago, all Stone Age research in Southwest Norway was carried out within in the coastal zone, in particular on the lowland plain of Jæren. As a result of lacking research, the mountains, even by well-acknowledged researchers (i.e. Mikkelsen 1978), was regarded as more or less untouched by the foot of man until far later prehistoric periods. However, archaeological surveys initiated by large-scale hydro-electric projects in the western and central mountain areas (Bang-Andersen 1989), or related to post investigation of earlier established and former unexamined water basins (Bang-Andersen 1990), have later brought such misunderstandings to an end. By a large number of totally excavated and well-dated sites, the cultural and natural historical development during then Mesolithic in many respects now appears to be better known in the mountains than its coastal and lowland counterparts.

The prospecting of virgin mountain areas subject to later disturbance has mainly due to planned watercourse regulations been carried out by small teams test-pitting pre-defined areas in an optimally homogenous way. On locations with intact vegetation cover and soil profile, test-pits were taken by spade, searched through by trowel and eventually water-sieved. In addition a close look-out was kept for surface exposed lithics, fire cracked stones and charcoal along paths, riverbeds, wattersides and eroded patches. During inventoryzation of the western Setesdal a total of 6320 test-pits were taken. Of these only 28 - 0,4 percent - turned out to be positive (Bang-Andersen 1987). Surveys of eroded beaches of mountain lakes which have been dammed or related to post investigation of earlier established and former unexamined water basins (Bang-Andersen 1990), have later brought such misunderstandings to an end. By a large number of totally excavated and well-dated sites, the cultural and natural historical development during then Mesolithic in many respects now appears to be better known in the mountains than its coastal and lowland counterparts.

The prospecting of virgin mountain areas subject to later disturbance has mainly due to planned watercourse regulations been carried out by small teams test-pitting pre-defined areas in an optimally homogenous way. On locations with intact vegetation cover and soil profile, test-pits were taken by spade, searched through by trowel and eventually water-sieved. In addition a close look-out was kept for surface exposed lithics, fire cracked stones and charcoal along paths, riverbeds, wattersides and eroded patches. During inventoryzation of the western Setesdal a total of 6320 test-pits were taken. Of these only 28 - 0,4 percent - turned out to be positive (Bang-Andersen 1987). Surveys of eroded beaches of mountain lakes which have been dammed up previously without any archaeological pre-investigations normally involves intuitive surface collection (Bang-Andersen 2006).

Excavation of the open air sites has invariably been performed by hand troweling 25x25 cm square units according to geological layers or, more often, in 5 cm thick artificial spits, followed by water screening all removed soil. All the find-bearing areas were investigated, except in some
very few instances where the sites were not threatened by later disturbance. By absence of faunal material and microfossils, scientific analyses are restricted to determination and radiocarbon dating of contextual charcoal (Bang-Andersen 2006). Due to the uniform archaeological field procedures applied both in the mountains and in the lowland zone since the early 1970-ies, excavated sites seem to be well comparable by later analyses, irrespective of time or place or the formal background of the investigation.

3. THE FIRST INTRUSION FROM THE COAST INTO ELEVATED AREAS (CA. 9800 - 9000 \(^{14}\)C Y.BP)

In spite of early deglaciation with a potentiality of being exploited by human groups between 15,000 and 14,000 y.BP, and intensive field investigations through several decades performed to spot Late Glacial pioneer sites, no conclusive archaeological traces of settlement antedating 10,000 y.BP have come into light from the seaboard of Southwest Norway, or from any other part of the country. However, when colonization first occurred, the process seems to have been rapid, robust and extensive, covering most of the 3000 km long Norwegian outer coastline between Oslofjord and the Barents Sea within 100 - 200 years (Bjerck 2009), or probably just a few generations (Bang-Andersen 2012).

Settlement sites of a diagnostic Early Preboreal character dating between ca. 10,000 and 9500 y.BP have come into light on the coast of Southwest-Norway at an increasing rate in the course of the last twenty to twenty-five years. They are either extremely small both by extent and artefact amount, or evidently reflect palimpsest of repeated short visits. In spite of lack of organic material in the find layers due to bad preservation conditions, the economy obviously was highly mobile, based on shifts of settlement and seasonal utilization of marine/maritime resources as seals, whales and sea fishes from lightweight crafts. Hypothetic suggestions made of coastal reindeer tribes as the main economic prey (Indrelid 1978, Fuglestvedt 2012) may by several reasons be considered as unlikely.

Unlike the coastal zone, certain restricted mountain areas prove to have been taken in use almost as soon as they became available by the step-wise retreats of the inland ice cap, which started around the Late Pleistocene/Early Holocene transition 10,000 y.BP. Clear and comprehensive evidence of this cultural development derives from the sandy shores of lake Fløyrlivatnet (760 m a.s.l.) and Myrvatnet (610 m a.s.l.), lying 20 km apart in bare-mountain environments bordering the southern margin of Lysefjord ca. 50 km east of the city of Stavanger. Water erosion caused by long-lasting artificial leveling of both lakes resulted in the first surface finds in 1984 and 1998, followed up by archaeological excavation campaigns in order to investigate and document still surviving in situ contexts (Bang-Andersen 1990, 1996, 2003a-b, 2006, 2012). The sites are revealed as horizontal lithic artifact scatters, ca 5 - 25 m in extension, with formal tool inventories normally restricted to tanged points, lanceolates and scrapers of flint. Significant technological features include the general macro lithic character and a broad spectrum of blades produced on unifacial cores with one or two tilted platforms by a hard, direct percussion technique. The microburin technique has partly been applied both on tanged points and microliths. Dwelling structures in the shape of 3 - 4 m wide stone-lined tent rings with indoor or outside hearths are preserved. Fig. 3. Series of C14-dates from some twenty sites range back to ca. 9750 y.BP at Fløyrlivatnet, and 9600 y.BP at Myrvatnet, ending about 9350 and 9050 BP respectively (Bang-Andersen 2003a-b). The lakes are situated respectively 5 km behind and directly within the Younger Dryas main moraine stage. The radiocarbon ages of a majority of the sites suggest occupations mainly to have occurred under or soon after the “Trollgaren” ice-advance ca. 9600 y.BP. Vitaly important is the environmental setting: a virgin, white-washed and tree-less pioneer landscape probably containing dead ice, and with the margin of the ice cap only 10 - 20 km further east and northeast. The former lake-side scrub vegetation consisted mainly of Salix with elements of Betula nana (Bang-Andersen 2006).

Despite a total absence of faunal material from the Preboreal sites also in the mountains, there can be little doubt to interpret the sites as specialized reindeer-hunting camps, as no other natural resources of economic or symbolic importance may have existed here at this early stage. Tree-less environments do not attract herbivorous
animals as red deer or elk, if these species were established at all in southwestern Norway at this early stage. Furthermore, the mountain lakes hardly contained migrating fish as trout due to both a high content of melt-water and the inclination of the watercourses westwards preventing natural immigration. The hunting activity by bow and arrow was probably not performed in the close surroundings of the sites, but during daily purposeful hunting expeditions into the periglacial surroundings of the inland ice.

Almost total use of flint (95 -100 percent) together with the types and technology expressed by the artefact material clearly links the sites to western coastal areas where both slightly earlier and contemporary sites are located. Accordingly, The Myrvatnet/Fløyrlivatnet Complex can only be understood as archaeological remains of short-term hunting stations visited repeatedly, but infrequent in the early autumn by small task groups from coastal settlements of maritime hunters. 30 to 60 km long watercourses of rivers and lakes leading straight into the interior obviously have functioned as geographical routes and mode of transportation, permitting use of light-weight canoes during most of the journey from the fjord mouths or river ends (Bang-Andersen 1990, 1996, 2003b).

The human exploitation of the bare-mountain areas on the southern margin of Lysefjord on a regular basis, separated by irregular intervals of no-use over a 700 - 800 year long period, appears to have been followed by two thousand years characterized by extremely low utilization of the mountain resources in Southwest-Norway. This may be due both to cultural conditions (economic, social or demographic), environmental changes or a combination of factors. Most likely the decline in use of the Myrvatnet and Fløyrlivatnet areas should be interpreted as basically a result of continued landscape changes. As the inland ice in South Norway, due to the improved climatic conditions of the late Preboreal and early Boreal, quickly retreated eastwards and northeastwards and opened new and sprouting grazing grounds, the wild reindeer in every probability followed on. Transformations of such a dimension would inevitably gradually leave the easiest accessible coast-oriented western mountain areas economically irrelevant, and ultimately washed out of people’s minds.

4. SPREAD OF MONTANE ACTIVITY INTO NEW AREAS (CA. 9000 - 5700 14C Y.BP)

A few open sites found along the lakes Ramsvåt in the Siljan watercourse and Bottsvatn in the Kvina watercourse, with artefact inventories containing i.a. narrow lanceolates of flint, prove former inhabited inland and mountains southeast and east of the Myrvatn/Fløyrlivatn area to
have been taken into use during the late Preboreal or in the early Boreal, ca. 9200 - 8500 y.BP. These finds, deriving from revisited, surface-eroded sites lacking any kind of radiocarbon evidence but coarsely datable by typology, most probably reflect restricted seasonal activity by north-south oriented linear moves performed from the southern Norwegian coasts, Sørlandet. The earliest use of the central south Norwegian high-mountain plateau, Hardangervidda, mainly elevated between ca. 1200 and 1400 m a.s.l. and still characterized by large populations of wild reindeer, according to radiocarbon analyses from an open site at lake Finnsbergvatnet (1190 m a.s.l.) dates back to about 8300 y.BP (Indrelid 1994). In contrast to widespread human enterprises into the central South Norwegian mountain areas during the Middle Mesolithic, the highest-lying parts of the southwestern mountains came into use far later. This will now be exemplified and compared with earlier the Myrvatn/Fløyrlivatn record.

Due to plans for extensive hydro-electric regulations large areas within the main water divide between the Ryfylke and Setesdal mountains were investigated archaeologically over the years 1973 - 1982 (Bang-Andersen 1987, 1989). Field inventorization by test-pits proved a clear majority of the Mesolithic sites - ten out of twelve - to be concentrated along the shores of two adjoining lakes, Storvatnet and Gygvatnet at 975 and 910 m a.s.l. (Fig. 2). All sites were open-air, situated either close to the water’s edge or at most 100 m away near the main river inlets or, more often, on the tops of well-drained gravel ridges. Several natural rock shelters were located in the close neighborhood, but contained no indications of prehistoric use.

The cultural layers at the Storvatnet and Gygvatnet lakes were thin and unstratified, normally restricted to lithic scatters measuring between ca. 20 and 60 sq. m and leached in such a way that organic material other than charcoal has not been preserved. Traces of tent rings or other evident dwelling constructions were not found. The spatial distribution of the lithics never-the-less indicates use of small tents several places. By the milder, less windy and more vegetated conditions during the Late Mesolithic, stone-linings need not have been necessary to keep the tent covers fastened to the ground. On most sites the artefact material, consisting mainly of flint by variable qualities, proved to be extremely low in number and formally restricted to waste, microblades and scrapers. The microblades, presumably intended as edges inserted in composite tools as arrows and knives, were pressured from handle cores. A series of 22 radiocarbon analyses proves the majority of the sites to be short-term palimpsest mainly used between 7000 and 5700 y.BP, or within a period of about 1300 years. When the reindeer resources in these areas were again exploited from ca. 4000 y.BP, it was probably under a new economic

Fig. 4 - In foreground a Late Mesolithic short-term reindeer hunting site (Gygvatnet Loc. 145, Setesdal mountains, Southwest-Norway), dated to 5670 ±90 y.BP. The wide overview of landscape with reindeer paths has permitted immediate, direct action from the site (Photo by Museum of Archaeology, University of Stavanger).

Fig. 4 - Il sito di caccia alla renna del Mesolitico finale di Gygvatnet Loc. 145 (montagne di Setesdal) è datato a to 5670 ±90 y.BP. (Foto: Museo di Archeologia, Università di Stavanger).
regime: by Neolithic groups making sporadic expeditions from summer pasture camps in surrounding lower-lying lake areas and valleys.

As the mountains within the water divide became ice-free as early as 8800 y.BP, a time-lag of about 1800 radiocarbon years exists between when the Storvatnet/Gyvatnet area first was available and the local resources were utilized. This stands out in marked contrast to Myrvatnet/Fløyrlivatnet which came into use almost as soon as it was physically possible. The reasons for the long delay still remain unsolved. Another dividing factor is the setting of the sites. While both Myrvatnet and Fløyrlivatnet during the Early Mesolithic appear to have functioned as logistic bases for hunting expeditions performed off-site rather far away, the Late Mesolithic sites at Storvatnet and Gyvatnet by their wide landscape overview and closeness to the reindeer main migratory trails were within the actual arena of subsistent activity: individual bow hunting and, possibly, at times a restricted element of communal drives of reindeer into water bodies.

One find context, “Locality 148”, located on a present-day reindeer path, deserves to be mentioned in particular. This particular site yielded only seven flint artefacts - weighing just 1.3 grams - found concentrated within less than 1 sq. m around a small hearth 14C-dated to ca. 5900 y.BP (Bang-Andersen 1987). The situation, like a crime site, seems to express a “clean” situation: the skinning and defleshing of a reindeer downed on the very spot and the lighting of a small bonfire. Such special-activity localities are almost impossible to detect by test pits. In spite of being probably the most common of all site types, they are only rarely known in the Norwegian mountains.

As pronounced seasonal hunting camps or kill spots only used briefly during late summer or early autumn, also the sites of the Storvatnet/Gyvatnet Group related directly to a lowland base area. The distance to the sea coast and flint-bearing areas suggests the most probable movement routes to have followed fjord heads and main river valleys in 50 - 60 km long west-east going transects. However, as the inland ice no longer existed as a barrier, movement routes from more distant coastal areas in south or southeast may not be excluded (Fig. 5).

5. CONCLUSION AND PERSPECTIVES

The review of earlier and ongoing research has proved a difference of almost 3000 radiocarbon years between the first human use of the Lysefjord mountains and the Setesdal mountains, which were both easily accessible from base settlements on the sea coast of Southwest Norway. In the interval Middle Mesolithic period, wide high-altitude areas within more central parts of the mountains as for instance the Hardangervidda plateau were taken in use. Specialized seasonal reindeer hunting, so far documented by osteological material only in some few sites (Indrelid 1994), appear to have been the main driving force behind the enculturation of successively larger mountain areas.

Only minor differences can be proved regarding the topographic setting, size, spatial organization and economic use of the Early Mesolithic and Late Mesolithic groups of sites in the southwest Norwegian mountains. On the other hand enormous environmental contrasts existed between the mountain areas as they first were taken into use: virgin, periglacial and recently ice-free terrain in the Myrvatnet/Fløyrlivatnet area, compared to developed and more vegetated postglacial landscapes around Storvatnet/Gyvatnet. Further, whilst the activities at Myrvatnet and Fløyrlivatnet seem to have ended as a result of environmental changes: retreat of the reindeer tribes to eastern areas, the specialized big game hunt at Storvatnet and Gyvatnet more likely faded out mainly due to a cultural factor, adoption of agricultural activities.

The claim of reindeer motivating the earliest human use also of the southwest Norwegian mountains,
based only on circumstantial evidence, will remain hypothetic until faunal material eventually is found. Reindeer need, however, not always and everywhere have been hunted primarily by need of its tasty meat and large nutritional value or the excellent properties its hide-, antler- and sinew material. As the mountains were exploited from base settlements in resource-rich and scattered populated coastal areas, food shortness or population stress may not necessarily have been triggering irregular, short-term expeditions into unfamiliar areas. Instead of intrusion of “hUNGY hunters” the mountains may have been visited by restricted groups driven by non-economic and non-utilitarian motifs as social prestige, search of the unknown, call of the wild, or by religious/mythical/ontological relations to reindeer as animal species. (f.i. Hill 2011). At least during the Late Mesolithic, when the ice cap no longer existed as a geographical bar, human coast-inland activity in South Norway may also have served to extend mating networks (Madden 1983). Denial of cosmology, perception and social network building as critical elements in the active behavior, as much as material need and environmental opportunity, would be to downgrade the Stone Age hunters as humans and ourselves as open minded researchers.

One third major factor still waiting to be better understood, is the postulated movement routes along river valleys connecting the lowland with the exploited areas in the mountains of Southwest Norway. The 30 - 60 km long and linear lines of communication, which would make the reindeer hunting grounds accessible by two to four days of travelling upstream partly by help of light-weight skin boats, have as yet not been subject to closer field investigation - which they certainly deserve. Transitory sites,probably extremely modest in extent, not necessarily containing lithic material at all and extremely difficult to detect, are most likely localized to natural resting places as the inlets and outlets of lakes in the drainage system. This makes an important, and hopefully rewarding, challenge to tomorrow’s archaeology.

The pioneer use of mountain areas, either it was performed from distant coastal areas as in South Norway and possibly also within Northeast Italy (Grimaldi 2006, Grimaldi & Flor 2009), or primarily from near-lying valley bottoms as it has also been suggested for the north-eastern Grimaldi & Flor 2009), or primarily from near-lying valley and possibly also within Northeast Italy (Grimaldi 2006, performed from distant coastal areas as in South Norway Bang-Andersen S., 1989 - Mesolithic Adaptations in the Norwegian Highlands. In: C. Bonsall (ed.) The Mesolithic in Europe. 338-350. Edinburgh.


