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THE MESOLITHIC BERGLIBALM ROCK SHELTER (MUOTATHAL, CT. SCHWYZ / CH)

Named after a nearby farmstead, the Berglibalm site is located in the municipality of Muotathal in the Canton of Schwyz (**figs 1-2**). The large, west-facing rock shelter is located at the foot of a 300 m long cliff situated above the right bank of the River Muota at an elevation of 1140 m a. s. l. (46° 55'83" N / 8° 50'48" E). The local cliff consists of an outcrop of schistous marls of the Spitzmeilen formation, a marine deposit of Sinemurian age about 195 million years old.

The site was discovered on 23rd April 2014 by the local teacher and cave explorer Walter Imhof, who found several well-preserved bones, charcoal fragments and a rock crystal flake in the spoil heap of a badger's den. A small test excavation in the area of the entrance to the badger's hole yielded stratified charcoal fragments at a depth of 70 cm below the surface. AMS dating of the charcoal carried out by the Laboratory of Ion Beam Physics at the Swiss Federal Institute of Technology in Zurich (ETH-55851) gave an Early Mesolithic date of 9138 ± 37 BP or 8532-8278 cal BC (2-sigma range).

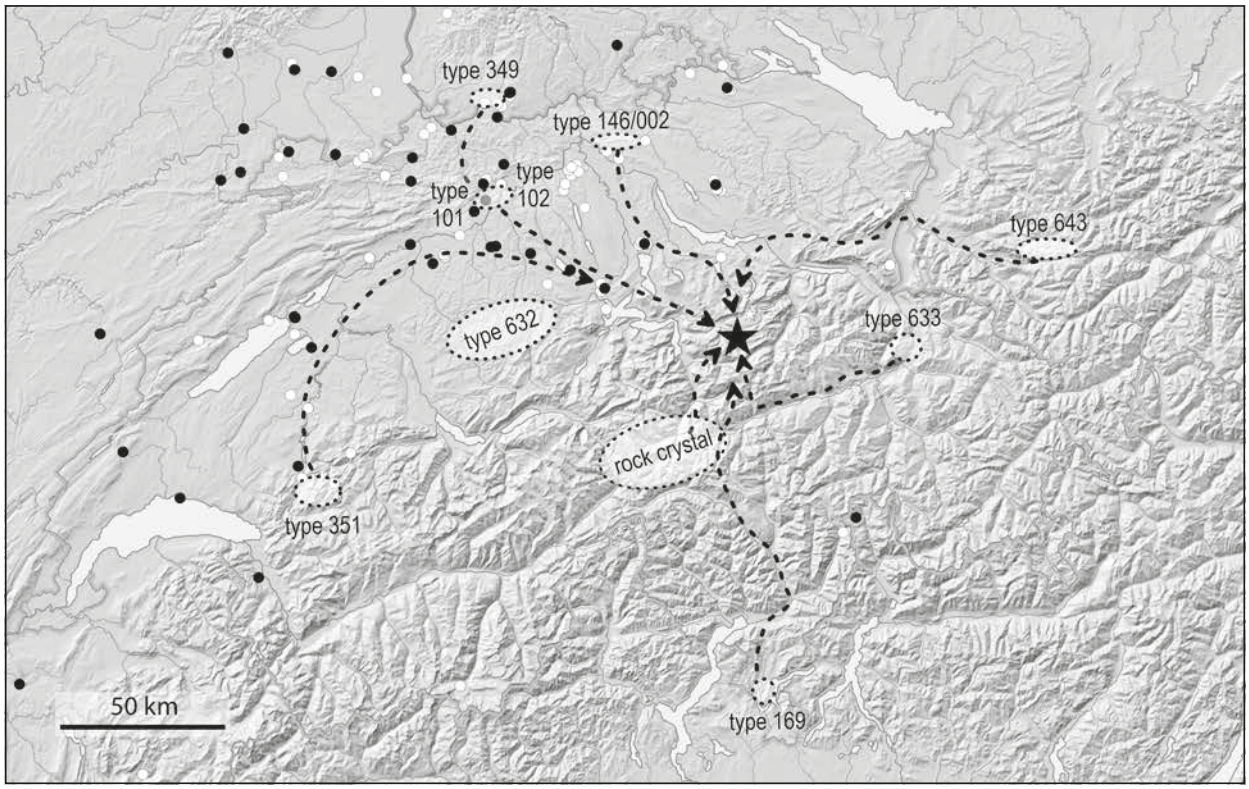


Fig. 1 The geographical location of the Muotathal-Berglibalm rock shelter (Ct. Schwyz/CH) (★), the provenience of lithic raw materials (for types see text), and possible flint supply routes to the Berglibalm site. – ● first phase of Early Mesolithic sites; ○ undiagnostic Early Mesolithic sites. – (Map R. Jagher; source: Federal Office of Topography).

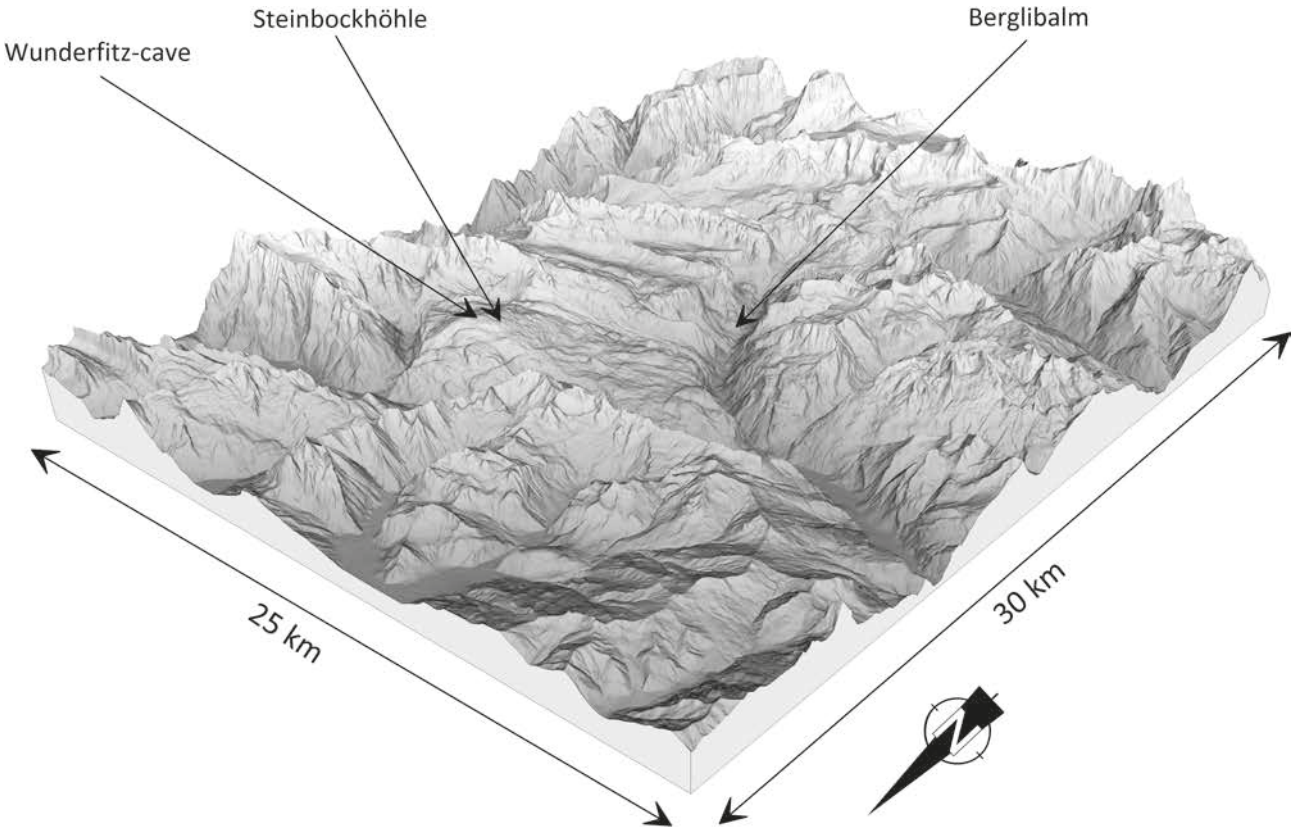


Fig. 2 Digital elevation model of the location of the Berglibalm rock shelter and the contemporaneous Steinbockhöhle and Wunderfitz caves (2240 m a. s. l.). – (Map R. Jagher; database: Federal Office of Topography).

Following this discovery and because of continued, stubborn digging by the badger despite extensive protection measures, archaeological excavations were performed in the Berglibalm rock shelter on behalf of the State Archives of the Canton of Schwyz in 2015 and again in 2019 (STASZ, SG.CIX.50.4.4.50) to salvage the cultural remains. Trench 1 (2015 excavation), which measured 4 m^2, and Trench 2 (2019 excavation), which covered just 1 m^2, were archaeologically investigated and documented (**figs 3-4**).

The stratigraphic sequence in the excavated areas was explored to a maximum depth of 1.4 m (**fig. 5**) and was roughly divided into four units: 1. modern-era deposits, 2. post-Mesolithic sediments, 3. the Early Mesolithic archaeological layer, 4. sediments devoid of finds underlying the archaeological layer. Several large boulders that had fallen from the cliff face had disturbed the regular and well-bedded sedimentation within the rock shelter. Bioturbation caused by burrowing animals such as badgers and rodents mainly occurred along the rock face.

THE EARLY MESOLITHIC LAYER

The Early Mesolithic layer was identified over an area of just under 5 m^2. Measuring between 7 and 12 cm in thickness, it sloped slightly north-east to south-west. In the northern area of Trench 1, the layer abutted several large boulders, which had fallen from the rock face in pre-Mesolithic times. The Mesolithic layer consisted of a dark-grey to reddish-brown, sandy-silty sediment with numerous weathered flakes from the rock face. The top and bottom of the Mesolithic layer were visible in the exposed sections due to its darker

Fig. 3 The Berglibalm rock shelter, view towards the north. The archaeological team at work during the 2019 excavation. – (Photo U. Leuzinger).

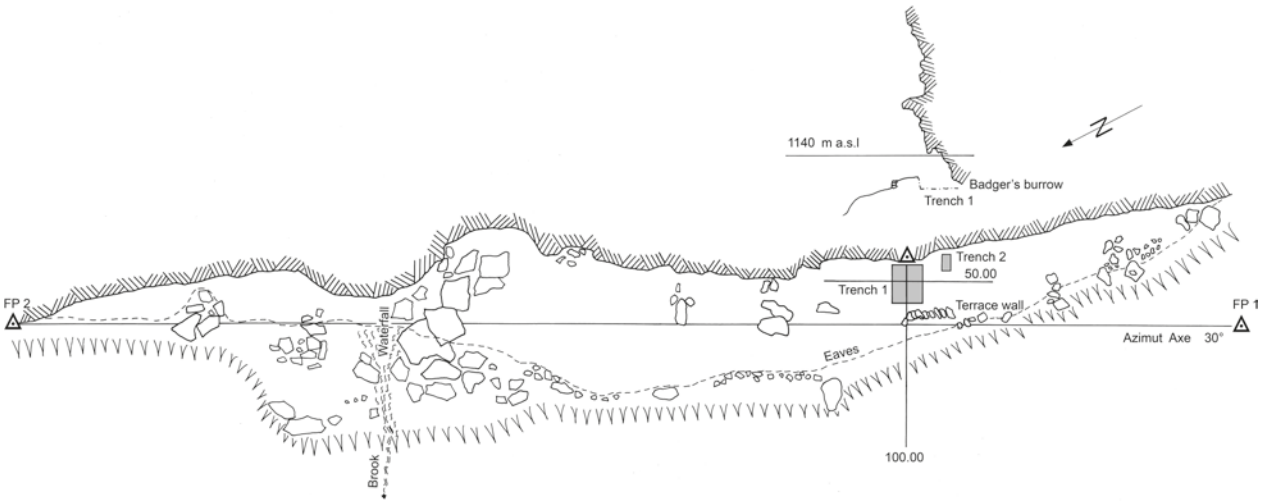


Fig. 4 Overall plan of the Berglibalm rock shelter with the local survey grid. Trench 1 (2015 excavation) and Trench 2 (2019 excavation). – (Illustration U. Leuzinger / E. Belz). – Scale 1:500.

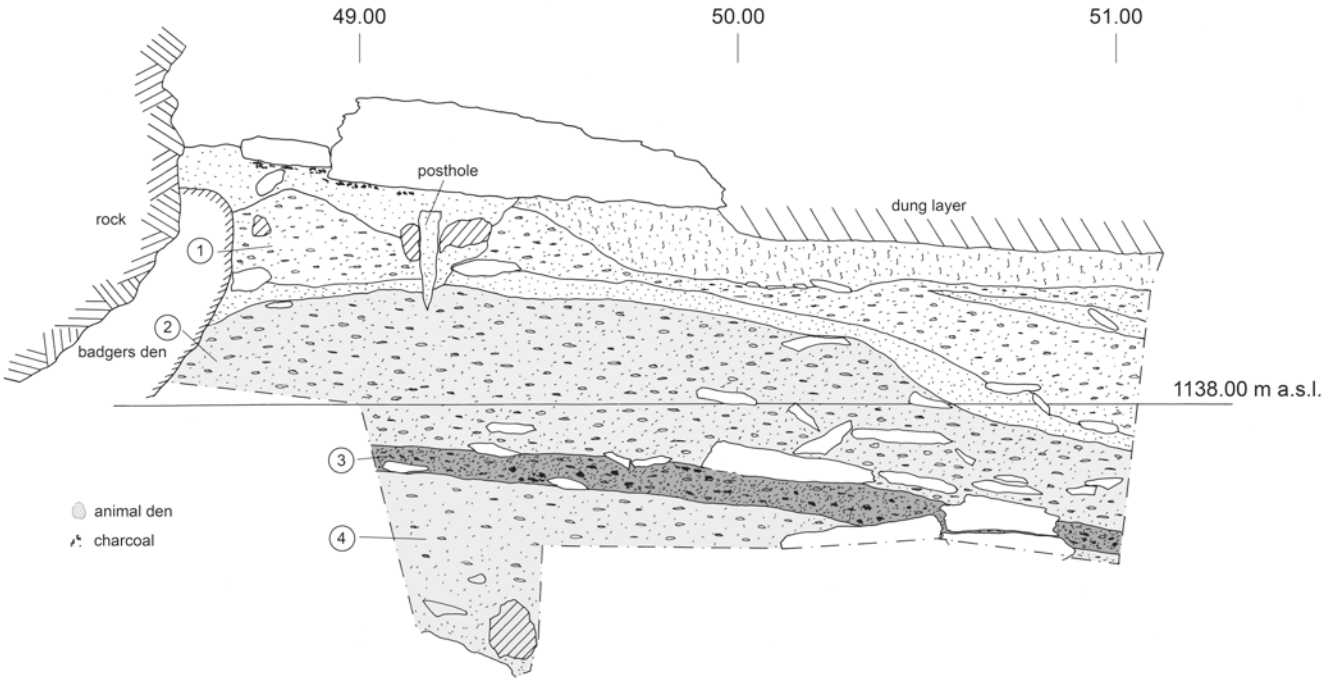


Fig. 5 Drawing of the southern section of Trench 1 at the Berglibalm rock shelter between 49.50 and 51.12 m on the local grid. – (Drawing U. Leuzinger / E. Belz). – Scale 1:20.

Fig. 6 The Early Mesolithic horizon of the Berglibalm rock shelter with a charcoal concentration after removal of the seventh spit. – (Photo U. Leuzinger).

basic forms	n	%	fine-grained quartzite	rock crystal	radiolarite	chert
core	7	1	7	0	0	0
cortical flake	3	1	0	0	0	3
flake	208	39	176	7	3	22
blade	6	1	6	0	0	0
bladelet	29	5	22	0	1	6
burin spall	2	0	1	0	0	1
chip	255	48	177	5	26	47
debris	25	5	18	5	0	2
total	**535**	**100**	**407**	**17**	**30**	**81**

Tab. 1 Basic lithic forms found at the Berglibalm rock shelter listed by raw material.

colouration by the omnipresence of charcoal fragments. This archaeological stratum yielded numerous bones and teeth, some severely weathered, and nearly all of the stone artefacts discovered at the site. The density of finds per square metre increased substantially between the Trenches 1 and 2, indicating that the main occupation was located south of Trench 2, i. e. on the right-hand side of the site (**fig. 4**). However, its extent has yet to be determined. Given the topographical situation of the rock shelter, it possibly extended over an area of a dozen metres.

No obvious structures such as stone-lined hearths or other features were observed in the Mesolithic horizon. However, several charcoal concentrations were located in Trench 1 indicating the presence of simple open fireplaces as are characteristic of the Mesolithic period (**fig. 6**). Because no rubefaction was observed on the sediment, it was not possible to provide clear evidence of a Mesolithic hearth *in situ*. However, 17 heat-damaged stone artefacts (out of 535 finds) and 56 more or less severely burnt bones (out of 567 finds) together with seven charred hazelnut shells, confirmed the contemporaneity of the hearths and the archaeological and archaeobiological remains at the site.

The extent of the Mesolithic level in Trench 1 was limited by a massive rockfall predating the human occupation (Leuzinger et al. 2016, 13 fig. 9) forming the northern edge of the settlement. Despite the limited extent of the excavated area, four *pièces esquillées* were recovered from a limited area in square 50/100, pointing to an activity zone probably for the purpose of extracting marrow from bones. The use of these tools in this location was confirmed by at least three flakes identified as waste resulting from the process.

THE EARLY MESOLITHIC STONE ARTEFACTS

The lithic assemblage comprised 535 stone artefacts including 255 chips smaller than 10 mm. Only 25 artefacts were recorded *in situ* with three-dimensional coordinates during the excavation. This was due, on the one hand, to poor lighting in the sounding and, on the other, to the fact that many of the dark-grey frost-weathered limestone flakes looked almost the same as the carbonate-coated quartzite artefacts. For this reason, the entire spoil from the Mesolithic layer was dry-sieved using various mesh sizes, with the final one measuring 3 mm. This resulted in a high proportion (48 %) of chips and a low average artefact length of just 12.6 mm.

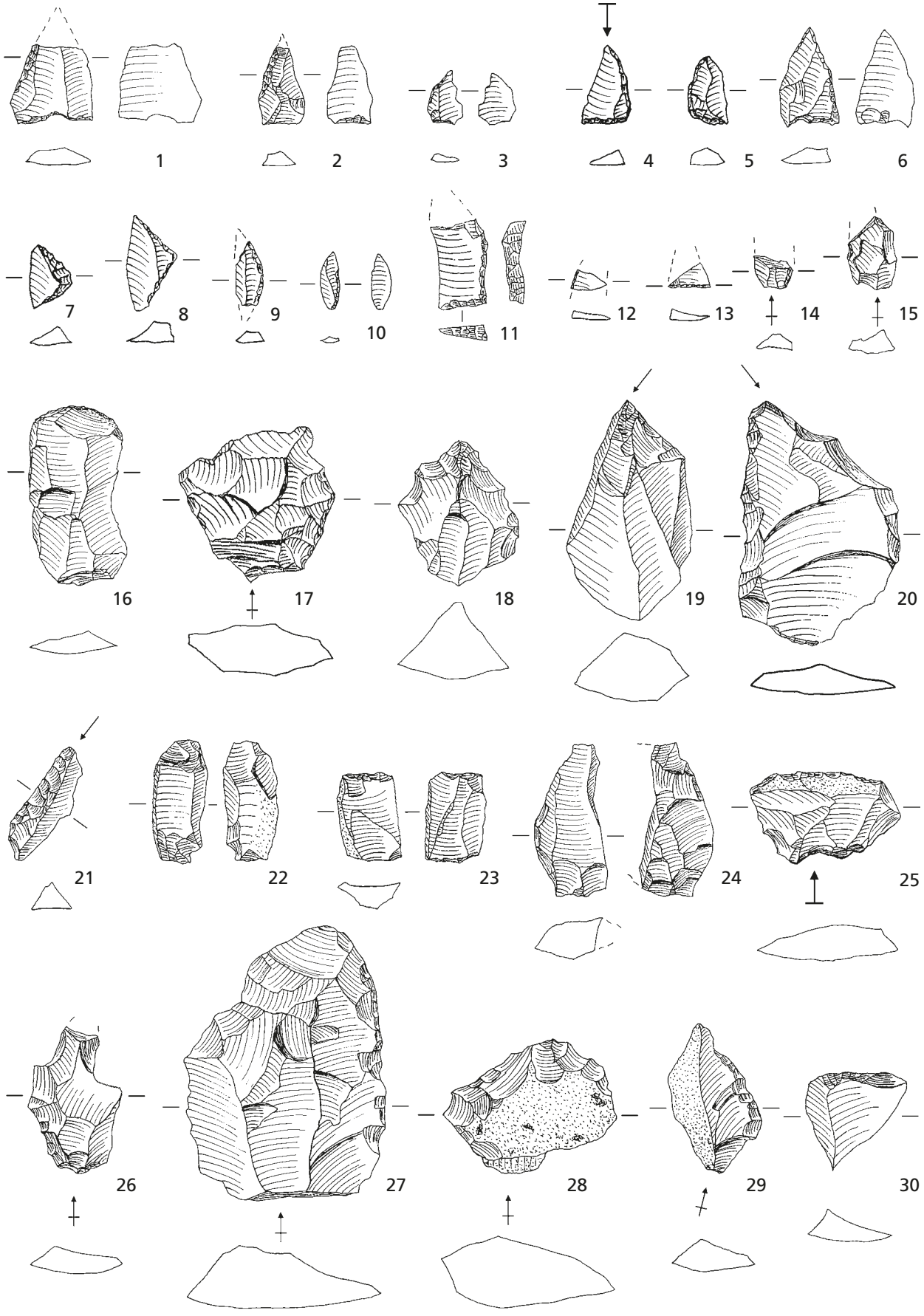
The assemblage of 535 stone artefacts was divided into nine basic morphological classes: nodules, cores, debris, cortical flakes, flakes, blades, bladelets, burin spalls (*Stichellamellen*) and chips (**tab. 1**). The com-

position of these basic classes showed that only the quartzites included more or less the entire production chain. This was because this raw material occurred in the close vicinity of the site and therefore did not have to be transported over long distances. The flakes made of fine-grained quartzite were generally small and very few would have been suitable for further shaping into a projectile point. Most of the quartzite flakes were produced locally, as was also demonstrated by the few polyhedral and poorly structured residual cores found and, to a lesser extent, by the resharpening of tools made from this raw material.
The other raw materials showed only incomplete reduction sequences and it can be assumed that they were brought to site as more or less finished and functional artefacts or at least as blanks, which were shaped on the site and later discarded. Quite intensive reshaping was attested to by numerous chips of various exogenous raw materials.
During cataloguing of the 535 lithic artefacts, additional technological information was recorded. A total of 83 % of the flakes and chips were completely preserved. This was to be expected given the limited average length of 12.6 mm. The pristine edges of the lithic artefacts point to rather uneventful sedimentation with little disturbance after the hunter-gatherers abandoned the rock shelter.
The majority of the 183 platform remnants examined were smooth or linear. Only one was faceted. Apart from dorsal reduction, which was identified on 63 proximal edges, the striking platforms were not worked. It can be assumed that the majority of flakes were struck by direct, hard blows. However, no hammerstones were found within the limited excavated area.

Microliths

A total of 15 objects can be associated with projectile points or by-products from their manufacture (microburins). These small artefacts, known as microliths, are usually identified as components of arrowheads commonly hafted onto arrowshafts, either on their own or as insets in a row, using some sort of glue, e. g. birch tar. The 14 microliths and one possible microburin from the Berglibalm rock shelter were made of fine-grained quartz, radiolarite or chert, but disproportionately more often of the latter two. This suggests that arrowshafts were already fitted with flint insets upon arrival at the site and that the projectiles were repaired and replaced here with local materials.
The microliths or insets found at the Berglibalm site included one point with oblique retouch and slightly concave base made of fine-grained quartzite (fig. 7, 1), one point with oblique truncation and basal retouch and with characteristic impact damage made of fine-grained quartzite (fig. 7, 2), one point with oblique truncations and basal retouch made of fine-grained quartzite (fig. 7, 3), one point with oblique truncation made of radiolarite (type 632; fig. 7, 4), two retouched points with basal retouch made of Triassic chert (type 349; fig. 7, 5) and of yellow-beige Jurassic chert (type 149/022; fig. 7, 6), two isosceles triangles made of Triassic chert (type 349; fig. 7, 7) and of fine-grained quartzite from Oberiberg (type 359; fig. 7, 8), a lunate fragment made of radiolarite (type 169; fig. 7, 9), one broken microlith with a backed retouch made of grey-brown radiolarite (type 645; fig. 7, 10), three microlith fragments made of fine-grained quartzite (fig. 7, 11), of white Jurassic chert (fig. 7, 12) and of fine-grained quartzite (type 351; fig. 7, 13), one

Fig. 7 Early Mesolithic tools from the Berglibalm rock shelter: **1** point with oblique retouch and slightly concave base. – **2-3** points with oblique truncation. – **4-6** retouched points with retouched base. – **7-8** isosceles triangles. – **9** lunate. – **10** bladelet with abrupt retouch. – **11-13** microlith fragments. – **14** backed bladelet/microburin. – **15** microburin (?). – **16-17** scrapers. – **18** scraper-*pièce esquillée*. – **19-20** burin on oblique truncation. – **21** burin on bladelet. – **22-24** *pièces esquillées*. – **25-30** retouched flakes. – (Drawings U. Leuzinger). – Scale 1:1.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	2015		2019		total	
raw material	n	%	n	%	n	%
fine-grained quartzite	219	77	188	75	407	76
rock crystal	16	6	1	0	17	3
radiolarite	6	2	24	10	30	6
chert	44	15	37	15	81	15
total	**285**	**100**	**250**	**100**	**535**	**100**

Tab. 2 Raw materials identified in the lithic assemblage recovered during the 2015 and 2019 excavations at the Berglibalm rock shelter.

backed bladelet/microburin made of orange Jurassic chert (type 146/002; **fig. 7, 14**), and finally, a possible microburin made of fine-grained quartzite (**fig. 7, 15**).

Macroliths

Overall, 15 tools were found that could not be identified as hunting weapons (**fig. 7, 16-30**). They can be classified as two end-scrapers, one combination of end-scraper and *pièce esquillée*, two burins on truncations, four *pièces esquillées* and six retouched flakes. The raw materials used to make these tools were identified as fine-grained quartz or Jurassic chert. All tools, and especially the very few end-scrapers, were made on polymorphous flakes and were shaped in a rather cursory way. In contrast to the microliths, little effort went into the making of these basic tools, which showed no intention of standardisation. As a whole, the tools give the impression of being rather improvised, which may be due to the function of the site as a short-term hunting stopover with a limited range of domestic activities.
Besides edge-retouched flakes, *pièces esquillées* were predominant. Eleven flakes from *pièces esquillées* attest to the frequent use of these artefacts by the Mesolithic hunter-gatherers during their occupation of the Berglibalm site. The exact purpose of these tools is still under debate. The characteristic bipolar chipping suggests that they were used as chisel-like tools, possibly to split bones to extract the marrow (Jagher/Fischer/Morel 1997, 4; Le Brun-Ricalens 2012). *Pièces esquillées* combined with intentionally smashed bones are often observed in early Holocene sites associated with hunting activities (e. g. Jagher et al. in prep.). Another, albeit outdated discussion is whether they were cores for further working using the so-called anvil technique (Hahn 1991, 199-200).

RAW MATERIAL ANALYSIS

The 535 stone artefacts were macroscopically divided into four raw material groups: fine-grained quartzite (so-called *Ölquarzit*), chert (Jurassic/Triassic), radiolarite and rock crystal (**tab. 2**). The lithic assemblage weighed 699.9 g in total, 653.4 g (93.4 %) of which can be classified as fine-grained quartzite. All 111 artefacts made of radiolarite and chert were analysed for their provenience employing a non-destructive method examining the depositional facies of each artefact using a stereoscopic microscope (Affolter 2002, 22-23). The term »facies« here refers to all sedimentary and palaeontological characteristics of sedimentary rock, including texture, depositional structure and fossil and detritus components (dead animals and plants). Together, they mirror the depositional environment. This tells us, for instance, when and where sedimentary

rocks formed, which, in turn, allows us to precisely pinpoint the geological origins of an archaeological flint artefact.

Fine-grained quartzite (»*Ölquarzit*«)

A total of 76 % of all artefacts were made of fine-grained quartzite, a raw material that naturally occurs in regional limestone deposits of the »Schrattenkalk« formation. However, these quartzites are often severely fissured, which makes them quite unsuitable for knapping. Deposits of workable materials outcrop, for instance, near the Isentobel Hut and in the Heikentobel and Hinter Silberenalp areas. All these locations are no more than 8-10 km from the Berglibalm site as the crow flies.

Chert

The 81 artefacts made of Jurassic chert of the Malm formation and Triassic can be divided into four types. The majority (55 artefacts) were similar to material from flint deposits in the Wettingen layers (Kimmeridgian) that occur near Otelfingen-Weiherboden (Ct. Zurich/CH) in the Lägern region (type 146/002; Affolter 2002, 90). This raw material type included a high percentage of shaped tools such as two retouched flakes, two *pièces esquillées*, a microlithic point with oblique retouch and a backed bladelet/microburin.
Artefacts made of light-grey to beige-pink chert, which probably originated from the Wangen layers (Kimmeridgian) at Wangen near Olten (Ct. Solothurn/CH) were far less numerous (type 101; Affolter 2002, 92). A total of 15 artefacts, including a scraper and a microlith fragment, were made from this raw material.
Only three unworked flakes were made of chert from layers of the Sequanian that outcrop near Olten-Chalchofen (type 102; Affolter 2002, 89-90). The absence of any production waste of this flint type indicated that these flakes were brought to the Berglibalm site as finished tools.
Remarkably, two microliths were made of Triassic chert from Degerfelden (Lkr. Lörrach/D) (type 349; Affolter 2002, 59-60) in the southern region of the Black Forest. The absence of production waste again indicated that they came to the Berglibalm site as finished tools, probably even mounted on a functional arrow. The other six artefacts (type 1) could not be associated with any particular deposit.

Radiolarite

30 artefacts were made of radiolarite, including a point with a retouched base, a bladelet with abrupt retouch, a lunate as well as flakes and chips. This raw material can be found redeposited in glacial moraines and derived from fluvial deposits in the Alpine foreland. Primary outcrops of radiolarite are known from the northern area of the foothills of the Alps from Lake Geneva to the Vorarlberg region in Austria (Leuzinger et al. 2016, 14). The microscopic analysis identified four different types or localities: type 169 is found in conglomerates from the region around Arzo (Ct. Ticino/CH) in the southern foothills of the Alps. A lunate and a small flake made of this raw material, therefore, suggested that the hunter-gatherer groups who used the Berglibalm rock shelter maintained contact with areas south of the Alps. Radiolarite of type 632 (24 artefacts) was retrieved from sediments of the so-called Napf alluvial fan located between Bern and Lucerne. A bladelet with abrupt retouch and a chip of grey-brown radiolarite of type 645 are worth special

mention. This raw material originated from a deposit in the Buchboden area of the municipality of Sonntag (Vorarlberg, Bez. Bludenz/A), thus confirming links between the Berglibalm hunter-gatherers and an area 100 km to the east. One of the small chips of radiolarite was associated with a deposit in the Chur region (Ct. Graubünden/CH) (type 633); another artefact made of radiolarite had been damaged by fire and could not be identified more precisely.

Rock crystal

17 artefacts were made of rock crystal knapped from clear and transparent crystals, with three still bearing remnants of idiomorphic unworked surfaces. The rock crystals are likely to have originated from crevices in the southern area of the present-day Canton of Uri, i. e. from the Saint-Gotthard Massif where crystalline rocks predominate (Reitmaier et al. 2016). These deposits are 1-1.5 day's march from the Berglibalm rock shelter.

Raw material supplies

The small assemblage recovered from the Berglibalm rock shelter permits us to make statements regarding the supply strategies and transport routes used by the Mesolithic hunter-gatherers (fig. 1). If possible, the Mesolithic hunter-gatherers preferred to exploit the raw materials within their daily activity range, as shown by the fact that the majority of artefacts were made from fine-grained quartzite and rock crystal, which were both locally or at least regionally available. Jurassic chert came from deposits in the Lägern mountain range and the Olten area. Raw material from the Lägern (type 146/002) may have been brought to the Berglibalm site using a route along the River Limmat, Lakes Zurich and Sihlsee, the Sihl valley and the Muotathal valley. The Early Mesolithic site at Einsiedeln-Langrüti (Ct. Schwyz/CH; Leuzinger-Piccand 1996) is just one of the sites located along that route. Another option is the route through the Lucerne region on the Swiss Plateau, the location of an important number of Early Mesolithic open-air sites (Nielsen 2009, 670-671) close to the area of origin of the radiolarites from the Napf alluvial fan (type 632). The raw material from the Olten region (types 101, 102) probably came to the Berglibalm rock shelter by the same route. The Early Mesolithic assemblages in the Canton of Lucerne usually have noticeably high proportions of chert from the Lägern region (Nielsen 2008; Bucher 2015, 224).

The lithic assemblage at the Berglibalm site included five long-distance imports made of radiolarite (types 169, 633, 645). They attested to the hunter-gatherers' links with the Chur and Vorarlberg regions in the east and with the Ticino in the south. A further connection was evidenced by artefacts made locally from rock crystal found in the Central Alps. Further long-distance import was attested to by two microliths made from Degerfelden flint (type 349) pointing to contacts with the Upper Rhine Valley and southern Black Forest region.

Because raw materials for stone tool production were a basic commodity the Mesolithic hunter-gatherers depended upon, these supplies from far-flung places are more likely to represent movements of people rather than importation through intermediaries. The corner points reflected in these »imports« indicate the potential area the Berglibalm hunter-gatherers covered during their forays. Extending approx. 220 km from east to west and around 210 km from north to south with the Berglibalm site roughly in the middle, the area covers various landscapes with different types of resources, including the Jura region, the Swiss Plateau, the foothills of the Alps and the Alpine region itself with altitudes from 260 m to almost 3000 m a. s. l.

CULTURAL ASSESSMENT OF THE BERGLIBALM FINDS

Despite the limited size of the lithic assemblage, it is possible to make a clear statement concerning the cultural position of the finds recovered from the Berglibalm site. This is rarely the case in high-altitude sites in the Swiss Alps, as assemblages are usually small and rarely include diagnostic finds that would allow for a firm cultural assessment. The style of production observed on the blanks and the morphology of the microliths place the occupation of the Berglibalm rock shelter in the Early Mesolithic, as also confirmed by radiocarbon dates (see below).

The Early Mesolithic on the Swiss Plateau, along the Jurassic Arc and in nearby regions can be divided into two successive periods based on the range of microliths found: Beuron A-B (»älteres Frühmesolithikum«) and Beuron C (»jüngeres Frühmesolithikum«) in the German definition or »Mésolithique ancien« and »Mésolithique moyen« in the French literature. Against this background, the microliths from the Berglibalm site can be placed in the first phase of the Early Mesolithic by the presence of truncated points and isosceles triangles and the conspicuous absence of progressive forms from the following phase.

RADIOCARBON DATES

Eight charcoal samples from the Mesolithic Berglibalm site were prepared and radiocarbon dated at the AMS facility at the Laboratory of Ion Beam Physics, ETH Zurich (Hajdas 2008; Syncal/Stocker/Suter 2007). Radiocarbon ages calculated following Stuiver/Polach (1977) were then calibrated using OxCal program (Bronk Ramsey 2020) and IntCal20 calibration curve (Reimer et al. 2020).

ETH-85196: 9399 ± 30 BP, cal 8766-8563 BC, 2 sigma	(charcoal, undetermined)
ETH-82428: 9308 ± 24 BP, cal 8632-8465 BC, 2 sigma	(charcoal, undetermined)
ETH-55851: 9138 ± 37 BP, cal 8532-8278 BC, 2 sigma	(charcoal, undetermined)
ETH-63150: 9044 ± 35 BP, cal 8297-8232 BC, 2 sigma	(charcoal, *Corylus avellana*)
ETH-63685: 8912 ± 33 BP, cal 8236-7957 BC, 2 sigma	(charcoal, *Corylus avellana*)
ETH-63687: 8909 ± 47 BP, cal 8252-7855 BC, 2 sigma	(charcoal, *Ulmus* sp.)
ETH-63686: 8812 ± 33 BP, cal 8172-7740 BC, 2 sigma	(charcoal, *Prunus* sp.)
ETH-101031: 8760 ± 76 BP, cal 8182-7596 BC, 2 sigma	(charcoal, deciduous tree species undeterminable, AMS gas measurement)

In true age (i. e. solar years) this span stretches over almost 1170 years after calibration. It is possible that humans repeatedly visited the Berglibalm rock shelter over the course of about one millennium. The discrepancy between the radiocarbon and calibrated ages is due to one plateau in the calibration curve between 8200 and 7950.

In principle, the archaeological evidence does not contradict the result that Mesolithic hunter-gatherers repeatedly visited the Berglibalm site over such a long time period. However, the rather limited number of finds, especially the scarcity of retouched tools and the very low minimal number of hunted animals (see the chapter on archaeozoology), point to occasional short stays during this long period. At closer inspection of the calibrated ages, an unexpected picture emerges: the dates are grouped in pairs and could be divided into three episodes about 200-300 years apart (fig. 8). It is tempting to use this observation to support the model mentioned. Nevertheless, it is difficult to substantiate the number of visits based on the radiocarbon dates alone.

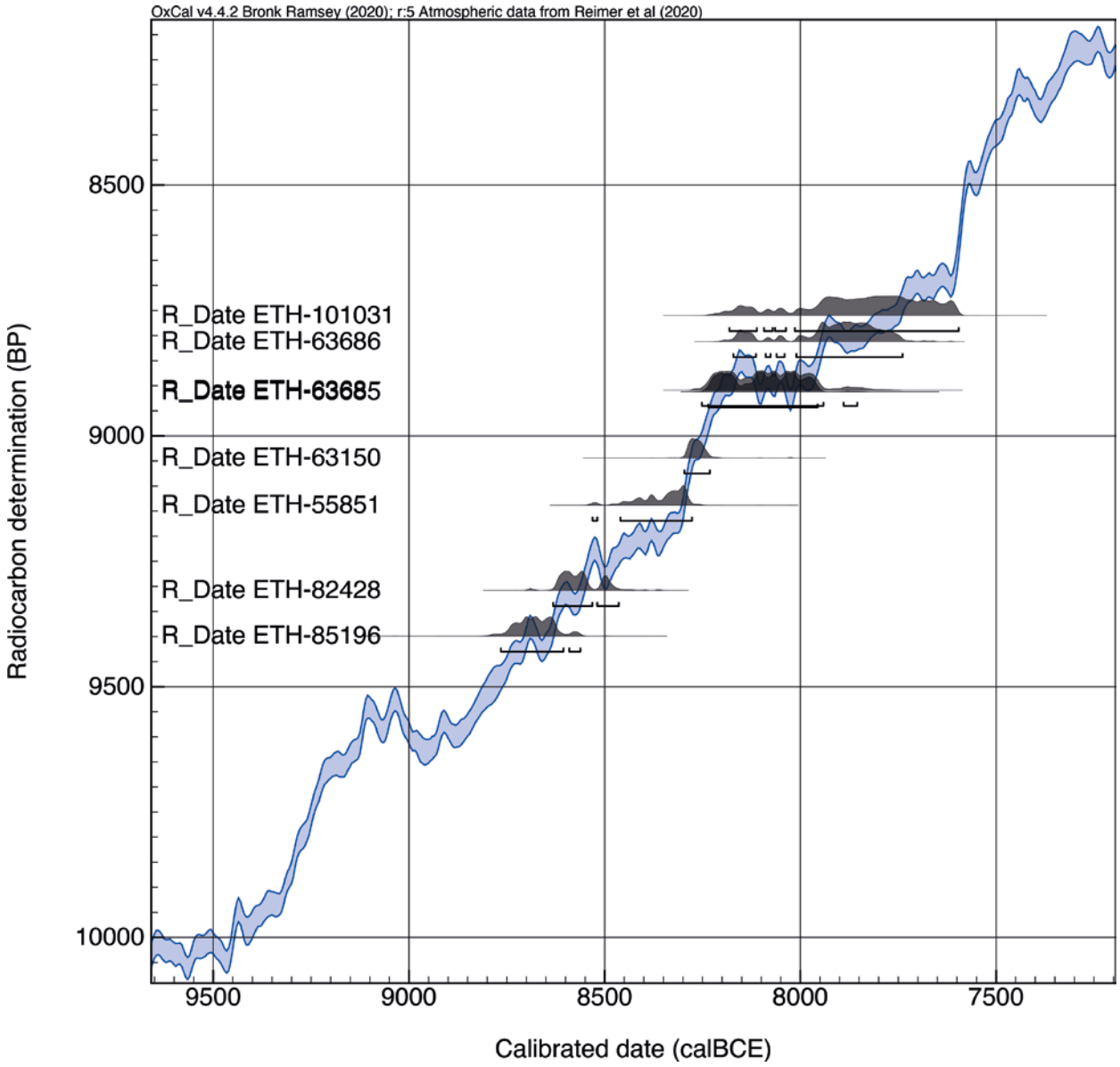

Fig. 8 Calibration of the Berglibalm radiocarbon dates using the OxCal v.4.4.2 calibration curve (Bronk Ramsey 2020; Reimer et al. 2020). – (Illustration I. Hajdas).

Considering the Berglibalm radiocarbon dates in the context of the Early Mesolithic, further conclusions are possible. Comparing 130 radiocarbon dates from the Swiss Plateau and the Jura region with a resolution of ± 1 % (i. e. the confidence interval of the date is equal to or smaller than 1 % compared to the mean age; database R. Jagher, University of Basel) provides a clearer picture. The evaluation of 61 dates from the first phase of the Early Mesolithic and 59 from its second phase allows us to pinpoint this transition to around 8800-8900 radiocarbon years ago, i. e. around 8000 years BC (Jagher et al. in prep.).

In this context, the two most recent dates from the Berglibalm rock shelter appear slightly too late compared to the overall scheme. However, given the constraints of the calibration curve mentioned above, it is perfectly acceptable to make such a contradictory observation since the prevailing conditions do not allow us to come to a more precise resolution. In conclusion, the radiocarbon evidence allows us to date the main occupations of the Berglibalm site to the very end of the first phase of the Early Mesolithic.

ARCHAEOBOTANY

Eleven charcoal samples were taken from the Mesolithic layer of the Berglibalm rock shelter for anthracological analysis. They were examined by Werner H. Schoch at the Laboratory for Ancient Wood Research (Langnau am Albis, Canton of Zurich) (Leuzinger et al. 2016, 20-21). The charcoal was relatively well preserved, and a total of 216 charcoal fragments were examined. Most of the firewood gathered during the Mesolithic period, i. e. 53 charcoal fragments, were identified as from hazel wood (*Corylus avellana*). A further 20 charcoal pieces were from maple (*Acer* sp.), 10 came from stone fruit trees (*Prunus* sp.), 2 from elm (*Ulmus* sp.) and 19 from undetermined deciduous trees. We can assume that the hunter-gatherers collected their firewood in the immediate surroundings of the Berglibalm rock shelter. Hazel, maple and elm were also found as pollen in the 9th millennium BC peat stratigraphy from Schattgaden-Moor on the Silberenalp (at 1890 m a. s. l.) and from the Bödmerenwald-Alp Tor (at 1680 m a. s. l.) in the municipality of Muotathal (Haas et al. 2013, 18-21; Sidler 2001, 51-64).

Eight macrobotanical remains, all charred, were retrieved from the mesh of the 3 mm sieve (Leuzinger et al. 2016, 20-21). They were identified as a fragment of a yew seed (*Taxus baccata*) and seven fragments of hazelnut shells (*Corylus avellana*). Hazelnuts are often found at Mesolithic sites, on the one hand because their shells are quite hard, and on the other because the oil-bearing nuts have always been gathered in large quantities as a source of food. The nuts ripen between early August and late September. If, as is quite likely, the specimens retrieved were gathered by the Early Mesolithic people near the Berglibalm site, we can assume that at least one of the visits to the rock shelter occurred during those months. It seems rather unlikely that the hunter-gatherers would have transported supplies of hazelnuts from the previous year in their shells from the lowlands to an altitude of 1140 m a. s. l. during the summer (in June or July). The yew seed is indicative of a stay in the late summer or early autumn when the berries of this conifer ripen.

ARCHAEOZOOLOGY

Bones and teeth survived in the Berglibalm rock shelter thanks to its calcareous alkaline sediment. The faunal remains were examined by Werner Müller at the archaeozoological laboratory of the University of Neuchâtel (Leuzinger et al. 2016, 22-24). The Early Mesolithic layer yielded 567 fragments of bones weighing a mere 243.6 g. Despite their strong fragmentation, the bones were well preserved, though some bore evidence of damage by roots. Charring was identified on 56 of them. Of the 567 bone fragments, 69 were determinable. Four species were firmly identified: Alpine ibex (*Capra ibex*), chamois (*Rupicapra rupicapra*), red deer (*Cervus elaphus*) and wild boar (*Sus scrofa*). The ibex had the highest representation with 18 fragments of at least two individuals, whereas the other species were represented with just one individual each. The second lower molar of one of the ibex suggests that it was around 15 months old, which would point to its death in the summer or autumn months. The small number of individuals of hunted game is further strong evidence for the intermittent and short-lived occupation of the Berglibalm site.

Intentionally shattered and burnt bones as well as fragments with cutting and scraping traces from flint tools confirm that the bones were brought into the rock shelter by the hunter-gatherers. Judging by the skeletal elements found, it can be assumed that the ibex, if not all the animals, were brought to the site as a whole.

The species identified belonged to the range of animals characteristic of the Holocene and are commonly found at other Mesolithic sites in Switzerland (e. g. Chaix 1993, 94-101). The differences in the preferred habitat of the different animals identified attest to hunting forays both in the Subalpine forests and also in the areas above the Early Holocene tree line (i. e. above 2200 m a. s. l.).

THE BERGLIBALM ROCK SHELTER AND ITS GEOGRAPHICAL AND SUBSISTENCE-ECONOMIC CONTEXT

Notwithstanding the importance of the geography of Switzerland, the Mesolithic archaeology of the Alpine region (i. e. above 1000 m a. s. l.) is still little known, despite decades of research. The scarcity of information is due to the vastness of the area, the difficult terrain, the short windows of opportunity in the summer months and the limited funding for large-scale surveys. However, the state of research has improved in recent years thanks to various investigations focused on specific landscapes (e. g. Huber/Bullinger 2010, 16. 19-21; Cornelissen/Reitmaier 2016; Mauvilly 2012). Random discoveries made by individuals or research groups have also contributed to our knowledge of Early Holocene archaeology in the Alps (e. g. Auf der Maur/Cornelissen 2013; Fricker/Leuzinger 2006; Nielsen 2009; Primas/Della Casa/Schmid-Sikimić 1992, 251-254. 263). In the case of at least 25 sites, the Mesolithic date of hearths is only confirmed by radiocarbon dates and undiagnostic lithics make it impossible to associate them with a specific cultural stage. So far, roughly the same number of sites above 1000 m a. s. l. in Switzerland date from the Early Mesolithic as from the Later Mesolithic. However, the later phase is largely evidenced by radiocarbon dates only.

Sites from the earlier phase of the Early Mesolithic contemporaneous with the Berglibalm rock shelter are well known on the Swiss Plateau and along the Jura Mountains. Confirmed sites of this period are extremely rare in the Alpine region. Intensive surveying carried out by the discoverer of the Berglibalm site in the context of speleological investigations led to the discovery of four more Mesolithic sites within the municipal territory of Muotathal: Muotathal-Steinbockhöhle (2053 m a. s. l.; **fig. 2**), Muotathal-Wunderfitz cave (2240 m a. s. l.; **fig. 2**), Muotathal-Milchbalmhöhle (1622 m a. s. l.) and Muotathal-Hüenderbalm (1460 m a. s. l.) (Imhof 2013, 34-52; Leuzinger/Imhof 2018, 23-24; Leuzinger et al. 2018). None of them yielded any lithic artefacts but all produced animal bones with cutmarks, signs of intentional breaking or traces of burning, and were radiocarbon dated. These caves indirectly showed that the Subalpine and Alpine zones in this area were occupied and regularly used as hunting grounds by Mesolithic hunter-gatherers. The Steinbockhöhle and Wunderfitz caves are both located approx. 8 km north by north-west of the Berglibalm site at a distance of about 500 m from each other. Both cave sites produced radiocarbon ages identical to the late phase of the occupation of the Berglibalm rock shelter. The bone assemblage of the Steinbockhöhle cave, which only comprised remains of ibex is a good example of a specialised hunting strategy. At the Wunderfitz cave the wild animal species were more varied and included red deer. The Wunderfitz cave dated from between 8035 and 7694 cal BC (8855 ± 70, ETH-27609) and the Steinbockhöhle cave yielded dates from between 8017 and 7680 cal BC (8815 ± 70, ETH-29331). Despite the chronological and geographical proximity, the Berglibalm rock shelter lay on the access route to a completely different landscape to its south and east with comparable resources at about the same altitude but in a more separate landscape within the catchment areas of Twärenen/Silberen, Ruosalp, Glattalp and Charetalp. Several easy to cross passes are located further to the south, which provides access to the Gotthard Massif and the upper regions of the Alpine Rhine Valley.

The Milchbalmhöhle and Hüenderbalm sites dated from a much later phase contemporaneous with the Later Mesolithic. The age of the Milchbalmhöhle finds, as determined by radiocarbon dating of a red deer bone, was between 6000 and 5710 BC (6960 ± 75, ETH-23864) (Imhof 2013). The Hüenderbalm site, whose age was determined on an ibex bone was occupied around 5710-5180 BC (6212 ± 25, ETH-80903) (Leuzinger et al. 2018, 145-147). Increased human activity is visible in the Central and Eastern Alps of Switzerland from

this period onwards. However, these observations are based almost exclusively on radiocarbon dates with very little archaeological corroboration, if any, so that cultural attributions can only be made in the most general terms.

From an ecological point of view, the altitude of the Berglibalm site at 1140 m a. s. l. is worth noting. During the Mesolithic, the landscape was densely forested with pine trees, hazel, and broadleaved trees (such as elm, lime and oak), and the tree line was located around 2200 m a. s. l. (Zoller/Haas 1995). A pollen profile recently taken at an altitude of 1980 m a. s. l. in the vicinity of the Steinbockhöhle and Wunderfitz caves at Schattgaden on Silberenalp has helped us to understand the evolution of the vegetation cover in this landscape in detail (Haas et al. 2013).

Despite the slim database, the Berglibalm site can be interpreted as a mid-altitude stopover site en route to local hunting areas at higher altitudes or even as a stopover for Alpine hunting expeditions into the Central Alps. It is evident that these areas were only accessible from spring to autumn and that the Early Mesolithic hunter-gatherers had to rely on areas at much lower altitudes during the period between late autumn and late spring. Consequently, there was a pattern of moving back and forth between the Jura Mountains and the Swiss Plateau at mid to low altitudes with seasonal use of high-altitude hunting grounds.

Similar models have been developed for the South Tyrol region in the Southern Alps (Broglio/Lanzinger 1990, 53-69; Lanzinger 1998, 125-140; Kompatscher/Kompatscher 2011, 205-241). There, links between camps in the low valleys and hunting stations high up in the Alps were established based on numerous sites throughout North and South Tyrol with differences between the raw materials and artefact compositions found at different sites. According to this model, Mesolithic hunter-gatherers roamed the low-lying regions from the autumn to the spring – and many during the summer months too (Bazzanella/Betti/Wierer 2007, 98) – whilst specialised groups took advantage of the warmer summer months to make forays into the areas above the tree line to hunt Alpine game. En route to the high mountains, convenient sites in the Montane zone (800-1200 m a. s. l.) served as rest stops or stopover sites (Kompatscher/Kompatscher 2011, 211; Walsh/Giguet-Covex 2019, 4).

Comparable but in many aspects different models of Mesolithic settlement were proposed for the south-eastern Alpine region (Fontana 2011, 302-303; Fontana/Guerreschi/Peresani 2011, 76-79; Grimaldi/Flor 2009; Cristiani/Pedrotti 2009) and for sites in Western Switzerland with an ecological and topographical setting comparable to that of the Berglibalm site (Mauvilly 2012, 40-42; Crotti/Pignat 1993, 141-142; Crotti/Curdy/Leuzinger 2004, 272-274; Crotti 2008, 170-173).

Although the data available for Central Switzerland are still quite limited compared to the other areas mentioned, the Berglibalm site still acts as an important link between the many Mesolithic open-air sites on the Central Swiss Plateau and the few Alpine hunting stations that have been found to date in the municipality of the Muotathal and the Central Alpine region in general.

No further archaeological excavations are set to take place at the Berglibalm rock shelter at this point. However, the site is monitored regularly by local volunteers to ensure that potential badger activity is spotted and appropriate action can be taken in time.

References

Affolter 2002: J. Affolter, Provenance des silex préhistoriques du Jura et des régions limitrophes 1-2. Archéologie Neuchâteloise 28 (Neuchâtel 2002).

Auf der Maur/Cornelissen 2013: Ch. Auf der Maur / M. Cornelissen, Die spätmesolithische und bronzezeitliche Fundstelle Hospental-Moos. Ein Einblick in das urgeschichtliche Urserntal. In: Spuren einer Kulturlandschaft: archäologische Untersuchungen bei Hospental 2007 und 2010. Historisches Neujahrsblatt des Kantons Uri, Neue Folge 68, 1. Reihe, 103. Heft (Altdorf 2013) 37-83.

Bazzanella/Betti/Wierer 2007: M. Bazzanella / I. Betti / U. Wierer, Mesolithic wetland exploitation at Galgenbühel/Dos de la Forca Italy, Eastern Alps. The fish fauna. In: H. Hüster Plogmann (ed.), The Role of Fish in Ancient Time. Proceedings of the 13th Meeting of the ICAZ Fish Remains Working Group in Octobre 4th-9th, Basel/Augst 2005. Internationale Archäologie: Arbeitsgemeinschaft, Symposium, Tagung, Kongress 8 (Rahden/Westf. 2007) 93-100.

Broglio/Lanzinger 1990: A. Broglio / M. Lanzinger, Considerazioni sulla distribuzione dei siti tra la fine del Paleolitico Superiore e l'inizio del Neolitico nell'Italia nord-orientale. In: P. Biagi (ed.), The Neolithisation of the Alpine Region. Natura Bresciana: Monografie 13 (Brescia 1990) 53-69.

Bronk Ramsey 2020: Ch. Bronk Ramsey, OxCal 4.4.2. http://c14.arch.ox.ac.uk/oxcal (24.8.2020).

Bucher 2015: A. Bucher, Sursee LU, Hofstetterfeld. Jahrbuch der Archäologie Schweiz 98, 2015, 224.

Chaix 1993: L. Chaix, Die Tierwelt der Alt- und Mittelsteinzeit. In: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter (SPM). I: Paläolithikum und Mesolithikum (Basel 1993) 85-103.

Cornelissen/Reitmaier 2016: M. Cornelissen / Th. Reitmaier, Filling the gap: Recent Mesolithic discoveries in the central and south-eastern Swiss Alps. Quaternary International 423, 2016, 9-22.

Cristiani/Pedrotti 2009: E. Cristiani / A. Pedrotti, Tradition and innovation between the Mesolithic and Early Neolithic in the Adige Valley (Northeast Italy). New data from a functional and residues analyses of trapezes from Gaban rockshelter. Documenta Praehistorica 36, 2009, 191-205.

Crotti 2008: P. Crotti, Le peuplement paléolithique et néolithique de la Suisse: la question de l'utilisation des étages montagnards dans les Alpes. Geographica Helvetica 63/3, 2008, 167-175.

Crotti/Pignat 1993: P. Crotti / G. Pignat, L'abri sous bloc de Château-d'Oex (VD, Suisse). Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte 76, 1993, 141-143.

Crotti/Curdy/Leuzinger 2004: P. Crotti / Ph. Curdy / U. Leuzinger, La région du Simplon (Valais) du Mésolithique à l'époque moderne. Campagne de prospection 2003. Jahrbuch der Archäologie Schweiz 87, 2004, 271-278.

Fontana 2011: F. Fontana, From Season to Season: a Revision of the Functional Status of Sauveterrian Sites in the North Eastern Sector of the Italian Peninsula and Implications for the Mobility of Human Groups. In: F. Bon / S. Costamagno / N. Valdeyron (eds), Hunting Camps in Prehistory. Current Archaeological Approaches. Proceedings of the International Symposium, May 13-15 2009, University Toulouse II – Le Mirail. Palethnology 3 (Paris 2011) 291-308.

Fontana/Guerreschi/Peresani 2011: F. Fontana / A. Guerreschi / M. Peresani, The Visible Landscape: inferring Mesolithic settlement dynamics from multifaceted evidence in the south-eastern Alps. In: M. van Leusen / G. Pizziolo / L. Sart (eds), Hidden landscapes of Mediterranean Europe. Cultural and methodological biases in pre- and protohistoric landscape studies. Proceedings of the international meeting Siena, Italy, May 25-27, 2007. BAR International Series 2320 (Oxford 2011) 71-81.

Fricker/Leuzinger 2006: H. R. Fricker / U. Leuzinger, Engelberg OW, Planggenstafel. Jahrbuch der Archäologie Schweiz 89, 2006, 217-218.

Grimaldi/Flor 2009: S. Grimaldi / E. Flor, From the mountain to the sea: an ethnographic perspective for the Early Mesolithic settlement dynamics in north-eastern Italy. In: S. B. McCartan / R. Schulting / G. Warren / P. Woodman (eds), Mesolithic horizons. Papers presented at the seventh International Conference on the Mesolithic in Europe, Belfast 2005 (Oxford 2009) 754-759.

Haas et al. 2013: J. N. Haas / N. Wahlmüller / Th. Kappelmeyer / B. Dietre / I. Hajdas / U. Leuzinger / W. Imhof, Zur Vegetationsgeschichte der Silberenalp im Muotatal SZ an Hand der paläoökologischen Untersuchung der Schattgaden-Moorsedimente. Mitteilungen des Historischen Vereins des Kantons Schwyz 105, 2013, 11-32.

Hahn 1991: J. Hahn, Erkennen und Bestimmen von Stein- und Knochenartefakten. Einführung in die Artefaktmorphologie. Archaeologica Venatoria 10 (Tübingen 1991).

Hajdas 2008: I. Hajdas, Radiocarbon dating and its applications in Quaternary studies. Die Radiokohlenstoffmethode und ihre Anwendung in der Quartärforschung. Eiszeitalter und Gegenwart – Quaternary Science Journal 57/1-2, 2008, 2-24.

Hajdas et al. 2007: I. Hajdas / G. Bonani / H. Furrer / A. Mäder / W. Schoch, Radiocarbon chronology of the mammoth site at Niederweningen, Switzerland: Results from dating bones, teeth, wood, and peat. Quaternary International 164/165, 2007, 98-105.

Huber/Bullinger 2010: R. Huber / J. Bullinger, Neue Territorien in Sicht! Wildbeutergesellschaften der Alt- und Mittelsteinzeit. Archäologie Schweiz 33/2, 2010, 15-21.

Imhof 2013: W. Imhof, Die ersten Muotataler. Spuren ur- und frühgeschichtlicher Jäger und Hirten aus Höhlen und Balmen (Schwyz 2013).

Jagher/Fischer/Morel 1997: R. Jagher / M. Fischer / Ph. Morel, Altwasser-Höhle 1: eine spätpaläolithische Jagdstation auf 1410 m ü. M. im südöstlichen Alpstein AI. Archäologie Schweiz 20/1, 1997, 2-8.

Jagher et al. in prep.: R. Jagher et al., Chronology of Late Pleistocene and early Holocene societies in the catchment of the Jurassic Arch (in prep.).

Kompatscher/Kompatscher 2011: K. Kompatscher / N. M. Kompatscher, Mittelsteinzeitliche Fernverbindungen über den Alpenhauptkamm. In: D. Schäfer (ed.), Mensch und Umwelt im Holozän Tirols 1. Das Mesolithikum-Projekt Ullafelsen (Teil 1) (Innsbruck 2011) 205-241.

Lanzinger 1998: M. Lanzinger, Sistemi di insediamento mesolitico come adattamento agli ambienti montani alpini. In: S. K. Kozlowski / C. Tozzi (eds), The Mesolitic. Proceedings of the XIII UISPP Congress, 8-14 septembre 1996 (Forli 1998) 125-140.

Le Brun-Ricalens 2012: F. Le Brun-Ricalens, Ausgesplitterte Stücke, Kenntnisstand nach einem Jahrhundert Forschung. In: H. Floss (ed.), Steinartefakte. Vom Altpaläolithikum bis in die Neuzeit (Tübingen 2012) 439-454.

Leuzinger/Imhof 2018: U. Leuzinger / W. Imhof, Von Steinzeitjägern und Laubsammlern – archäologische Untersuchungen in der Gemeinde Muotathal. Mitteilungen des Historischen Vereins des Kantons Schwyz 110, 2018, 23-33.

Leuzinger et al. 2016: U. Leuzinger / J. Affolter / C. Beck / S. Benguerel / M. Cornelissen, / R. Gubler / J. N. Haas / I. Hajdas / W. Imhof / R. Jagher / C. Leuzinger / C. Leuzinger / Ph. Leuzinger / W. Müller / Ch. Pümpin / S. Scandella / T. Scandella / W. H. Schoch / M. Warburton, Der frühmesolithische Abri Berglibalm im Bisistal, Gemeinde Muotathal SZ. Jahrbuch der Archäologie Schweiz 99, 2016, 7-26.

2018: U. Leuzinger / I. Hajdas / W. Imhof / C. Leuzinger-Piccand / W. Müller /W. H. Schoch, Knochen, Karst und Kohle – Archäologische Prospektion 2017 in der Gemeinde Muotathal SZ. Jahrbuch der Archäologie Schweiz 101, 2018, 145-151.

Leuzinger-Piccand 1996: C. Leuzinger-Piccand, Einsiedeln SZ-Langrüti: eine spätmagdalénienzeitliche und mesolithische Freilandstation in den Voralpen. Grabungsbericht und Sammlungsstudie. Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte 79, 1996, 7-26.

Mauvilly 2012: M. Mauvilly, Das Mesolithikum im Kanton Freiburg: Bilanz nach 10 Jahren Forschung. In: A. Boschetti-Maradi / A. de Capitani / S. Hochuli (eds), Form, Zeit und Raum. Grundlagen für eine Geschichte aus dem Boden. Festschrift für Werner E. Stöckli zu seinem 65. Geburtstag. Antiqua 50 (Basel 2012) 37-45.

Nielsen 2008: E. H. Nielsen, Hitzkirch LU, Richensee, Interkantonale Polizeischule. Jahrbuch der Archäologie Schweiz 91, 2008, 166.

2009: E. H. Nielsen, Paläolithikum und Mesolithikum in der Zentralschweiz: Mensch und Umwelt zwischen 17000 und 5500 v. Chr. Archäologische Schriften Luzern 13 (Luzern 2009).

Primas/Della Casa/Schmid-Sikimić 1992: M. Primas / Ph. Della Casa / B. Schmid-Sikimić, Archäologie zwischen Vierwaldstättersee und Gotthard. Siedlungen und Funde der ur- und frühgeschichtlichen Epochen. Universitätsforschungen zur Prähistorischen Archäologie 12 (Bonn 1992).

Reimer et al. 2020: P. J. Reimer et al., The IntCal20 northern hemisphere radiocarbon age calibration curve (0-55 cal kBP). Radiocarbon 2020. DOI: 10.1017/RDC.2020.41.

Reitmaier et al. 2016: Th. Reitmaier / M. Seifert / Ch. Walser / Ch. Auf der Maur / L. Reitmaier-Neaf, Spätmesolithischer Bergkristallabbau auf 2800 m Höhe nahe der Fuorcla da Strem Sut (Kt. Uri/Graubünden/CH). Arch. Korrbl. 46, 2016, 133-148.

Sidler 2001: C. Sidler, Spätglaziale und holozäne Vegetationsgeschichte des Bödmerenwaldes, Gemeinde Muotathal/SZ (Pollenanalyse). Berichte der Schwyzerischen Naturforschenden Gesellschaft 13, 2001, 51-64.

Stuiver/Polach 1977: M. Stuiver / H. A. Polach, Discussion: Reporting of ^{14}C data. Radiocarbon 19/3, 1977, 355-363.

Syncal/Stocker/Suter 2007: H. A. Syncal / M. Stocker / M. Suter, MICADAS: A new compact radiocarbon AMS system. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms 259, 2007, 7-13. DOI: 10.1016/j.nimb.2007.01.138.

Walsh/Giguet-Covex 2019: K. Walsh / Ch. Giguet-Covex, A History of Human Exploitation of Alpine Regions. Encyclopedia of the World's Biomes. Elsevier. 1-19. DOI: 10.1016/B978-0-12-409548-9.11908-6.

Zoller/Haas 1995: H. Zoller / J. N. Haas, War Mitteleuropa ursprünglich eine halboffene Weidelandschaft oder von geschlossenen Wäldern bedeckt? Schweizerische Zeitschrift für Forstwesen 146/5, 1995, 321-354.

Zusammenfassung / Summary / Résumé

Der mesolithische Abri Berglibalm (Muotathal, Ct. Schwyz/CH)

Die Fundstelle Berglibalm befindet sich in der Gemeinde Muotathal im Bisistal auf 1140 m ü. M. Die Grabungsflächen von 2015 und 2019 umfassen insgesamt 5 m^2 und legten eine frühmesolithische Schicht aus der Zeit von 8766 bis 7596 v. Chr. frei. Die vorhandene Holzkohle belegt Hasel und Ahorn als bevorzugtes Brennmaterial. Daneben kamen viele gut erhaltene Faunenreste, wenige botanische Makroreste sowie ein lithisches Inventar mit 535 Artefakten, darunter 15 Mikrolithen, zum Vorschein. Die Rohmaterialanalyse bezeugt, dass die Jäger und Sammler lokale und regionale Rohstoffe wie Ölquarzit bevorzugten. Einige fernimportierte Artefakte zeigen aber auch Kontakte in die Region Chur und ins Vorarlberg im Osten, ins Tessin im Süden sowie in die Gegend Oberrhein bzw. südlicher Schwarzwald im Norden. Der Abri diente als Lagerplatz für mittelsteinzeitliche Jäger, die im hinteren Bisistal Jagd auf Steinbock, Gämse, Hirsch und Wildschwein machten.

The Mesolithic Berglibalm Rock Shelter (Muotathal, Ct. Schwyz/CH)
The Berglibalm rock shelter is located in the municipality of Muotathal in the Bisistal valley at an altitude of 1140 m a. s. l. The areas excavated in 2015 and 2019 measured 5 m^2 and yielded the remains of an Early Mesolithic layer dating from around 8766 to 7596 BC. The charcoal concentrations recorded showed that hazel and maple were the main species used for firewood. The excavation also unearthed many well-preserved faunal remains, a small quantity of plant macrofossils and a lithic assemblage comprising 535 artefacts including 15 microliths. The raw material analysis revealed that the hunter-gatherers preferred local and regional raw materials including fine-grained quartzite (»*Ölquarzit*«). Some long-distance imports attested to contacts to the Chur and Vorarlberg regions in the east, the Ticino in the south and the Upper Rhine Valley or southern Black Forest region in the north. The rock shelter served as a campsite for Mesolithic hunters targeting ibex, chamois, deer and wild boar deep in the Bisistal valley.

La Berglibalm (Muotathal, Ct. Schwyz/CH), un abri sous roche mésolithique
La Berglibalm est un abri sous roche mésolithique situé dans la vallée du Bisistal (commune de Muotathal), à 1140 m d'altitude. La surface fouillée en 2015 et 2019, couvrant 5 m^2, a livré une couche du Mésolithique ancien datée d'environ 8766 et 7596 av. J.-C. On y recense des concentrations de charbons de bois – le noisetier et l'érable comme combustibles principaux. Le site a livré de nombreux restes de faune bien conservés, quelques macrorestes botaniques, ainsi qu'une industrie lithique comprenant 535 artefacts, dont 15 microlithes. L'analyse de la matière première révèle que les chasseurs-cueilleurs portaient leur dévolu sur les roches dures d'origine locale et régionale, comme le quartzite à grain fin (»*Ölquarzit*«). Quelques artefacts importés sur de grandes distances indiquent cependant des contacts avec la région de Coire et jusqu'au Vorarlberg à l'est, au Tessin vers le sud, et dans la région du cours supérieur du Rhin ou de la Forêt Noire en direction du nord. L'abri servait de campement à des chasseurs mésolithiques en quête de bouquetins, chamois, cerfs et sangliers des régions d'altitude du haut de la vallée du Bisistal.

Schlüsselwörter / Keywords / Mots clés

Frühmesolithikum / alpine Archäologie / Radiokarbondaten / Rohmaterialanalyse
Early Mesolithic period / alpine archaeology / radiocarbon dates / raw material analysis
Mésolithique ancien / archéologie alpine / dates radiocarbones / analyse de la matière première

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