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RAW MATERIAL AND HABITAT – THE FORMATION OF REGIONAL HABITATS DURING THE LATE GLACIAL. TWO CASE STUDIES: THE NEUWIED BASIN (RHEINLAND-PFALZ, GERMANY) AND LE MAS D'AZIL (ARIÈGE, FRANCE)

Abstract

Significant changes in the composition of lithic raw material spectra can be observed in the stratigraphy of sites along the northern edge of the French Pyrenees, from the late Pleniglacial to the Late Glacial Interstadial. This can be illustrated in particular at the site of Troubat (Hautes-Pyrenees; Lacombe, 1998a, 1998b) and in the stratigraphic sequence on the left river terrace of the tunnel-cave of Le Mas d'Azil (Ariège, Kegler, 2007). Both sites show a change, from the use of large proportions of exogenous lithic raw materials – mainly from the Périgord, the Dordogne and the French Mediterranean – during the Magdalenian period, to an almost exclusively local and regional exploitation of raw materials during the Azilian period. The ratio of exogenous to local raw materials is almost completely reversed (Kegler, 2007). From the end of the Pleniglacial to the Late Glacial period, this phenomenon can also be observed at other sites in this region, as well as in other regions of Europe, where lithic raw materials are naturally accessible to a limited extent or in low quality only. Another example of such a development in Central Europe is the well-studied region of the Middle Rhine Area, more specifically, the Neuwied Basin. The raw material spectra of the Magdalenian sites of Gönnersdorf and Andernach are dominated by exogenous silices from the north and northwest, respectively (Floss and Terberger, 2002). In contrast, local and regional raw materials (up to 20 km in the vicinity) predominate in almost all known Late Glacial sites attributed to the *Federmessergruppen* (Floss, 1994; Gelhausen, 2011; Street et al., 2006).

Keywords

Magdalenian, Azilian, *Federmessergruppen*, raw material procurement, regional territories

INTRODUCTION

In 1994, three students under the direction of the Archaeological Heritage Mangement of Rhineland-Palatinate in Koblenz, together with the excavation technician Manfred Neumann, took over supervision of an excavation on the Martinsberg in the city of Andernach. Not far from there, the first evidence of an Ice Age site in the region was provided by Hermann Schaaffhausen in 1883 (Schaaffhausen, 1888). The site became known nationwide as containing one of the first evidences of Ice Age art in Central Europe – a bird carved from antler. Between 1979 and 1983, the first regular excavations were carried out to the immediate southwest of Schaaffhausen's 1883 trench. This site was consequently named Andernach 2, and it revealed two superimposed Palaeolithic horizons (Veil, 1982), the lower attributed to the Magdalenian and the upper to the Late Glacial curve-backed point industries or *Federmessergruppen*. As a new building was planned to be constructed nearby in the Roonstrasse, our excavation started in 1994 as an emergency excavation. Our fieldwork finished in 1996, and resulted in the documentation of a further Magdalenian concentration and the spatial continuation of the *Federmesserguppen* horizon (Andernach 3; Bergmann and Holzkämper,

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Fig. 1 Location of the French Pyrenees with the site Le Mas d'Azil and the Neuwied Basin. – (Graphic: J.F. Kegler).

2002; Holzkämper, 1996; Kegler, 2002). However, the intended new building was not constructed immediately, and in 2006 a fourth archaeological campaign was realised at the site (Krahl and Maier, 2020).
The excavation technique employed between 1994 and 1996 was based on Martin Street's many years of experience, as he was responsible for the technical execution of the excavations between 1979 and 1983. The long cooperation in the former research period at the *Forschungsbereich Altsteinzeit* of the Römisch-Germanisches Zentralmuseum, Mainz, developed into a collegial cooperation in which the two jubilarians played a significant role with their profound knowledge, combined with English charm. An example of Martin Street's multifaceted scientific oeuvre is a paper published together with the MONREPOS team, entitled "*L'occupation du bassin de Neuwied par les Magdaléniens et les groupes à Federmesser*" (Street et al., 2006). This closes the circle for the author of this contribution, because the examination of material from the *Federmessergruppen* of Andernach 3 (Kegler, 1999, 2002) turned into a doctoral thesis on the eponymous site of the Azilian at Le Mas d'Azil in the French Département Ariège (Kegler, 2007) (Fig. 1).

THE NEUWIED BASIN "REGION"

The Neuwied Basin – a geomorphological depression in the Middle Rhine Valley, which is otherwise characterised by the low mountain ranges of the Eifel, Hunsrück, Siebengebirge, Westerwald and Taunus – provides a unique situation for the preservation of Pleistocene and Late Pleistocene sites (Fig. 2). Due to the eruption of the Laacher See volcano some 13,000 yrs cal BP (cf. Reinig et al., 2020), large parts of the landscape were partly buried by massive deposits of pumices and ignimbrites. The discovery of the Magdalenian site of Gönnersdorf (Bosinski, 1979) at the end of the 1960s led to a lively research exploration into the Palaeolithic archaeology of the region. In the course of this, the Magdalenian site of Andernach-Martinsberg was rediscovered and party excavated (Veil, 1982). Late Palaeolithic *Federmessergruppen* sites such

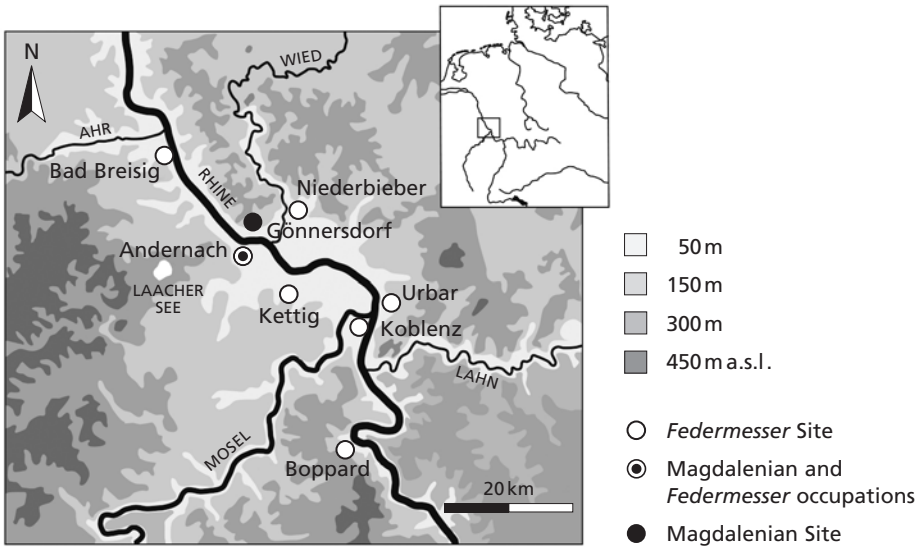
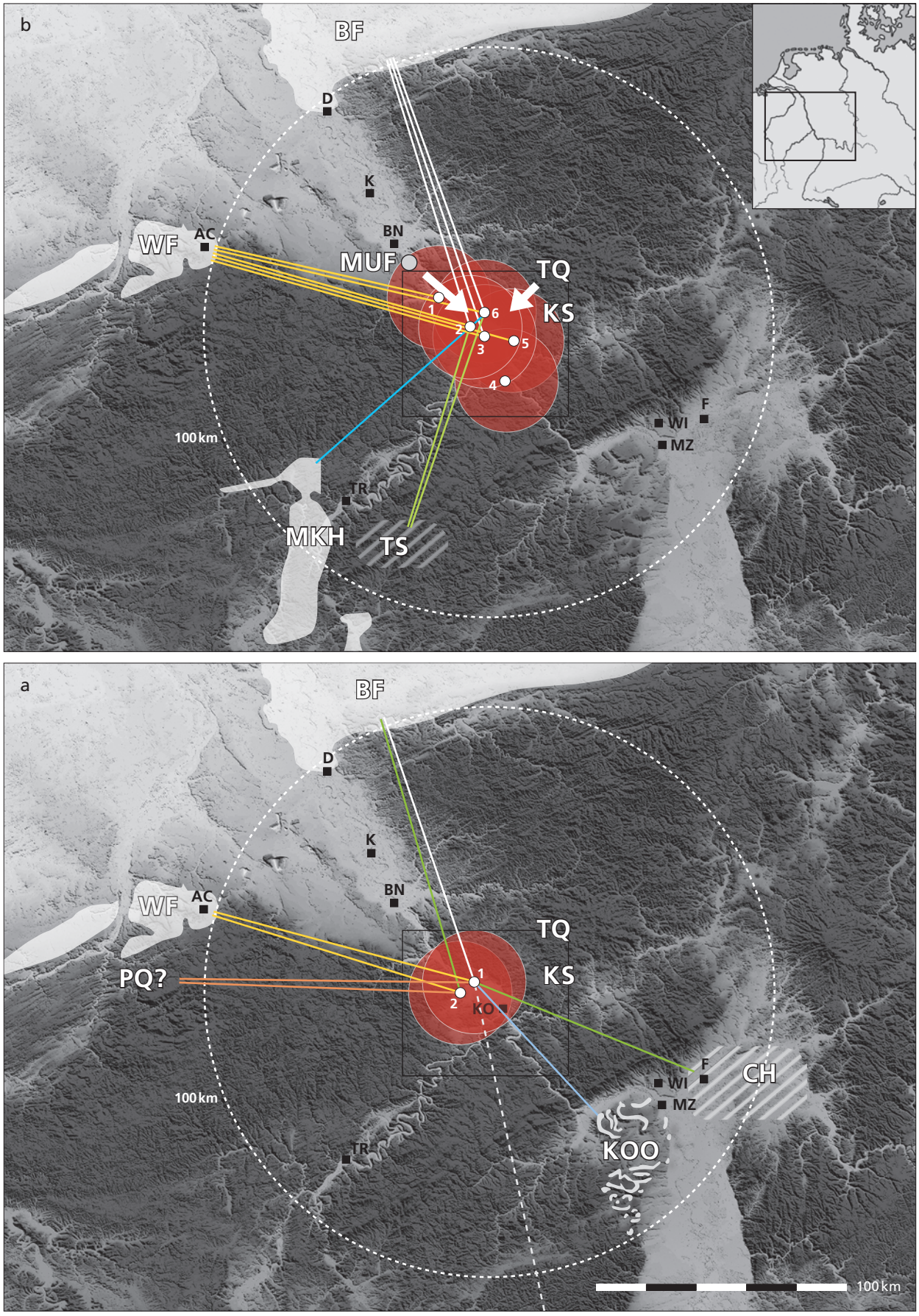


Fig. 2 Location of the Magdalenian and *Federmesser* sites in the Neuwied Basin. – (Graphic: J.F. Kegler; modified from Street et al., 2006).

as the upper horizon of Andernach (Bolus and Street, 1985) and several new sites at Niederbieber (Bolus, 1992; Gelhausen, 2011), Kettig (Baales, 2002), Urbar (Baales et al., 1998) and, at a somewhat further distance, the sites of Bad Breisig (Grimm, 2004) and Boppard (Wenzel, 2004) were discovered and excavated. Furthermore, individual fireplaces assigned to the Late Palaeolithic indicate ephemeral, short-term stays in the Neuwied Basin (von Berg, 1994). As all these sites have already been extensively acknowledged in the literature (e. g., Street et al., 2006), their in-depth presentation is not intended here. Chronologically, two main phases are represented in the region, comprising the two large Magdalenian settlement sites of Gönnersdorf and Andernach, which were settled during the end of the Pleniglacial around 15,700 cal BP (Stevens et al., 2009), and the above listed sites of the *Federmessergruppen,* which date into the Late Glacial Allerød interstadial, at about 13,800 to 12,800 cal BP. Less well documented is the period in-between, in which the find concentration of Gönnersdorf-Südwest (Buschkämper, 1993), the site of Neuwied-Irlich (Baales, 2002) and, some 30 km to the north, the site of Bonn-Oberkassel (Baales and Street, 1998), date. The latter three sites date to ca. 14,700-13,800 cal BP and are characterised by a small find scatter at Gönnersdorf and by the burials at Neuwied-Irlich and Bonn-Oberkassel.

Common to the sites assigned to the two major periods of settlement is the presence of a rich lithic inventory, composed of numerous blanks and tools. The lithic raw materials had been brought to the sites in order to be processed or further used. In 1994, Harald Floss provided the essential basis for the characterisation of the different types of raw material used. This makes it possible to differentiate between raw material types and the localities they originate from at the fine scale. With the exception of certain silicified quartzites ("tertiary quartzite") and silicified slates ("siliceous slate"), the Neuwied Basin is a region where no raw materials of sufficiently good quality are available (Floss, 1994). In order to be able to produce tools, following the characteristic reduction sequences of each period (i. e., the Magdalenian and the *Federmessergruppen*), qualitatively suitable raw materials had to be imported into the Neuwied Basin from outside. The general picture that can be sketched from these data, allows us to conclude on the extent and type of the land-use of (late) Pleistocene groups. In most cases, the lithic find concentrations within each site were examined individually. For Gönnersdorf, these are the concentrations K-I to K-IV and Gönnerdorf-Südwest,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and for Andernach the concentrations C-I to C-IV. From the younger period, 23 lithic concentrations from the above-mentioned *Federmessergruppen* sites are available, and have been studied (Street et al., 2006: 765 f.).

The Magdalenian sites of Gönnersdorf and Andernach, which are considered as base camps in a differentiated subsistence system, show quite similar raw material spectra (**Fig. 3: a**). The concentrations are mainly dominated by raw materials from the north-west. In Andernach this consists of Western European Flint (WF), from the region around Aachen and the so-called Palaeozoic Quartzite (PQ). From Gönnersdorf on the opposite side of the Rhine River, significant amounts of Baltic flint (BF) from the north are also recorded. In addition, silices such as *Kieseloolite* (KOO) and chalcedony (CH) from the Mainz Basin were used. The latter indicated a south-eastern origin. Despite the proximity to local raw materials, such as silicified slates (KS) and tertiary quartzite (TQ), these materials are only represented in marginal amounts (Street et al., 2006: 753 f.).

During the *Federmessergruppen*, however, the general pattern of raw material procurement was reversed compared to the pattern described for the Magdalenian (**Fig. 3: b**). *Federmessergruppen* find concentrations are dominated by local and regional raw materials. These are tertiary quartzites, siliceous schist, and a specific type of chalcedony from an outcrop at Bonn-Muffendorf, which is located about 35 km northwest of the Neuwied Basin. The individual concentrations of the *Federmesser* sites consist almost exclusively of a single type of raw material, so that it is assumed that only this material was brought in and processed locally. Two unprocessed raw material units of Muffendorf chalcedony in the middle of Niederbieber concentration XV indicate the import of this material (Gelhausen, 2011: 24, 204 f.).

The significantly lower proportions (volumes) of exogenous raw materials illustrate supra-regional contacts between the settlements of the *Federmessergruppen* within the Neuwied Basin and other (previously unknown) sites in mostly northern or north-western direction.

In summary, a clear link to exogenous raw materials is evident for the Magdalenian sites of Gönnersdorf and Andernach in the Neuwied Basin. The very good quality of the imported raw materials is characteristic; it was essential for reduction concepts that focused on the production of regular blades as blanks for tool production. In contrast, the 23 *Federmessergruppen* find concentrations from the Neuwied Basin, give a different picture: All known concentrations are largely dominated by local raw materials. They can be divided into three groups. The first two (concentrations Niederbieber I, III, IV, V, VI, VIII, IX, X, XII, XIII, XVII, XVIIa, Andernach 3, Bad Breisig and Urbar; Street et al., 2006: 769) are represented by eight find concentrations each. They are characterised by the locally available tertiary quartzite (first group) or by the regionally available chalcedony from Bonn-Muffendorf (second group). These two groups are followed by a third group of seven find concentrations (Niederbieber II, VII, XI, XIV, XVI, Kettig and Andernach 2; Street et al., 2006: 769) that show more diverse raw material spectra. Four concentrations of the latter group show high frequencies of exogenous materials imported from the north and north-west. Investigations into the seasonality of the hunted game from all *Federmesser* sites in the region indicate a more 'sedentary' faunal profile, consisting of temperate climate fauna which would have been present in the local region throughout the year (Street et al., 2006: 763).

Fig. 3 Raw material procurement in the Neuwied Basin (after Street et al., 2006: 766, Fig. 7). The lines show the main import directions. **a** Magdalenian of Gönnersdorf (**1**) and Andernach (**2**). – **b** *Federmessergruppen* sites of Bad Breisig (**1**), Andernach (**2**), Kettig (**3**), Boppard (**4**), Urbar (**5**), Niederbieber (**6**). – Arrows: regional import of Muffendorf chalcedony and tertiary quartzite. Small circles: 20 km distance around the sites. A ~ 100 km circle around the centre of the Neuwied Basin is shown for comparison. – BF Cretaceous "Baltic" flint from moraine deposits; KS indurated shale; TQ Tertiary quartzites; CH chalcedony; KOO indurated oolites; TS argillaceous shale; MKH Triassic cherts (*Muschelkalkhornstein*); PQ "Paleozoic" quartzite; WF Cretaceous flint from chalk or reworked in fluvial terraces; Muf Muffendorf chalcedony. AC Aachen; BN Bonn; D Düsseldorf; F Frankfurt am Main; K Cologne; KO Coblence; MZ Mainz; TR Trier; WI Wiesbaden. – (Graphic: J.F. Kegler).

Fig. 4 Entrance of the impressive Grotte du Mas d'Azil (Ariège) with a length of ~450 m and a portal height of ~60 m and width of 50 m. – (Photo: J.F. Kegler).

LA GROTTE DU MAS D'AZIL, ARIÈGE

The cave of Mas d'Azil in the department of Ariège, on the northern edge of the French Pyrenees, is one of the most impressive natural monuments of France (**Fig. 4**). It is famous for its large galleries on the right bank of the Arize River, which streams directly through the cave. Many of the most impressive Magdalenian art objects originate from this site. The left bank river terrace of the Arize has also yielded famous artefacts, namely the engraved and painted pebbles which were found here (Couraud, 1985). The Mas d'Azil cave was the subject of several archaeological excavations from a very early date. The pioneering work of Edouard Piette at the end of the 19th century deserves special mention: between 1887 and 1891, Piette excavated in the karst galleries on the right bank, and on the river terrace on the left bank of the Arize. He summarised the finds made on both banks of the river in his classification of the Late Upper Palaeolithic and of the Final Palaeolithic in his so-called "*Phase de Transition*" (Piette, 1889, 1891, 1895a, 1895b). The "*Phase de Transition*" defined for the first time in research history the transition between the Palaeolithic cultures of the Ice Age and the Holocene Neolithic cultures in France. A few years later, Piette's pupil Henri Breuil also worked in the cave of Mas d'Azil, and discovered the first rock engravings in the gallery which, years later, was named after him (Bégouën and Breuil, 1912). Until the 1930s and 1940s new regular excavations were carried out by the Péquart family. They confirmed Piette's stratigraphy on the left bank and discovered the late Magdalenian *Galerie des Silex* on the right bank, which they excavated shortly before and during the Second World War (Péquart and Péquart, 1936, 1937, 1939, 1941a, 1941b, 1960, 1961, 1962, 1963).

The archaeological work of Piette and of the Péquarts on the left bank exposed several Magdalenian horizons, separated from each other by sterile layers of silt. Superimposed layers with Neolithic and younger finds sealed two layers from Piette's transitional period. Edouard Piette defined the lower of the two layers as "*Azilien*", named after the cave (Piette, 1895c), and the upper as "*Arisien*" (Piette, 1903). Piette based the definition of the Azilian on its characteristic backed points, short scrapers, engraved or red-painted pebbles, harpoons made of red deer antler, and the presence of red deer as the dominant hunting game

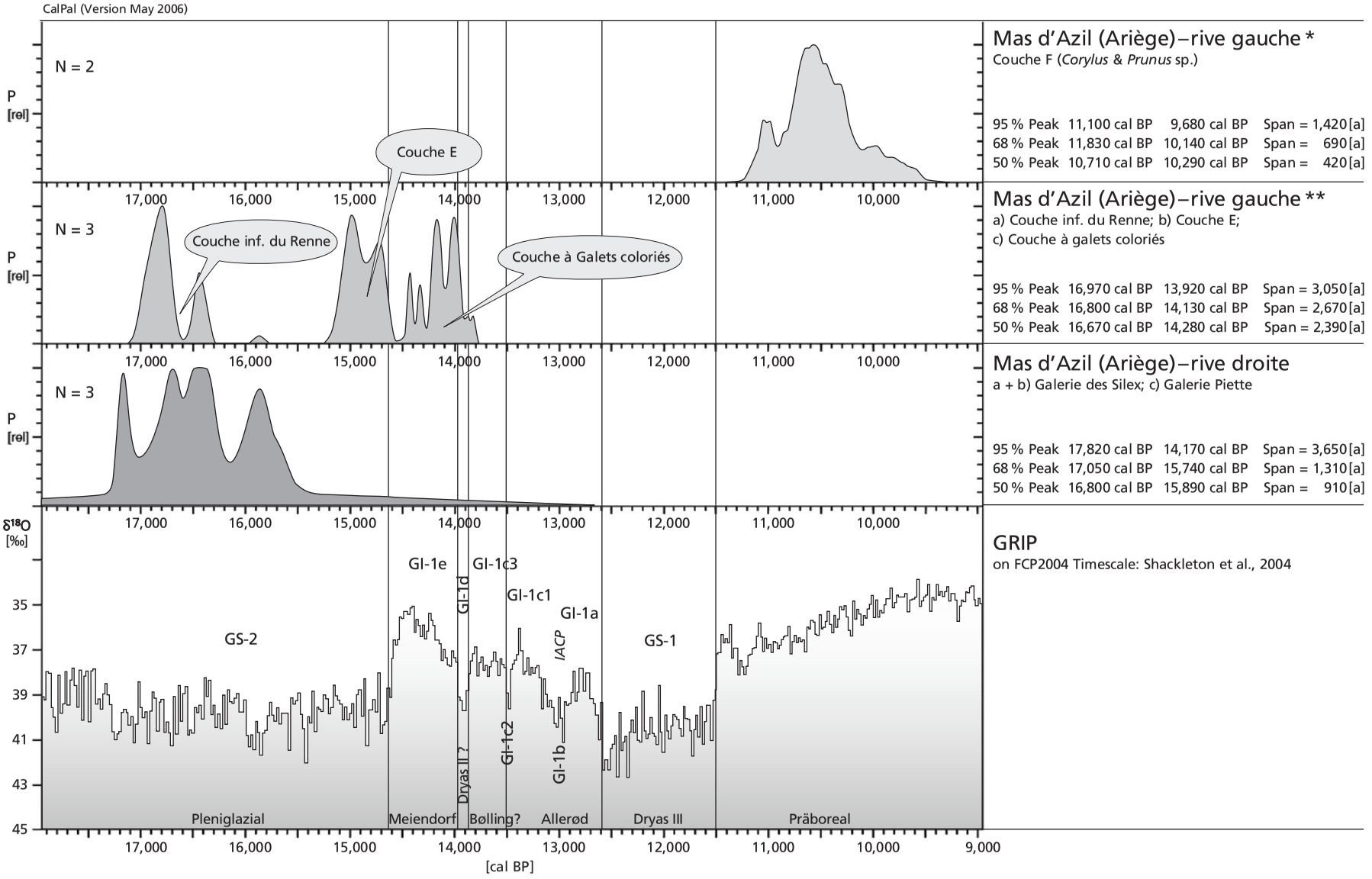


Fig. 5 Calibrated radiocarbon dates from the site of Le Mas d'Azil (Ariège). Dates from the *rive droite* after Alteirac and Bahn (1982). *AMS ^{14}C measuremnts (Dynamitron-Tandem-Laboratorium, Ruhr-Universität Bochum). **Conventional ^{14}C measurements (Cologne Laboratory for age determination). Radioocarbon dates calibrated with glacial calibration dataset <CalPal 2005 sfcp> (Weniger and Jöris, 2004). Correlation with the δ^{18}O-record of the GRIP Greenland ice core project (modified from Shackleton et al., 2004). – (Graphic: J.F. Kegler).

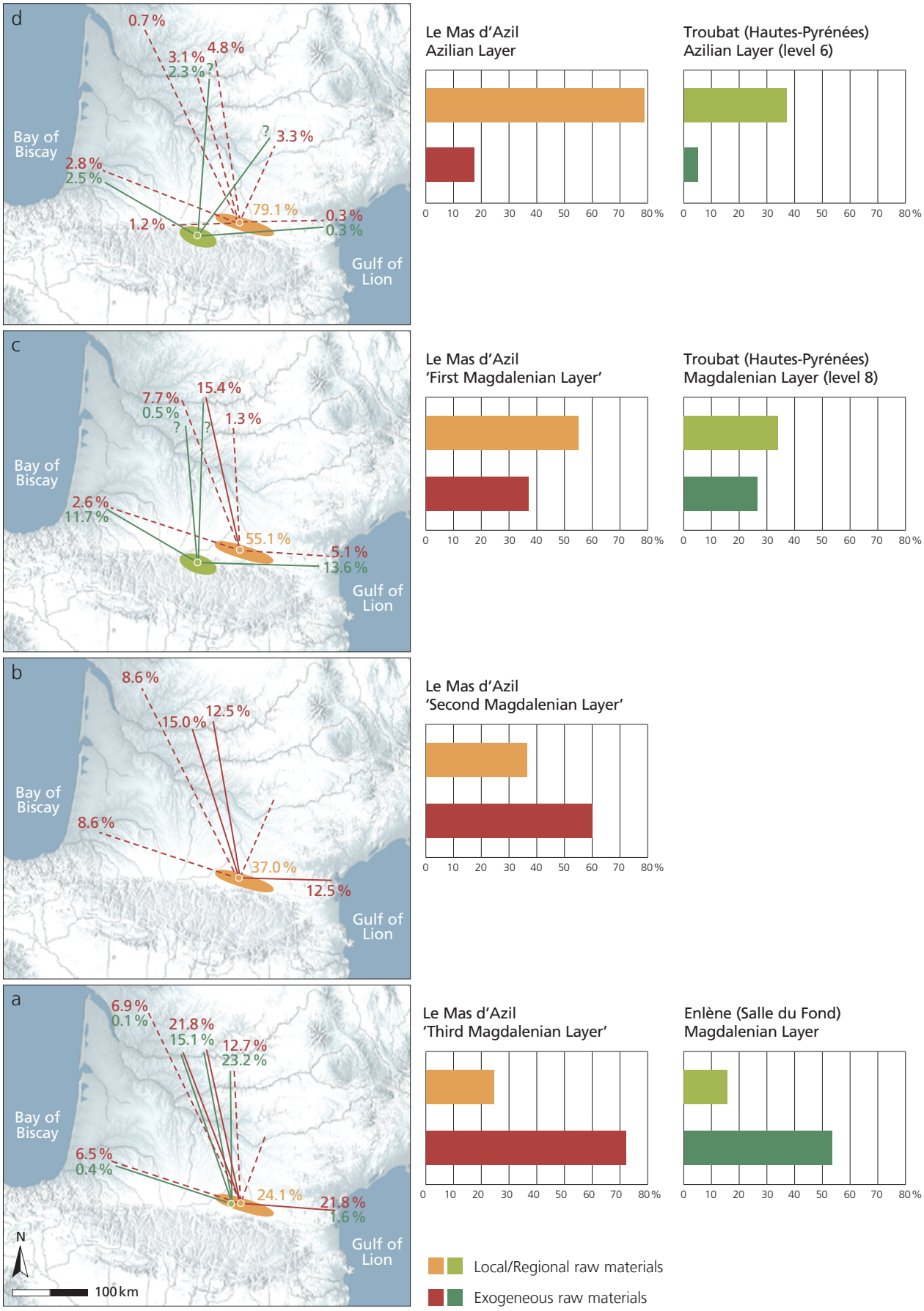
(Piette, 1895c). In analysing this "*Phase de Transition*", Edouard Piette was one of the first researchers who combined typological aspects with palaeoclimatic information derived from the fauna he found in the stratigraphic sequence. Today, the *Azilien* refers to a backed point industry at the end of the last glacial period between ~14,300 and 11,600 cal BP. It comprises the climatic phases of the Late Glacial Interstadial and the Younger Dryas period. For the transition from the preceding Magdalenian to the Azilian the term of "Azilianisation" finds widespread use in current French research (Bodu and Valentin, 1997).

Unfortunately, the basic information regarding the exact sequence of deposits on the left bank at Le Mas d'Azil can only be reconstructed from the literature, that was published between 1889 and 1907 by Piette and by the Péquart family in the 1930s and 1940s. The information available from these early sources is quite contradictory. As a reference for the origin of the eponymous find material of the *Azilien*, the sequence of layers from the "*Hiatus et Lacune*" publication (Piette, 1895c) has been used so far. One of the main questions was to reconstruct to what extent the material of the collections in the museums could be re-assigned to the original layers, as found by Piette (Kegler, 2007). With the help of a Harris Matrix, the available geological and archaeological information was linked to each other in order to clarify the temporal relationships between the individual layers. This allowed a comprehensive reconstruction of the sequence on the left river bank. Without going into the details, the sometimes-contradictory information on the individual stratigraphic sequences could be collated, and the find material from collections stored in different museums could be assigned to these layers. As a result, a succession of three Magdalenian horizons overlain by an Azilian find horizon can today be analysed in more detail.

Until now, radiometric dates have only been provided from the sequence on the right bank at Le Mas d'Azil (Alteirac and Bahn, 1982). Only recently were the first series of animal bone samples from three layers of the *rive gauche* radiocarbon dated at the Cologne laboratory for age determination (**Fig. 5**; Kegler, 2007: 158 ff.). For the lowest of the three Magdalenian horizons (*Couche inférieur du Renne*) a ^{14}C date of 13,300 ± 70 ^{14}C BP (16,670 ± 60 cal BP; KN-5590) was produced, placing this horizon into the outgoing pleniglacial. With an age of 12,580 ± 85 ^{14}C BP (14,880 ± 180 cal BP; KN-5591) the archaeologically sterile clay layer (*Couche E*) directly below the Azilian dates to the beginning of the Late Glacial Interstadial (i. e., *Interstade du Tardiglaciare*). The ^{14}C date for the Azilian *Couche à Galets* confirms the successive sequence of the stratigraphy, resulting in the ^{14}C age of 12,130 ± 70 ^{14}C BP (14,200 ± 180 cal BP; KN-5592). The latter date, however, appears somewhat too old compared to the general development of the Azilian in the region and corresponds more closely to the dates available for the regional Final Magdalenian. The stratigraphic sequence at the *rive gauche,* although limited due to early discovery and excavation, presents insights into the cultural transition into the early Late Glacial interstadial.

Due to its geological past, France is a country rich in varied flint deposits that formed in different geological eras and facies. French research has therefore a strong focus on tracing the siliceous rocks used in different archaeological periods. In particular, Robert Simonnet (1981, 1985, 1996, 1998, 1999, 2002, 2003) and Sébastian Lacombe (1998a, 1998b) have recently worked on raw materials and their areas of origin from sites in the Pyrenean region. Their publications are basic for the raw material analysis at Le Mas d'Azil. Due to the uplift of the Pyrenees in the Tertiary, flint deposits are missing, and all known deposits are mostly of

Fig. 6 Raw material procurement, Le Mas d'Azil, *rive gauche*. The lines show the main import directions. **d** *Azilien* Layer of Le Mas d'Azil (Collection Piette, Péquart, Bégouen) in comparison with the material from Abri Troubat (*Couche 6*) after Lacombe (1998a, 1998b, 2005). – **c** 'First Magdalenian Layer' of Le Mas d'Azil (Collection Péqart), in comparison with the material from Abri Troubat (*Couche 8*) after Lacombe 1998a, 1998b, 2005). – **b** 'Second Magdalenian Layer' of Le Mas d'Azil (Collection Péquart). – **a** 'Third Magdalenian Layer' of Le Mas d'Azil (Collection Péqart), in comparison with the material from Grotte Enlène (*Salle du fond*) after Lacombe (1998a, 1998b, 2005). – (Graphic: J.F. Kegler).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Exogeneous raw materials

older geological ages. The Pre-Pyrenees themselves provide only restricted flint sources, most of which are of modest quality.

Within this region, lithic raw materials from different archaeological sites and layers show significant changes in the mode of exploitation between the Magdalenian and the Azilian periods. In a coarse grained perspective, the raw materials can be divided into two groups. The first group consists of local and regional raw materials, which are located in the immediate vicinity of the sites, or have been imported from maximum distances of ~ 30 km. The second group consists of exogenous raw materials, which are available at distances of approximately 100 km to a maximum of ~ 300 km from a specific site.

The raw materials used at Le Mas d'Azil were compared with the results of a study of raw material use in the Pyrenean region (Lacombe, 1998a, 1998b). A comparison of the outcome of these studies with the raw materials recorded from Le Mas d'Azil is presented briefly below, following successive time slices (**Fig. 6**):

In the lowermost Magdalenian layer of Le Mas d'Azil, termed as the 'Third Magdalenian Horizon', a clear dominance of exogenous raw materials can be observed (**Fig. 6: a**). In this layer, exogenous raw materials represent about 70 % of the total lithic assemblage; whereas local raw materials are represented by only ~ 20 %. A comparable raw material ratio has been recorded from the Salle du Fond of the neighbouring Grotte Enlène (Lacombe, 1998a, 1998b). Here, too, the proportion of exogenous raw materials is significantly higher than that of local raw materials. Most of the raw materials originate from the Dordogne, some ~ 250 km to the north-northwest or from the Mediterranean coast near Perpignan at about 180 km distance towards the east.

Unfortunately, there are no assemblages that correlate chronologically with the next younger 'Second Magdalenian Horizon', which succeeds at Mas d'Azil. Estimates, however, show that the amount of exogenous raw materials slightly decreases in favour of local raw materials, which now comprise percentages of ~ 35 % (**Fig. 6: b**).

In the uppermost 'First Magdalenian horizon' and the chronologically comparable layer 8 of the cave of Troubat this trend continues. In Troubat, the importing of raw materials from near the Atlantic and Mediterranean coasts along the Pyrenean chain is particularly evident (Lacombe, 1998a, 1998b). This is not the case in Le Mas d'Azil (**Fig. 6: c**). However, it is striking that, for the first time at both sites, the proportion of local raw materials outweighs that of exogenous materials (Kegler, 2007: 79).

At both the sites of Le Mas d'Azil and Troubat, the late Magdalenian is followed directly by an Azilian layer. The raw material spectrum of the Azilian is clearly dominated by local raw materials that comprise almost 80 %, while the exogenous materials are represented in small quantities only (**Fig. 6: d**).

Therefore, during the transition from the *Magdalénien supérieur* to the *Azilien* a clear reduction of the amount of exogenous raw materials transported to the sites along the northern edge of the Pyrenees can be observed. However, as red deer predominates in all the strata on the left river bank of Le Mas d'Azil, no difference between Magdalenian and Azilian subsistence strategies can be stated. Unfortunately, no studies on the seasonality of the Azilian hunting fauna have been carried out yet. Furthermore, for the northern foreland of the Pyrenees, there are almost no open-air sites known (neither of Magdalenian, nor or Azilian age) that could provide information on the land-use strategies outside cave sites, or between the areas of raw material occurrence and use.

INTERPRETATION – THE FORMATION OF REGIONAL HABITATS

In the stratigraphical sequences of the sites along the northern edge of the French Pyrenees, a clear change in the composition of the lithic raw material spectra can be seen during the period spanning from the late Pleniglacial into the Late Glacial Interstadial. This development is best illustrated at the sites of Troubat and the stratigraphic sequence on the left river terrace of the tunnel-cave of Le Mas d'Azil. At both sites, a development from a large proportion of exogenous lithic raw materials – mainly from the Périgord and the French Mediterranean area – during the Magdalenian period, to an almost exclusively local and regional use of raw materials during the Azilian period is evident. The proportions of exogenous to local raw materials is almost completely reversed during this transition.

This phenomenon can also be observed at other sites, both within this region and in other regions of Europe, where lithic raw materials are naturally limited or of lower quality. Another example of such a development in Central Europe is the very well-studied Middle Rhine region of the Neuwied Basin (Street et al., 2006). The raw material spectra of the Magdalenian sites of Gönnersdorf and Andernach are dominated by exogenous silicates from the north and northwest, respectively. In contrast, local (up to 30 km in the vicinity) or regional lithic raw materials predominate in almost all known *Federmesser* find concentrations.

In summary, for the two regions on the northern edge of the French Pyrenees and the Neuwied Basin, the following patterns can be identified for the transition from the Magdalenian to the Azilian. In a supra-regional comparison, the Magdalenian shows a clear preference to the use of exogenous silices, which are usually of excellent quality. This fact is associated with the Magdalenian subsistence system, which consists of a system of base and supply camps, and the relocation over large areas. This is associated with the large-scale migratory movements of herds of animals, which were the main game at the end of the Pleistocene.

In contrast, the hunting economy of the Azilian or *Federmessergruppen* is based on the exploitation of the local-bound fauna of the temperate climate. The changing composition of the species spectrum in the different regions illustrates the fundamental changes caused by Late Glacial climate change (Bridault and Fontana, 2003). The sustainability of ecological habitats is therefore limited in its regenerative and natural resources. A high degree of mobility, by the means of numerous relocations of settlement sites with rather shorter stays at each of the sites, must therefore be assumed (cf. Gelhausen, 2011: 248). With the *Federmessergruppen*, we therefore see a stronger reliance on regionally or geographically more restricted subsistence areas.

This development suggests that between the final Magdalenian and the Azilian (resp. *Federmessergruppen*), in the time-span between ca. 14,000 and 10,000 ^{14}C BP in Europe, there is a significant intensification in the exploitation of local resources, which is particularly well evidenced by the lithic raw materials used. The picture drawn from the evidence of raw material sources, leads to the conclusion that Azilian people lived permanently in regionally restricted territories and – as far as the supply of lithic raw materials is concerned – supplied themselves from the silicate deposits of the regional area. This is defined here as a "regional habitat". In anthropology, the term habitat refers to a dwelling, such as a house or tent, or even a settlement. However, the term "habitat" is not clearly defined in different disciplines. For example, at a conference in Aix-la-Provence in 1953, only a general delimitation in the sense of an architectural spatial definition was agreed upon: "The members [of the conference] were unable to define precisely what they meant by habitat, however, they generally agreed that it referred to an environment that could accommodate the 'total and harmonious spiritual, intellectual, and physical fulfillment' of its inhabitants" (Pedret, 2005: 20). The term habitat can therefore also be understood in the context of a settlement area. It refers to the region typically exploited by a group or population. The size of the habitat is irrelevant in the first instance. In the course of a seasonal rhythm, habitats provide sufficient food resources to ensure that a

population of a certain size can stay all year round. Correspondingly, according to the raw material evidence discussed, a regionalisation of the habitats is documented in Azilian/*Federmessergruppen* contexts. Frank Gelhausen also assumes that the Neuwied Basin may have been the centre of such a "regional habitat", from which the surrounding low mountain ranges were accessed, and the raw material collected and transported to the sites, where they were then used (Gelhausen, 2011: 261 ff.). After Gelhausen, the individual find concentrations at the site of Niederbieber reflect very short-term stays, which can be understood as hunting preparation and post-hunting activities, embedded in a system of residential mobility similar to that described by Lewis Binford (1980; cf. Gelhausen, 2011: 265). The fact that an intensive exchange between the local habitats has continuously taken place is illustrated by the similar spectrum of tools and technologies used throughout Europe during the Azilian period (Kegler, 2007: 282 ff.). The find concentrations of the *Federmessergruppen* in the Middle Rhine area with small percentages of exogenous raw materials (Street et al., 2006; Baales, 2002), as well as the shares of exogenous raw materials in Le Mas d'Azil, can be used as evidence that such supra-regional contacts have continued (Kegler, 2007: 86-87).

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