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Reflections on the term Micoquian in Western and Central Europe. Change in criteria, changed deductions, change in meaning, and its significance for current research

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Abstract

The primary objective of this contribution is to show the intricate ways of over 100 years of research concerning the term Micoquian and its multiple shifts in meaning. A detailed analysis of the course of the research history has made it possible to identify several tendencies of shifting meaning. This concerned both its position within the chronology, its spatial extent, and decisive assemblage components. The term Micoquian has been used to describe complexes with very different characteristics. Chronologically, both assemblages dating before, during, and after the last interglacial period were referred to as Micoquian. To avoid difficulties in understanding the term, different names for the generic units of the respective assemblage units have been proposed from time to time. Due to the reflections on the research history, it is possible to investigate the question of whether and to what extent the term Micoquian should continue to be used and what significance is attached to it today, and to what extent it appears necessary to pursue other approaches to the classification of the Middle Paleolithic record. In conclusion, a multidisciplinary approach is proposed (including lithic, faunal, radiometric, site catchment, and/or settlement dynamic analysis) to build a multifaceted framework that is able to form clusters of similarities. The formerly defined generic units (called technocomplexes, facies, groups, space–time units, and so on) are seen purely as umbrella terms to structure the Paleolithic record, without claiming to reflect the former Paleolithic reality. With the addition of a tight chronological corset, the definitions of technocomplexes (by using lithic, faunal, and possibly floral data) could allow small, manageable space–time units to be formed and then compared with one another.

Keywords *Micoquien* · Micoquian · *Faustkeilschaberinventare* · *Keilmessergruppen* · Micoquo-Prondnikian · *Bocksteinkultur*

Introduction

This article examines the research history of the term Micoquian. It contributes to the discussion of chronological–

spatial units in Paleolithic research and discusses the varying uses of the term in the context of over 100 years of research.

On the whole, the majority of researchers have increasingly narrowed down the term chronologically. However, tendencies toward the use of long chronologies can also be observed occasionally. At times, the term Micoquian was charged with very different, incompatible meanings, which led to a parallel use and made it difficult to give a uniform definition. The generic units defined in this way are sometimes spatially or temporally separated from each other, but are nevertheless assigned the same term, a phenomenon that can also be observed for other chrono-spatial units (e.g., the Mousterian facies of Bordes).

Sometimes ambiguity is countered by trying to define new terms for a generic unit. New definitions occasionally use different basic components for definition, although the same name is used for the generic unit. The reverse case can also be observed. In contrast to biological taxonomy (e.g., McCarthy 1995), there is no recognized set of rules on the basis of which

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it is possible to provide the phenomena recognized in Paleolithic research with a uniform name.

The definition of the term technocomplex represents an attempt to taxonomically structure the archeological material (Clarke 1968, pp. 328–329): “These grosser entities involve *groups of cultures* which are *not related* or collateral cultures but which do *share polythetic complexes of type families* on the basis of common factors in *environment, economy* and *technology*. Since it is extremely difficult to discuss an entity without a name let us tentatively call these gross groupings *technocomplexes*. [...] The technocomplex represents the partly independent arrival of diverse developing culture systems at the same general equilibrium pattern based on a *similar economic strategy*, in *similar environments* with a *similar technology* and a *similar trajectory*.” (emphasis added by the author). Let us summarize this definition of technocomplexes as follows: (Lithic) assemblages that share the same economic strategy, in similar environments with a similar technology and a similar trajectory (see also Frick 2016, pp. 85–87).

The formation of chrono-spatial units in Paleolithic research was and is mainly based on stone artifacts, since their large quantity and generally good preservation allow phenomena to be observed in space and time. With regard to the generic unit of the Micoquian, bifacial lithic objects were and are mostly used as the main criterion for classification.

In the course of the research history, it is easy to observe how the reference system, the systematic approach to these pieces, changed. At the beginning of research, individual lithic index fossils were decisive for the assignment to a generic unit (Mortillet 1873), which could separate coarse bifaces (Acheulian) from more finely made bifaces (Mousterian). The typological approach established by Bordes tried to ensure a higher objectivity by using a larger selection of pieces within an assemblage. Although bifacial pieces were measured here, they were still evaluated qualitatively (Bordes 1953a, b; Bordes and Bourgon 1951). The technological lithic investigations, which were intensified from the 1980s onwards, provided deep insights into the production process of the pieces (Tixier et al. 1980). As a result, the previously determined lithic types lost their static character, since their great mutability was shown by the extraction of reworking and remolding processes. The limiting factor is that in many cases these three approaches mix and only detailed restudies show how attempts were made to classify the existing material. Particular methodological approaches are already presented in early work, which have become popular later on.

We investigate how the term Micoquian, including alternative terms and synonyms, was used in the course of research below. In order to make the shifts in meaning visible, an attempt will then be made to analyze them over time in order to show the different ways in which the term has been and is used in research. We will also examine the question of whether, given the current state of research, it might make sense to

continue to use such a superordinate cluster, the so-called generic unit.

Earliest definitions

In the search for the origins of the term Micoquian, one comes across the dissertation of Hauser (1916). However, the term was already used earlier by different authors. In this early phase, the term was used primarily in direct relation to the La Micoque site. First, the term was used as an adjective (*micoquien, micoquienne*) to describe corresponding phenomena of the La Micoque site. Convincingly, here are the classifications of bifaces, for example:

- Peyrony (1908): *pointes micoquiennes* [Micoquian points]
- Obermaier (1908a): *Reduzierter lanzenspitzförmiger Faustkeil vom Typus von La Micoque or Micoquekeil* [Reduced lance-shaped biface of the La Micoque type or Micoquian biface]
- Schmidt (1912b): *Langausgezogener, lanzenspitzförmiger Fäustel vom Typus La Micoque* [Long extended, lanceolate biface of the La Micoque type]
- Hauser (1916): *Micoque-Keil-Spitze* [Micoquian wedge point]

These, however, make it clear that even at the beginning of the research at this site, unusual lithic pieces (deviating from the known norm) enjoyed special attention. The question of what can be addressed as Micoquian biface will be encountered frequently below.

Let us now return first to the site of La Micoque, discovered in 1895 and first excavated by Chauvet and Rivière in the following year (Capitan 1896a, b; Chauvet 1896; Chauvet and Rivière 1896, 1898). Subsequently, further researchers undertook excavations at the site (Peyrony, Coutil, Cartailhac, Hauser, Bordes, Laville, Rigaud, and Debénath). Rosendahl (2004, 2006, 2011) has summarized the extensive research history of the site, and therefore, it is not repeated here.

The term *Micoquien* itself, for a generic unit (initially related only to La Micoque) was used by Hauser years before his dissertation: „[...] das "Micoquien", wie ich bereits 1907 den Sondertypus der auf dieser Station gefundenen, bis jetzt von der Prähistorie dem Acheuléen (Obermaier) bzw. einem warmen Moustérien (Wiegers) zugewiesenen Artefakte genannt habe, eine Sonderkultur der dritten Interglazialzeit darstellt, [...]“ (Hauser 1915, p. 443) [the “Micoquien,” as I already called the special type of artifacts found on this station in 1907, assigned to the Acheulian (Obermaier) or to a warm Mousterian (Wiegers) by prehistoric research until now, a special culture of the third interglacial period].

The earliest extensive descriptive and written reference to the term for a spatial-temporal unit was most probably made

by Hauser (1916). However, he already used it in two ways (Hauser 1916, p. 55). On the one hand, he used the term to describe all archeological remains found in La Micoque under his direction; on the other hand, he used the term to describe numerous sites in Central Europe (German Micoquian). Chronologically, he regarded the Micoquian between the Mousterian and the Aurignacian and justified this on the grounds that the assemblage he regarded as Micoquian was a mixture of Acheul-like, Moustier-like, and Aurignac-like types; see also, Hauser (1916, p. 55).

This was contradicted by the assumption of H. Obermaier, who saw the industry of La Micoque as a subgroup of the late Acheulian (Obermaier 1908a, b, 1912, pp. 128–129; 1924, pp. 8–9). Moreover, the finds were already assigned to the Acheulian within the first excavations, before Obermaier and Hauser described them (Capitan 1896a, b).

Chronologically, the Micoquian was assigned to an interglacial, with Obermaier, Hauser, and Wieggers agreeing. However, the allocation to larger units was different. Obermaier suggested an affiliation to the Acheulian (Obermaier 1908a), Hauser saw a positioning between the Mousterian and Aurignacian (Hauser 1916), and Wieggers placed the Western and Central European Micoquian in the “warm Mousterian” defined by him (Wieggers 1920, 1928).

Both Obermaier (1912, pp. 129–130) and Wieggers et al. (1913, p. 134) have examined the finds from La Micoque in detail, but arrive at completely different conclusions, mainly due to their different approaches. While Obermaier emphasizes the Acheul character (referring to the bifacial pieces and the outline of tools), Wieggers focuses on the Mousterian character (referring to the unifacial components, the cross-section, and blanks) of the finds (see also Weißmüller 1995, p. 40).

In this context, the fact that Hauser as a person was considered controversial during his work in the Vézère valley must be taken into account. The literature of this period includes both defamation (Bégouën 1915a, b; Boule 1915a, 1916a, b, c; Cro-Magnon 1915; Obermaier 1908b; Verneau 1915) and support for the excavation work and the subsequent doctoral thesis (Bayer 1920; Birkner 1918a, b; Boule 1915b; Hörmann 1916; Mortillet 1907; Werth 1916a, b, 1919). Through this fame, the concept of the Micoquian spread more and more. A total of three positions can thus be identified for the late 1910s:

- The Micoquian is an independent unit, located between Mousterian and Aurignacian, and is chronologically assigned to an interglacial period (Hauser).
- The Micoquian is part of the Acheulian, temporally between the early Acheulian and the Mousterian and is chronologically assigned to an interglacial period (Obermaier).
- The Micoquian is part of the Mousterian, temporally located between the Acheulian and the cold Mousterian, and is chronologically assigned to an interglacial period (Wieggers).

In the 1910s already, numerous sites in France (Baudouin 1913; Birkner 1918a; Hauser 1916; Schmidt 1911, 1912a) and Germany (Birkner 1918a; Hauser 1916; Hörmann 1916) were assigned to the Micoquian. In the 1920s, sites were added from Great Britain (Breuil 1926) and Poland (Kozłowski 1924) (see Fig. 1).

Toward the end of the 1920s, Hauser (1928) himself recorded a total of $n = 116$ sites throughout Europe and even in Central Asia, the Middle East, and Central Africa, which he assigned to the Micoquian. If one compares the distribution of Micoquian sites according to Obermaier (1908a) in Western Europe and Kozłowski (1924) in Central Europe, Hauser’s distribution map can be regarded as vastly unrealistic (see also Fig. 2). However, this only applies if rough criteria are used for the assignment of an assemblage to the Micoquian (or any other generic unit).

In the 1910s and early 1920s, the Micoquian was uniformly assigned to an interglacial period, although the cultural assignment (generic unit) sometimes differed greatly (see Fig. 3). The use of the Micoquian biface as index fossil for the respective allocation remained uniform here.

Generic unit

At this point, let us briefly specify what we mean by the term *generic unit*. Since terms such as Micoquian, Mousterian, Acheulian, and others (and in all their spellings) are not uniformly regarded as a term for a specific unit (in space and time), the term generic unit is used, which very generally implies a supposed connection within a common term. Thus, the generic unit is regarded as an umbrella term under which, depending on the approach, different phenomena or characteristics of an artifact or assemblage can be united. We see this as a way of dealing with the fact that very different definitions of the same term can be presented and examined. Thus, a generic unit can reflect a technocomplex, a facies, a group, a space–time unit, a cultural group, a cluster of sites, etc.

Research in the course of the 1920s

It already became apparent in the 1920s that the chronological position of assemblages, that were referred to as Micoquian, cannot always be clearly located in the Interglacial, even when Obermaier’s industrial definitions were applied instead of Hauser’s. The best example of this is Kozłowski’s (1924) explanations of Polish sites, which were placed in the early Würm. One could see this as the starting point where the research community began to use the term Micoquian on the basis of different definitions, not necessarily according to the artifact addressed, but according to the supposed chronological position. This is clearly visible when the approaches of Breuil (1926, 1932a, b) and Riek (1934) are juxtaposed. On the basis of Peyrony’s

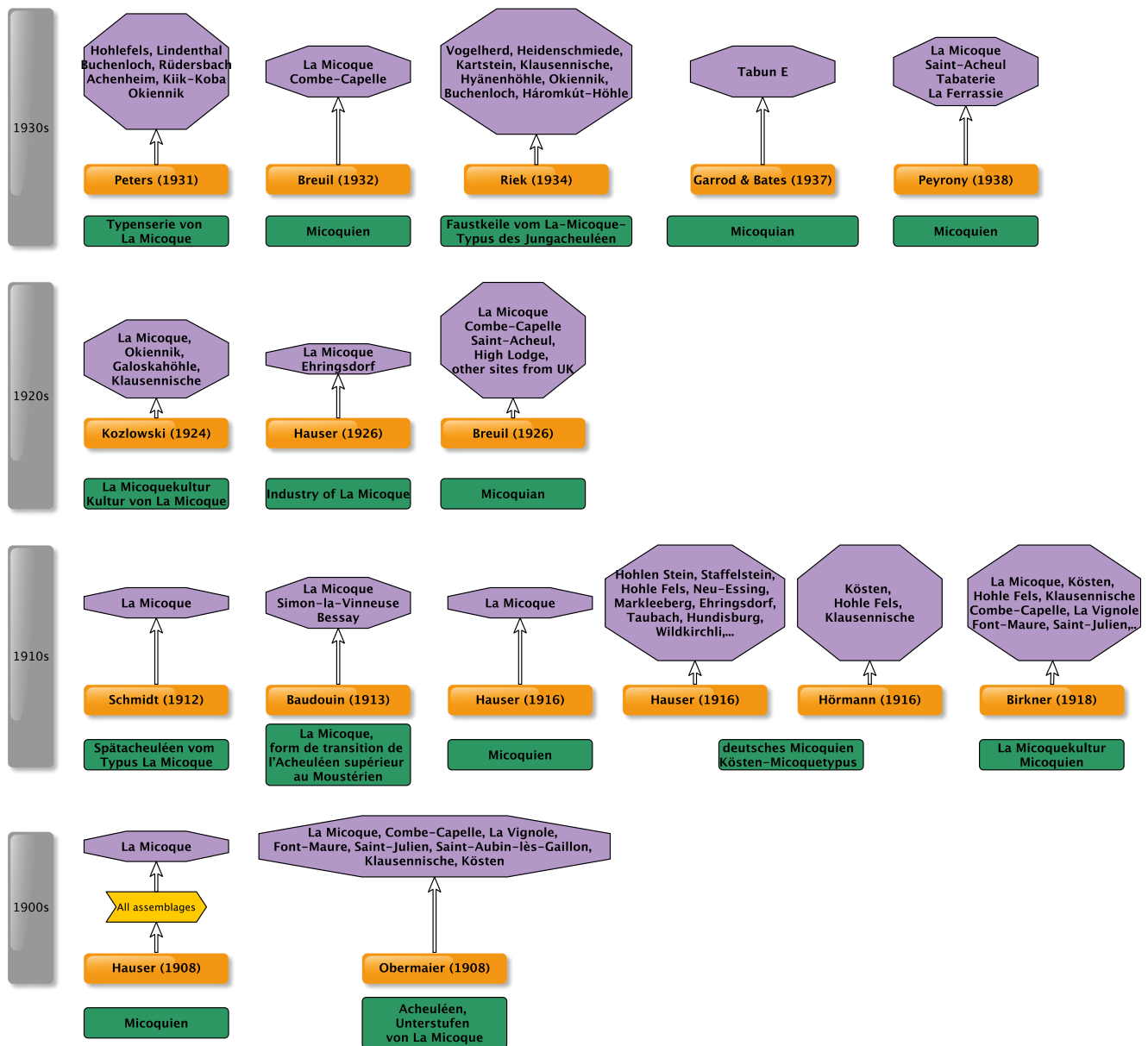


Fig. 1 Cladogram of the term Micoquian and closely related terms (1908–1926). The use of the term, or related terms, is clearly visible here, either solely for the La Micoque site or with the addition of further sites (here: independent of which layers in La Micoque are called Micoquian)

(1930, 1933, 1938) excavations in 1929, Breuil narrowed the term Micoquien to the layer N/6 in La Micoque. He proposed a branched system of complexes that followed each other in time or were parallel to each other, whereby the Micoquian originated from the Acheulian (the hypothesis of Obermaier) and merged into numerous other mousteroid industries (see Fig. 3).

In contrast, Riek (1934) used the term Micoquian for occupations after the Interglacial (as Kozłowski 1924 did), but designated in clearly as part of the Upper Acheulian (as Kozłowski 1924; and Obermaier 1924 did). Riek quoted the work of Kozłowski (in relation to the Aurignacian), but for the Micoquian he followed Obermaier's explanations and assigned the Micoquian to the Upper Acheulian.

The naming of independent complexes was also a controversial issue in the 1920s and 1930s, with both factual (Menghin 1926) and polemical national (Andree 1930) arguments being put forward. At the beginning of the 1930s, the term Micoquian was used for two different units. Firstly, Breuil's definitions were used in francophone countries, and secondly, researcher from Poland and Germany used their own definitions. Since the Micoquian biface continued to be used as the defining element, the definitions differed mainly in the chronological location of the assemblages. The German and Polish assemblages (early Würm), for example, were estimated to be much younger than similar sites in France (last interglacial).

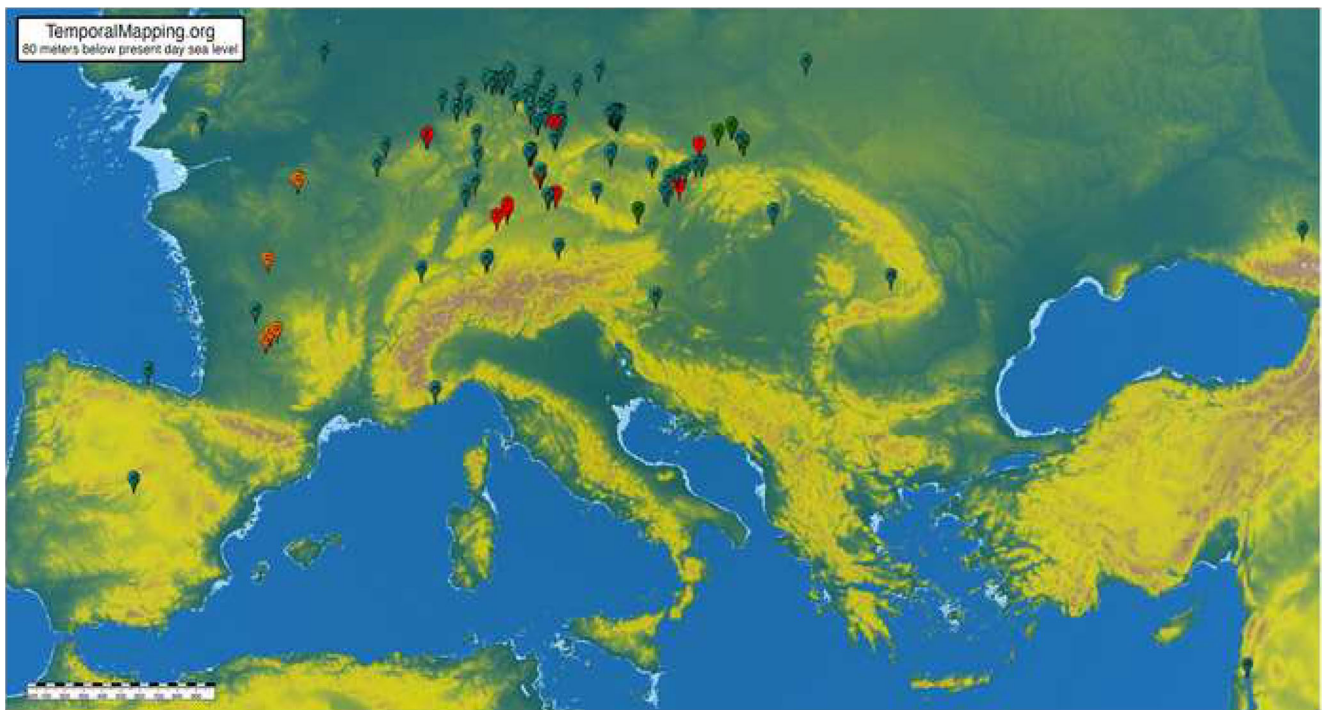


Fig. 2 Map of sites attributed to the Micoquian: orange markings with O (*Unterstufe von La Micoque, lokale Fazies des jüngeren Acheuléen*), according to Obermaier (1908a), green markings with K (*La Micoquekultur*), according to Kozłowski (1924); petrol markings with H (*Artefakt- u. Menschfundorte des Micoquien*), according to Hauser

(1928); and red markings with Z (distribution of sites attributed to the Micoquian), according to Zolt (1951). Base maps from TemporalMapping.org (80 m below present-day sea level) from GoogleEarth Pro

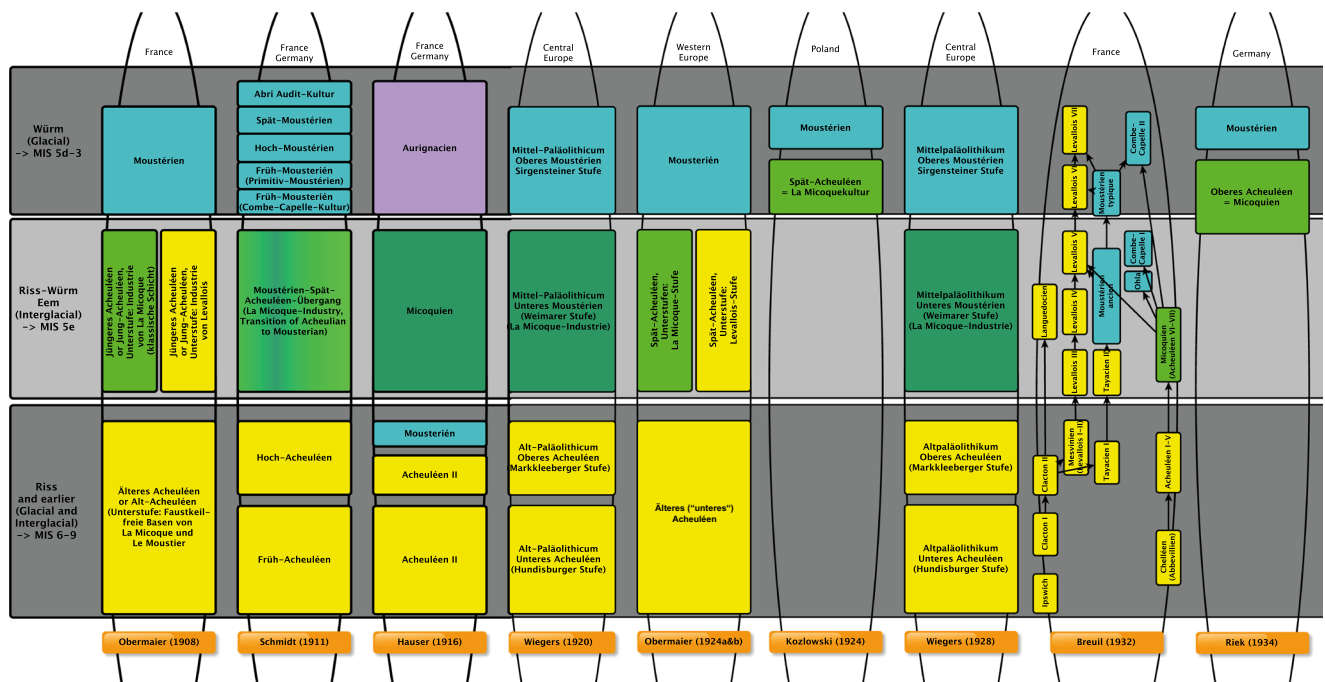


Fig. 3 Cladogram of the chronological positioning of the term Micoquian (1908–1934). For an overview of the diversity of the assignment of the Micoquian, the considerations of Obermaier (1908a), Schmidt (1911), Hauser (1916), Wiegiers (1920), Obermaier (1924), Kozłowski (1924), Wiegiers (1928), Breuil (1932b), and Riek (1934) are outlined here.

Color code: yellow (Lower Paleolithic, Acheulian), light green (Micoquian as part of the Acheulian or Middle Paleolithic), dark green (Micoquian as part of the Middle Paleolithic), blue (Mousterian or Middle Paleolithic), and violet (Upper Paleolithic)

Research of the 1930s and 1940s

During the 1930s and 1940s, the Micoquian became an integral part of chrono-cultural terminology and was used for numerous industries in Eurasia and Africa, as the following examples show. As with other industries, affiliation was determined on the basis of index fossils. For the Micoquian, the presence of *Micoquekeile* [Micoquian bifaces], and those similar enough, according to the researchers, to be determined as such, became the primary determining element.

The first example is the Kiik-Koba site on Crimea, which was described with a La Micoque affinity from the late 1920s onwards due to the bifacial pieces (Bonč-Osmolovskij 1929; Golomshtok 1938), but which was criticized at the same time (Zamiatnin 1929). Furthermore, the layer E in Tabun, which was called Micoquian in its first description, deserves mention (Breuil 1938; Garrod et al. 1937). Another example is Stellenbosch in South Africa, where the upper layers were compared to the Micoquian (Grenier 1945), similar to other sites in Southern Africa (Breuil 1930) or the Wadi Kom Ombo in Egypt (Vignard 1945). In that time, it also became increasingly apparent that the term developed a life of its own, so to speak: the meanings of what was to be understood by the term became more and more different. For this reason, Zamiatnin (1929, p. 293) writes that sites from Germany, Austria, Moravia, Poland, Hungary, Transylvania, Crimea, and the North Caucasus are part of this “culture,” whereby these sites are spread over a large area and do not have any contemporaneity.

While industries attributed to the early Würm and showing micoquoid elements in Central Europe were referred to as Micoquian, in Western Europe, the industries attributed to this unit were considered older and attributed to the Interglacial or the period before. For example, in Germany, the post-interglacial layers (layer 8, later named layer h) of Bocksteinschmiede (Wetzel 1944, p. 90; Wetzel et al. 1941), like the lowest layers of Vogelherd (Riek 1934), were assigned to the Micoquian. The important finds of Bocksteinschmiede were also acknowledged in a review by Zotz (1941), who emphasized the micoquoid character of the finds.

In addition to the common use of the established French terms for generic units, which originated from the Mortillet’s school (e.g., Mortillet 1869, 1873; Mortillet 1883) and was modified and extended by numerous researchers (e.g., Breuil 1932b; Peyrony 1921), German researchers tried to introduce their own terms (Andree 1930, 1939; Menghin 1926, 1931; Wiegers 1920, 1928). Some of these different approaches are illustrated (Fig. 4).

In exceptional cases, researchers went so far as to completely reject established systems and attempted to develop independent chronological systems. Andree’s (1939) system (see Fig. 4) is a good example of how approval or rejection took place within language (attitude) boundaries. Andree suggested that the units envisaged by Wiegers and Menghin

should only be considered suitable and valid for Germany. Like Wiegers, he considered Paleolithic research to be a geological discipline that had to base its chronology mainly on geological observations. If the term culture is replaced by industry in the following statement, it can be endorsed to a large extent even today: “Es ist also nicht angängig zu sagen, daß in einem bestimmten Zeitabschnitt nur eine ganz bestimmte Kultur auftreten könne oder daß alle Funde aus einer bestimmten Zeit zu einer einzigen Kultur gehören müssen.” (Andree 1939, p. 140) [Thus, it is not appropriate to say that in a certain period of time only a certain culture (industry) can appear or that all finds from a certain time must belong to a single culture (industry)]. Andree adopted Wiegers’ division of the generic units: *Faustkeilkulturen* [Biface cultures], *Breitklingenkulturen* [Broad blade cultures], and *Schmalklingenkulturen* [Narrow blade cultures] and rejected Menghin’s terms (Protolithic, Miolithic, and Neolithic), since they only represent new names for applicable units. Based on an index fossil approach, he suggested the following hypothesis regarding the classification of German assemblages (Andree 1939, p. 142): hand points (*Handspitzen-*), leaf points (*Blattspitzen-*), and blades cultures (*Klingenkulturen*).

Broadly speaking, this approach and its terminology are plausible as well. At this point, however, the difficulty begins in understanding what is meant by these terms and of what types are referred to as such. According to Andree’s (1939, p. 142) descriptions, the greatest difficulty lies with the term hand point [*Handspitze*], because these pieces can be produced both unilaterally and bifacially and can be made from blanks or raw pieces. In the case of very large pieces, the term large point [*Großspitze*] is used. The chronological–geological framework for the hand point cultures covers the period between the Günz-Mindel-Interglacial and the early Würm and had to be seen as a step backwards even in the 1930s, since there already were much finer subdivisions, which enjoyed a certain geochronological certainty in individual cases. In order to further complicate the classifications, Andree also mentions the Western European Biface culture [*Faustkeilkulturen*], including a larger biface and a scraper from the Neanderthal (Andree 1939, p. 569). He completely contradicts the tripartite division of the Biface culture according to Zotz (1939) and tries to prove that assemblages from its middle stage are actually located in the Saale (Riss) glacial, Saale-Weichsel (Riss-Würm) interglacial, and Weichsel (Würm) glacial (Andree 1939, p. 576). Here, the Nordic chronological system is chosen to structure the ice ages for the whole of Central Europe, in contrast to the system established by Penck and Brückner (1909) for the Alpine region. As Weinert (1939) pointed out, in this context, the cultural sequence established by Mortillet is not indispensable for the Central European region and the time before the Upper Paleolithic. Even though Zotz’s temporal division is no longer

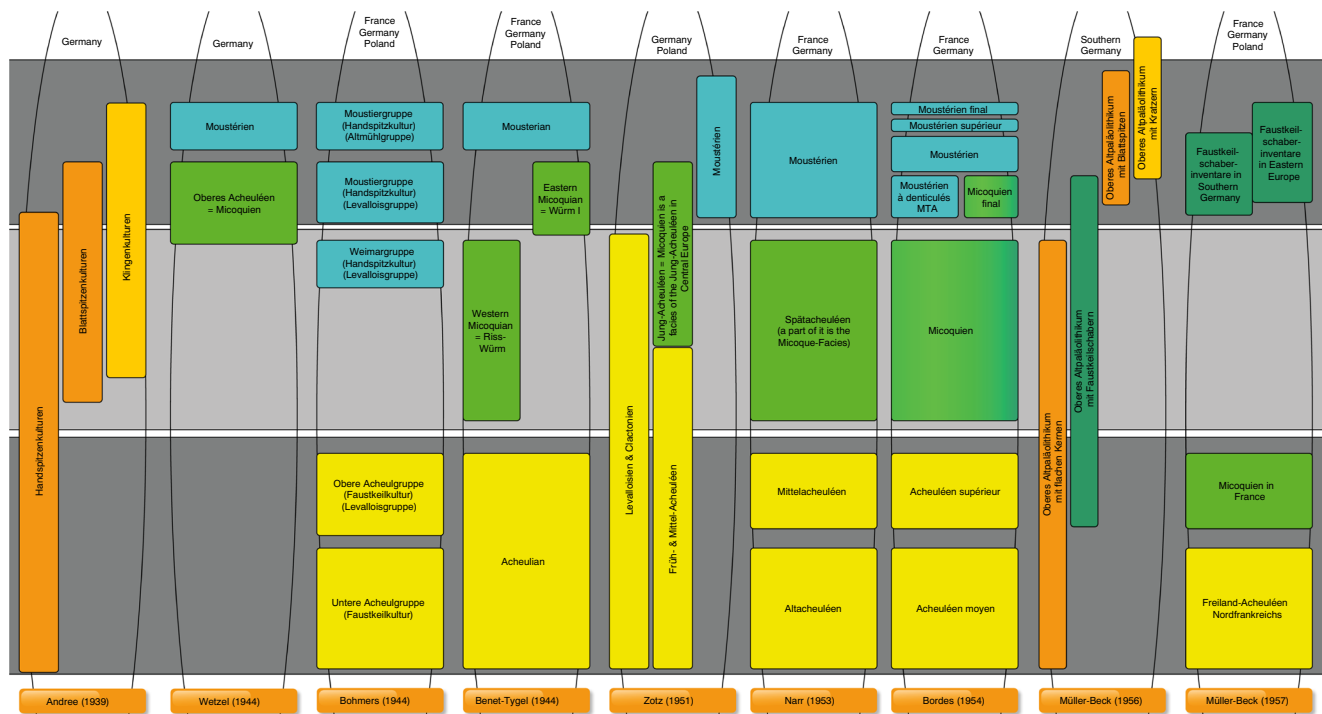


Fig. 4 Comparison of the chronological sequence of generic units proposed by various authors in the end of the 1930s to 1950s. For comparison, the approaches of Andree (1939), Wetzel (1944), Bohmers (1944), Zotz (1951), Narr (1953), Bordes (1954), and Müller-Beck (1956, 1957) are compared. Color code: yellow (Lower Paleolithic, Acheulian),

light green (Micoquian as part of the Acheulian), green gradient (Micoquian is Acheulian or Middle Paleolithic), dark green (Micoquian as part of the Middle Paleolithic), blue (Mousterian or Middle Paleolithic), and orange (allocation according to tool types)

tenable today, Andree’s division of the assemblages was even more imprecise and completely contradicted the results obtained until then.

This can also be seen in numerous reviews of his book. Grahmann (1940, pp. 188–189) writes that Andree’s classification scheme provides developmental lines at best, but no chronological stages. Pittioni (1939, p. 452) also comments on the different structures of the archeological material and that terminological issues have always been delicate, since several different names for the same object have always created confusion. McBurney (1950), too, spoke about the typology used by Andree (1939) and did not find it useful for comparison: “Unfortunately this last [contribution], though of crucial importance from a geographical point of view, is rendered a good deal less useful than it might otherwise have been by the author’s very novel typological classification.”

While Andree and other authors introduced terms for Paleolithic generic complexes, German Paleolithic researchers (including Jacob-Friesen, Rust, Weinert, Wetzel, Wiegers, and Zotz) met in 1939 and agreed to continue the system introduced by Mortillet and Breuil (Zotz 1941, p. 180). This quite positive result for the retention of Mortillet’s system also manifested itself in the fact that similar units were assigned the same name despite different time allocations. This problem was taken up again in the 1950s.

Research in the 1950s

In his presentation of the Paleolithic of Central Europe, Zotz (1951) made reference to his teacher Obermaier and classified the Micoquian as a special form of the Upper Acheulian. The point of reference for his explanations are the artifacts addressed as Micoquian bifaces, though he only describes sites in Central Europe (see Fig. 2).

McBurney (1950), who was familiar with the discussions on Micoquian and Mousterian assemblages, examined the spatial distribution of cordiform bifaces and miniature plano-convex points. He already noticed at this time that a dating of the type site (La Micoque) was not possible. However, he saw great similarity between la Micoque and two southern German sites (Klausennische and Heidenschmiede), assuming that both sites date back to the beginning of the last glacial, which was in line with the approaches of other authors for Bockstein, Vogelherd, etc.

In France, however in the meantime, the definition coined by Breuil was retained for the time being. For example, Blanchard (1948) continued to place the Micoquian (in his capacity as Acheulian VII) in the end of the Riss glacial and the beginning of the last interglacial. Bordes (1954), who assigned numerous assemblages of the Paris Basin to the Upper Acheulian and thus also to the Micoquian, also adhered to this concept. The connection of Upper Acheulian,

Micoquian, and interglacial, or pre-interglacial assemblages, remained accepted academic opinion until the 1980s (Bordes 1981, 1984).

But Bordes (1954, p. 440) also remarked that the sites he referred to as Micoquian are very difficult to classify if bifaces are not taken into account. For Houpeville, he explained that the assemblage could be assigned to a *Moustérien de tradition acheuléenne de facies Levallois* (like Moustier G), if these various bifaces, which distinguish the assemblage as Micoquian, did not exist.

In some cases, even sites which do not meet the author's own definition seem to be attributed to the Micoquian. This is clearly visible in a summary of the prehistory of mankind [Urgeschichte der Menschheit] by Grahmann (1952, p. 260), where he writes: "Das Micoque ist immer zusammen mit der Tierwelt des letzten Interglazials vergesellschaftet." [The Micoque is always associated with the fauna of the last interglacial]. On the next page (but in the same paragraph), he deals with Bocksteinschmiede, which, however, was clearly assigned to the period after the last interglacial (Wetzel 1935, 1944).

Müller-Beck (1956, 1957) already recognized this discrepancy in the definitions between Western and Central Europe, so that he described the assemblages in southern Germany, previously referred to as Micoquian, as *Faustkeilschaberinventare* [Hand axe-side scraper assemblages]: "Die Faustkeilschaberinventare Süddeutschlands besitzen mit dem französischen Micoquien einen nur sehr indirekten, lockeren Zusammenhang. [...] Eine etwas nähere Beziehung scheint dagegen zum späten Freiland-Acheuleen Nordfrankreichs (Bordes 1954), das auch mit dem anschließenden Micoquien im engeren Sinne nicht direkt gleichgesetzt werden darf, zu bestehen. [...] Das Jungacheuleen Nordfrankreichs ist in die letzte größere Oszillation der vorletzten Kaltzeit zu stellen (Bordes 1954), die Faustkeilschaber dagegen in das beginnende „Postglazial“ der gleichen Periode." (Müller-Beck 1957, p. 124). [The Hand axe-side scraper assemblages of southern Germany have only a very indirect, loose connection to the French Micoquian. [...] In contrast, there seems to be a somewhat closer relationship to the late open-air Acheulian of northern France [...], which cannot be equated with the subsequent Micoquian in the narrower sense. [...] The Upper Acheulian of northern France should be placed in the last major oscillation of the penultimate cold period [...], while the Hand axe-side scrapers should be placed in the beginning "postglacial" of the same period]. The temporal and spatial difference of these industries with the same name had thus been recognized and a separate name was proposed for the eastern half.

From the mid-1950s onwards, Polish and German researchers mostly assume that the assemblages they had agreed upon as Micoquian originate from the Würmian period and should be referred to as Middle Paleolithic. The Western and Central European discrepancy in the allocation of the Micoquian to the Lower or Middle Paleolithic remained largely unchanged from the 1950s to the 1980s (see also Fig. 4).

Research in the 1960s

From the 1960s onwards, the different use of the term Micoquian manifested itself. In Western Europe, the Micoquian continued to be mostly assigned to the Upper Acheulian, the dominant element remaining the Micoquian biface. In Central Europe, a change in the approach took place, building on the work of earlier researchers (e.g., Wetzel). The Micoquian biface increasingly lost its character as an index fossil, with the Keilmesser (*Prondnik*, *Faustkeilschaber*, etc.) taking its place. At this time at the latest, the term Micoquian was used for two units, very probably separated in time and space. The result was that since then, the terms Western and Eastern Micoquian have been used more and more.

Micoquian research from Western Europe in the 1960s

Let us now first look at the research developments of the 1960s in Western Europe. Burdo (1960), e.g., referred to pieces from La Cotte de-Saint-Brelade in Jersey as micoquoid. In earlier papers, he placed the assemblage in the Mousterian or Acheulian (Burdo 1951, 1956). Due to its great age, this site was later seen as evidence of a long chronology of the Micoquian (Gouédo 1999) or as evidence of the repeated use (or invention) of a very specific technology (tranchet blow) (Frick et al. 2017).

At the beginning of the 1960s, Bordes (1961a) raised the question of whether the MTA (*Moustérien de tradition acheuléenne*) developed directly from the Acheulian, or whether a Micoquian was interposed, and whether the Micoquian could also occur at the same time as the lower MTA. At the same time, for Bordes, as also for Lumley (1960), it was clear that the Micoquian must belong to the interglacial (Riss-Würm). For Daniel (1965), the Micoquian was also a transitional industry toward the MTA.

Through Bordes (1961b), providing a typological overview of the Lower and Middle Paleolithic, the assignment of artifacts designated as Micoquian bifaces to the Upper Acheulian manifested itself and thus demonstrated the entrenchment of different views of what should now be addressed as Micoquian. This is also reflected in the fact that Bordes (1961a) does not regard the Micoquian as part of his Mousterian complex. Bordes (1966, p. 50) assigned La Micoque to the early last glacial and said that the Acheulian ends far later than previously thought: "There is perhaps place here to say some words about the date of the Micoquian at la Micoque. It has been attributed to the penultimate glacial or to the last interglacial on very flimsy evidences. Modern studies have conclusively shown that it belongs to an early moment of the last glaciation. So the true Acheulean ends much later than was commonly thought. But, outside of la Micoque, there are other Micoquian sites which can be older and this Late Acheulean seems to begin toward the end of the penultimate glacial."

Numerous other publications from the 1960s, that dealt with finds from Western Europe, agree that atypical bifaces, which can neither be assigned to the classical Acheulian nor to the MTA, are to be added to the Micoquian (e.g., Blanchard 1963; Combier 1965; Joullié 1963; Lumley 1960).

The assemblage of the Verrières-le-Buisson site (excavated between 1958 and 1967), which was later analyzed by Gouédo (1999), was assigned to the Micoquian, but the artifact names manifested the great proximity to the Acheulian, as seen in the following example: *bifaces micoquiens de tradition acheuléenne* [Micoquian bifaces of Acheulian tradition] (Basse de Ménorval 1966). During the 1970s, the assemblages were increasingly published and assigned to the Micoquian (Daniel et al. 1973; Sacchi et al. 1978). Ulix-Closset (1969–1970) was also able to determine that industries containing Micoquian bifaces could easily be addressed as Middle Paleolithic if these pieces were not taken into account. This can be seen as one of the central observations of the 1960s and 1970s. Even Bordes (1984) noted this in his concluding summary of the European material. For French research in the 1960s, the term Micoquian was only of secondary importance: it either represented a subset of the Upper Acheulian or was regarded as a short transition between the Acheulian and the Mousterian. Sometimes, the Micoquian was also seen as a parallel development alongside the *Moustérien de tradition acheuléenne* (Giot 1962–1963). Thus, the chronological placement of the unit remained inconsistent.

Central European Micoquian research in the 1960s

At the beginning of the 1960s, Kozłowski summarized the state of Paleolithic research in Poland and assigned the Pradnik group, as defined by Krukowski, to the Mousterian (Kozłowski 1961). Sometimes, the assignment to generic units was simplified by referring to an Acheulian-Micoquian (Acheulo-Micoquian, etc.), like Günther (1962) or Krüger (1964–1965). The former considered the Micoquian as independent and the latter assigned it to the Upper Acheulian.

In the course of the 1960s, assemblages with asymmetrical bifaces, Keilmesser, Faustkeilschaber, Prondniks, etc., were classified in a variety of ways. The term Micoquian was used for assemblages of the Würm glacial (Bosinski 1967; Günther 1964). Bosinski (1967, 1970) even made a special reference to the finds from La Micoque N/6. Günther (1964) also sees a clear connection to La Micoque for his finds from Balve, the connecting elements are to him being the Micoquian bifaces. He rejects the name Micoquian, however, for the northern French and Belgian sites, which are supposed to be a Levalloisio-Upper Acheulian and a legacy of the Riss-Acheulian, which partly reaches into the early Würm (Günther 1964, p. 131). Bosinski (1967), who analyzed the known Middle Paleolithic finds from Western Central Europe, divided the finds, that he assigned to the Micoquian into four

groups (Bockstein, Klausennische, Schambach, and Rörshain). He saw the Micoquian as spread from southeast Europe to Western Europe and saw the oldest evidence in southwest France (La Micoque) and the Crimea (Kiik Koba II). Furthermore, he suspected the origin of this industry in the Eem interglacial (1967, p. 83).

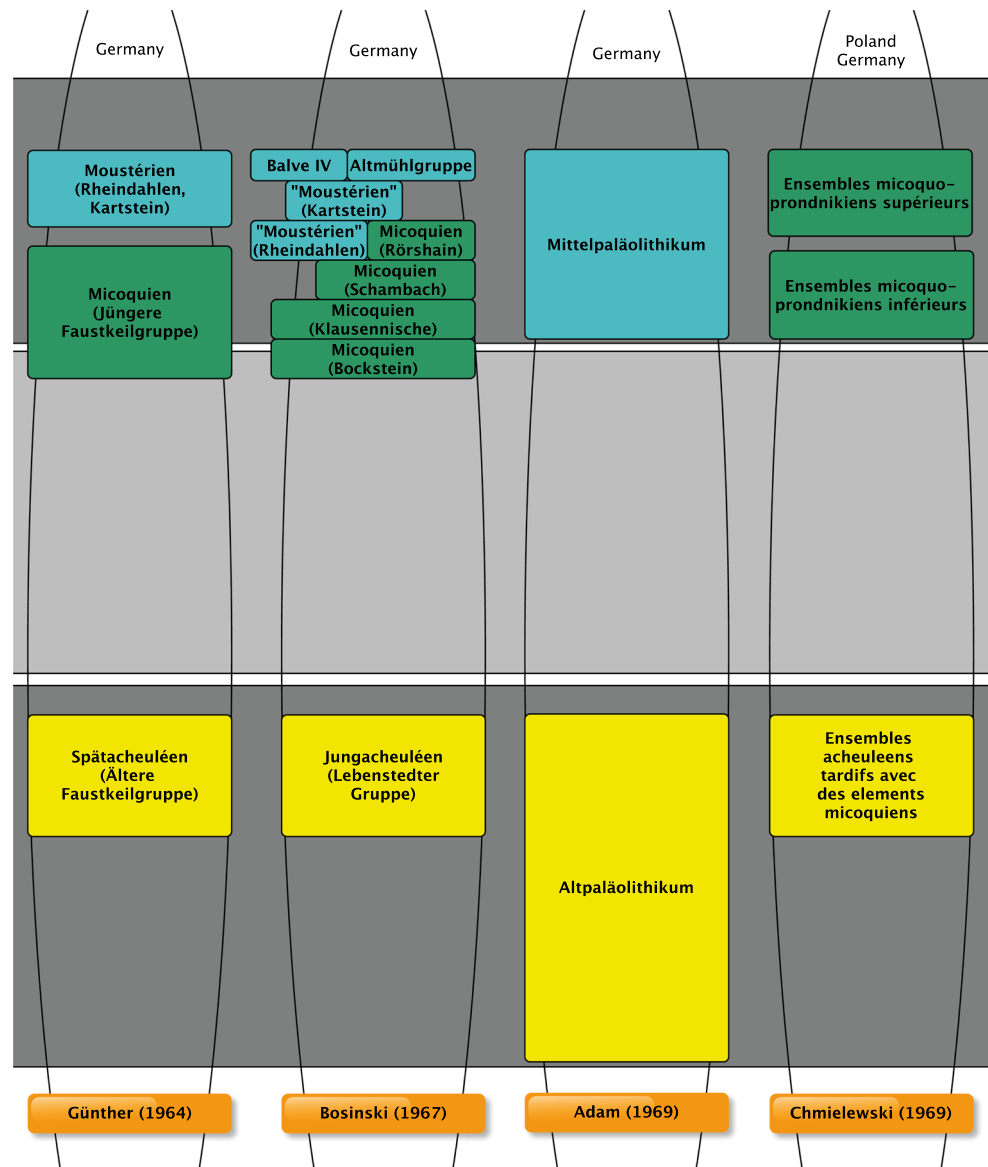
According to Bosinski (1967), the most striking feature of the (Central European) Micoquian is the *wechselseitig-gleichgerichtete Kantenbearbeitung* [alternating unidirectional edge regularization, AUER], where an edge is processed uniaxially over its entire length before the artifact is turned over so that the same edge can also be processed from the other side.

Another terminological way was chosen by Chmielewski (1969, 1970, 1972, 1975), who kept the La Micoque reference, but included a regional name, where three features outlined the Micoquo-Prondnikian culture he referred to (Chmielewski 1972, p. 174): “1. The production of bifacially retouched tools (handaxes and some scrapers) from flint nodules. Cores with prepared and unprepared striking platforms for flake manufacture, mainly circular in shape, accidental blades. No traces of Levalloisian technique. Large and medium size of the artifacts. 2. Surficial flat retouche covering whole or most part of the tool surfaces. 3. Side-scrapers prevail over other types of tools. Numerous hand-axes and similar bifacially retouched tools (prondniks) and scrapers. Very few Mousterian points. Few circular scrapers and burins, mainly made of broken tools.” He referred to sites from southern Poland (Wylotne Cave, Ciemna Cave, Piekary I and III, Kraków Wawel) and southern Germany (Vogelherd). Using the stratigraphy of Ciemna cave, Chmielewski (1969) divided the Micoquo-Pradnikian into two parts. Ciemna 5 and Buhlen were integrated into the upper unit. The lower unit was formed by numerous assemblages (Wylotne 5, 6, 7/8; Okiennik; Vogelherd; Piekary I and II; Hohle Stein and Ciemna 6). A cladogram of the assemblage cluster term Micoquian for the 1960s is depicted in Fig. 5.

The French Micoquian was regarded by Müller-Beck (1966, p. 1209, note 32) as part of the Micoquoid complexes: “The term “Micoquoid” is used here only to indicate the partial relationship with the Micoquian in Western Europe, which is a late stage of the hand-ax traditions there. In reality the Micoquian of France is itself just one facie; among the Micoquoid complexes.” (see Fig. 6).

In his revision of the prehistory of mankind [*Urgeschichte der Menschheit*], Müller-Beck (Grahmann and Müller-Beck 1967, pp. 232–248) placed the Micoquian in Western Europe in the Upper Lower Paleolithic (Middle Paleolithic) and classified it after the Upper Acheulian. The main distinction he mentions here is that the artifacts of the Upper Acheulian are large and those of the Micoquian rather small. He placed it into the interglacial (the lower Upper Pleistocene by his definition) and shortly thereafter. He further distinguished a West-Micoquian

Fig. 5 Cladogram of the chronological positioning of the term Micoquian (1964–1969). For the clarification of the Micoquian, mostly attributed to the Middle Paleolithic, the approaches of Günther (1964), Bosinski (1967), Adam (1969), and Chmielewski (1969) are juxtaposed. Notice that Adam does not mention the Micoquian in his structure of the Paleolithic [Großgliederung der Altsteinzeit]. Color code: yellow (Lower Paleolithic, Acheulian), dark green (Micoquian as part of the Middle Paleolithic), and blue (Mousterian or Middle Paleolithic)



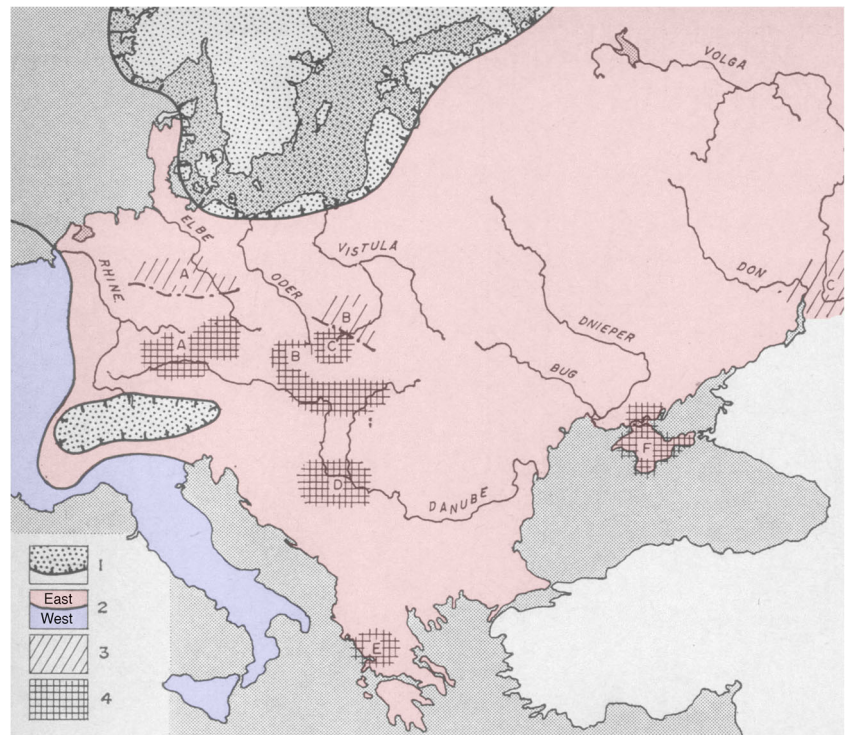
(Western Europe) and East-Micoquian (Central and Eastern Europe). In the discussion of the East-Micoquian, he distinguished an older phase (Bocksteinschmiede, Vogelherd) and a younger phase (Krapina, Kiik Koba, Pantanassa, Okiennik, Ripiceni, Ilskaya, and Starosel'e). The term Micoquian, however, is used by him only for assemblages within Europe.

At the end of the 1960s, Valoch (1967) took a different path for former Czechoslovakia, using the typology established by Bordes and assigning the finds of the Kůlna Cave (layer 7) to the *Charentien de tradition micoquienne*. Other researchers followed a similar path later. He described how he determined this assignment in the following year by saying (Valoch 1968, p. 355): "A more significant group, appearing fairly frequently in the western part of Central Europe, is one that corresponds to the biface group of Western Europe. It contains industries distinguished by largely sharp-pointed hand-axes with a thick

base, hand-axe-leaves, and small hand-axes, and designated as Micoquian or, in the later phase of their evolution, as Charentien of Micoque tradition. For the period of the last Interglacial, we have as yet insufficient proof of the existence of this Micoque group, yet such industries appear in several localities of South and West Germany in the late Eem, and reach their climax in the early Würm."

The works of the 1960s, mentioned above, all agreed that particular Middle Paleolithic Central European assemblages had to be related to the finds from La Micoque and that they had to be located in the early Würm (see Fig. 5). They all emphasized the similarity of their assemblages to the finds at La Micoque. Chmielewski's approach also combined the proximity of La Micoque with the assemblages published by Krukowski (1939–1948) in which he combined concepts. Already Kozłowski (1924), Benet-Tygel (1944), and

Fig. 6 Distribution of handaxe–scraper complexes in Europe. Adopted from Müller-Beck (1966, p. 1196, Fig. 5, modified). In pale blue: distribution of the Western micoquoid complex (Western Micoquian) and in pale red: distribution of the handaxe–scraper complexes (Eastern Micoquian)



Krukowski (1939–1948) recognized the similarity of Polish finds and La Micoque. It is very likely that the latter used the concept of Breuil to place Polish sites (e.g., Piekary III) into the Upper Acheulian Krukowski (1939–1948, pp. 50–53).

To what extent the temporal shift of the glacial affiliation of sedimentary units (from Riss to Würm), as Gross (1962–1963) explained, is connected with the increasing location of micoquoid industries in the Würm, remains to be investigated. In this context, not only newly recognized sites of the Würm possessed micoquoid character, but sites that were formerly described as pre-Würm are now to be attributed to the Würm.

At the end of the 1960s, it was possible to intensively investigate further sites by means of improved excavation methodology and typological artifact naming (partly with technological approaches). Buhlen is a good example here (Bosinski 1969; Bosinski and Kulick 1973). An important aspect of this site is the fact that the tranchet blow technology, previously known only from Ciemna in literature (Krukowski 1939–1948), came to light at another site. Initial evaluations in Buhlen made it necessary to extend Bosinski's model of four assemblage types of the Micoquian by the so-called Pradnik horizon (Bosinski 1969). The Bosinski assemblage types are based on the stratigraphic contexts of the Balve cave, in which the Bockstein type is followed by the Klausennische type. Then, the type Schambach follows and the upper end is represented by the type Rörshein, which is a daring assumption (Bosinski 1967, p. 50). Bosinski now tried to assign the assemblage from Buhlen IIIb to his Micoquian and assumed that it must be younger than the type Bockstein and older than the

type Schambach. He saw many parallels to the type Klausennische, but could not make a more exact assignment (Bosinski 1969, p. 73). Sometimes, there were also efforts to date the site La Micoque on the basis of the Central European sites dated to Early Würm and assigned to the Micoquian (Collins 1969), which is, of course, circular reasoning.

To differentiate the French Micoquian of the Seine basin or from La Micoque and the German sites according to Wetzel, Bosinski, or Müller-Beck, Bordes (1968) called the Central European Micoquian: “Micoquien allemande” [German Micoquian]. Bosinski (Wetzel and Bosinski 1969, p. 67) also considered whether it might be necessary to eschew the term Micoquian for one complex or another: „Vielleicht sollte man dieser forschungsgeschichtlich bedingten Zweideutigkeit des Terminus „Micoquien“ durch die Wahl einer neuen Bezeichnung entweder für das mittel-und südosteuropäische Micoquien oder für das westeuropäische, zum Jungacheuléen gehörige „Micoquien“ aus dem Wege gehen.“ [Perhaps one should avoid this research-historically related ambiguity of the term Micoquian by choosing a new name either for the Central and Southeast European Micoquian or for the Western European “Micoquian” that belongs to the Upper Acheulian]. Thus, by this time at the latest, it is clear that these are probably two complexes that have been given the same name.

The non-European Micoquian in the 1960s

The term was also in use outside Europe, for example there are descriptions of assemblages from the Levant (e.g., Prausnitz

1969) or from Anatolia (Esin and Benedict 1963). However, it was occasionally mentioned that the term should only be used for assemblages in Europe. Balout (1967, p. 110) argued that terms coined for industries outside Africa (Clactonian, Micoquian) should not be used in Africa unless their use can be clearly justified. This definition is based on conferences in 1947 (Nairobi, Pan-African Congress on Prehistory), 1955 (Livingstone, Pan-African Congress on Prehistory), and 1965 (Burg Wartenstein Symposium by the Wenner-Gren Foundation) and was published in a very similar way by Clark et al. (1966) a year earlier.

Negation of the term Micoquian in the 1960s

At the same time, the assignment to the Micoquian was also rescinded. An example is given to illustrate this fact. In the 1930s, Garrod published the finds from Tabun E as Upper Acheulian or Micoquian (Garrod et al. 1937). Now she adopted the nomenclature of Rust and assigned the finds to the Yabrudian (Garrod 1962), as Clark (1966) did, too. The possible link between the Yabrudian and the Micoquian was the subject of lively discussions later on (Ronen and Weinstein-Evron 2000).

Micoquian research in the 1970s

Micoquian research from Western Europe in the 1970s

According to Bosinski (1970), all layers (other than layer I) of the Peyrony excavation at La Micoque belong to the Micoquian (Middle Paleolithic) and layer VI corresponds to the assemblage type Bockstein. According to him, the lower layers possibly represent the initial phase of the Micoquian. This assumption contradicts the analyses of Peyrony (1938) and Breuil (1932b), who assumed that only layer VI could be addressed as Micoquian (as part of the Acheulian). In the same *Festschrift* volume, Baudet (1970) applied the term Micoquian according to Bordes and Breuil to assemblages from northern France which date to the pre-Würm period.

Increasingly, it can be observed that the typological artifact determination Micoquian biface is becoming more and more detached from the generic unit Micoquian, since the term Micoquian biface can only be interpreted as form-specific and no longer contains a chrono-spatial assignment. In retrospect, this can be seen for sites in the Paris Basin which were deposited during and after the last interglacial and yet all were assigned to a Micoquian due to the presence of pieces referred to as Micoquian biface. It is likely that Brézillon (1971, pp. 160–161) summarized French definitions of Micoquian bifaces from this perspective. On one of these sites in the Paris Basin mentioned earlier, Verrières-le-Buisson, the term Micoquian is used to describe one of the “cultures” that occur.

Fig. 7 Cladogram of the chronological positioning of the term Micoquian (1969 to 1979): **a** chronological positioning between 1969 and 1976 using the approaches of Bosinski (1969), Schwabedissen (1973), Bosinski and Kulick (1973), Ulrix-Closset (1975), and Lumley (1976); and **b** chronological positioning between 1976 and 1979 using the approaches of Desbrosse et al. (1976), Gábori (1976), Fiedler (1977), Kozłowski and Kozłowski (1977), and Tuffreau (1979)

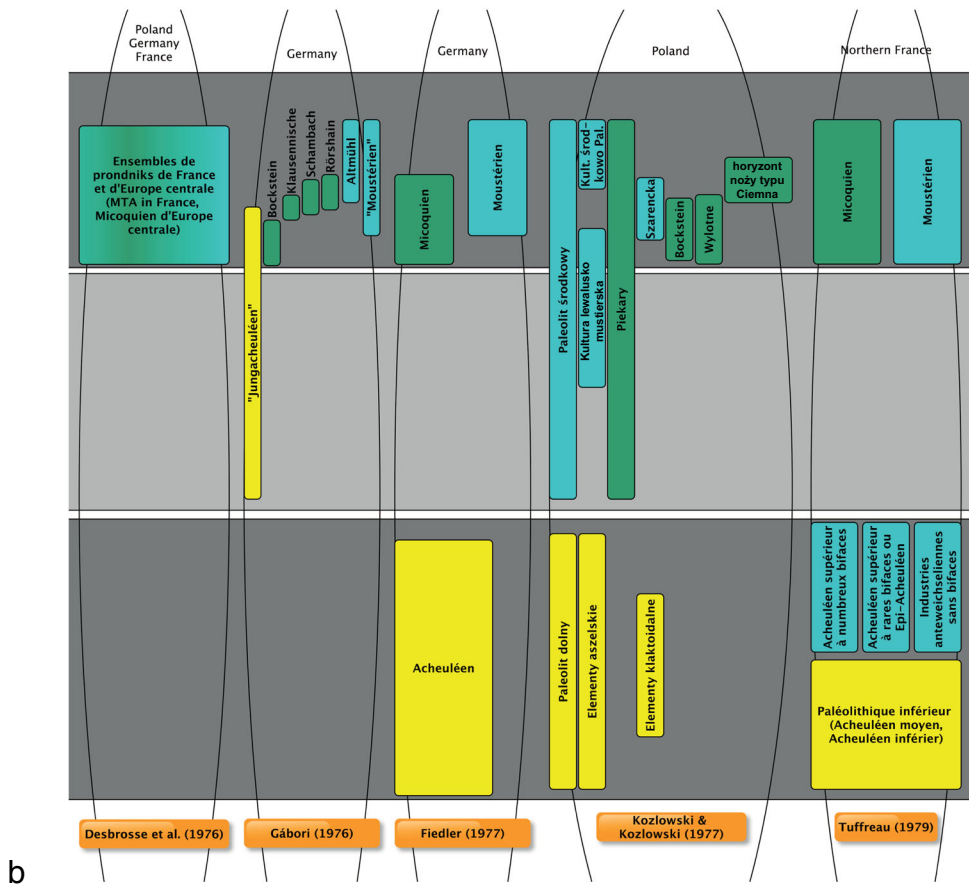
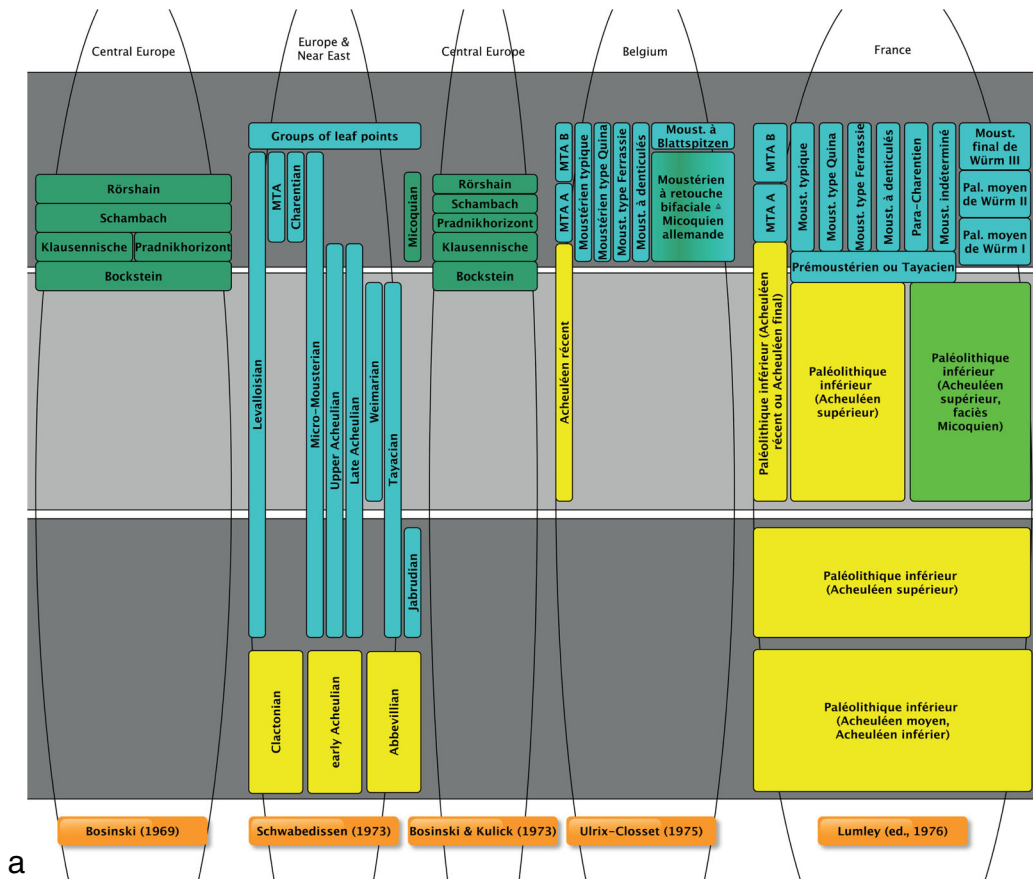
In this case, an assemblage of the early Würm is mentioned as Micoquian (Bailloud et al. 1973, p. 105): “[...], l’horizon inférieur a donné une industrie à bifaces appartenant à un Micoquien récent de faciès Levallois du Würm I, le supérieur à un Moustérien tardif du Würm II, également de faciès Levallois.” “[...], the lower horizon has yielded a bifacial industry belonging to a recent Micoquian of Levallois facies of Würm I, the superior one belonging to a late Moustérien of Würm II, also of Levallois facies]. The temporal and “cultural” allocation corresponds to Bordes’ (1954) approach for sites in the Parisian basin.

The work of Ulrix-Closset (1975) introduced a common element to the Middle Paleolithic in the eastern part of Western Europe (Belgium). She was familiar and worked with the two established classification systems of Bordes and Bosinski and equated her *Moustérien à retouche bifaciale* with the German Micoquian. At the same time, she used the Mousterian facies developed by Bordes in the 1950s (see Fig. 7a). Further examples of an assignment to the Micoquian come from Eastern France. For Combiér and Thévenot (1976), various sites also had at least some affinity to the Micoquian (in particular La Mère Grand in Rully, Saône-et-Loire). However, it is difficult to verify this allocation on the basis of the figure that is intended to demonstrate this (Combiér and Thévenot 1976, p. 78, fig. 31). For us, the fragment of a bifacial piece shown there is not enough to make such a precise assignment to a generic unit.

In Western European research, the 1970s was marked by the extensive use of the Bordesian method. This is clearly visible in the very detailed summary of the French research on the Paleolithic, which was compiled for the 9th UISPP Congress 1976 in Niza (Lumley 1976).

In the same year, Desbrosse et al. (1976) published their studies on *Prondniks* from Germolles. They pointed out the similarity between artifacts from Germolles (Grotte de la Verpillière I) in Saône-et-Loire and those from German and Polish sites, even though, or precisely because, the sites were classified differently. On the one hand, Germolles was attributed to the MTA. On the other hand, the German (Buhlen) and Polish (Ciemna and Okiennik) sites were attributed to the Micoquian. They regarded the “*racloirs-couteaux*” du type de *Prondnik* as a common element. For Bosinski (1969), the same artifacts (but named *Pradnikmesser*) were the common element of his *Pradnikhorizont* (see Fig. 7a).

In the late 1970s, Bordes (1977, p. 37) raised the question of how the Mousterian should be defined and to what extent



the Micoquian should be integrated into it: “So, one is a little at a loss how to define the Mousterian even in Europe. We can try a chronological approach and say that the Mousterian represents the cultures that flourished during the first half of the last glaciation. But then we would have to include the Micoquian, and to exclude such industries as the interglacial one from Ehringsdorf (East Germany), the Rissian one from Rigabe (Provence, France) or the one from layer 4 at la Micoque, all of which, found outside a stratigraphy, would unhesitatingly have been called Mousterian.” This clearly shows that chronological and cultural classifications of assemblages do not necessarily have to coincide.

Through his work in Biache-Saint-Vaast, Tuffreau (1979) was able to show that the beginning of the Middle Paleolithic in northern France probably had to be pushed far back into the penultimate glacial period (see Fig. 7b). His assumption was that alongside the bifacial industries attributed to the Acheulian, there are also unifacial industries (Biache-Saint-Vaast) that would typologically be addressed as Mousterian (*Moustérien typique de faciès levalloisien*) in a more recent context. This shifting back of the beginning of the Middle Paleolithic was discussed controversially at the beginning of the 1980s.

Micoquian research from Central Europe in the 1970s

In Central Europe, the two terms Micoquian and Micoquopradnikian were mostly used synonymously. Sometimes, artifacts were not described as belonging to the Micoquian, but as possessing a Micoque influence (Boecking 1971, p. 126): “Bei einigen Geräten kann ein gewisser Micoque-einfluß festgestellt werden.” [For some tools, a certain Micoque influence can be detected]. Similarly, in southwestern France, Bordes (1971, p. 19) was also able to detect a Micoquian tendency in artifacts from Combe-Grenal: “[...] biface à tendance micoquienne (couche 58).” [Biface with Micoquian tendency (layer 58)]. This Micoquian influence or the Micoquian tendency will still be encountered frequently later on.

Kozłowski already pointed out in 1972 that the term Micoquian may have been poorly chosen for assemblages with Keilmesser with Pradnik form and perhaps also for assemblages with Keilmesser with tranchet blow (Kozłowski 1972, p. 160): “Je ne suis pas favorable à l’introduction du nom ‘micoquien’ pour les ensembles à couteaux-raclours du type de Pradnik en Europe centrale. Les ensembles du Paléolithique moyen à bifaces d’Europe centrale demandent encore une classification plus détaillée. Il faut introduire pour ces ensembles des dénominations locales.” [I am not in favor of the introduction of the name “Micoquian” for assemblages with knife-scrapers of the Pradnik type in Central Europe. The Middle Paleolithic bifacial assemblages of Central Europe still require a more detailed classification. Local denominations must be introduced for these assemblages].

As Central European assemblages have increasingly been reconsidered, the notion of correlation between La Micoque and the Central European sites has given way to the notion that these sites have similar, or to some extent identical, types of finds. Remarkably or particularly noticeably, Bosinski’s (1967) observations of the find material increasingly shifted the point of view, with the biface referred to as the Micoquian biface receding into the background in favor of the Keilmesser (with its multitude of names). This has started earlier, when Müller-Beck (1956) adopted the term *Faustkeilschaber* and promulgated it intensively.

In addition to the assemblages analyzed by Bosinski, further assemblages were added in the course of the 1970s. On the basis of Bosinski’s (1967) and Müller-Beck’s (1958) nomenclature and explanations of the Micoquian, Mania and Toepfer (1973) integrated the assemblages from Königsau A and C into the Micoquian as defined by Günther (1964) and Bosinski (1967). Mania and Toepfer (1973, pp. 144–145) also found a connection between Mousterian and early glacial bifacial cultures, which they initially call Micoquian: “Nach der vergleichenden Betrachtung der frühglazialen [sic!] Biface-Kulturen des europäischen Moustériens, die vorerst als Micoquien bezeichnet wurden, lassen sich einige allgemeine Überlegungen anstellen.” [On the basis of a comparative examination of the early glacial Biface cultures of the European Mousterian, which were initially called Micoquian, some general considerations can be made]. Building on a previous work, the Micoquian also represented a pan-European generic unit for Mania and Toepfer (1973). As can also be seen on other maps (see Fig. 2), the Micoquian seems to be predominantly represented in Central Europe. To the west and completely remote La Micoque can be found, but east of the main distribution there are also isolated sites (see Fig. 8).

After completion of the excavations in the late 1960s, a preliminary report on the Buhlen site was presented (Bosinski and Kulick 1973). It was suggested to place the assemblage IIIb (*Buhleiner Pradnikhorizont*) chronologically somewhere between type Klausennische and type Schambau (see also Fig. 7a). For the Weinberghöhlen (layer 5 (F’, G’, G, H) near Mauern, Müller-Beck spoke of a mousteroid late Micoquian followed by an assemblage of the “Altmühl group” (Koenigswald and Müller-Beck 1975) or a Central European Late Micoquian (Koenigswald et al. 1974), but he had to admit that the available assemblage was too small to make reliable statements. After viewing the drawings, it seems as though the levalloid character of the unifacial pieces was noticed and set aside as an antithesis to the asymmetrical bifacial component. This type of synthesis of unifacial and bifacial assemblage components will be encountered again in later times.

Gábori (1976) was extensively occupied with the assemblages of the Micoquian in the region between the Alps and the Urals. He correlated the temporal position of assemblages

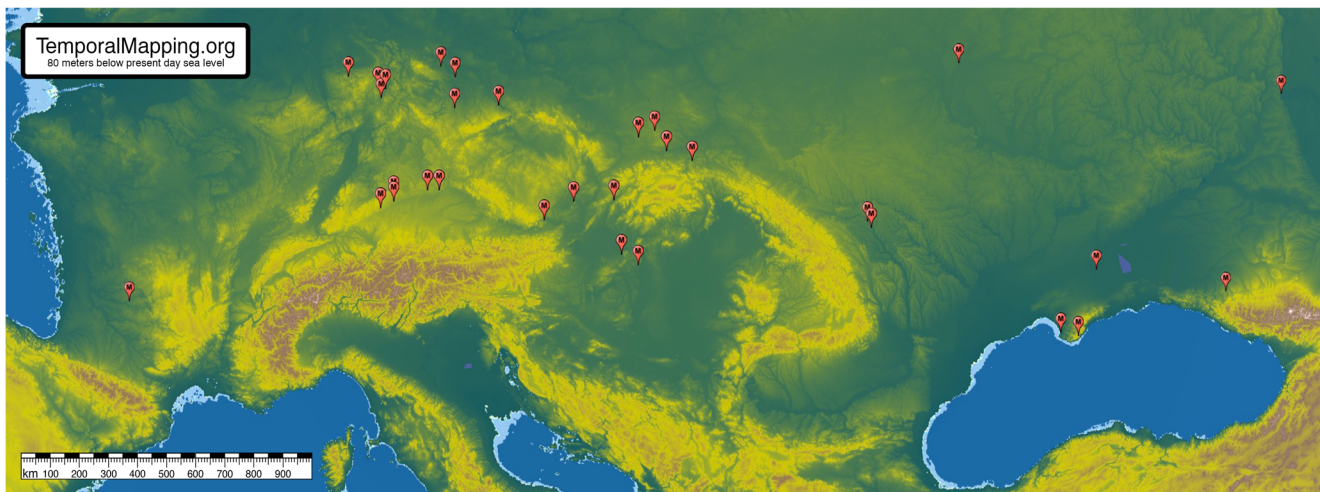


Fig. 8 Distribution of the Micoquian according to Mania and Toepfer (1973, Abb. 37). Base map from TemporalMapping.org (80 m below present-day sea level)

with the inventory types defined by Bosinski and derived a refined chronological assignment of the inventory types (see Fig. 7b).

The assumption that the Levallois concept within the assemblages described as Micoquian was of very subordinate importance or even completely unknown manifested itself visibly. For Fiedler (1977), this was impressively demonstrated in Buhlen IIIb: “Die meisten Werkzeuge sind in „Kerntechnik“ durch beidflächige Retuschierung hergestellt, während Abschlagwerkzeuge selten sind und die Levalloistechnik praktisch keine Rolle spielt.” [Most tools are manufactured in “core technology” by double-surface retouching, while blank tools are rare and the Levallois technique plays practically no role]. It was only in the 1990s that it was recognized that in some sites there was a connection between Keilmesser (of any shape) and the Levallois concept (e.g., Richter 1997).

Discussion of a long or short chronology for the Micoquian

Since the 1970s, there has been an enormous increase in the knowledge of relative and absolute chronological dating. These new and more precise methods were used to re-evaluate the generic units that had previously been considered fixed in time. Through more precise evaluations of the chronological position of recognized phenomena, the chronological approaches varied in length. Furthermore, the system established by Bosinski (1967) was used to structure the Middle Paleolithic assemblages of western Central Europe and was even extended to eastern Central Europe and Eastern Europe (Gábori 1976). This short chronology for the Micoquian stood in contrast to the long chronology for Polish sites proposed by Kozłowski and Kozłowski (1977) which spread from the early Würm to the last interglacial period.

They also distinguished seven types of assemblages and separated assemblages with asymmetric knives and foliated pieces (see Fig. 7b). The term Group of backed Bifaces was used by Schild and Wendorf (1977) only to group bifacial objects of the Central European Middle Paleolithic and not to classify assemblages as a whole (in our understanding).

At this point, at the latest, it is obvious that different chronological systems are applied in the association of assemblages with the term Micoquian. If the Upper Acheulian (*Jungacheuléen*) is included in the analysis, the chronological framework becomes even more complex (depending on whether the Micoquian is added to the Upper Acheulian or the Middle Paleolithic).

The question also arose as to whether the Micoquian might not also be part of the Moustérien. Ulrix-Closset (1975, pp. 11–12), for example, coined the term “Moustérien à retouche bifaciale” because she could not find a suitable name in French terminology. She did not want to use the term “Moustérien à Blattspitzen” because it did not describe the Central European assemblages (up to 50% bifaces, Keilmesser and Blattspitzen) precisely enough, and the term Blattspitze was described very precisely in German literature. For her, the term “Moustérien à Blattspitzen” is synonymous with “Altmühlgruppe” as defined by Bohmers (1944, 1951) and should not be used as an umbrella term. In her understanding, the term “Micoquien,” as it was used by various German authors, can no longer be used, since it has already been assigned a very precise meaning (in chronological and typological terms) in French literature. Thus, she attests the same meaning to the different terms “mitteleuropäisches Micoquien” (sensu Bosinski) and Eastern Micoquian (sensu Müller-Beck) and believes that these correspond best with a “Charentien de tradition micoquienne” (sensu Valoch). Her “Moustérien à retouche bifaciale” is characterized by a high percentage of bifaces, bifaces scrapers (or bifacially backed

pieces), and foliated pieces. For her, the term emphasizes that it is indeed a Mousterian industry with points and scrapers, but it is clearly characterized because of the use of a particular retouch technique.

The example shows that the former division into a western and eastern Micoquian, which are represented in different time stages, is no longer applicable. Thus, the controversy remains as to what or which assemblages should now be subsumed under the term Micoquian.

Research during the 1980s

The 1980s brought momentum to the Micoquian discussion in that the beginning of the Middle Paleolithic was massively postponed and now falls into the period of the Saalian/Riss glacial (Bosinski 1982; Tuffreau 1982). This shift of the transition from the Lower to the Middle Paleolithic was also reflected in the assignment of the Micoquian. Three approaches to the classification of the Micoquian and the beginning of the Middle Paleolithic are shown in Fig. 9, each of which is plausible for its region.

From this time on, the Micoquian in Western Europe is also increasingly classified as belonging to the Middle Paleolithic, but still with the difficulty that the upper layers of the eponymous site have no dating and were destroyed by former excavations (Rigaud 1986). The spectacular assemblages from La Cotte-de-Saint-Brelade (Callow and Cornford 1986), Biache-Saint-Vaast (Tuffreau and Sommé 1988), or Mesvin IV (Cahen et al. 1984; Cahen and Michel 1986), which probably date from the Saalian glacial, were able to show at that time that elaborated finds could be much older than previously thought. It is noteworthy in this context that two of the sites have evidence for the presence of Keilmesser with tranchet blow (Pradniks, see Soriano 2000, 2001), a technology that was repeatedly attributed to the so-called *Pradnikhorizont* in the following decade (e.g., Jöris 1992).

1980s research on the Micoquian from Central Europe

The existing diversity of names in relation to assemblages that (predominantly) have great similarities in their bifacial components was discussed by Bosinski (1981). He agreed that the assemblages referred to by Chmielewski (1969) as *Micoquo-Pradnikien*, those referred to by Ulrix-Closset (1975) as *Moustérien à retouche bifaciale* and referred to by himself as *Micoquien*, could possibly, on the basis of Kolosov (1986), be referred to with the term *Bockstein culture* (see also Bosinski 1985, p. 62). Kolosov adopted this term probably from Wetzel (but referred to Wetzel and Bosinski 1969), who used it as synonym for his Micoquian at the Bockstein site (Wetzel 1954). Obviously, this was a rather impractical suggestion, since Bosinski himself used the term Bockstein as

an assemblage type within his Micoquian and thus represents a *pars pro toto*. Only one further use of the term as a synonym for the Micoquian in the literature could be discovered (Freericks 1995).

The “antipodes” Micoquian and Mousterian were increasingly established and so Feustel (1983, p. 12) wrote in this context: “Trotz der nun großen Vielzahl und mehr oder weniger klar zu unterscheidender Typen ist über weite Räume hin eine gewisse Gleichförmigkeit zu beobachten; Bezeichnungen wie Moustérien und Micoquien bringen bei aller Differenziertheit im Einzelnen doch große Zusammenhänge zum Ausdruck.” [In spite of the now large number and more or less clearly distinguishable types, a certain uniformity can be observed over wide spaces; designations such as Mousterian and Micoquian express broad interconnections despite all the differentiation in the details].

Ringer (1983, pp. 68–69) adopted the technological distinction introduced by Bosinski (1967) between the edge retouching of the German and French Micoquian for bifaces and his new defined Babonyian. Here, we want to illustrate these three technological production approaches on bifaces (see Fig. 10). The produced bifaces differ not only in the order in which the surfaces or edges are processed, but also in the different cross-sections created.

In many sites, even in the 1980s, it can be seen that a shift in the value of bifacial pieces has taken place. While in earlier works the focus was on the presence of the so-called Micoquian bifaces, this increasingly shifted to the presence of asymmetric bifacial pieces that could not be described adequately with the Bordesian typology. A dichotomy was thus revealed, which was met by using the Micoquian biface as a representative of a Micoquian according to Bordes, whereas asymmetrical bifacial pieces (Keilmesser) were associated with the Central European Micoquian. This dichotomy was already detected in the 1950s by Müller-Beck. He emphasized the differences between the central French assemblages and the southern German assemblages (Bordes and Müller-Beck 1956; Müller-Beck 1956, 1957).

The presence of Keilmesser has been used as a decisive criterion for assemblage classification into the Central European Micoquian since, at the latest, Bosinski (1967). This is evident, for example, for the Micoquian layers of the Kůlna cave. Valoch (1988, p. 55) writes that bifaces and Keilmesser are of decisive importance for the classification, although their share in the type spectrum is rather small. Twenty years earlier, he used the term *Charentien de tradition micoquienne* [Charentian with Micoque tradition] to express the scraper component (Valoch 1967). In the meantime, different terms were used as synonyms for the Central European assemblages, often side by side, since both terms are roughly to bundle the same assemblages within one term. Thus, increasingly similar sentences as the following one can be found in many publications since the 1980s (Kozłowski 1989, p.

Fig. 9 Cladogram of the Lower and Middle Paleolithic transition. Here, the approaches of Bosinski (1982), Laville (1982), and Tuffreau (1982) are juxtaposed

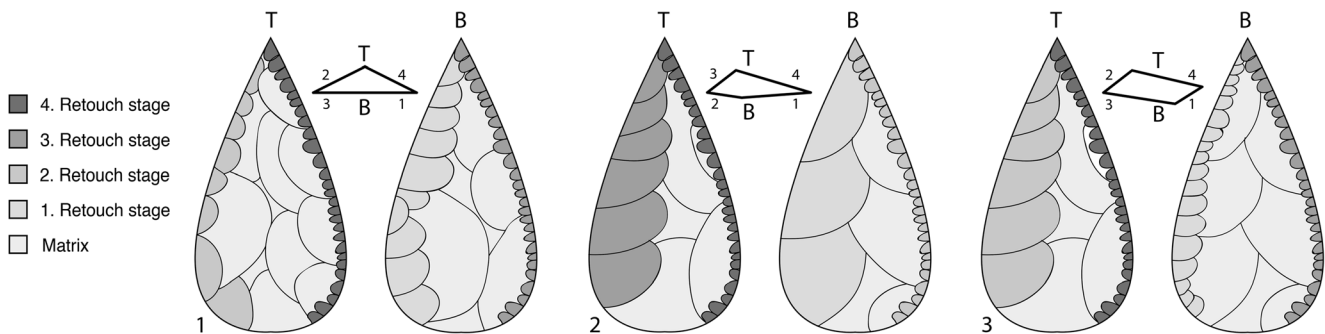
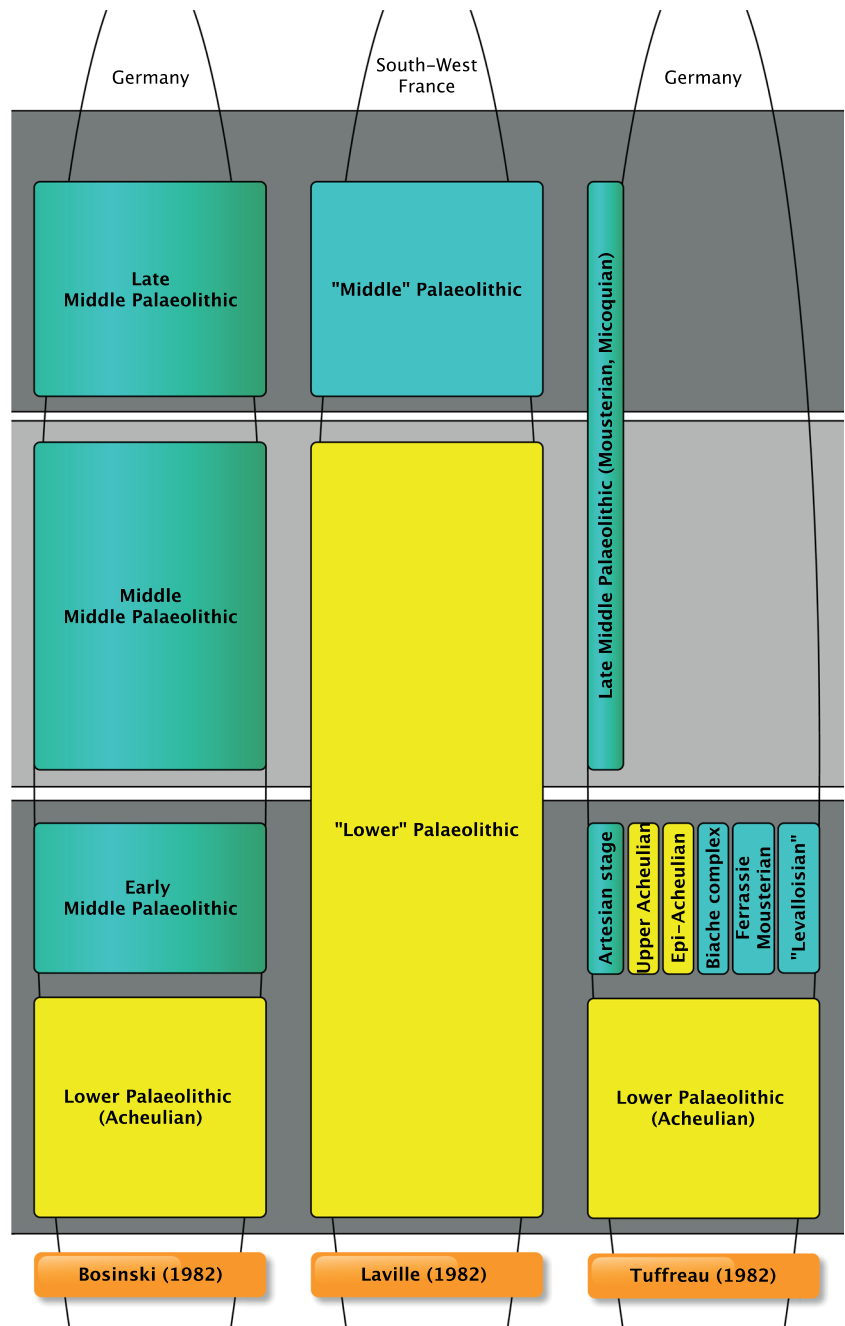


Fig. 10 Technological approach on edge retouch. (1) German Micoquian (Bosinski 1967) and (2) French Micoquian and (3) Babonyian (Ringer 1983), added by retouch stage succession

139): “Les autres sites attribués à la „culture micoquo-prondnicienne” ou au, Micoquien de l’Europe centrale”, n’ont que des analogies plus générales avec l’industrie de la grotte Ciemna.” [The other sites attributed to the “Micoquo-Prondnician culture” or the “Micoquian of Central Europe”, only have broader analogies with the Ciemna cave industry].

1980s research on the Micoquian from Western Europe

In contrast to Central European researchers, Bordes (1981, 1984) maintained the connection between the Micoquian and the Upper Acheulian for the West European assemblages (see also Fig. 11a). However, he was aware that the Micoquian differed from La Micoque (and thus certainly also from the sites he worked on in the Seine basin) and the German Micoquian. He also drew attention to the differences in relation to tools from blanks (Bordes 1981, p. 78): “Les relations du Micoquien de la Micoque et du Micoquien allemand sont également peu claires: s’il y a de grandes similitudes en ce qui concerne les bifaces, l’outillage sur éclats du gisement allemand est pauvre et peu nombreux, à l’inverse de ce qui se rencontre à la Micoque.” [The relationship between the Micoquian of la Micoque and the German Micoquian is unclear: while there are great similarities in terms of bifacial tools, the German sites’ flake tools are poor and few in number, unlike those found in la Micoque]. Bordes’ approach is complemented by the approaches of Tuffreau (1988) and Campy et al. (1989). However, the latter two contradict each other. Tuffreau (1988) argued that the French Micoquian should be placed in the same time span as an early Mousterian: before the last interglacial (Fig. 11b). This stands in contrast to Campy et al. (1989), who continue to regard the Micoquian as an interglacial phenomenon (Fig. 11c).

The combination of micoquoid-looking artifacts and dating into the early Würm was described repeatedly in the course of the 1980s. Examples come from the extreme East of France (Guillaume 1982; Janot 1981), from Jura Dept. (Campy et al. 1989) or from Aube Dept. (Boëda and Mazière 1989). However, the opposite combination, the connection between micoquoid artifacts and a pre-Würm dating, can be found as well. Here, we refer to works from Central France (Despriée and Lorain 1982) or southwestern France (Leclercq and Briois 1982). In the Dordogne for itself, only layer 6 of La Micoque was considered to be the actual Micoquian (see Rigaud 1988, p. 437) as Breuil did in the 1930s.

Focusing on the northwest of France, we can see that there were different described sites (Treissény, Bois-du-Rocher, or Kervouster) that supposedly had a certain similarity to the Central European Micoquian or *Jungacheuléen* (Monnier 1988, p. 77).

Due to the presence of pieces with tranchet blow (lateral tranchets or LSF removals), the Mesvin IV and La-Cotte-de-

Saint-Brelade sites were compared to the Central European Micoquian most often attributed to the last glacial (Cahen and Haesaerts 1984; Cahen et al. 1984; Cahen and Michel 1986; Callow and Cornford 1986). Thus, it was recognized that technologies that are very similar or even identical to each other can sometimes occur in clearly separated periods of time. This can be seen as a further indication that while it may be appropriate to compare such phenomena technologically, it is not sensible to combine them in the same generic unit.

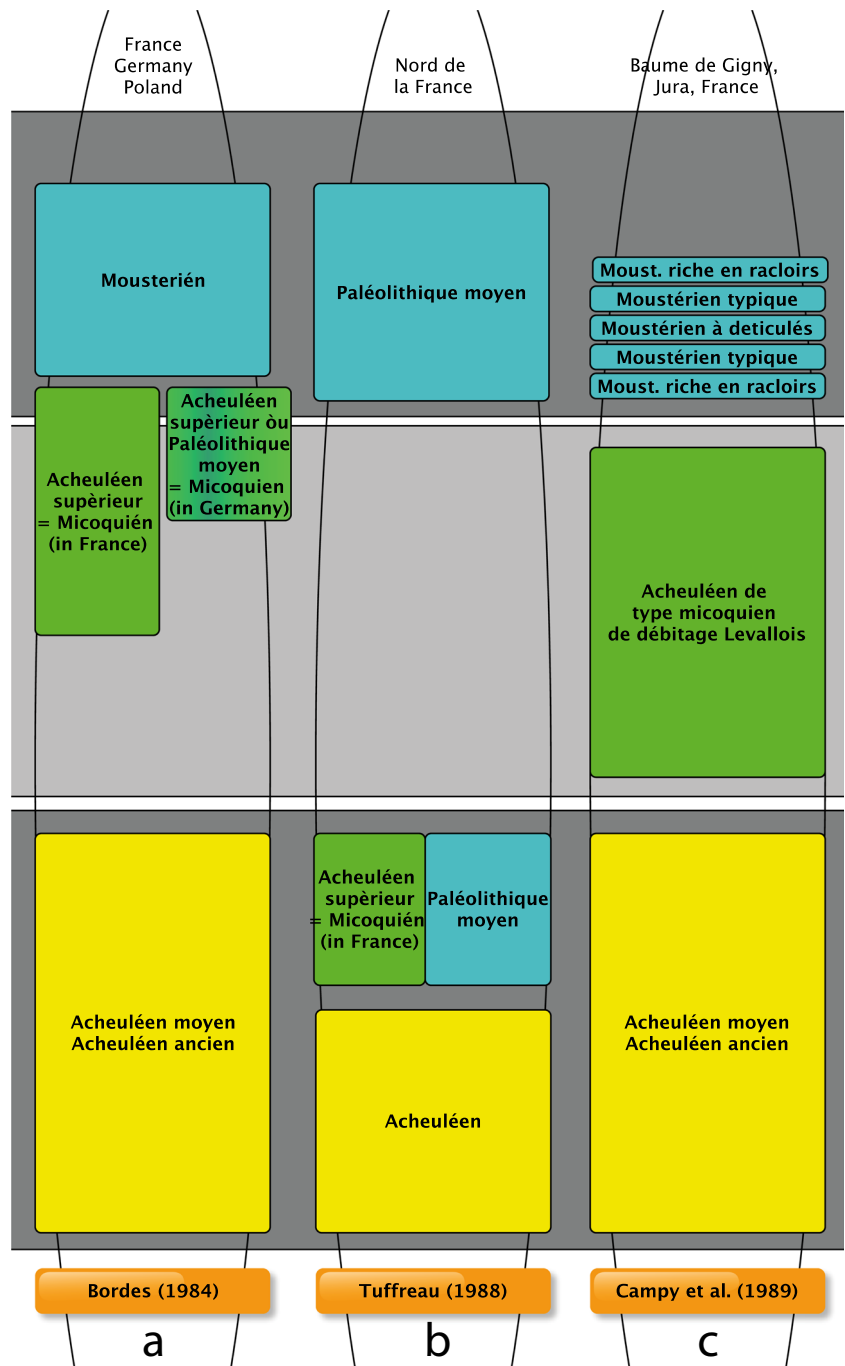
Micoquian research in the 1990s

The 1990s in Central Europe: new approaches bring forth new concepts and terms

Another prominent point in the history of Micoquian research is the attempt to give a new name to Keilmesser-bearing assemblages in Central Europe. At this point, at the latest, the Micoquian biface loses its significance as a name-giving assemblage element and is replaced by the Keilmesser (as reported, Müller-Beck used the term *Faustkeilschaber* for his generic unit), which was already regarded as definitive for complexes in the 1950s (Müller-Beck 1956, 1957).

To structure the material of the Bilzingsleben site, Mania (1990) distinguished two groups of assemblages for the late Middle Paleolithic and used two characteristic bifacial object groups (*Keilmesser* and *Blattspitzen*) as the distinguishing feature. For the first groups, he used three descriptive terms: *Inventare mit Keilmessern* [assemblages with Keilmesser], *Keilmesserinventare* [Keilmesser assemblages], and *Keilmessergruppen* [Keilmesser groups]. He described these groups as belonging to the Micoquian (Mania 1990, p. 146): “Diese Inventare werden im allgemeinen dem Micoque-Kreis (Fundstelle La Micoque vom Vezere-Tal) zugeschrieben und sind durch asymmetrische, schlanke Faustkeilmesser mit seitlichem Rücken charakterisiert.” [These assemblages are generally attributed to the Micoque circle (La Micoque site of the Vezere Valley) and are characterized by asymmetrical, slender biface-knives with lateral backs]. Mania (1990, pp. 146–148) does not limit his description to this assignment, but also describes the lithic typo-technology of these assemblages: long narrow biface leaves (*Faustkeilblätter*) produced in the same technique, Levallois technique predominates, numerous discoid cores, differently shaped scrapers (single, double, angled, convex, curved, straight, and transverse scrapers), and numerous blades. The presence or absence of the Levallois concept will be discussed repeatedly in later works. In addition to the discussion of the lithic assemblages, Mania (1990, p. 148) narrows the groups down to the early Würm (see Fig. 12) and describes their distribution over the whole of Western, Central, and Eastern Europe. The main area of the

Fig. 11 a–c Cladogram of the Micoquian positioning in Western Europe (1984–1989), according to Bordes (1984), Tuffreau (1988), and Campy et al. (1989)



Moustérien, however, was in the west, whereas the main area of the Keilmesser groups was in the east. This description barely differs from other descriptions of the previous two decades, and only the term Micoquian was replaced by the term *Keilmessergruppen*. For groups that were chronologically later, he adopted the term *Blattspitzengruppen* from the literature, a term that has already been used by various researchers for some time (e.g., Freund 1963; Kozłowski 1961; Müller-Beck 1956; Schönweiß 1962–1963; Valoch 1955; Zotz 1951).

In the following years, the term *Keilmessergruppen* was adopted by various authors, most of them German-speaking, and mostly used as a synonym for the assemblages previously defined as central European Micoquian. The point of reference for this renaming was essentially that even more recent investigations in La Micoque were not able to work out a clear chronological classification of the upper layers. Veil et al. (1994, pp. 40–41) give some reasons why the term Micoquian should be replaced:

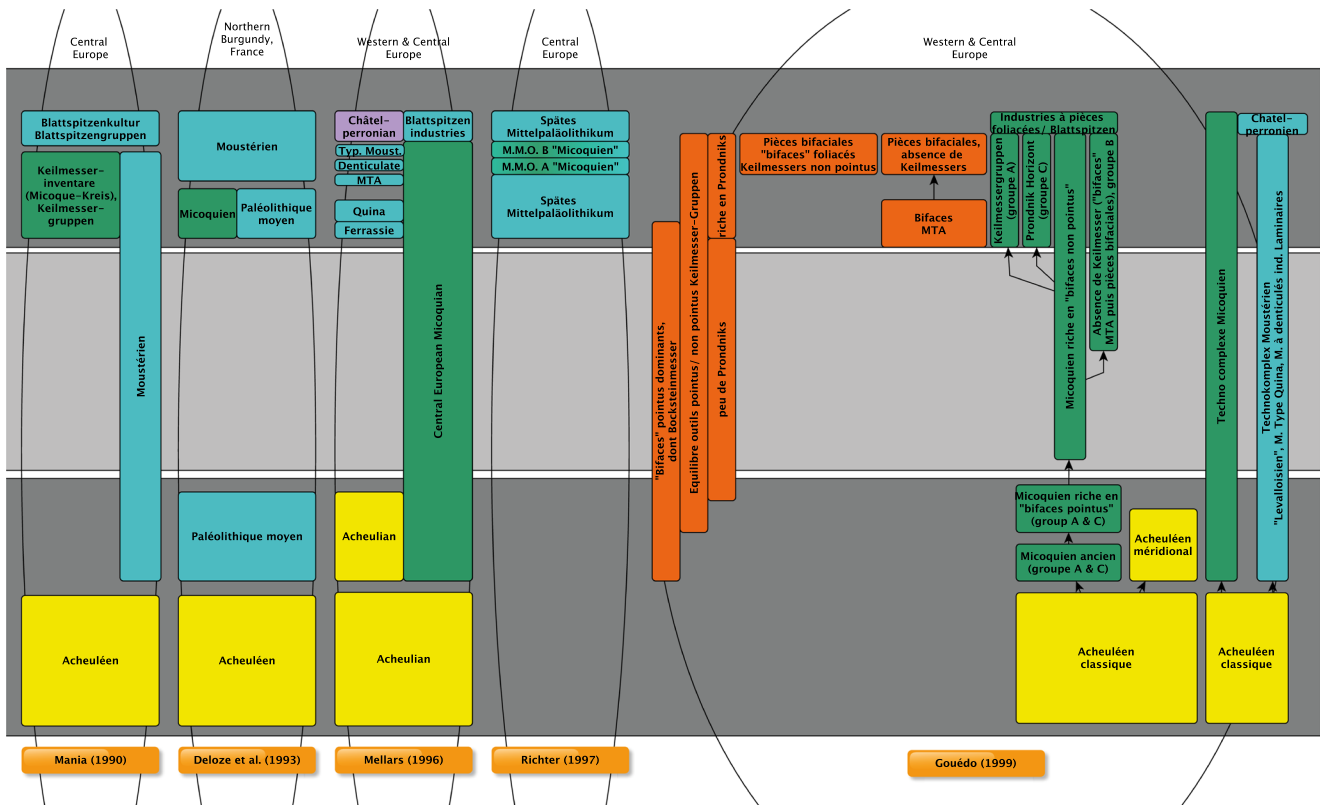


Fig. 12 Cladogram of Micoquian positioning in Western and Central Europe (1990–1999), according to Mania (1990), Deloze et al. (1994), Mellars (1996), Richter (1997), and Gouédo (1999)

- The type assemblage of the layer N/6 (Peyrony excavation) of La Micoque is not considered typical or representative of all the assemblages covered by the term Micoquian.
- The characteristic element in La Micoque, the Micoquian biface, is not or only very rarely present in Central European sites (Lichtenberg and Königsau are mentioned here).
- Although the tool spectrum of the assemblage N/6 is considered representative of Bosinski's Bockstein type, it has very little in common with the entirety of the sites in Central and Western Europe, apart from a special processing technique [this probably refers to the alternating unidirectional edge regularization, AUER].
- Uncertain time setting of the type assemblage.
- Uncertain in situ character.
- Ambiguity due to the research history of the term Micoquian.

On the basis of these arguments, Veil et al. (1994, p. 41) propose using the term *Keilmessergruppen* (Micoquian sensu Bosinski, Günther, Toepfer, Valoch) as it designates the smallest common denominator of the comprehensive Weichselian bifacial assemblages of Central and Eastern Europe, and assemblages of these groups are apparently generally characterized by very standardized bifacial cutting

tools, which are formally known as leaf-shaped scrapers, foliated bifaces, etc. In this context, it has to be borne in mind that Keilmesser appearing in the assemblage are not to be understood as *conditio sine qua non* for belonging to these groups. Another important statement is to be reproduced here literally: “Selbstverständlich soll die vorgeschlagene Zusammenfassung der Inventare unter diesem deskriptiven Namen zunächst keine Aussage über ihre Beziehungen untereinander beinhalten, seien sie nun ethnischer, funktional, aktivitätsspezifischer oder chronologisch-genetischer Art.” [Therefore, Keilmesser appearing in the assemblage are not to be understood as *conditio sine qua non* for belonging to these groups [...]. Of course, the proposed consolidation of the inventories under this descriptive name should not initially contain any statement about their interrelationships, be they ethnic, functional, activity-specific or chronological-genetic.]. The preceding explanations led Jöris (1993, p. 46) to regard the terms Micoquian and Keilmessergruppen being synonymous: “Micoquien [= Keilmessergruppen (VERF.).]”

Bosinski (1967) already suspected a decrease of the bifacial assemblage component within his Micoquian. Kind (1992) adopted this assumption and attempted to divide the Middle Paleolithic assemblages in southern Germany into groups on the basis of data from the literature. In addition to a tripartite division already established by Bosinski (Micoquian, Mousterian, Leaf point group), he was able to identify another

mixed group which has strong similarities to the Moustérien group. A limiting factor in this study, which is also mentioned therein, is that typological evaluations from earlier years had to be used. In the 1990s, Bosinski also began to understand the terms Micoquian and *Keilmessergruppen* as synonymous (Bosinski et al. 1995, p. 848). Numerous researchers also began to favor the term *Keilmessergruppen* over the term Micoquian (e.g., Street et al. 1999).

Parallel to the establishment of the new term *Keilmessergruppen*, the term Micoquo-Pradnikian used by Chmielewski (1969, 1970, 1972) continued to be used and Bárta (1990) thus used the term *Micoquien-Pradnik-Kultur*. Sometimes, it seems that the differences between Mousterian and Micoquian in western Central Europe have been emphasized more than in the eastern part, e.g., Bárta (1990, p. 125) discusses the possible existence of the Micoquien facies of the Mousterian.

Another approach was advocated by Richter (1997). In the analyses of the assemblages of the G-layer complex of the Sesselfelsgrötte, he found that sometimes the assemblages alternate between many and few or no bifacial elements. His conclusion was that these were *initial* and *consecutive* (subsequent) assemblages with a high raw material diversity in the early stages (initial) and only a few or no bifacial elements at all. In the late stage (consecutive), the raw material diversity decreases, but the bifacial component increases. If the unifacial component is considered to be Mousterian and the bifacial component represents Micoquian, these assemblages can be considered to be Mousterian with Micoquian option, whereby the Micoquian option increases over the duration of the settlement. In this approach, Mousterian and Micoquian are no longer perceived as separate entities. In a further evaluation of the assemblages, that had previously been classified as Micoquian (or *Keilmessergruppen*), he divided the M.M.O. into an early (M.M.O.-A) and a late phase (M.M.O.-B). These two phases differ not only in their chronological position (see Fig. 12), but also in their production of the unifacial accompanying industry. The older Micoquian (M.M.O.-A) is a (mainly) non-Levallois industry, whereas the younger one (M.M.O.-B) is characterized by Levallois.

Micoquian research in Western Europe during the 1990s

In contrast to research in Central Europe, where new terms were established for the Micoquian, the term Micoquian continued to be used intensively in Western Europe.

In the course of technological considerations, Boëda (1991a) described characteristic differences between MTA bifaces and Micoquian bifaces and thus showed a further way to delineate differences between morphologically similar objects by means of technological criteria. Although both pieces are retouched at the edge in such a way that they become plano-

convex and are only retouched at the convex edge, the shape of the surfaces is very different. Both surfaces of Micoquian bifaces are plano-convex. On the other hand, the surfaces of the MTA bifaces are generally convex and only the edges are plano-convex. There are also differences in symmetry. Micoquian bifaces show a double asymmetry, which can be seen in cross- and longitudinal section. In the MTA bifaces, however, the cross-section is only slightly asymmetrical. However, both can be symmetrical when viewed from the top.

During the 1990s, the question of which assemblages can or should be addressed as Micoquian was raised again. In addition to the sites in Brittany (Cliquet and Monnier 1993; Monnier 1986), systematic research in eastern France also contributed to the discussion. In this context, sites investigated by Farizy (formerly Girard) in the 1980s and early 1990s played a role. Of importance here is the site Champlost (Yonne), which was attributed to a “charentoïdo-micoquien” facies (Deloze et al. 1994, p. 20) by its asymmetrical bifacial component and a systematic Levallois reduction. Thus, the reference was assigned to the Mousterian system, but the deviating bifacial component was taken into account. Of interest at this site is not only the combination of Levallois and asymmetrical bifacial components but also the known tentative TL dating between 65 and 45 ka (Farizy 1995). According to Farizy (1995), the Grotte de la Verpillière I (Desbrosse et al. 1976; Desbrosse and Texier 1973b), Blanzay (Desbrosse and Tavoşo 1970), or Bissy-sur-Fley (Desbrosse and Texier 1973a) in southern Burgundy also belongs to these sites and is part of her *Industries charentiennes à influences micoquiennes*. Also, in the course of motorway constructions in the early 1990s, numerous open-air sites were excavated in northern Burgundy. In two sites (Les Hauts Massous in Vinneuf and La Prieuré in Villeneuve-l’Archevêque), the bifacial component was used to assign find layers of the early Würm to the Micoquian (Deloze et al. 1994). In contrast to earlier French works, these assemblages described as Micoquian were clearly assigned to the Middle Paleolithic and sometimes seen as western extensions of the Micoquian sensu Bosinski (1967).

Understandable as it may be to place these assemblages alongside the Central European Micoquian, the question now arises to what extent assemblages before the Eem, during the Eem, and after the Eem might be interrelated. This is one of the questions to which Gouédo (1999) devoted himself. Gouédo (1999, pp. 7–16) is intensively concerned with the research history of the generic unit Micoquian and identifies the definitional differences between the typological approaches of Bordes (1954) and Bosinski (1967). However, both typological approaches are based on the presence of “Micoquian bifaces.” The decisive difference between the two approaches is what is meant by this. For French research, the Micoquian biface plays the central role, as there are hardly any other types. Outside of France, however, the focus is on the *Keilmesser* family. The further we move east, the rarer the Micoquian biface becomes. These are essential factors that attracted the attention of

researchers as early as the 1950s. The unifacial reduction systems used at the same time are also of great relevance. In addition to typological criteria, technological criteria also play a role in bifacial pieces. Here, Gouédo (1999, pp. 15–16) refers to the morphology of the pieces and points to plano-convex cross-sections and trifacial concepts of the tools, regardless of whether they occur in France or east of the Rhine, or whether the accompanying industry is based on Levallois or not. He then distinguishes the views of typologists and technologists on the research object Micoquian: “La vision technologiste tend donc à unifier le monde micoquien tout en montrant des différences entre groupes alors que la vision typologiste bordienne tend à accentuer ces différences.” [The technologist vision therefore tends to unify the Micoquian world while showing differences between groups, while the Bordian typologist’s vision tends to accentuate these differences]. Overall, he concludes that the Micoquian phenomenon is by far not considered homogeneous. Gouédo’s evolutionary approach to the course of the Micoquian involves a threefold division in time (*Micoquien ancien*, *Micoquien riche en “bifaces pointus,”* and *Micoquien riche en “bifaces non-pointus”*) and in its structure (groups A, B, and C). Group A is based on the assemblages in Vinneuf and Verrières. Group B is represented by the MTA-A and group C is based on the assemblage of Champlost (see Fig. 12). According to him, the Micoquian originates from the classical Acheulian as in the sites in Cagny around 450 to 400 ka. The *Micoquien ancien* and then the *Micoquien riche en “bifaces pointus”* contain two development groups that are not entirely separate (groups A and C); only later in the *Micoquien riche en “bifaces non-pointus”* do the development lines separate. On the one hand, there is a branch that is characterized by Keilmesser (*Keilmessergruppen*, group A) and one that is called *Pradnikhorizont* (group C). On the other hand, there is a branch in which only very few Keilmesser occur, but other types of bifacial pieces (Gouédo 1999, fig. 176). This approach attempts to draw a clear line of development for sites from Western and Central Europe that have so far been referred to as Micoquian. The Micoquian, parallel to the Mousterian, is regarded as an independent development. However, it should be noted that the context presented contains only the technical development and the Micoquian is regarded as a technocomplex (as understood by Clarke), within which the same or very similar concepts of tool manufacture are applied.

Micoquian research in the 2000s

Micoquian research in Central Europe during the 2000s

In the early 2000s, the amount of data that can be evaluated in relation to the literature available increased enormously, so that a strict selection had to be made. The reason for this is twofold. One is the increasing amount of written literature; the

other is the amount of scanned or online publications that can be searched successively for keywords. Therefore, hopefully, an adequate selection of representative contributions has been made to do justice to the matter.

At the beginning of the 2000s, Conard and Fischer (2000) attempted to summarize and present the current state of research on the Middle Paleolithic in relation to cultural units. In contrast to Bosinski (1982), who favored a tripartition, they assume a dichotomy into Early Middle Paleolithic (Saalian/Rissian assemblages) and Late Middle Paleolithic (Eemian and Weichselian/Würmian assemblages). The term *Keilmessergruppen* is preferred to the term Micoquian. They also propose using the terms *Keilmessergruppen* and *Pradnik Group* as synonyms. Furthermore, the authors suggest that the term *para-burin*, which was introduced into research in the 1960s by Polish researchers (Chmielewski 1969; Kowalski 1967), be preferred to the term *Pradnik technique* in order to emphasize it. They also assume that although the separation of Keilmesser assemblages and Mousterian assemblages can sometimes be imprecise, reduction systems alone cannot be used for the separation (Conard and Fischer 2000, p. 12): “While it is clear that the distinctions between Late Mousterian and Keilmesser assemblages are not always sharp, it seems unlikely that the observed variation can be explained solely on the basis of reduction sequences.” Nevertheless, the Mousterian in particular remains a reservoir for assemblages made by blank tools with or without the use of the Levallois concept. Furthermore, they note that their approach assumes that similar assemblages do not necessarily have to be of the same age as often assumed in earlier approaches. They also point out that no more precise classifications can be made without further reliable chronological data. The isolated generic units are summarized in Fig. 13 (left).

Bosinski’s (2000–2001) approach is slightly different (Fig. 13 mid). He distinguished the assemblages of the early Middle Paleolithic according to their age, differentiating between two supergroups in the younger phase, which are separated in time (early and late phase). He distinguished two assemblage types within the early phase (laminar *Rheindahliense* in MIS 5c, laminar *Wallerheim D* also in MIS 5c). Within the following *Keilmessergruppen* (*los grupos Keilmesser*), he distinguished five assemblage groups, which, in contrast to earlier works, he staggered differently in time. The *Keilmessergruppen* are placed between MIS 5a and the middle MIS 3. He differentiates between two chronologically successive units, which we would like to call early and late *Keilmessergruppen*. The early groups contain the types *Königsau*, *Bockstein*, and *Klausennische*, which are regarded as being chronologically parallel to each other. The late groups consist of the contemporaneous types *Lebenstedt* and *Pradnikhorizont*. This structure differed fundamentally from the sequence established by Bosinski (1967). Not only do the types *Rörshain* (now placed into the

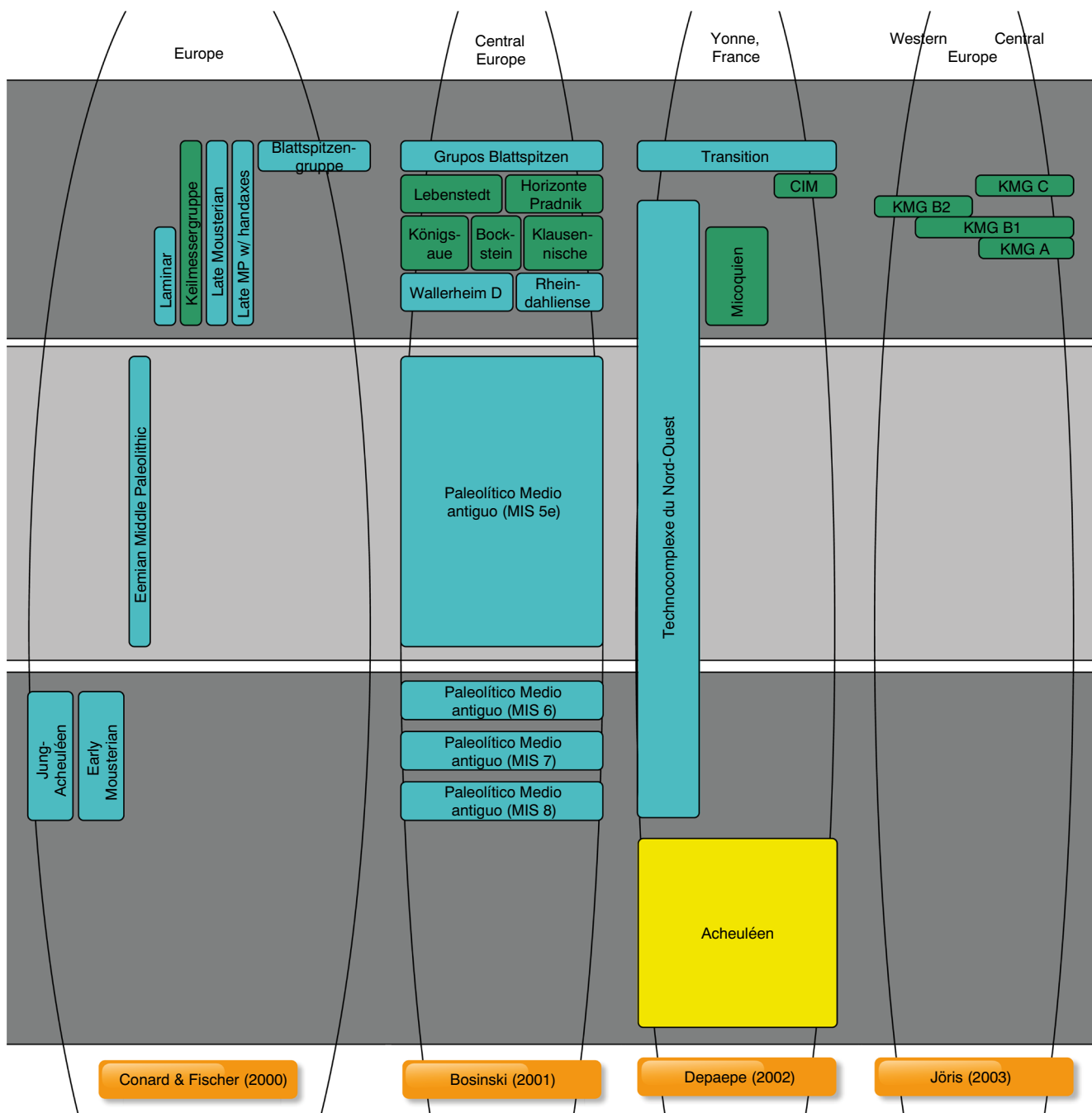


Fig. 13 Cladogram of Micoquian positioning in Western and Central Europe (2000–2003), according to Conard and Fischer (2000), Bosinski (2000–2001), Depaepe (2002), and Jöris (2003)

Blattspitzengruppen) and Schambach not occur, but the types Königsau and Pradnikhorizont were also included. In his very early works, Lebenstedt was seen as the type location of the *Jungacheuléen*, which was located before the Eem (Bosinski 1963).

Böhner (2000, p. 1) sees a clear shift of the Micoquian into the MIS 3 due to dating of newly excavated sites and agrees with the considerations presented by Uthmeier (2004, pp. 381–396) summarizing the assemblages described so far as

Micoquien, Moustérien, Altmühlgruppe, and Szélétien [Obviously, the text of the dissertation available on the Internet is not the submission version from the year 2000, but a revised version. The dissertation was subsequently also published as a book: Böhner (2008)].

In his analysis of the Late Middle Paleolithic and Early Upper Paleolithic in Bavaria, Uthmeier (2004) subsumes the assemblages previously referred to as Mousterian, Micoquian, and Blattspitzengruppen under the generic term Micoquian.

He refers to the concept of the context area coined by Weißmüller (1995) here, but defines it differently (Uthmeier 2004, p. 297): Micoquian as distribution area of technological and typological features that combine several local groups within the distribution boundaries of a “technocomplex” to form a larger supra-regional unit. On the basis of Richter’s (1997) works, he combines the Mousterian and Micoquian of his work area into a single technocomplex. In a similar way, he groups assemblages with leaf points into his regional Micoquian (Uthmeier 2004, p. 299). In his opinion, evaluation units and assemblages with leaf points within Bavaria are part of the regional Micoquian. Therefore, he mapped the Micoquian without leaf points, Micoquian with isolated leaf points (< 5%), and Micoquian with leaf points (> 5%) into one map (see Fig. 14).

According to Jöris (2003, p. 53), the term Keilmessergruppen should be preferred to the term Micoquian, because of the presence of specific bifacial tools, especially the Keilmesser. He referred to the discussion in Veil et al. (1994) and chronologically rearranged the complexes defined by Bosinski (2000–2001) within the Keilmessergruppen (KMG). According to the data available at that time, he assumed that the KMG date both before and after the first glacial (MIS 4, see Fig. 13 right). He assumed a period of about 80 to 43 ka. In his opinion, the assemblages could be chronologically divided into three groups, which he called KMG A (early), B (middle), and C (late) and which essentially correspond to Bosinski’s assemblage types:

- KMG-A: assemblage type “Königsau-Lebenstedt.” Occurs in the north German lowlands, as well as in the northern and southern Central European low mountain ranges. Assemblages dominated by Levallois reduction. Keilmesser and scrapers with convex cutting edges.
- KMG-B1: “Pradnik-Horizont.” Northern Central European low mountain ranges. Levallois reduction

concepts are almost insignificant, and the systematic extraction of reductions is almost completely absent. Handaxes are rare, domination of Keilmesser with straight cutting edges.

- KMG-B2: not defined for Central Europe. Occurs in Western Europe.
- KMG-C: assemblage type “Bockstein-Klausennische.” Northern and southern Central European low mountain ranges. Highly variable shapes of tools, mostly straight cutting edges.

Bosinski (2008) assumes that the majority of the assemblages to be assigned to the Keilmessergruppen are to be placed in the MIS 5a (Odderade), whereby according to Jöris (2003), assemblages belong after the first glacial maximum, and Richter (2002) wants to place the entire Keilmessergruppen (*Moustérien mit Micoquien-Option*) in the MIS 3 on the basis of ¹⁴C data. Bosinski’s sequence of assemblages is based on the stratigraphic sequence of the Balve cave, as determined in his doctoral thesis (Bosinski 1967). This approach (Fig. 15 mid) is congruent to the one he published in 2000–2001 (Fig. 13 mid)

Micoquian research in Western Europe during the 2000s

So as not to completely go beyond the scope, we limit ourselves to a few (hopefully well chosen) contributions. Let us first take a look at the east of France, where large-scale excavations along a motorway route yielded numerous results. Depaepe (2002) summarized the work in Yonne, northeast France. He extracted four Middle Paleolithic generic units after the Acheulian (Fig. 13 mid) and distinguished two units of “micoquoid” assemblages:

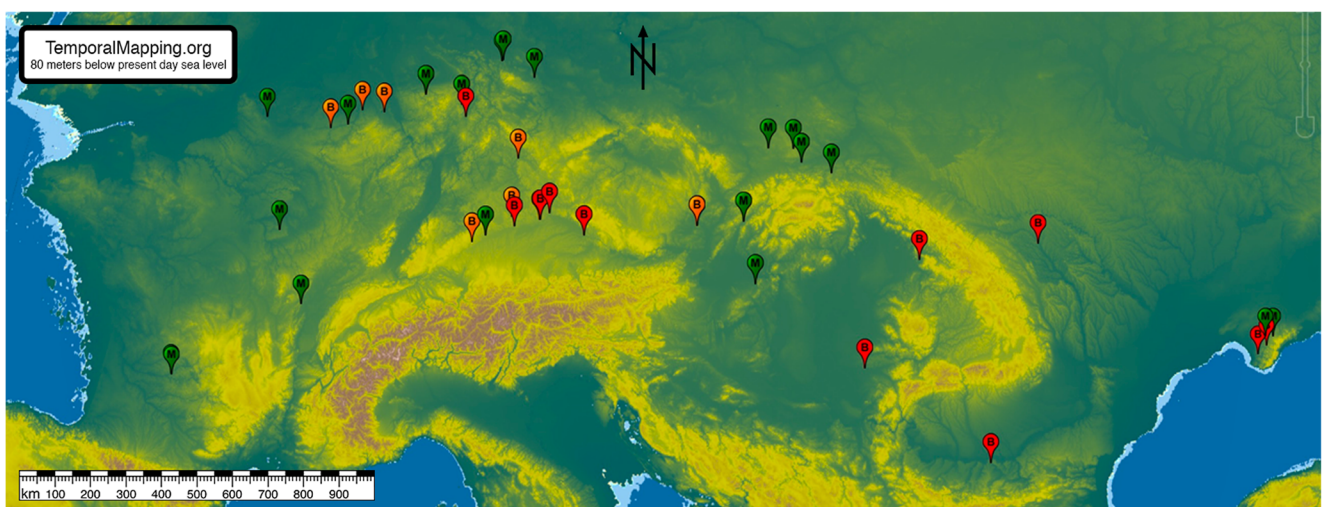
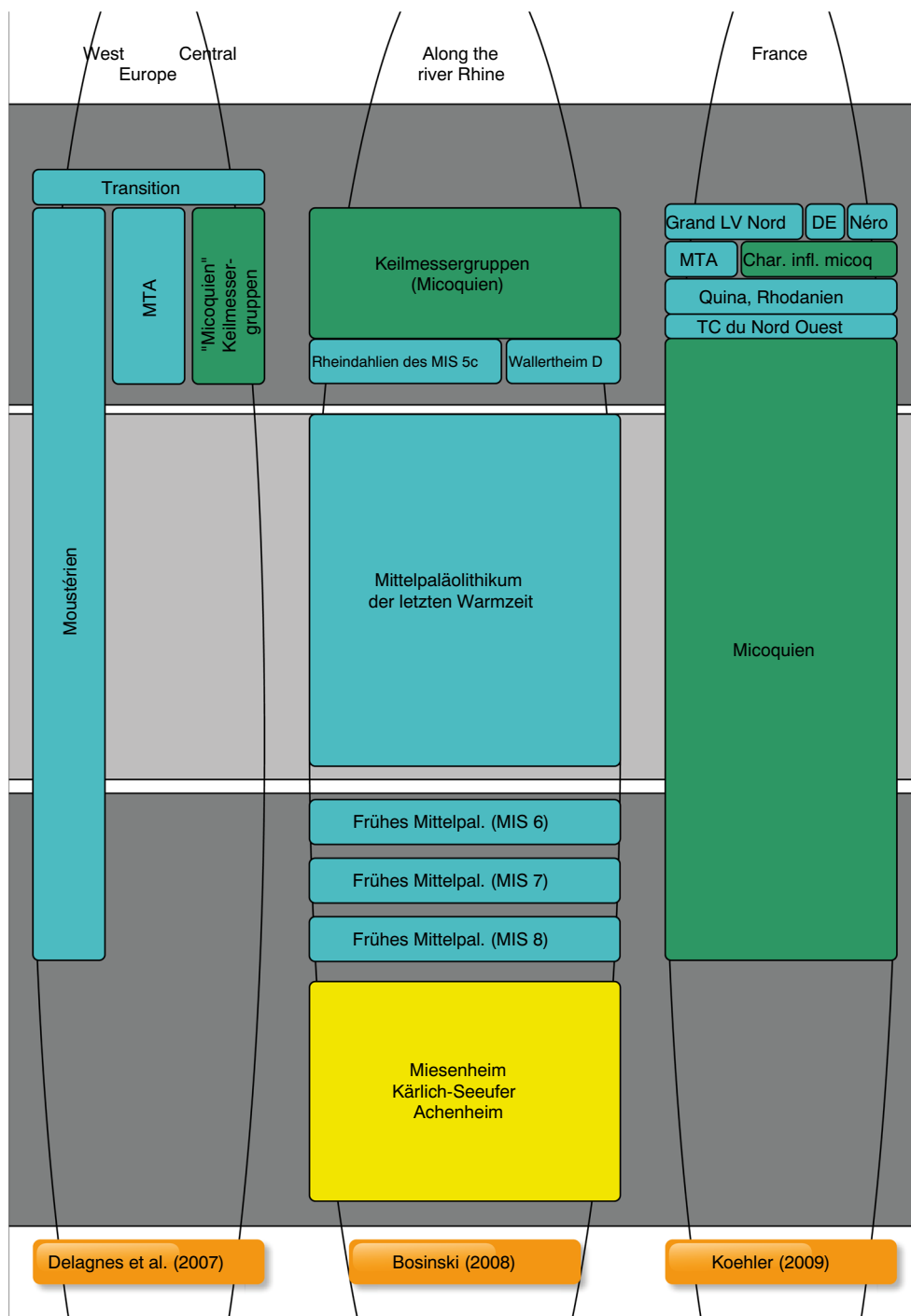


Fig. 14 Sites of the Micoquian with and without leaf points, according to Uthmeier (2004, p. 298, Abb. 11.1)

Fig. 15 Cladogram of Micoquian positioning in Western and Central Europe (2007–2009), according to Delagnes et al. (2007), Bosinski (2008), and Koehler (2009)



- “Classical” Micoquian with handaxes according to Bordes and Bosinski at Vinneuf C at the beginning of the Würm glacial (MIS 5)
- CIM (Charentian with Micoquian influence) described by Farizy (1995) at the Champlost site in the middle Pleniglacial (MIS 3)
- Technocomplexe du Nord-Ouest at Le Fond de la Tournerie in Lailly, at Le Domaine de Beauregard in Lailly, at le Grand Chanteloup in Molinons or at La

Prieurée in Villeneuve l’Archevêque from the Saalian (MIS 6) to the early Pleniglacial (MIS 4)

In describing “technocomplexes” in Western and Central Europe, Delagnes et al. (2007) continued the division into mousteroïd and micoquoid assemblages. Bifacial pieces can be found in the MTA as well as in the Micoquian. The MTA is present in southwestern France, sporadically in northern France and in England. In contrast, the Micoquian

(Keilmessergruppen) is mainly concentrated in Central Europe, but similar industries were also reported from Brittany (Molines et al. 2001), Burgundy (Gouédo et al. 1994; Gouedo 1988), and the Périgord (Bourguignon 1992; Brenet and Folgado 2003). In addition, the contemporaneity of the MTA and the Keilmessergruppen was assumed (Fig. 15 left).

Koehler's (2009) approach to technocomplexes in France differs from the previous one in that she attempts to include numerous regional studies in her chronology scheme, thus achieving a finer structure (Fig. 15 right). With regard to micoquoid industries, she distinguishes the Micoquian (Paris Basin, alternating unidirectional edge regularization) from the CIM (numerous often bifacial side scrapers and Levallois reduction; eastern France), whereas the Micoquian is situated in MIS 6 to 5d and the CIM in MIS 4 to 3. All these French approaches are based on a single, uniform Late Middle Paleolithic industry (Keilmessergruppen) in Central Europe. The works of Bosinski (1967, 2000–2001, 2008) or Conard and Fischer (2000), however, show the complexity of the Middle Paleolithic in western Central Europe and different generic units.

Micoquian research in Western and Central Europe during the 2010s

More recently, the term Micoquian has been used mostly in conjunction with the term Keilmessergruppen. However, we will first compare the approaches of Baales (2013) and Kozłowski (2014) favoring a short chronology for the western part of Central Europe (Fig. 16 left) and a long chronology for the eastern part of Central Europe (Fig. 16 right), respectively. For Baales, Keilmessergruppen (Micoquian) and Mousterian are generic units running side by side, while the Keilmessergruppen (Micoquian) only occur between MIS 5b and MIS 3. This is in contrast to the Mousterian, which appears from MIS 8 to MIS 3. For Kozłowski, there are three units: a pure Mousterian, a pure Micoquian, and a mixture of both.

Richter (2014) takes a slightly different approach (Fig. 16 left). While the Micoquian *sensu lato* has a long chronology (MIS 7 to MIS 3), the position of the M.M.O. (Mousterian with Micoquian Option) is exclusively in MIS 3. The eastern Micoquian has a somewhat longer chronology (MIS 5 to MIS 3). The MTA in Western Europe is contrasted with the M.M.O. in Central Europe. In addition, for the early MIS 3, he designed a model of five European settlement zones (Richter 2014, p. 203):

- Northwestern Europe—different Mousterian facies
- Southwestern France—classical MTA and other Mousterian facies

- Central Europe (from the Rhine to the Carpathian Mountains)—industries with Keilmesser (Central European Micoquian or M.M.O.)
- Eastern Europe (from the Carpathian Mountains to the Ural)—eastern Micoquian and different Mousterian facies
- Southern Europe (Balkan)—different Mousterian facies

In his overview of the European Middle Paleolithic, Depaepe (2014) made it clear that the facies model built by François Bordes has a spatial limitation. This quickly became visible for other regions by adopting the model and led to the definition of own generic units, which better described the features recognized. Figure 16 (mid) shows an attempt to represent the generic units described by Depaepe in a cladogram. He recognized that the term Mousterian is nearly synonymous to the term Middle Paleolithic. For the Micoquian, he defines two phases: phase 1—Keilmessergruppen and phase 2—Blattspitzengruppen. This corresponds to the approach advocated by Richter (2014), whereby the M.M.O.-A and B correspond to the Keilmessergruppen and the M.M.O.-C to the Blattspitzengruppen. He also sees connections between the Micoquian, on the one hand, and the Babonyan, Szeletian, and Altmühlian, on the other hand. To complete this approach, Depaepe examines the chronological range of various lithic reduction concepts. He attests Levallois and Discoidal a long chronology. In contrast, Quina and Laminar occur only toward the end of the Middle Paleolithic.

Last but not least, in this chronological view of the term Micoquian, we would like to present and contrast three models from the year 2016 with very different approaches to deal with the Micoquian controversy. First, we consider the approach of Blaser and Chaussé (2016), who compiled the definitions of the term Micoquian for assemblages from the Paris basin. They make two remarkable observations. First, they can show that the Micoquian biface (or what has been described as such) is not suitable for forming generic units. Second, they can show that a total of three temporally separated generic units were described as Micoquian (Fig. 17 right). Due to the use of the term Keilmessergruppen, which is now increasingly used in Central Europe, they propose to form a separate term for the industries at the beginning of the last glaciation (but make no proposal).

Locht et al. (2016), who avoid using cultural allocations or generic units to describe the assemblages wherever possible, consider the production systems for flakes, blades, points, and bifaces in each chronostratigraphic phase for northern France (MIS 7 to early MIS 3). They come to the conclusion that the individual reduction systems do not always occur and that bifacial elements are only sporadically present in individual units (Fig. 17 left). The approach chosen by Kozłowski (2016) for the eastern part of Central Europe uses generic units and recognizes a juxtaposition of these Mousterian and Micoquian industries (Fig. 17 mid).

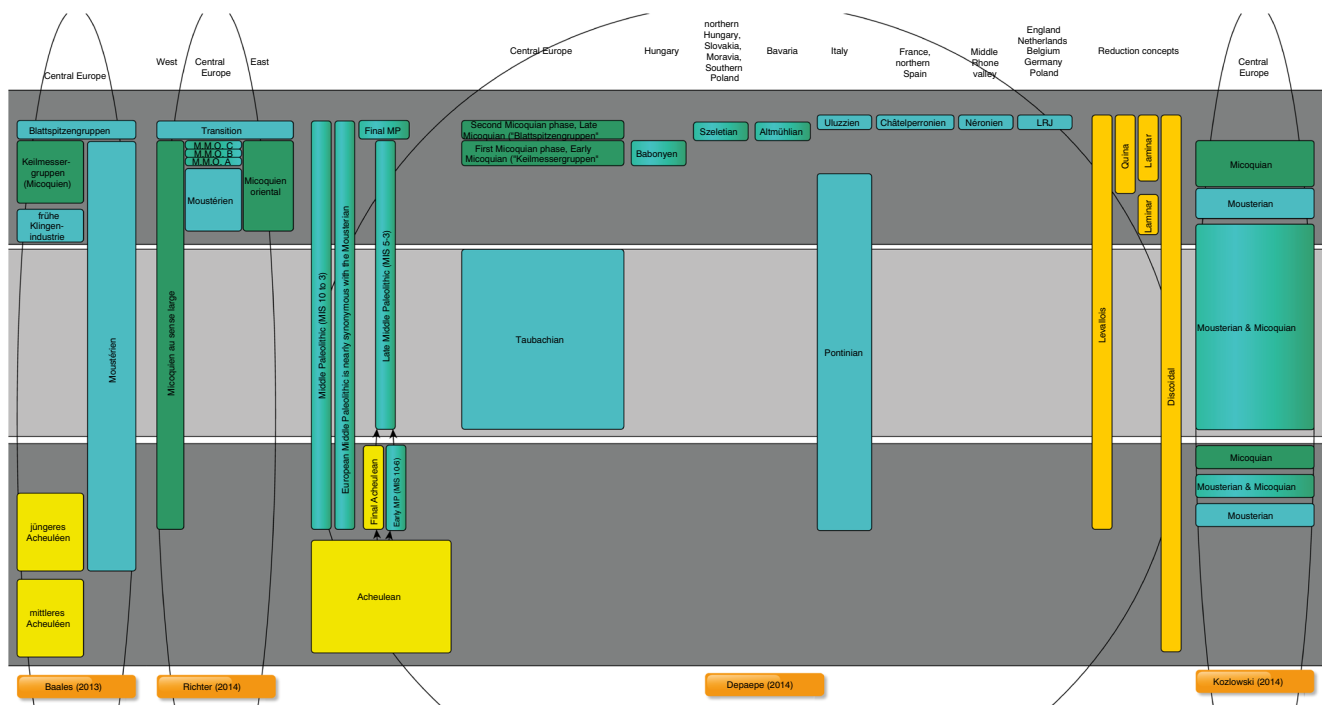


Fig. 16 Cladogram of Micoquian positioning in Western and Central Europe (2013–2014), according to Baales (2013), Richter (2014), Depaepe (2014), and Kozłowski (2014)

Discussion

Shifts in chronological and epochal affiliation

In the course of more than 100 years of Paleolithic research, in which the term Micoquian was used as a generic unit, several chronological shifts of the term’s use can be observed. A total of 58 sources were used, in which clear information on the chronological position and its affiliation was given (Fig. 18). It is good to see that there is an interplay between the affiliation to the Lower (Acheulean) or Middle Paleolithic (starting right from the beginning of the use of the term). From the 1950s onwards, the assumption that the generic unit Micoquian can be attributed to the Middle Paleolithic prevails. Predominantly French authors continue to use the term Micoquian according to Breuil and Bordes and declare the assemblages to belong to the Acheulean. The term was thus not only increasingly used for chronologically younger assemblages, but also underwent a spatial shift from Western Europe to Central and Eastern Europe. The sources used show five significant shifts of meaning:

1. Discovery phase (1908–1932)
2. Würmian phase (1951–1969)
3. Chronological expansion phase (1977–1989)
4. New naming and Würmian phase (1990–1993)
5. Chronological expansion but Würmian manifestation phase (2014 to today)

The discovery phase (1) is characterized by a repeated change in affiliation, although the chronological assignment to the last interglacial is retained. In the Würmian phase (2), a twofold shift is visible: on the one hand, the chronological assignment of the assemblages to the last glacial, and on the other hand, to the Middle Paleolithic. In the chronological expansion phase (3), the duration of the Middle Paleolithic was extended to the time before the last glacial period, and thus, numerous assemblages were also assigned to the Middle Paleolithic. In the new naming and Würmian phase (4), a new name for the corresponding assemblages was defined with the term Keilmessergruppen and an assignment to the last glacial was manifested. In the newest phase (chronological expansion but Würmian manifestation phase, 5), two tendencies are visible: on the one hand, a manifestation in the last glacial, and on the other hand, an extension of the definition to older assemblages.

Spatial shifts in affiliation

The spatial shift of the affiliation of assemblages to the Micoquian is closely related to the question of whether the eponymous site La Micoque should be added or not. In the descriptions before 1990, a reference (explicit or not) to the eponymous site La Micoque was repeatedly made, either through the similarity of the assemblages or through the use of the term Micoquian. From the 1990s onwards, La Micoque was increasingly detached. This

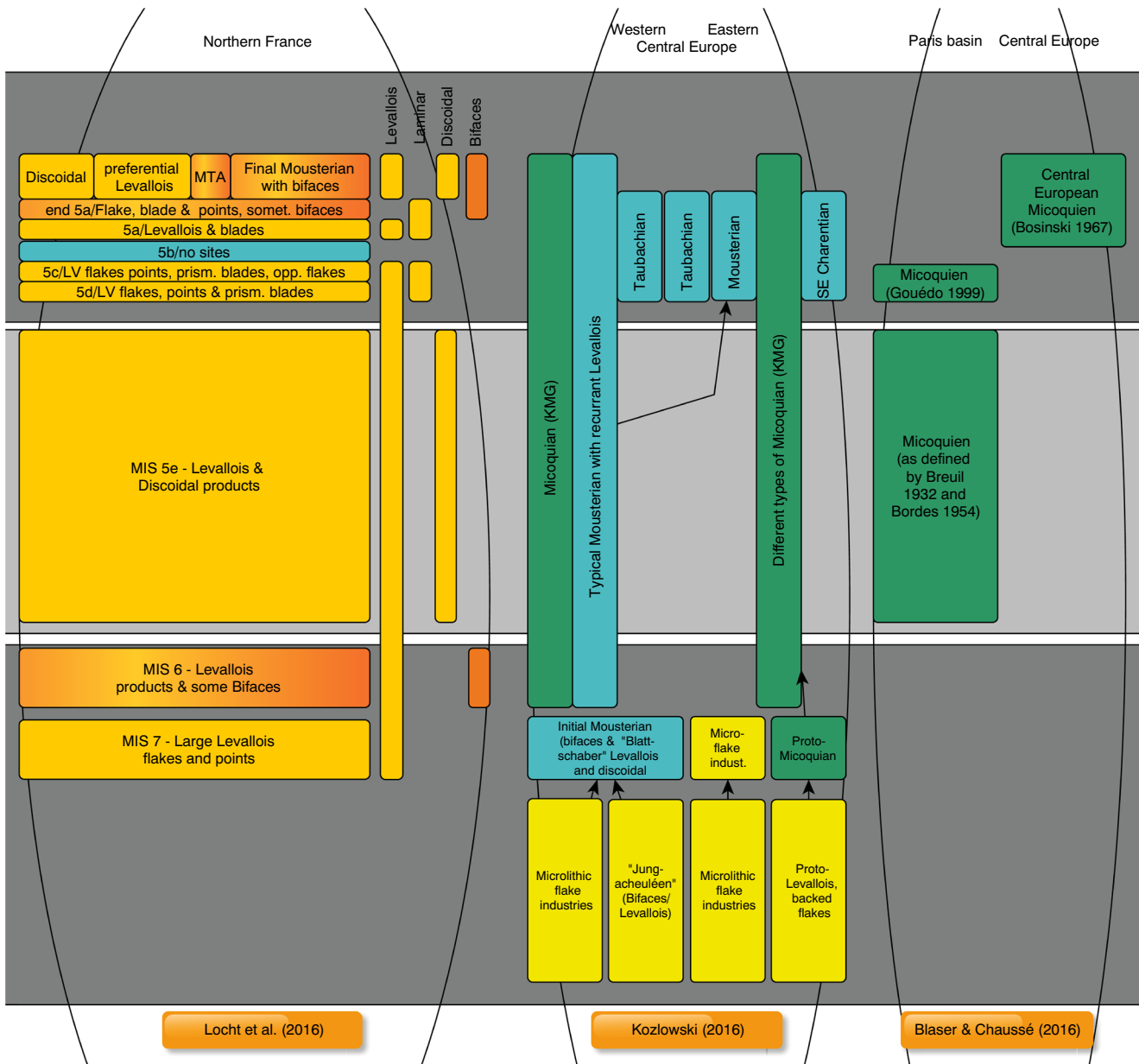


Fig. 17 Cladogram of Micoquian positioning in Western and Central Europe (2016), according to Locht et al. (2016), Kozłowski (2016), and Blaser and Chaussé (2016)

took place with the reference to the spatial distance of the sites, the undated layer N/6 in La Micoque, as well as the now recognized differences in the assemblages. On the one hand, despite the spatial distance, Bosinski (1967, 1970) explicitly interpreted the micoquoid assemblages he analyzed in Central Europe with reference to la Micoque. On the other hand, despite the name connection (Micoquo-Pradnikien), Chmielewski (1969) drew attention to the differences between the Central European assemblages and the eponymous site. The distribution of the Micoquian strongly depends on whether the eponymous site is part of the respective definition (see Figs. 2, 6, 8, and 14).

Assigning new names

Looking back to the 1990s, the differences between the eponymous site and the Central European assemblages were emphasized more intensively. Veil et al. (1994, p. 40) summarize the reasons for replacing the term Micoquian with a more appropriate one and point out that the lithic of the eponymous layer (La Micoque N/6) is not considered to be typical for the whole of what is now considered to be part of this group in Central and Eastern Europe. The mentioned difficulties with the eponymous site, as well as the fact that other northern French complexes were also called Micoquian, led to the search for a new term. Veil et al. (1994, pp. 40–41), as well

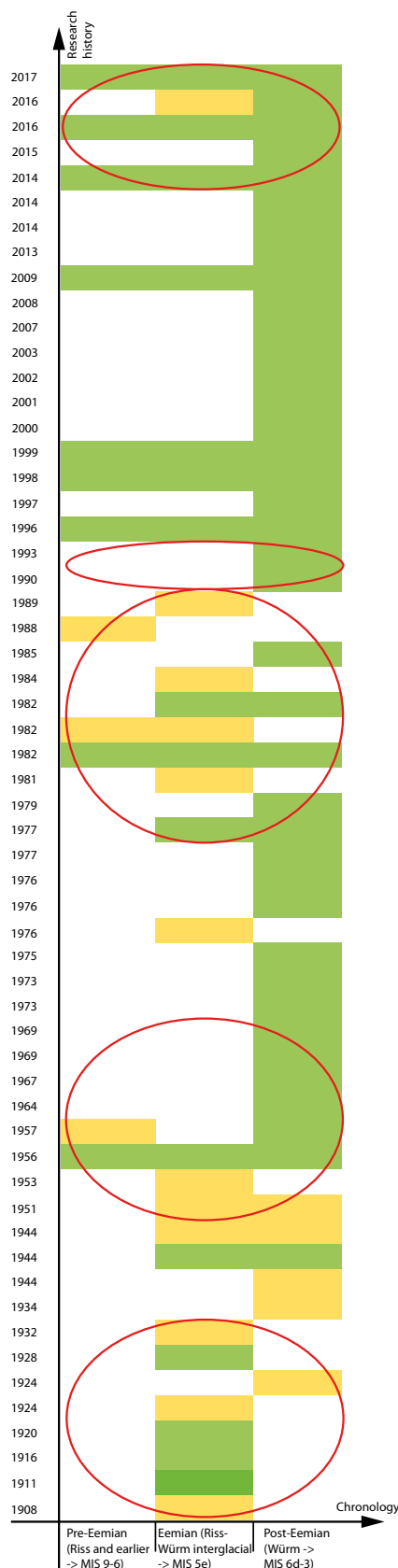


Fig. 18 Diagram of the Micoquian’s chronological positioning in the course of the research history

as Jöris (1993), proposed the term “Keilmessergruppen,” introduced by Mania, as a substitute for the Micoquian (according to Bosinski, Günther, Toepfer, or Valoch). Jöris (1993, p. 45) writes in the same spirit that on the basis of the premises made against the term “Micoquien,” there is a tendency to abandon all the termini for Micoquian associated with the research history and to introduce a more neutral term, that of the Keilmessergruppen, as a substitute. Throughout the research history, a huge variety of terms as generic units have been proposed to replace the term Micoquian. We would like to contend ourselves here with a (certainly incomplete) list (Table 1).

When we consider controversies about the eponymous site (La Micoque), we recognize a juxtaposition of terms that either have a regional reference (e.g., Prądnik River in Poland) or refer to a specific assemblage component (Keilmesser, asymmetrical knives, backed bifaces). The name controversies are depicted in Fig. 19. The generic units described are seen either as a subset or an intersection of the umbrella term Micoquian.

Shifting the focus of bifacial elements

At the beginning of the Micoquian research, the focus was on the preference of bifaces, which looked similar to pieces from la Micoque but different from comparable pieces from, e.g., Le Moustier. The importance of pieces that were mentioned from the 1940s onwards as Keilmesser, Faustkeilschaber, etc. (asymmetrical backed knives) in determining whether they belonged to a generic unit increased successively. Along with this added value, which bifacial pieces are now decisive, the spatial and temporal shift also came about. Thus, the meaning of the term Micoquian in more recent studies differs massively from what was regarded as Micoquian in the first half of the twentieth century.

Linking the Mousterian with the Micoquian

The attempt to systematically link the research approaches of the term Mousterian and Micoquian has been repeated in research. While at the beginning the industry of La Micoque was regarded as part of the Acheulian (Obermaier 1908a) or as transitional industry (Schmidt 1911, 1912a), the idea also arose that the Micoquian should be placed in the Middle Paleolithic. This raised the question of the simultaneity of Mousterian and Micoquian. The term Middle Paleolithic (*Mittelpaläolithikum*) was already introduced 10 years earlier (Blankenhorn 1905) and taken as a synonym for the Mousterian (see also Sollas 1911). The decisive difference, however, was that Hauser placed the Micoquian between the Mousterian and the Aurignacian, and Wieggers saw it as the Lower Mousterian. Perhaps Breuil (1932b) was the first to

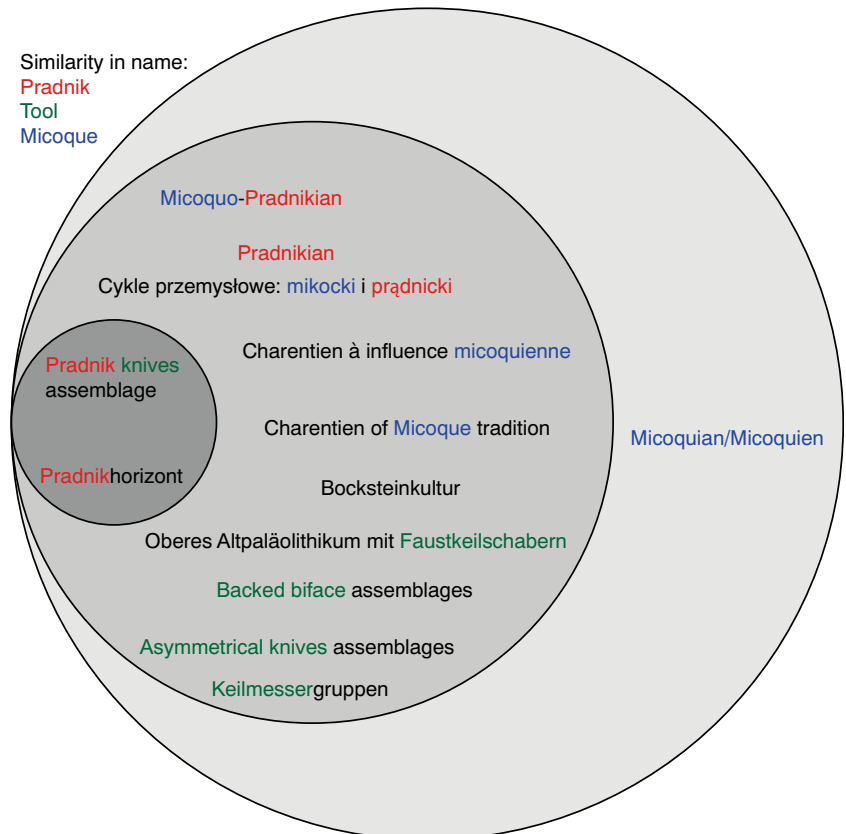
Table 1 Variety of terms of generic units to replace the term Micoquian

Term	Translation	Literature
<i>Cykle przemysłowe - mikocki i prądnicki</i>	Industrial cycles of the Micoquian and Pradnikian	Krukowski (1939–1948)
<i>Bocksteinkultur</i>	Bockstein culture	Wetzel (1954)
<i>Oberes Altpaläolithikum mit Faustkeilschabern</i>	Upper Lower Paleolithic with handaxe–scrapers	Müller-Beck (1956, 1957)
Charentien of Micoque tradition	Charentien of Micoque tradition	Valoch (1968)
<i>Micoquo-Pradnikien, Prondnikien</i>	Micoquo-Pradnikian, Pradnikian	Chmielewski (1969, 1970)
Group of backed bifaces	Group of backed bifaces	Schild and Wendorf (1977)
<i>Keilmessergruppen</i>	Keilmesser groups	Mania (1990)
<i>Charentien à influence micoquienne</i>	Charentian of Micoquian influence	Farizy (1995)
<i>Moustérien mit Micoque-Option</i>	Mousterian with Micoquian Option	Richter (1997)
Prondnikian, backed biface assemblages	Prondnikian, backed biface assemblages	Burdukiewicz (2000)
Asymmetrical knives assemblages	Asymmetrical knives assemblages	Urbanowski (2003)
Keilmessergruppe (Micoquian/Pradnikian)	Keilmessergruppe (Micoquian/Pradnikian)	Conard (2011)

juxtapose the Micoquian (Acheulian VI–VII, now limited to layer N/6) and the Mousterian (see Fig. 3).

Two newer approaches are briefly examined in more detail here. We want to call the first approach an extension of typology. Valoch (1968, 1988) recognized during the analysis of

the lithics from Kůlna that the common typology established by Bordes (1961b) was only insufficiently suitable to describe the assemblage variability. This was particularly visible in relation to bifacial pieces (Keilmesser) or special scrapers (Groszaki). Quintessentially, he described the assemblage

Fig. 19 Name controversies in regard to the terms Micoque, Prądnik and lithic assemblage component

added by him to the Micoquian as a Charentian with Micoque tradition, pointing out the special significance of scrapers and special bifacial pieces, which did not occur in the Bordesian facies (Bordes 1953a, 1984 defined the Charentian as Quina or Ferrassie industry with a predominance of side scrapers, but relatively few handaxes and blades). In this case, both the bifacial assemblage component (Micoque tradition) and the unifacial assemblage component (Charentian) were emphasized.

The second approach extends the consideration of unifacial and bifacial assemblage components by a settlement dynamic element and was described by Richter (1997, 2002, 2006, 2014, 2016, 2018) as Mousterian with Micoque Option. His approach is based on the observation that in a conventional typological classification, the problem arises that assemblages can be called both Micoquian and Mousterian, depending on whether the affiliation is derived from bifacial tools (Micoquian) or unifacial tools (Micoquian). Thus, Micoquian and Mousterian are interwoven aspects of the same technological repertoire, but not different cultural units that can be clearly distinguished in time and space (Richter 2016, p. 118). The settlement dynamic momentum of this approach is based on the assumption that when a site or area is repopulated, other objects are deposited than if it had been settled there for a longer period of time. On the one hand, a repopulation assemblage (*Initialinventar*) is characterized by high raw material diversity, indifferent tool spectrum, and a low number of Micoquian tools. On the other hand, such a long duration assemblage (*Konsequativinventar*) is characterized by a lower raw material diversity, a differentiated tool spectrum, and a high number of Micoquian tools. A question that keeps coming up is exactly what status bifacial tools constitute in this cycle. For Richter (2016, pp. 118–119), bifacial tools, at the beginning of land use cycles, tend to reflect their initial status, but at the end of the cycle, they tend to be more strongly reduced. The difficulty here in this approach for us lies in the fact that the M.M.O. model tries to unite all Central European sites in one model and to compare this model with a selected section of sites (MTA) in Western Europe (see Richter 2014).

Structuring by means of the unifacial assemblage component

Within the assemblages referred to as Micoquian/KMG/M.M.O., etc., the unifacial assemblage component was sometimes used to structure them. Thus, Richter differentiated his M.M.O. into an older one (with Quina and other non-Levallois concepts) and a younger one (with Levallois concept). This unambiguous temporal differentiation of the assemblages must be accompanied by some remarks that have been compiled in the literature. We selected some examples of assemblages which can no longer be sorted into the M.M.O. model so clearly.

Let us first turn to the eponymous site (La Micoque). The upper strata in La Micoque remain undated despite several attempts (Rosendahl 1999, 2004, 2006, 2011). However, an age of about 300 to 250 ka is assumed (Rosendahl 2006), meaning that these assemblages would fall out of Richter's time frame. As Rosendahl (2004, 2006, 2011) discovered, the assemblages of the upper layers (layer 6 to 8) are dominated by the reduction of "ingot-shaped cores" (according to Luttrupp and Bosinski 1971). The Levallois and Discoidal concept is present but very rare. However, there is no evidence for Quina reduction. This would fit into the older M.M.O. according to Richter's model.

Another site considered here is the Bockstein. The faunal analysis by Krönneck (2012) assumes a probable deposition of the Micoquian assemblage (IIIa, IIIb) in the MIS 5a (or a warmer phase of MIS 5). This would fit into the older M.M.O. according to Richter's model, but not in the model of the KMG proposed by Jöris (2003), where the Bockstein site is placed into the MIS 3. The unifacial reduction of the site, however, is not so easy to grasp. Çep (2014, 2019) and Çep and Krönneck (2015) described it as a Quina concept in the broader sense, which carries a certain Levallois reduction. This raises the question of whether the reduction concepts for blank production have been sufficiently well described and separated from each other so far (Frick 2016, pp. 215–218; Frick and Herkert 2014).

Possibilities and ideas for overcoming the term Micoquian

According to our understanding of the matter, the approach described below could help to overcome these inconsistencies. However, we must stress that this hypothetical construct is still far from mature and applicable. As described above, the term Micoquian was used in a variety of different ways to form generic units. If we look at the latest uses of the term, there is no uniformity here either. If the aforementioned M.M.O. is equated with the Keilmessergruppen, Richter (1997, 2002, 2014, 2016, 2018) assumes a very short chronology (exclusively MIS 3), while Jöris (2003) proposed a longer chronology (MIS 5 to 3) and Kozłowski (2014, 2016) applies an extended chronology (MIS 7 to 3). These massive differences in the application of the term make it difficult to compare the respective approaches.

Let us now move on to the approach proposed here for the classification of assemblages. As we have seen, over the decades, the bifacial assemblage component was first chosen intensively in order to assign the assemblages to a generic unit. Over time, the unifacial component has also been used. With a similar intensity, the further method apparatus was expanded within Paleolithic research (faunal remains, sedimentology, radiometric dating, settlement dynamic, etc.). We would therefore like to make use of this expansion of knowledge and the apparatus of methods to develop a classification system for the Middle

Paleolithic. As lithologist, it is our intention to expand and specify the methodological apparatus of lithic technology. With this in mind, it must be examined:

- Whether there are transitions between the concepts of unifacial reduction, as well as bifacial and trifacial production already described
- Whether only inadequately described concepts need to be specified

When the assemblage components are described and a chronological framework exists, the assemblages are compared to one another. Similarly, Locht et al. (2016), Hérissou et al. (2016), or Soriano (2000) also tried to describe assemblages according to the reduction concepts and to fix them chronologically.

In other words, it is the attempt (as unbiased as possible) to get a clear understanding of the situation on the basis of technological and radiometric data (and by consulting further data). If we determine the types of assemblages chronologically piece by piece, it should be possible to recognize the respective patterns. It goes without saying that we are always confronted with the dynamics of settlement: not in terms of population shifts but in terms of different types of camp sites, which can have very different assemblages, depending on what is needed at the particular site before deposition (in terms of import, export, deposition, reduction, modification, or recycling). Here, generic units are irrelevant, because it must first be clarified (in relation to the lithic assemblage component) to what extent the unifacial, bifacial, and trifacial reduction systems analyzed in detail relate to one another.

Conclusion

In considering the research history of such a complex and controversial term, it is difficult to draw an appropriate conclusion that adequately takes into account the different opinions. First and foremost, the aim of this article is to show the complicated and intricate ways of researching the concept of Micoquian. It was demonstrated that a shift in the meaning of the term was made several times (see Fig. 18). This concerned its position within the chronology, its spatial extent, and the decisive assemblage components. The shift in meaning is associated with different levels of reflexivity or the question of which methodological apparatus should be used to analyze the underlying lithic artifacts.

The shifts in meaning are therefore closely related to the change in the way lithic assemblages are analyzed. In the early phase, the index fossil (in this case the Micoquian biface) was the point of reference for the assignment to a generic unit. The typological considerations since the 1950s took into account a larger number of pieces, pushing the biface somewhat into the

background, but it turned out that the unifacial assemblages were hardly distinguishable from classical Mousterian assemblages. With the increase of technological analyses from the 1980s onwards, assemblages were not only examined for their specific (static) lithic components, but the dynamic momentum of assemblages was also reflected. Some authors who became aware of this problem of the different levels of observation avoided these difficulties by either proposing a name for a defined generic unit or attempting to dispense with these generic units in order to take into account the assemblage components in their respective position in space and time.

It is very significant when three chronologically separated and technologically different units (Bordesian Micoquian, pre-Eem; Yonne Micoquian, MIS 5; and Charentien à influence micoquienne, MIS 3) within a region are labeled with the same term, as Blaser and Chaussé (2016) could show for the Parisian basin. In addition, it appears that these three units have little correspondence with the assemblage of the eponymous site La Micoque.

After this extensive (but certainly not complete) discussion of the use of the term Micoquian, the question remains as to whether the term should continue to be used or whether it is time to classify the Middle Paleolithic using new approaches. However, the simple assignment of a new name to a defined unit may not always be the most elegant way. The assignment of a new name should be strictly linked to the definitions of a technocomplex. Recalling the aforementioned definition ((Lithic) assemblages that share the same economic strategy, in similar environments with a similar technology and a similar trajectory) and supplement it with a narrow chronological framework, we should be able to form generic units that can be visibly separated from other units and perhaps even hint at certain settlement patterns.

As, for example, showed by the work in southwest France, it is necessary to build up and refine a regional chronological framework with which interassemblage comparisons are increasingly made possible (Jaubert 2011, 2014). However, in this context, it is important to include assemblages that are “out of the ordinary” in the considerations. On the one hand, we think of decontextualized assemblages, which can be added to models by new patterns of observation; on the other hand, we think of technologically unusual assemblages, which, for the time being, cannot quite be integrated into the already existing picture.

The essential definitions of generic units are derived from the consideration of the lithic assemblage component; therefore, it is important to include other disciplines in the reflections. The approach of Delagnes and Rendu (2011), for example, combines the data on lithic production systems and fauna and was thus able to show correlations that could previously only be conjectured, such as the differences in subsistence strategies between Laminar/Levallois systems, Discoidal-Denticulate, MTA, and Quina reduction systems. Due to the enormous amount of data to be processed, these large-scale reflections

have only been possible since a short time, but they open up numerous possibilities for us to combine the partial results of Paleolithic disciplines in order to look at the finds anew and, if necessary, make changes in the generic units. From our lithic point of view, however, it is not only necessary to merge the data, but also to intensively reflect on the lithic reduction systems already recognized and their variations in order to use them as a lithic basis for regional and supraregional comparisons. Sometimes, it turns out that the intensive technological examination can uncover further, previously unknown reduction systems (e.g., Boëda 1991b, 2013; Bourguignon 1996; Čep 2014; Delagnes 1993, 2000; Frick and Herkert 2014; Luttrupp and Bosinski 1971; Slimak 2004), which can be incorporated into the corpus as a basis for further considerations and comparisons. Based on these reflections, we come to the conclusion that the previous terms that were used as names for generic units can only be seen as umbrella terms or coarse units until the underlying assemblages are sufficiently understood to map settlement, movement, and subsistence patterns.

Acknowledgments This contribution arose from our desire to understand when the term Micoquian was used, how it was used, and for what purpose. If there are inconsistencies, they are due to me not accurately understanding certain facts. I would like to dedicate this contribution to Hansjürgen Müller-Beck, who encouraged me to reflect intensively on Paleolithic phenomena. My thanks go to Dominique Rose for her excellent linguistic review of the manuscript and the discussions with many colleagues, greatly enriching the content. I would also like to thank the reviewers and editors of the journal who ensured that the manuscript was transformed into an article worth publishing. The web page for downloading the map layers with sea levels (see Fig. 2, 8, 14), which was used in GoogleEarth as base map (www.temporalmapping.org) can no longer be accessed (last access in 2016). The cladogrammes also represent my interpretation of the respective facts and are not to be seen as absolute chronological fixations.

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Compliance with ethical standards

Research does not involve human participants and/or animals.

Conflict of interest The author declares that he has no conflict of interest.

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