Chapter 2
When Did the Middle Paleolithic Begin?

Jürgen Richter

Abstract The Middle Paleolithic has widely been understood as the epoch of the Neanderthals, including early (Pre-Neanderthals) and classic Neanderthals. The onset of the Middle Paleolithic has conventionally been defined as the time when the Levallois concept of flake production became a dominant and regular feature in stone artifact assemblages. The same "Levallois generalization" seems to have started after the Holsteinian interglacial and before the Drenthe ice advance. New radiometric dating for the Holsteinian (now around 300 ka) and Drenthe (now around 150 ka) indicates the ages for some early Middle Paleolithic assemblages to be much younger than previously thought. Regional chronologies need re-evaluation based on the new, shorter chronological model.

Keywords Middle Paleolithic • Chronology • Levallois • Discoid • Quina • Drenthe ice advance • Holsteinian interglacial

Introduction

The Middle Paleolithic began around 300 ka (Delagnes et al. 2007) and is generally looked upon as the cultural stage of Pre-Neanderthal and Neanderthal man, classic Neanderthal humans having only occurred after 130 ka. This means, classic Neanderthals were only responsible for the second half of the Middle Paleolithic. Moreover, the extinction of Neanderthal man around 30 ka coincides with the end of the Middle Paleolithic.

The term Middle Paleolithic is of quite recent origin: In 1836, C.J. Thomsen defined the Stone Age, the Bronze Age and the Iron Age as the three principal ages of prehistory. In 1865, J. Lubbock introduced the terms Paleolithic and Neolithic (the time when polished stone artifacts came into use), thus subdividing the Stone Age. In 1897, G. de Mortillet subdivided the Paleolithic into the stages *Chelléen*, *Acheuléen*, *Moustérien*, *Solutréen*, *Magdalénien* and *Tourassien* (the last one later omitted). A further subdivision into *Paléolithique inferieur* (including Acheulean and Mousterian) and *Paléolithique superieur* (Upper Paleolithic) was made available by 1912 (Breuil 1912). Several decades later, the term *Paléolithique moyen* came into use for the last stage of what was earlier called *Paléolithique inferieur*. Only after the 1950s, the term "Middle Paleolithic" became widely accepted as indicating the period between Lower Paleolithic and Upper Paleolithic.

Definition of "Middle Paleolithic"

Nowadays, we understand the Middle Paleolithic as the time when lithic assemblages came into use which were characterized by the predominance of tools made on flakes from standardized flake production such as the Levallois concept, the discoid concept or the Quina concept of flake production. Occasionally, Middle Paleolithic lithic industries may also display bifacial tools (Bosinski 1967; Richter 1997) and blades (Conard 1992), sometimes as a dominating component.

As one possibility, the first occurrence of assemblages dominated by the Levallois concept (the Levallois Generalization) has often served as a chronological marker for the onset of the Middle Paleolithic (Bosinski 1967). The disappearance of the Levallois concept (Boëda 1994) and its substitution by blade production as the predominant or exclusive production concept (accompanied by a whole range of other Upper Paleolithic innovations) indicates the end of the Middle Paleolithic.

As a second and third possibility, the first appearance of the discoid concept (Boëda 1995) and of the Quina concept (Bourguignon 1997) of flake production may be taken as a common feature of the Middle Paleolithic age, although there are also some rare examples of those technological

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concepts to be of much earlier age (Delagnes and Meignen 2006). The emphasis is on the predominance, not on the first occurrence of complex, standardized flake production. Although somewhat vague, this seems the best practical way to separate the Middle Paleolithic from the earlier Paleolithic, because it prevents multiple claims for particular early occurrences of the Middle Paleolithic which would then be based on unique pieces of Levallois (or discoid etc.) character. Such unique Levallois occurrences have been attested at Cagny la Garenne, Orgnac 3 and at Atelier Comment in the Somme Valley, for example (cf. Soriano 2000).

The Time Range of the Middle Paleolithic

According to the mentioned definition, the Central European Middle Paleolithic lasted from 300 to 30 ka and spanned over three major glacials and two intersecting interglacials (Fig. 2.1): MIS 8 (Early Saalian glacial, *sensu lato*), MIS 7 (interglacial), MIS 6 (Saalian glacial, *sensu stricto*, including the Drenthe and Warthe stages), MIS 5e (Eemian Interglacial) and a part of the Weichselian Glacial, including MIS 5d, 5c, 5b, 5a, 4 (Early Weichselian Glacial including the first maximum of the Weichselian glaciation) and finally the first half of MIS 3 (Interpleniglacial between MIS 4 and MIS 2). Within the time range of the Middle Paleolithic, Pre-Neanderthal and Neanderthal man emerged (cf. Serangeli and Bolus 2008); Modern Man appeared in the Near East (around 90 ka) and in Europe (around 40 ka) and Neanderthals were extinct (around 30 ka).

Early sites from the very beginning of the Middle Paleolithic are scarce, if compared with the number of sites known from the younger part of the Middle Paleolithic.

New Chronological Insights

The question when the Levallois Generalization (as preferred indicator for the onset of the Middle Paleolithic) took place is closely connected with problems of the Middle Pleistocene chronology. Here, the correlation between the global climatic calendar on the one hand, as represented by the oxygen isotope stages from deep sea and ice cores, and corresponding terrestrial evidence on the other hand has been subject to permanent debate. Three major issues have resulted from the debate of the last years which essentially changed the chronological scheme of the Middle Pleistocene:

1. The Holsteinian is only 300 ka old, not 400 ka (Geyh and Müller 2005).
2. The Drenthe glacial advance took place only 150 ka, not 250 ka (Litt et al. 2007).
3. The correlation one interglacial soil – one MIS interglacial warm phase has been rejected as a general rule (Schirmer 2002).

Recent datations of the Holsteinian type site at Bostel, near Hamburg in Northern Germany, proved the "Holstein" botanical sequence to be around 300 ka old, thus coinciding with MIS 9 (Geyh and Müller 2005). The Holsteinian displays the most favorable interglacial climate during the Middle Pleistocene. Bilzingsleben (Central Germany), with its late *Homo heidelbergensis* fossils, and the lower horizons of Schöningen date to the Holsteinian period. All over Europe, Holsteinian and/or MIS 9 assemblages clearly belong to the Lower Paleolithic, characterized by Acheulean handaxes or/and simple flake technologies ("Clactonian") in Western Europe and by simple flake technologies ("Clactonian") in Central Europe.

The subsequent period, the interface from the MIS 9 Holsteinian interglacial to the MIS 8 glacial, is well documented at the Schöningen site. The find horizon of the famous wooden spears has been dated to the very beginning of the post-Holsteinian glacial (MIS 8), although still controversially debated (Thieme 2007; Litt et al. 2007; Voormolen 2008). The lithic assemblage still demands for proper evaluation. At the present time it is not entirely clear whether Lower or Middle Paleolithic attributes prevail in the assemblage.

In Europe, the earliest truly Middle Paleolithic assemblages, dominated by the Levallois concept, seem to occur during MIS 8, the cold phase after the MIS 9 interglacial. The climatic deterioration of MIS 8 has recently been identified with the Fuhne glaciation, newly defined by (Eissmann 1994) as the major glaciation preceding the Saale *sensu stricto* (Drenthe and Warthe) glaciation which is now argued to be of MIS 6 age. Matching evidence comes from new radiometric measurements that date the principal Drenthe (Lower Saale *sensu stricto*) continental ice advance, the largest continental Europe ever saw, at around 150 ka (Litt et al. 2007).

Impact of the New Chronology on the Possible Onset of the Middle Paleolithic

The new chronological framework has caused serious uncertainty about the age of some well-known reference sites, which are usually looked upon as examples of the earliest Middle Paleolithic. All sites which are connected with the datation of the Holsteinian or the Drenthe maximum extension of the Scandinavian ice shield need re-evaluation. Moreover, dating based on counts of losses and soil horizons appears to be doubtful now.

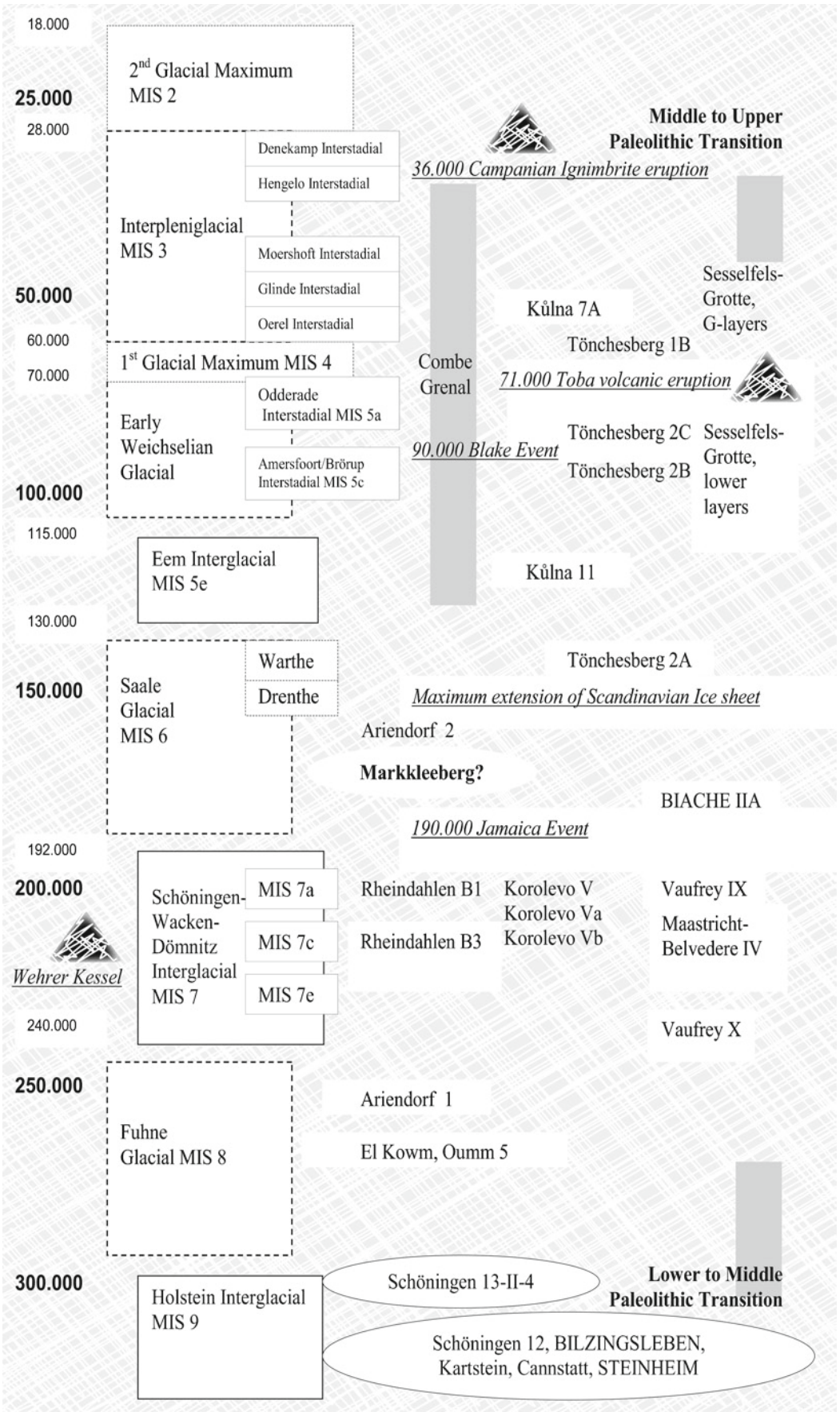

Fig. 2.1 Chronological scheme of the European Middle Paleolithic according to the tentative new correlations of the Drenthe ice advance with MIS 6 and the Holsteinian interglacial with MIS 9. Triangles indicate important volcanic eruptions attested in European sequences. Human fossils in CAPITALS

This applies, for example, to the Markkleeberg site near Leipzig, Germany (see Schäfer et al. 2003). Here, the Middle Paleolithic archeological horizon is securely stratified, underlying the Drenthe gravels, which previously gave reason to date the archaeological find horizon to early MIS 8, but might now be either MIS 8 or as young as MIS 6. The Markkleeberg assemblage combines bifacial tools (handaxes and bifacial scrapers) with highly developed Levallois products of various kinds (Mania 1997). Markkleeberg was formerly accepted as one of the earliest Middle Paleolithic sites in Europe, attributed to the *Jungacheuléen* (Upper Acheulean). Accidentally, Markkleeberg was also attributed to the *Lebenstedter Gruppe* (Bosinski 1967), which term had been synonymously used along with *Jungacheuléen*. As the eponymous site, Lebenstedt, has since been proved to be middle Weichselian and part of the Central European Micoquian (Richter 1997), Markkleeberg must be removed from the *Lebenstedter Gruppe* (Bosinski 2008), if this term should any be used, because Markkleeberg is more than 100 ka earlier than Lebenstedt.

Another problem arose when double and triple interglacial soil formations were recognized, as has recently been done in the Rheindahlen Loess sequence by W. Schirmer. It turns out that three subsequent Loess and soil formations do not represent a full glacial/interglacial cycle each (cf. Bosinski et al. 1966; Klostermann and Thissen 1995), but two of them belong to the younger part of (triple) interglacial MIS 7 and one of them belongs to MIS 5e, but mixed with the Holocene soil (Schirmer 2002). Whereas the soil sequence had previously been dated by simply counting the soil formations (last soil – MIS 5e, second-last soil – MIS 7, third-last soil – MIS 9), it now appears to represent a much shorter period from MIS 7 to MIS 5e, the Rheindahlen B3 assemblage of Mousterian-Ferrassie type dating to the middle MIS 7 interglacial and the Rheindahlen B1 Middle Paleolithic blade assemblage (*Rheindahlien*) to the last warm phase of MIS 7 (Ikinger 2002; Richter 2006).

Further re-evaluation is needed for two most important loess sequences in Europe: Achenheim (Heim et al. 1982; Junkmanns 1991; Bosinski and Richter 1997; Bosinski 2008) and Korolevo (Haesaerts and Koulakovskaya 2006), which both seem to display the interface between Lower and Middle Paleolithic.

At Achenheim (Fig. 2.2) the interface appears between the layer 20 complex (Lower Paleolithic with some Middle Paleolithic components, such as limaces) and layers 19, 18 and 17 which show similarities with the Mousterian of Ferrassie type. In the same stratigraphic portion, mammoth and woolly rhino occur for the first time. Dating of the Achenheim sequence has always been based on the count of Loess accumulation stages, given that one Loess horizon equals one glaciation. Thus, the Lower to Middle Paleolithic interface occurred in the third loess accumulation phase from top. The loess accumulation phases were stratigraphically distinct by intersecting humic horizons or soil formation processes. According to the count of loess accumulation phases, the lower to middle Paleolithic interface at Achenheim would date to MIS 8, formerly identified as the lower Rissian (Saalian) glaciation. Of course, we presently know that MIS 7 can contain up to three soil horizons. If more than one soil complex would belong to stage 7 at Achenheim, then layer 18 would represent stage 7.1 (cf. Fig. 2.1) and layers 20c to 29 would become much younger, being possibly of an Intra-MIS 7 or MIS 8 age, and the whole transitional portion (layers 20 to 17) of the stratigraphy would date to the second half of the long MIS 7 interglacial.

At Korolevo (Fig. 2.3), the Lower to Middle Paleolithic interface appears between the archaeological horizons VIe and Vb. The first occurrence of the fully developed Levallois concept in layer Vb has usually been dated into MIS 9, around 300 ka. Recently; Paul Haesaerts has corrected this estimation. He would place all early Middle Paleolithic horizons present at Korolevo (V, Va and Vb) now into MIS 7 (Haesaerts and Koulakovskaya 2006). The Korolevo sequence is, as a whole, most important for the discussion about the evolution of the Levallois concept, because the lower horizons, such as VIe (formerly dated to an inter-Mindel, MIS 11 interglacial) displays all attributes of a kind of proto-Levallois concept. This is characterized by roughly prepared cores wider than long, thus comparing to the Victoria West cores in eastern Africa. The particular technological features found at Korolevo might indicate a very early local invention and evolution of the Levallois concept.

With the new chronological results in mind, it becomes clear that tracing earliest Middle Paleolithic sites can neither rely on counts of subsequent soil formations/subsequent Loesses nor on simple one-to-one correlations of MIS interglacials and terrestrial loess or soil formations. Additional evidence is needed, such as for example radiometric dates, paleoenvironmental and mineralogical (such as chemical finger-print) correlations. Tephra markers, windblown ashes from volcanic eruptions, yield excellent chronological evidence, because they allow for firm stratigraphic correlation (if two or more sequences display the same tephra marker), and they are themselves datable by particular radiometric methods.

An Early Middle Paleolithic Site Preceding the "Wehrer Kessel Tephra": Ariendorf 1

In the Middle Rhine area, the best early Middle Paleolithic stratigraphy comes from the Ariendorf gravel pit (Bosinski et al. 1983; Turner 1997). Here, 150 m² of the Ariendorf 1 site were excavated in 1982/1983 from the lowest level of Loess LD I (Fig. 2.4). Ariendorf 1 has been dated to MIS 8, because the site must be older than the overlying soil horizon, followed by another Loess layer (LD II) and by the "Wehrer Kessel" tephra layer (ARI-BT1) dated to around

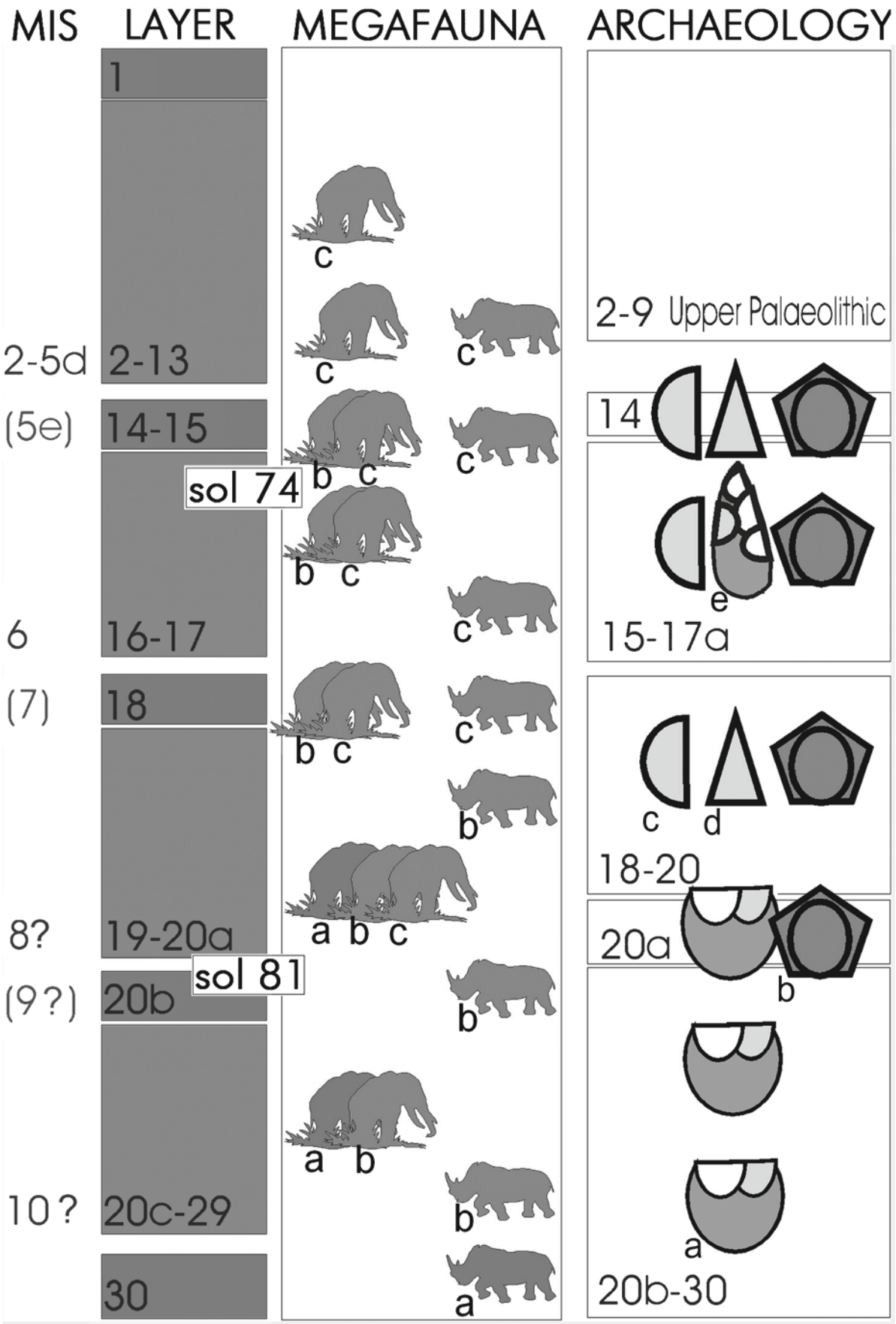

Fig. 2.2 Loess sequence at Achenheim (Compiled from Junkmanns 1991; Bosinski and Richter 1997). Layers 1–30 (After Wernert in Junkmanns 1991) combined with sol 74 and sol 81 (After Heim et al. 1982). Faunal remains from elephants (a: *Elephas antiquus*; b: *Elephas trogontheri*; c: *Mammuthus primigenius*) and rhinos (a: *Dicerorhinus mercki*; b: *Stephanorhinus hemitoechus*; c: *Rhinocerus tichorhinus*). Archaeological occurences (a: Lower Paleolithic pebble tools; b: Levallois technology; c: Middle Paleolithic sidescrapers; d: Middle Paleolithic convergent scrapers; e: bifacial tools)

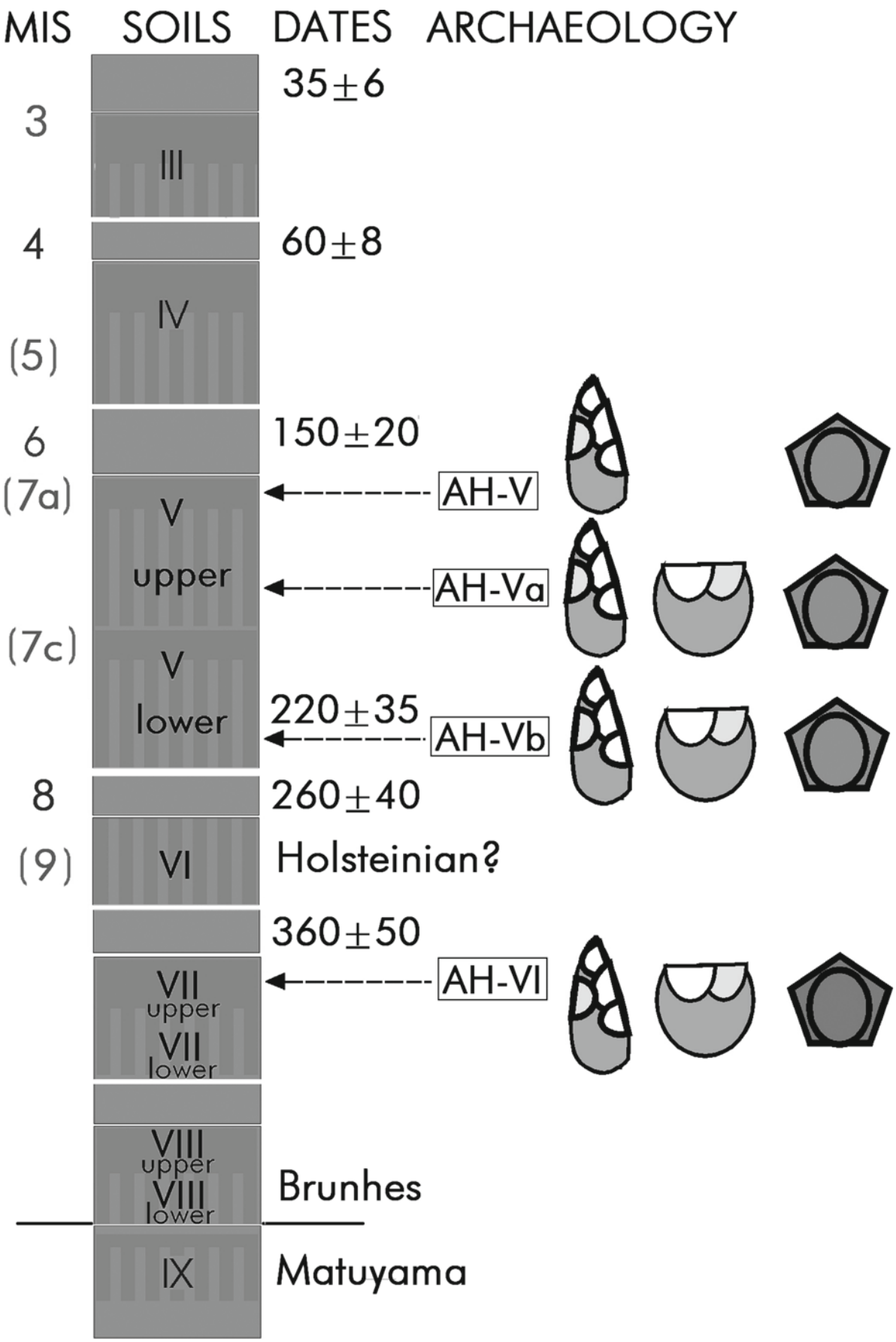

Fig. 2.3 Loess sequence at Korolevo, revised chronology (Compiled from Haesaerts and Koulakovskaya 2006). Arrows indicate the stratigraphic position of archaeological horizons (AH). Sediments are: hatched: soils; plain: Loess. Symbols see Fig. 2.2

220 ka. Around 250 ka (MIS 8; Bosinski and Richter 1997: 10), humans were present at the site situated close to a small brook. One hundred and twenty-six stone artifacts have been found, made of quartz, quartzite and lydite coming from river gravels. Refittings of artifacts not only demonstrate core reduction at the site, but at the same time point to an *in situ* preservation of the assemblage that includes prepared cores of Levallois character. Scrapers and denticulated pieces were found among the retouched tools, and horse, mammoth, woolly rhino, red deer, bovid and wolf were among the faunal remains. The 1982 excavations uncovered a second, younger archeological site (above the "Wehrer Kessel" tephra) within the MIS 6 Loess of the Ariendorf sequence. Only one retouched tool was found among 37 stone artifacts, comprising some cores, but mostly flakes made of lydite, quartz and quartzite along with bones of mammoth, woolly rhino, horse, red deer, bovid and wolf. The find scatter has formerly been interpreted as a dwelling structure, but has since been demonstrated to be a natural pit which may have attracted human activities (Turner 1997).

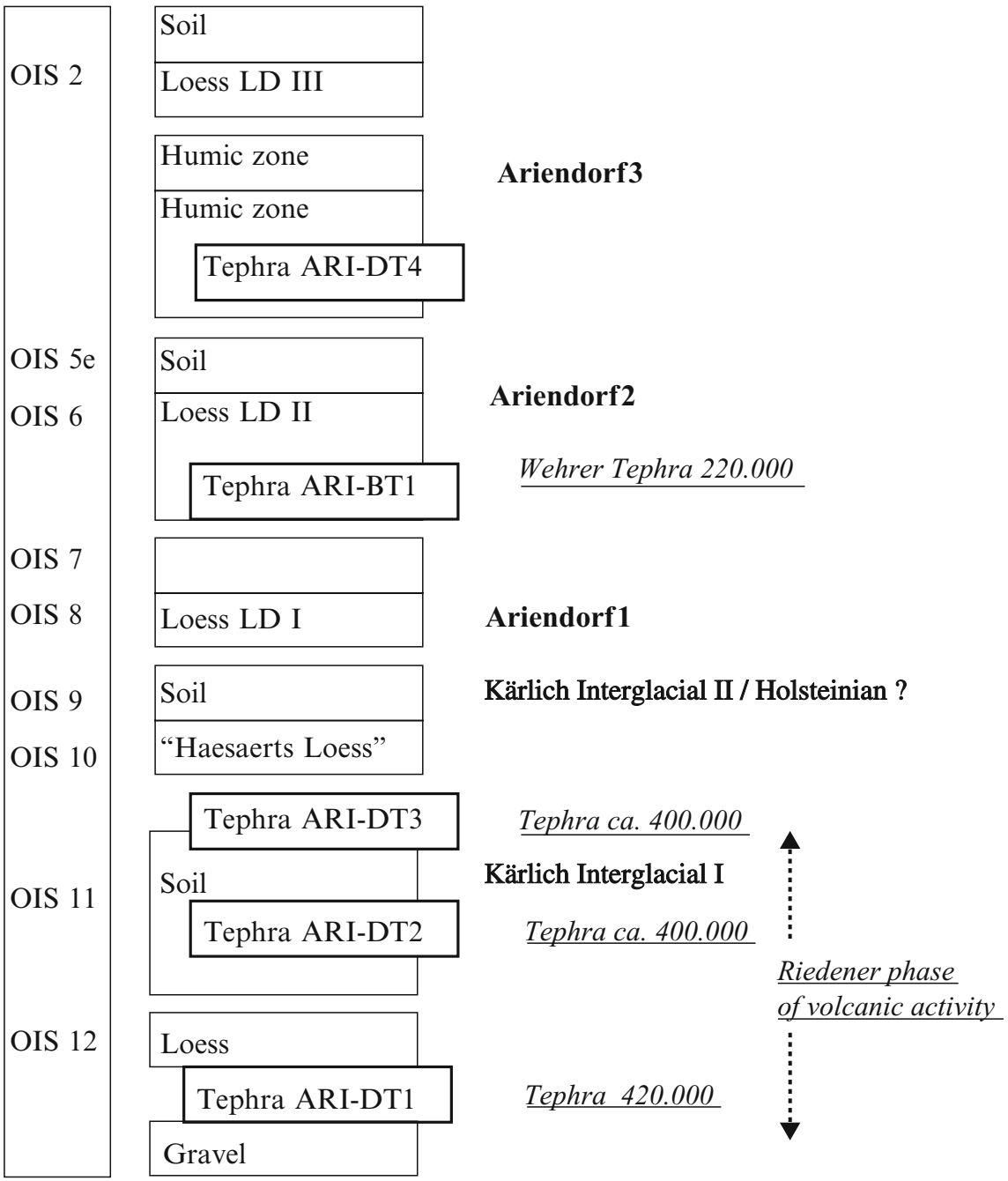

Fig. 2.4 Loess sequence at Ariendorf. The "Wehrer Kessel" tephra gives a *terminus ante quem* of 220 ka for the early Middle Paleolithic assemblage Ariendorf 1

Conclusion

The last two decades of research saw major corrections in the middle Pleistocene chronology of Europe. When the oxygen isotope chronology was initially correlated to terrestrial archives, this was often done in a very simplistic way underestimating specific problems connected with different kinds of archives, different kinds of dating and regional differences. Moreover, new radiometric data from the Holsteinian type site and from the Drenthe ice advance along with the detection of multiple interglacial soils (namely within MIS 7) have led to a shorter chronology for the first half of the Middle Paleolithic. In some cases, early Middle Paleolithic assemblages, who had previously been dated to MIS 8, have skipped now to MIS 7 and MIS 6. This means, assemblages like Markkleeberg, Rheindahlen B3 or Korolevo Vb might rather represent more advanced stages of the Middle Paleolithic rather than its initial stage.

Consequently, the question arises whether MIS 8 belonged rather to the late Lower Paleolithic than to the early Middle Paleolithic age. This would place the lower to middle Paleolithic transition around 250 ka. On the other hand, there are Middle Paleolithic assemblages which are resistant to the mentioned chronological corrections, because their dating relies on independent arguments, as, for example, stratigraphic linkage to tephra chronologies.

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