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Bronze fibula with three pinned-on rings from Crustumerium, Monte Del Bufalo burial ground, Tomb 153 (photo G.J.M. van Oortmerssen, RUG/GIA).

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CONTENTS

IN MEMORIAM WIM VAN ZEIST R.T.J. Cappers & P.B. Kooi	1
BLIOGRAPHY OF WIM VAN ZEIST R.T.J. Cappers, K. van der Ploeg & M. Schepers	4
IN MEMORIAM JAAP BOERSMA & OTTO HARSEMA	11
PREHISTORIC OCCUPATION OF THE LOWER PONTINE PLAIN (LAZIO, CENTRAL ITALY): THE EVIDENCE FROM RECENT FIELD SURVEYS M. La Rosa, T.C.A. de Haas & G.W. Tol	21
THE NEOLITHIC STONE CIST AT HEVESKESKLOOSTER (PROV. OF GRONINGEN, THE NETHERLANDS) H.K. Kamstra, J.H.M. Peeters & D.C.M. Raemaekers	37
HEATHLAND AND THE PALYNOLOGY OF PREHISTORIC BARROWS. REFLECTIONS ON THE INTERRELATION BETWEEN SOIL FORMATION AND POLLEN INFILTRATION W. Groenman-van Waateringe & T. Spek	55
A BRONZE HARVEST: DUTCH BRONZE AGE SICKLES IN THEIR EUROPEAN CONTEXT S. Arnoldussen & H. Steegstra	63
LATE ENEOLITHIC AND EARLY BRONZE AGE FUNERARY EVIDENCE FROM THE SANT'ANGELO IV CAVE (NORTHEASTERN CALABRIA, ITALY) F. Ippolito	111
EARLY IRON AGE TOMBS AT CRUSTUMERIUM (ROME), CA. 850-725 BC F. di Gennaro, B. Belevi Marchesini & A.J. Nijboer	117
CITY, COUNTRY AND CRISIS IN THE <i>AGER CRUSTUMINUS</i> . CONFRONTING LEGACY DATA WITH RESURVEY RESULTS IN THE TERRITORY OF ANCIENT CRUSTUMERIUM J.F. Seubers & G.W. Tol	137
DIE TERRA SIGILLATA AUS FRIESISCHEN TERPEN T.B. Volkers (mit einem Beitrag von M. Polak)	235

A BRONZE HARVEST: DUTCH BRONZE AGE SICKLES IN THEIR EUROPEAN CONTEXT

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ABSTRACT: A total of 42 bronze sickle blades dating from the Middle Bronze Age-B (c. 1500-1000 cal. BC) to the Early Iron Age (c. 800-600 cal. BC) are known from the Netherlands, yet these have never been studied or published in full. In this contribution, we aim to determine the significance of Bronze Age sickles in both practical and symbolic terms. Did communities in later prehistory perceive sickles solely as functional tools for agricultural tasks such as reaping, pruning, coppicing or weeding, or did sickles obtain a particular symbolic significance that rendered them suitable for votive depositions in hoards, graves and settlements? To answer this question, first a *status quaestionis* of European Bronze Age sickle research is presented and the terminology and typology applied are explained. Following this, the Dutch corpus of sickles with tangs, knobs (Groups 1-2), elongated knobs (Group 3) and peg holes (Group 4) is described, with particular attention to their dating, use-histories and the context of their deposition. Moreover, analysis of their alloy compositions was deployed to classify sickles of dubious “Dutch” provenance. For all proposed groups of sickles, their supra-regional affinities are discussed. From such supra-regional affinities it can be shown that communities in the Dutch later Bronze Age were integrated into Nordic as well as Central European exchange networks. In addition to this supra-regional integration, distinctly regional types of bronze sickle can be identified as well.

KEYWORDS: Netherlands, sickles, tanged sickles, knobbed sickles, Bronze Age, Iron Age, metalwork, provenance.

1. PROBLEM DEFINITION: (AGRICULTURAL) TOOLS AS UNDERSTUDIED CATEGORY

Within the wider group of bronze implements known from the Dutch Bronze Age (c. 2000-800 cal. BC), tools other than axes have received limited attention. Particularly Bronze Age axes and hoard assemblages have received scholarly attention in the Netherlands,¹ but other bronze implements related to craft and agricultural activities have been rather neglected. In part, this may reflect a culture-historical tradition of research in which axe typology internationally took main stage,² but also the fact that implements other than bladed weapons and axes figure less prominently in the more often analysed Dutch multiple-object hoards and funerary assemblages that provide contextual evidence for the interpretation of bronze items.³

Yet even for these contexts, discussions of bronze weaponry⁴ and ornaments⁵ significantly outnumber the studies of bronze tools for crafts and agriculture. Drenth’s (1996) analysis of bronze chisels from funerary contexts and Fontijn’s (2003: 137) brief discussion of sickles and other tools are notable exceptions. This situation unfortunately means that the role that bronze implements other than axes and weapons played in the daily life of Dutch Bronze Age communities, is under-studied. It reflects a wider research bias in which archaeologists have been preoccupied with hoards, monuments and cemeteries at the expense of the overall fabric of the cultural landscape and the place of settlements, field systems and craft production within it.⁶

In this contribution, we aim to redress this balance by studying the distribution, composition, origin and depositional context for a particular group of Bronze Age agricultural implements: bronze sickles. In total, 42 bronze sickle blades (and one iron specimen⁷) are said to have been found in the Netherlands. We scrutinize this dataset for clues to the production, use and supra-regional affinities of these tools, and use the contextual evidence to reconstruct past perceptions: what Bronze Age farmers themselves considered appropriate life-histories for these artefacts. All this, of course, cannot be done without a broader European contextualisation of bronze sickle research, to which we provide a brief introduction below (sections 2.1-2.2). Thereafter, we discuss what aspects of Dutch Bronze Age sickles are as yet unknown and merit study, whilst also explaining specific sickle nomenclature and proposing a pragmatic typological scheme for Dutch bronze sickles – based on sickle studies from other parts of Europe (section 2.3). After this, the Dutch corpus of bronze sickles is discussed in full (section 3). Using pXRF analysis, the composition of 12 sickles claimed to be of Dutch provenance has been analysed, corroborating typological arguments for a non-local origin for some of the sickle blades (section 4.1). We end this contribution with a reflection on the past use and perceptions of Dutch bronze sickle blades, paying particular attention to their depositional contexts (section 5). But first the *status quaestionis* of Bronze Age sickle research is outlined below.

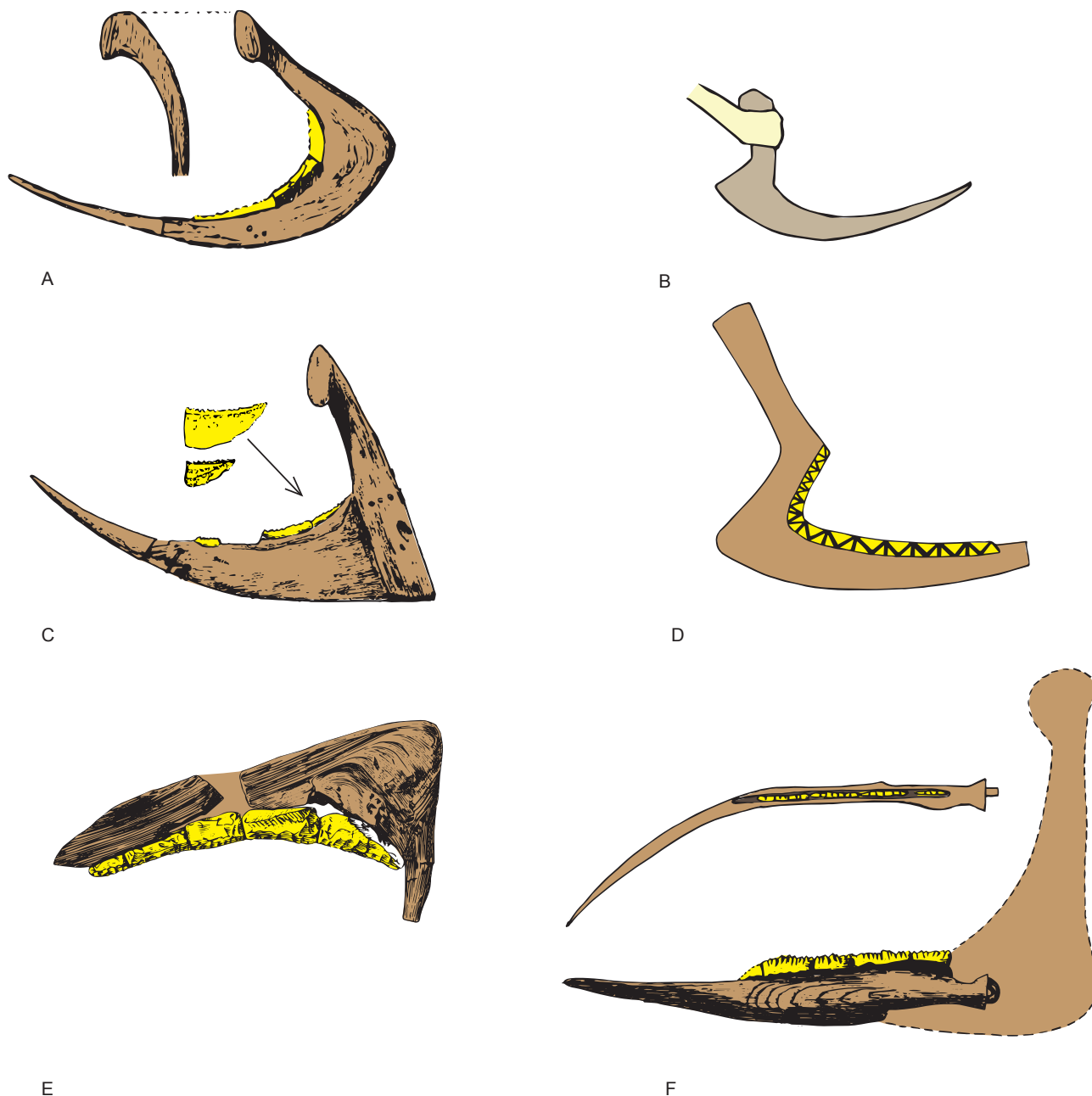


Fig. 1 Examples of composite sickles: wooden hafts and serrated flint blade inserts (A: Kahun, Egypt, 12th dynasty; after Flinders-Petrie 1891: Pl. II, B: Sickle depiction from a Gizeh harvest scene, Egypt, 4th dynasty; after Spurrell 1892: Pl. III, C: Egypt, 18th dynasty; after Flinders-Petrie 1891: Pl. VII, D: Sickle hieroglyph from the tomb of Rahotep, Egypt, 4th dynasty; after Spurrell 1892: Pl. III, E: Solferino, Italy, late Neolithic; after Vayson 1919: 402 fig. 5, F: composite-sickle fragment from the *palafitte* area; after Munro 1908: 227 pl. 34; Spurrell 1892: Pl. II).

2. ON ORIGINS: PREVIOUS SICKLE STUDIES

2.1 Sickles as agricultural tools

The study of sickle blades as agricultural implements has a long-standing tradition in Neolithic archaeology. Even in 1891, Flinders Petrie (1891: 12; 15; 53) commented on the hafting of flint blades in wooden handles. Flinders Petrie (1891: 55) and Spurrell (1892: Pl. II) noted similarities to the ‘*ma*’ hieroglyph and pictorial representations of sickles in tombs at Gizeh (fig. 1). Childe (1930: 101) noted that animal mandibles may have inspired the

form of these tools (fig. 1, A; C, *cf.* Clark 1952: 110). Currently, the antler sickles with flint inserts from the Neolithic Karanova I phase (6th millennium BC) are the oldest preserved examples of such tools.⁸ Although from Egypt composite harvesting implements of a straight shape are also known (*e.g.* Caton-Thompson 1927: 336 pl. VI), most of the younger sickles (and pruning hooks) must have taken their curved morphology from the Neolithic ancestry described above. Examples outside the Middle East, such as the Neolithic Iberian sickles of La Draga, may be slightly more angular (being formed from branching wood)⁹, yet represent only a minor variation to

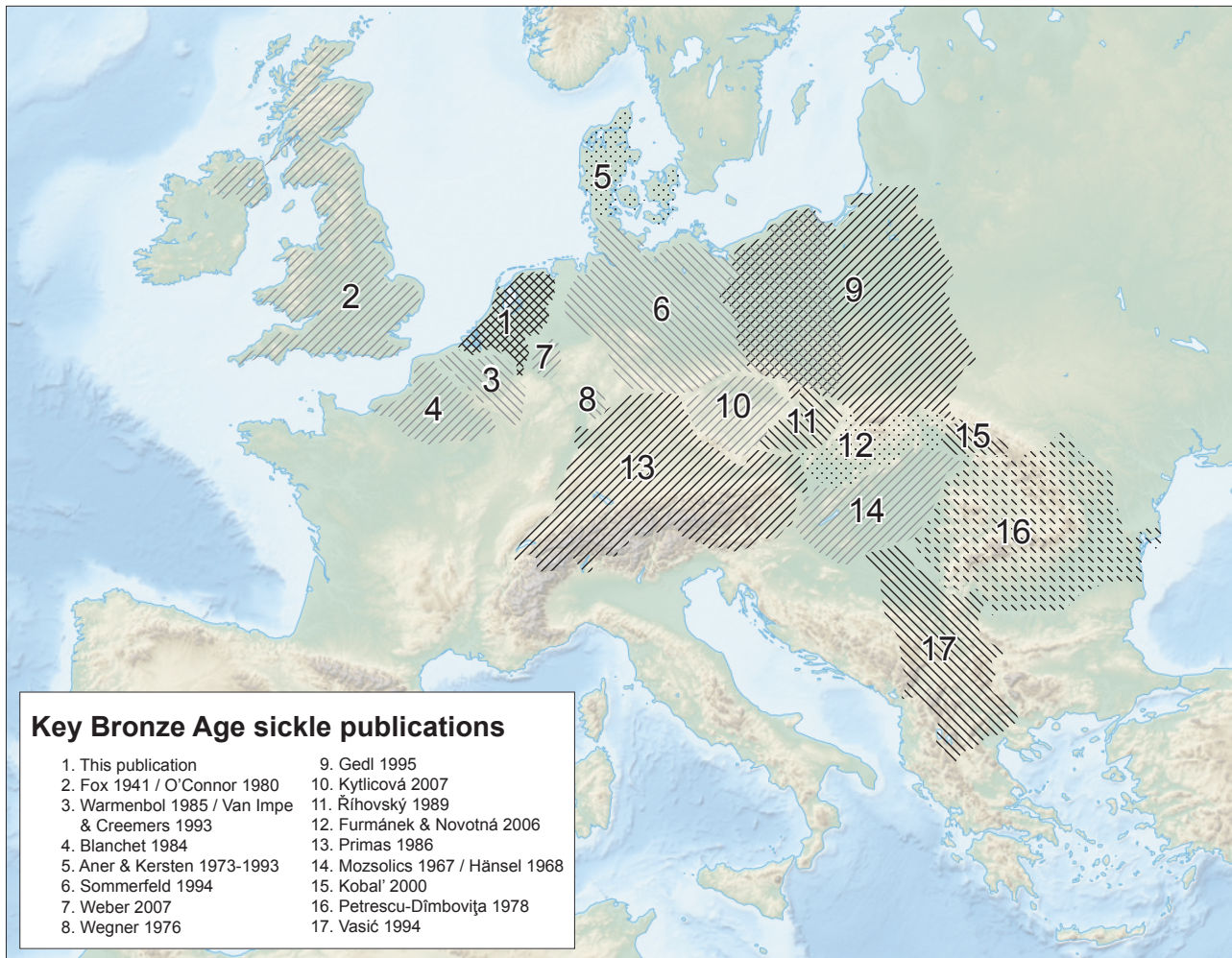


Fig. 2. Map showing the areas covered by key publications on Bronze Age bronze sickle blades: PBF volumes in black hatching, other regional studies in grey hatching (present study area in black cross-hatching). Drawing S. Arnoldussen, RUG/GIA.

the more widely shared dominant technological scheme. In any case, composite *palafitte* sickles still employ the scheme of serrated flint blades inserted into wooden (composite) hafts (fig. 1, E-F; Munro 1908: 227 Pl. 34; Vayson 1919: 402 fig. 5).

The transition from flint insets to bronze, and later iron, blades in such implements is not solely related to issues of availability. Reaping experiments using sickles of different materials (flint, bronze, iron) and finish (smooth cutting edges versus serrated edges), have shown that smooth-edged bronze and iron blades optimized the harvesting of cereal crops (less reaping time, fewer uprooted plants; Steensberg 1943: 23 Tab. 1). Nevertheless, cherished traditionality in agricultural systems could mean that flint-set sickle technology was retained even when metal was available (Childe 1930: 11), as may be illustrated by the Stenild flint-set tool (Clark 1952: 111).

2.2 European research context

Various regional studies of European bronze sickle blades have been published, of which the monographs in the *Prähistorische Bronzefunde* (PBF) series have been

particularly influential (fig. 2). Various PBF publications for eastern and central Europe are available. Hungarian sickle finds were described by Mozsolics (1967) and Hänsel (1968), with the adjacent trans-Carpathian area being published in 2000 by Kobal'. In 1978, Petrescu-Dîmbovița published the Romanian sickles, and those of Moravia, Slovakia and Bohemia were published in 1989 (Říhový), 2006 (Furmánek & Novotná) and 2007 (Kytlicová 2007: 143-154), respectively. Towards the southeast, the sickles of parts of Serbia, Kosovo and Macedonia were published by Vasić (1994); and to the north, studies are available for Poland (Gedl 1995), and Austria, Switzerland and southern Germany (Primas 1986).

In addition to the main PBF publications, several other very informative publications on bronze sickle blades from outside our study area are available. For the United Kingdom, the studies by Fox (1941) and O'Connor (1980: 62-63; 177) remain the sole available overviews. For Belgium, Luxemburg and adjacent northern France, Warmenbol's (1985), Van Impe & Creemers' (1993) and Blanchet's (1984) publications remain the most valuable contributions. For the Danish, northwest German and Schleswig-Holstein region, Jacob-Friesen (1967),

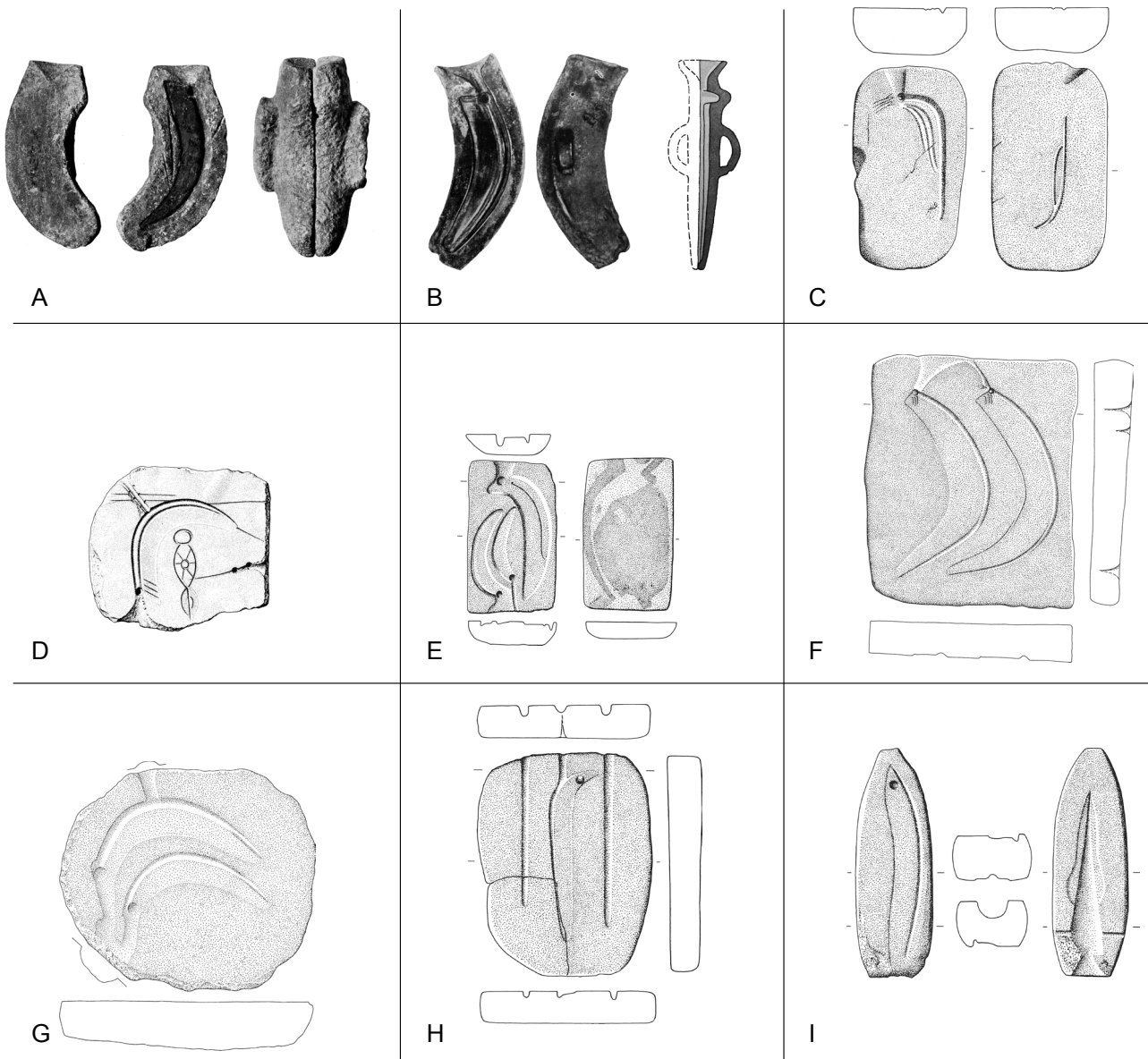


Fig. 3. Moulds for knobbed sickles, not to same scale (A: Brandholm (Denmark), talcose schist; after Steensberg 1943: 99 fig. 33, B: Schinna (Germany), bronze, after Dresscher 1957: *Taf.* 3, C: Bojadla (Poland), clay; after Gedl 1995: 94; *Taf.* 30 no. 654, D: Preist (Germany), diabase, after Primas 1986: *Taf.* 18 no. 289, E: Karzec (Poland), stone, after Gedl 1995: 91; *Taf.* 31 no. 658, F: Pobedim (Slovakia), sandstone, after Furmánek & Novotná 2006: 47; *Taf.* 12 no. 285, G: Brno-Obřany (Czech Republic), after Říhový 1989: 40; *Taf.* 10 no. 138, H: Gogolin-Stzebnów (Poland), stone, after Gedl 1995: 91; *Taf.* 30 no. 657, I: Głubczyce (Poland), stone, after Gedl 1995: 91; *Taf.* 30 no. 656).

Aner & Kersten (various years), Sommerfeld (1994) and Hachmann (1957) are valuable repositories. Additional German sickle finds are described by Von Brunn (1968), Wegner (1976) and Weber (2008). Collectively, these studies provide a solid basis for the contextualisation of the Dutch bronze sickle finds.

2.3 What we don't know about Dutch bronze age sickles

2.3.1 Production

Despite the fact that Bronze Age bronze sickle blades are known in some numbers (n=42; *infra*) from the

Netherlands, various aspects of the use-life of these sickles remain poorly understood or under-studied. For a start, the metallurgic composition of the Bronze Age sickles has not been studied, which means we cannot establish the homogeneity in composition or evidence of remelting cycles (*cf.* Bray & Pollard 2012; Ling *et al.* 2012: 117). A first attempt at determining the elemental composition of eleven Dutch bronze sickle blades through pXRF analysis is provided in section 4.

Following the obtaining and smelting of a suitable alloy, the Dutch bronze sickle blades were cast in moulds. The Posterholt sickle (DB 2440; *infra*) still shows where the casting funnel was broken off from the base of the blade, near the knob (*cf.* Gedl 1995: 3). Tanged sickles

are generally cast with the pouring funnel protruding from the apex of the back (Sommerfeld 1994: 164; but see Primas (1986: 7) or Kytlicová (2007: 144) for examples of spur-attached pouring funnels). Parallels outside the Low Countries (fig. 3) show that knobbed (and tanged) sickles were cast in bivalve moulds of sandstone, diabase, talcose schist, bronze and possibly moulding sand and clay, of which generally few traces have been preserved.¹⁰ Preserved mould halves show that both tanged and knobbed sickles were cast with a flat covering mould half (of stone or clay; Sommerfeld 1994: 161; 164, but see fig. 3, C). Frequent casting seams at the backs of knobbed sickles, and the miscast sickle of Auvernier (reflecting a crack occurring in the – also recovered – mould during casting; Primas 1986: *Taf.* 94 nos. 1552-1554) in any case argue against general use of the lost-wax technique (Primas 1986: 7; but see Sommerfeld 1994: 162). Moulds may have been pretreated prior to casting by pre-heating and/or the application of a layer of soot or clay (Sommerfeld 1994: 162). After casting, stone moulds may have held a significance that rendered such moulds suitable for depositions in mould hoards or to be incorporated into graves and barrows.¹¹

After casting, casting seams were removed and the blade edge was sharpened through hammering ('peening') and whetting¹². The latter processes were regularly repeated during the use-life of the sickle, resulting in an overall change of the shape (e.g. more obtuse blade angle due to hammering of the blade) and c. 4-10% loss of weight.¹³ Such use-wear-related weight loss, combined with weight differences originating from the variable depth with which templates were pressed into moulding sand, significantly hampers analysis of sickle weight distributions (Sommerfeld 1994: 38; 37-60).

From the Netherlands, bronze and clay moulds for axes, spearheads and a socketed knife are known¹⁴, yet no mould (fragment) for a sickle blade has ever been found. This means that positive evidence for local production is as yet lacking for the Netherlands, albeit that regionally specific types of blade embellishment (e.g. grooves; section 3.3) do hint at regional production.

2.3.2 Hafting

Not only is it unclear whether any, and if so where and in what types of moulds Dutch sickles were produced, we are also uninformed about their method of hafting. Dutch examples are predominantly knobbed sickles (*infra*), as they are in other parts of Europe (*cf.* fig. 7A); hafting is a widely shared problem as so far no handle for a knobbed sickle has been found in Europe. In the Schwarza (Kr. Bühl) barrow grave, a knobbed sickle blade was recovered near the lower leg amidst a mass of very decayed wood (Sommerfeld 1994: 160), suggesting that the knobbed sickle was originally attached to a wooden handle.¹⁵ The very presence and shape of the knob could be a device to control the rigidity (and angle? *cf.* fig. 4, C) of haft-blade

interlocking. The observation that the bottom 2-3 cm at the base sometimes displays less use-wear (Steensberg 1943: 161), may mean that the back of the blade was slotted into an organic (wooden) handle (fig. 4, A-C). This is also suggested by the placement of three notches for rivets or rope fixtures on the 3 cm closest to the base on the sickle blade of Précieux (Guilaine 1976: 511 pl. 2), and the absence of blade ribs on the first 3.5 cm of the blade from Chevroux (Primas 1986: *Taf.* 118 no. 2027).

There have been several attempts at creating haft reconstructions for knobbed sickle blades, most notably Steensberg's (1943: 14; 16; 160) handles used in his reaping experiments. The slotting-in of blades from the back of the handle (as shown in fig. 4 C; Sommerfeld 1994: 160), presents itself as a plausible option as it can combine good rigidity, ease of blade change and possibly adjustment of blade-to-haft angle. Possibly, some additional locking (wooden wedges?) or fixation by cords or sinew (*cf.* Gedl 1995: 2) was required to counter dislodgement. An iron sickle from Ruda Pabianicka still retained parts of a wooden haft and cord winding (Gedl 1995: 96; *Taf.* 34 no. 694). An altogether different method of hafting was suggested by Gaudron (1944: 161; fig. 4, B). In this reconstruction, rigidity is achieved by placing the knob into a recess in the (split) handle, after which a semicircular clamp or wedge is fixed onto the blade by a tubular (bronze?) ferrule. Such a method, would require the blade base to be narrower than the ferrule diameter (in order for the ferrule to be slipped off to allow removal or replacement of the blade).

From the *palafitte* area, several wooden handles for tanged sickles are known (fig. 4, D-E). These share several distinct characteristics that may also have applied to handles for knobbed sickles. First, all handles have been carved so as to ensure maximum transfer of control and force from the hand to the blade. The former was achieved by creating thumb rests and an ovoid central handle area that can be well gripped by the four fingers; the latter was achieved by creating a large pommel area through which pulling momentum is effectively transferred from the ulnar side of the hand, through the handle's pommel, to the blade. The *palafitte* handles for tanged sickles appear to be rather short (length of fig. 4 E, Grandson-Corcelettes, is 19.5 cm). This characteristic is probably shared by the socketed sickles known mainly from the United Kingdom, as the preserved handle of the Shinewater socketed sickle only measures 16.5 cm in length (fig. 4, F; Brysbaert 1998: fig. 1). From the Early Iron Age sickle and haft preserved in the Vimose bog, we know that sickle hafts could be up to 24 cm long (Engelhardt 1869: 26-27 fig. 27; fig. 4, G). Given these parallels, and assuming generic functional similarities, a wooden handle of 17-24 cm may be assumed for the Dutch examples, but various other details – most notably blade orientation in relation to grip orientation (e.g. compare fig. 4, D with F-G), or any additional (cord) wrapping – remain unknown. This means that any attempt at

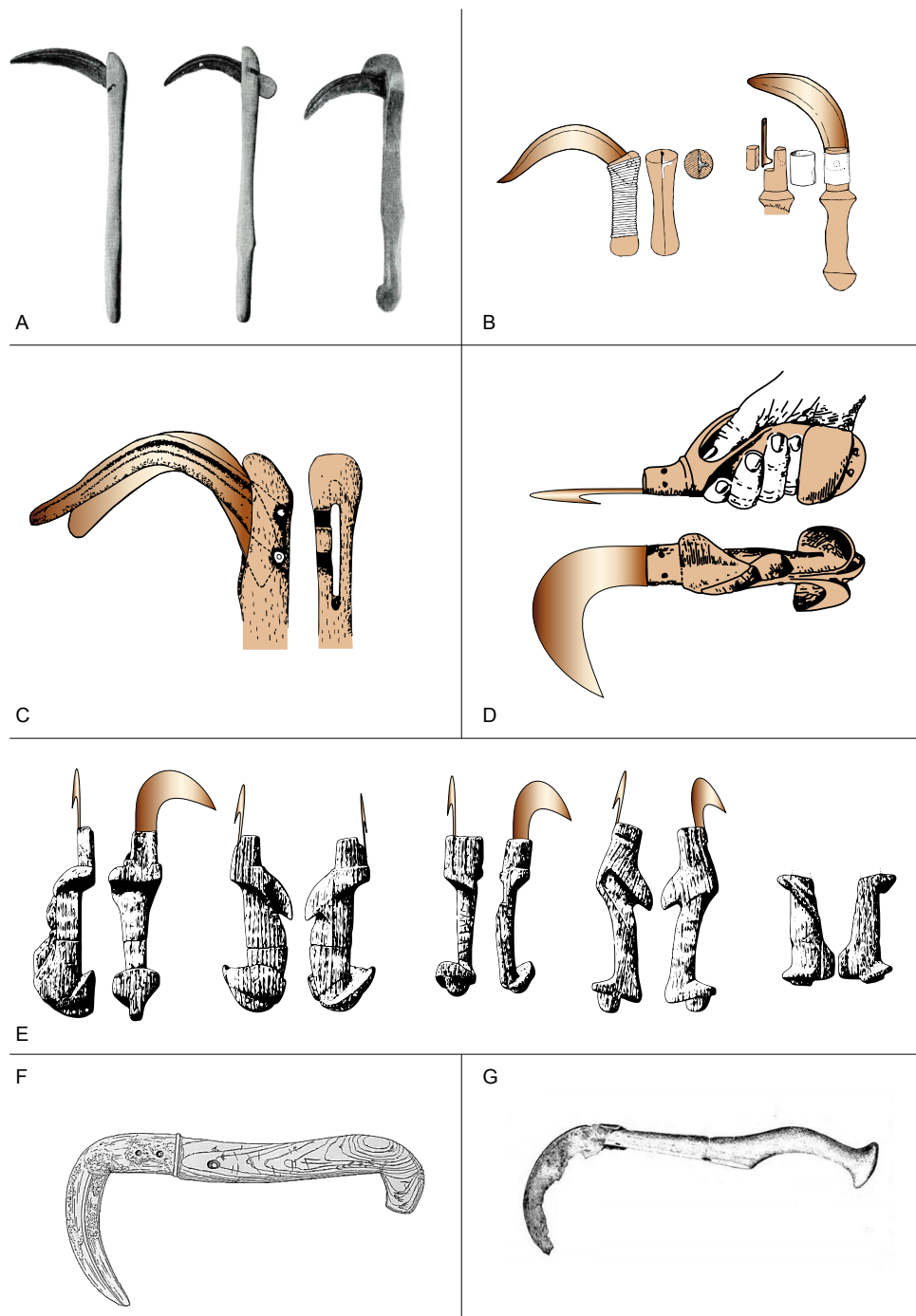


Fig. 4. Reconstructions for the hafting of knobbed sickles (A: after Steensberg 1943: 14 fig. 5; 16 fig. 7; 160 fig. 56; B: after Gaudron 1944: 161; C: after Sommerfeld 1994: 160 *Abb.* 46), handling reconstruction of the Mörigen sickle (D: after Clark 1952: 11 fig. 54), wooden handles for tanged sickles from the *palafitte* region (E: left to right; Grandson-Corcelettes, Mörigen, Grandson-Corcelettes, Zurich and Zug; after Primas 1986: *Taf.* 123), socketed sickle and handle from Shinewater (F: after Brysbaert 1998: fig. 1) and tanged Early Iron Age sickle from Vimose (G: after Engelhardt 1869: fig. 27).

typological classification should be based on properties of the blade alone.

2.3.3 Typology and terminology

All *Prähistorische Bronzefunde* volumes on sickles from particular areas of Europe (fig. 1 and references) start

off with a recapitulation of the regional research history and regional typological approaches up to their respective publication dates, so we shall here dispense with these. Instead, we shall briefly evaluate the principles of bronze sickle classification for the various regions and discuss their potential for contextualising the Dutch examples.

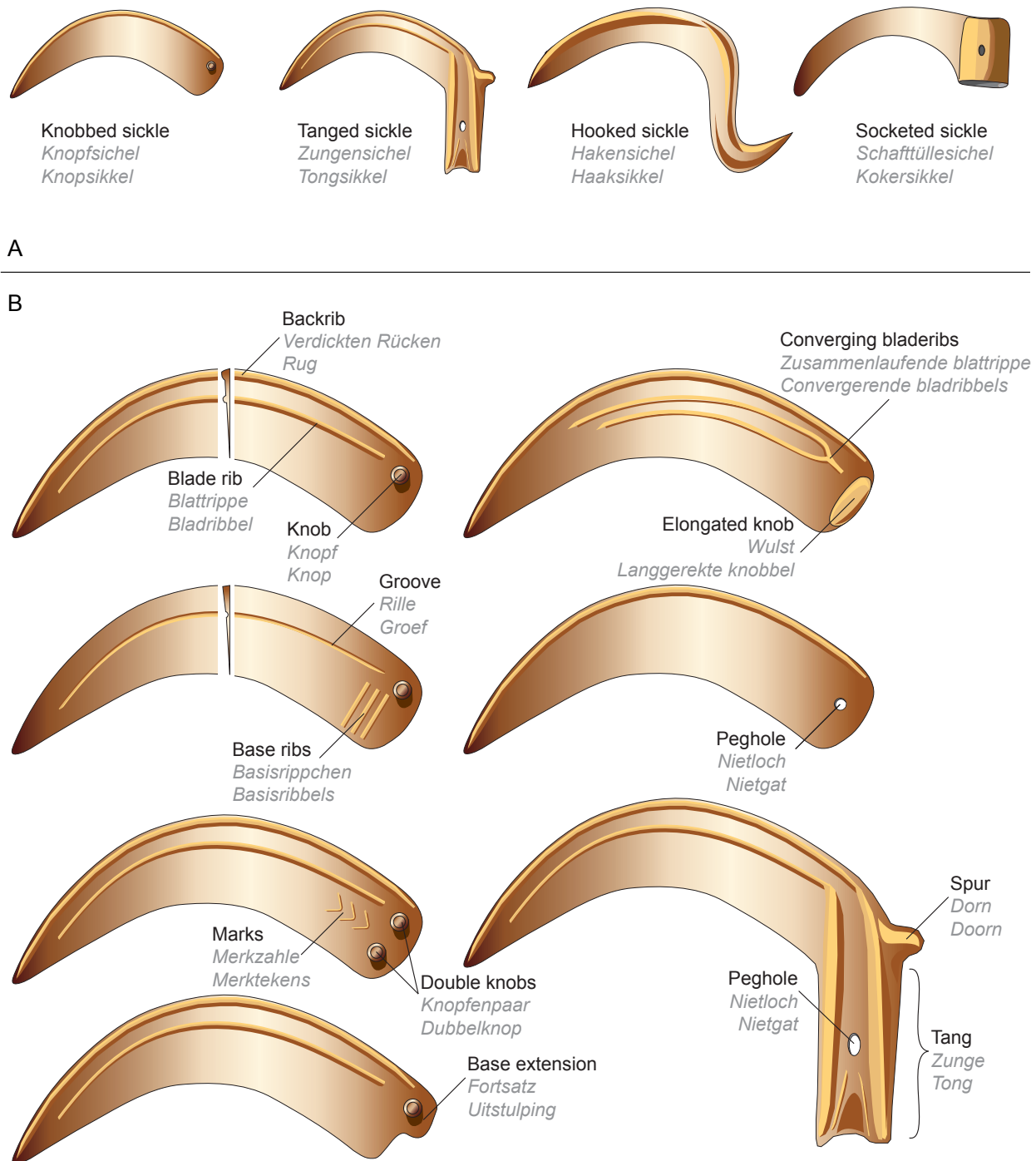


Fig. 5 A: Basic morphological types of Bronze Age sickles: knobbed sickle (or button sickle / *Knopfsichel* / *knopsikkel* / *faucille à bouton circulaire*), tanged sickle (*Züngensichel* / *tongsikkel* / *faucille à languette*), hooked sickle (*Hakensichel* / *haaksikkel*), socketed sickle (*Schaftfüllesichel* / *kokersikkel* / *faucille à douille*). B: Terminology used in this contribution, with German, Dutch and French equivalents (drawing S. Arnoldussen, RUG/GIA).

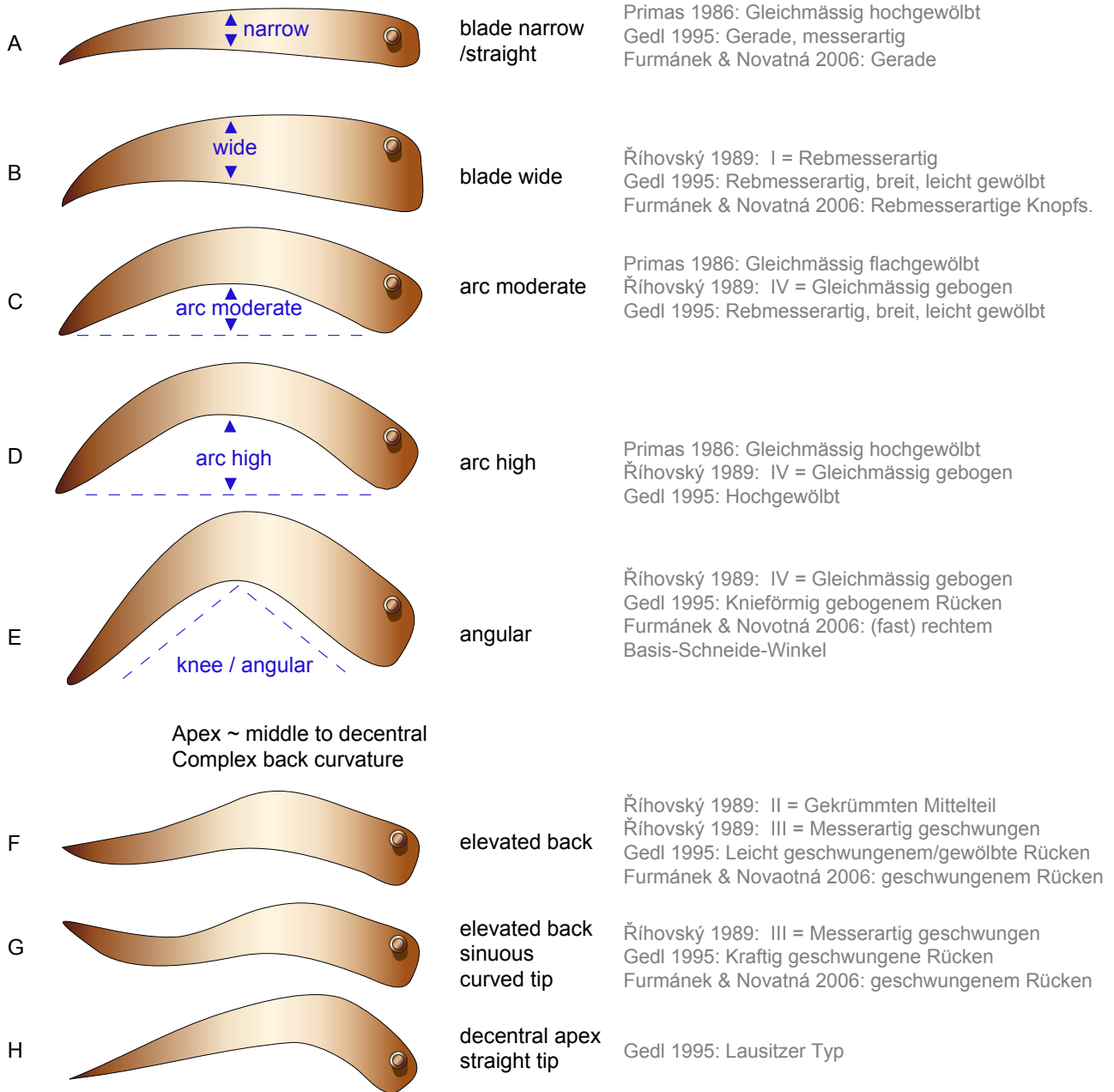
This, however, necessitates clarification of the terminology employed (fig. 5).

At the most fundamental level (fig. 5, A), Bronze Age sickles are traditionally classified by a combination of form and presumed hafting methods into tanged sickles, knobbed sickles (also known as ‘button sickles’; Childe 1930: 103 fig. 92), hooked sickles and socketed sickles.¹⁶ Childe (1944: 15-16) proposed some additional types (types VI to IX) to incorporate sickles from the

Mediterranean, the Aegean, and the Near East. Later, in 1978, Petrescu-Dîmbovița (1978: 1, cf. Vasić 1994: 23) added ‘archaic’ sickles (cf. Primas’ (1986: 46) *Typ Böhheimkirchen*) and sickles with appending casting-jets, but the usefulness of the latter category in particular is doubtful. For various regions, much more detailed subtypes have been postulated,¹⁷ which are differentiated by – for the knobbed sickles – (a) the shape of the blade, (b) the number and shape of the knob(s), (c) the presence,

BLADE FORMS (A to H)

Apex ~ middle
Single back curvature



BASE FORMS (1-7)

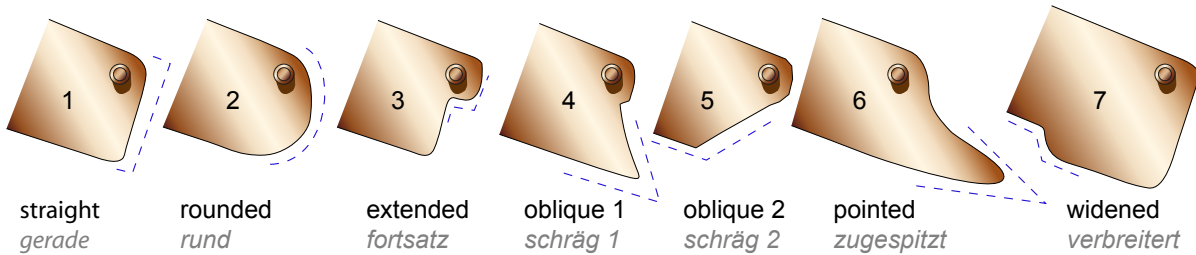


Fig. 6. Classification scheme for knobbed sickles, based primarily on blade form (A to H) and secondarily on base form (1-7). To the right, in grey, nomenclature from other studies has been incorporated to facilitate comparison with previously published typologies (drawing S. Arnoldussen, RUG/GIA).

number and placement of blade ribs, (d) the presence and form of base ribs, (e) the shape of the base and (f) their overall size (e.g. miniatures).

Unfortunately, there is little consistency between regions in the exact hierarchy of typologically relevant features, which hampers the interregional comparability of the types. Here, we propose that – for knobbed sickles – a more descriptive system using a hierarchical sequence of parameters may be the way forward (fig. 5, B). The proposed sequence would be to characterize (1) blade form, (2) base form, (3) shape and location of knobs, (4) type, number and morphology of blade ribs/grooves, and at the lowermost level (5) blade embellishments (e.g. base ribs, marks, decoration).

Unfortunately, the data-set discussed here is too small to warrant the assumption that it contains a representative, exhaustive range at determination levels three and beyond. Whereas some variation on the form (round or elongated) and placement of the knobs is reflected in the present corpus (cf. Sommerfeld 1994: 168), we are reluctant to extrapolate this into a full set of level-three descriptive parameters. Therefore our proposal for standardization in the descriptions of knobbed sickles (fig. 6) has been purposely limited to levels one and two (blade form and base form). For other regions, locally tailored schemes for properties at levels three and beyond should be compiled independently. Moreover, one should keep in mind that any typology based on blade form should take into account unintentional form variations stemming from post-casting deformations through resharping. Peening may cause the outermost tip of the blade to curve upwards and to change the blade angle, in extreme cases by as much as 50%.¹⁸ Consequently, any characterisation of blade form should take account of the suspected use intensity of the artefact and its intended form. For example, we suspect that in the case of the Epe sickle its upward-curved tip (DB 346; see section 3.2) is due to its evident intensive resharping; yet, had such traces been absent, one might have speculated about import from areas where sickles with strongly sinuous blade forms were cast.¹⁹ As the state (i.e. present shape, preservation) of the blades may vary (as-cast, light use, heavy use, scrapped) between contexts of deposition (e.g. graves, hoards, settlements), analysis of the physical state and the context of recovered sickles should accompany any analysis of supra-regional affinities.

2.3.4 Context and supra-regional affinities

For the Dutch Bronze Age sickle blades, no integral study of their contexts or supra-regional affinities had been undertaken. Hence at the outset of this study there was little information about what kinds of contexts (e.g. hoards, graves, settlements) Dutch Bronze Age sickle blades figured most prominently in (but see Fontijn 2003: 144-147); this hampered analysis of what Bronze Age communities themselves considered preferred biographies for

these items (cf. Arnoldussen & Ball 2015). Furthermore, systematic analyses of these sickles for traits that might suggest supra-regional contacts were lacking. On the basis of documented contexts of bronze sickle blades outside the Netherlands, a wide range of depositional environments may be expected, including hoards, settlements and funerary contexts. A wider European survey shows that Bronze Age bronze sickle blades are most frequently recovered from hoards²⁰ and depositions in wet contexts.²¹ Jahn (2012: 191) states that hoards account for 83% of the known tanged sickles. Sickle blades and blade fragments frequently occur in mixed-object (scrap/*bruchertz*; cf. Kytlicová 2007: 144) hoards, where they may be the dominant tool - represented by hundreds of specimens.²² In addition to these mixed deposits, hoards comprising solely sickles and sickle fragments are also known.²³

Outside the Netherlands, Bronze Age sickle blades are rarely recovered from settlements. Petrescu-Dîmbovița (1978: 13) states that in Romania not even 0.4 % (n = 11) of the knobbed sickles originated from settlement sites. Low values have been established also for Slovakia, where only 26 out of 244 knobbed sickles were found in settlements (Furmánek & Novotná 2006: 54). The Polish evidence studied by Gedl (1995: 18-19) supports this low incidence in settlements; only 44 knobbed sickles were found at Lausitz settlements there (of a total of 453). For European tanged sickles, Jahn (2012: 192 *Abb. 2*) reckons that c. 10% originate from settlements, but he notes that among settlement finds, depositions figure prominently – blurring the distinction between hoards and settlement finds.

In addition to settlement finds and deposition sites, outside the Netherlands Bronze Age sickle blades also figure in funerary contexts. Barrows, urned cremations and inhumation graves occasionally contain bronze sickle blades.²⁴ Notably, the tradition of incorporating sickle fragments and sickles in funerary contexts is more regionally differentiated than the widespread custom of their incorporation in hoards. Primas (1987: 17) in southern central Europe noted a more common occurrence of sickles in graves, and Gedl (1995: 18) in Wielkoposka/Greater Poland and Silesia. Jahn's (2012: 192-193 *Abb. 3*) distribution map shows concentrations of tanged sickles in graves on the upper reaches of the rivers Danube and Rhine versus concentrations of knobbed sickles in funerary contexts in the upper Vistula and upper and middle Danube regions. Yet another concentration of sickle-containing graves can be outlined in Schleswig-Holstein (Sommerfeld 1994: *Beil. IV*). It should be noted that within areas that *do* yield sickles from funerary contexts, they still are a rare occurrence. Gedl (1995: 17-18) lists 144 sickles from 110 cemeteries, which indicates that – save for a few cemeteries with 2-6 sickles – sickle graves remain rare even in larger cemeteries. Conversely, areas with few sickle graves have been identified as well (e.g. the southern Balkans (Vasić 1994: 16-17) and Slovakia (Furmánek & Novotná 2006: 51; 55).

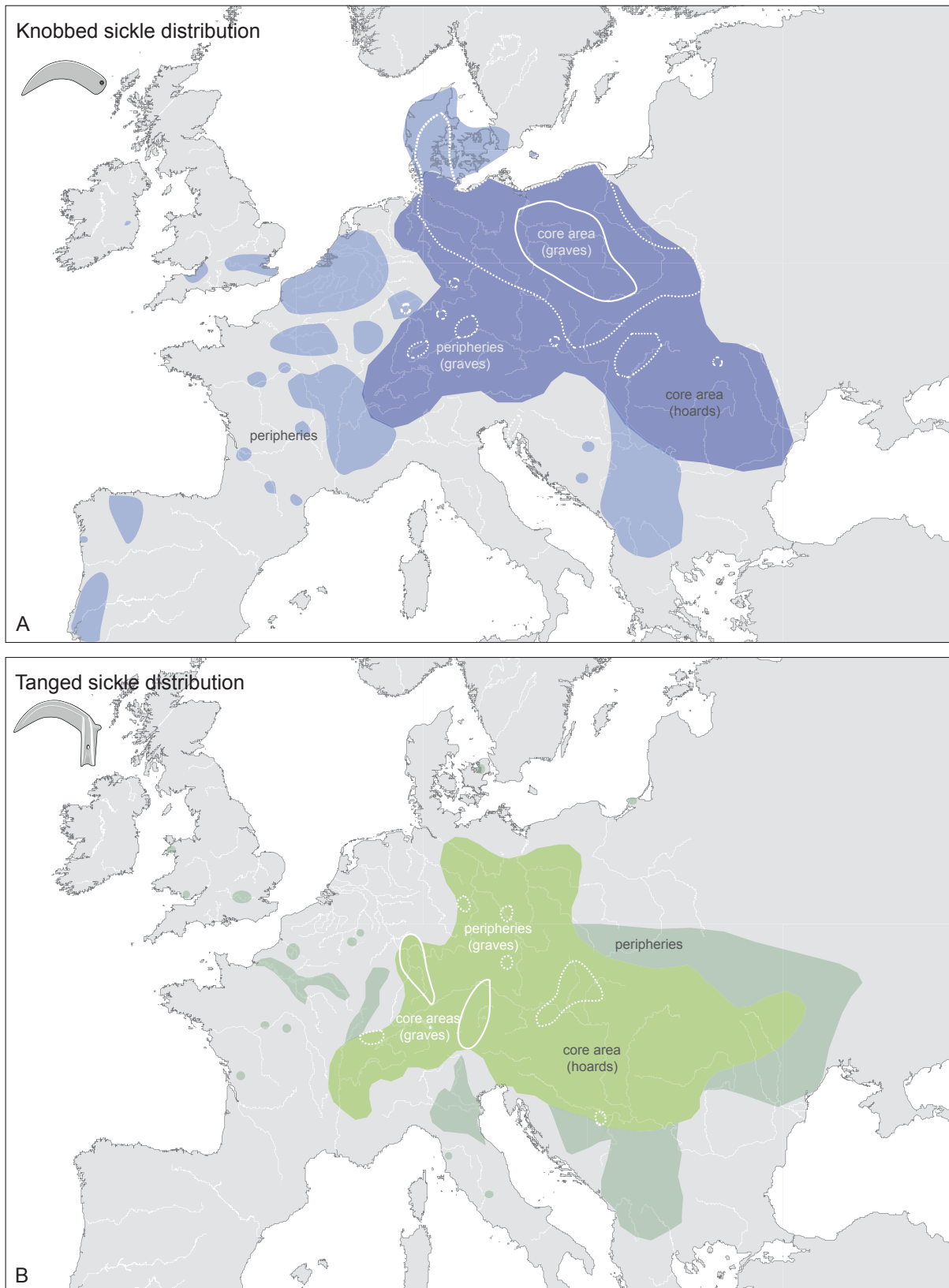


Fig. 7. Generalized distribution maps for knobbed sickles (top) and tanged sickles (bottom), darker areas indicate main zones of hoard incorporation, lighter areas peripheral occurrences (various contexts). White closed outlines indicate the main zones of sickle presence in graves, white dashed lines indicate peripheral areas of sickle presence in graves (after: Poste 1858; De Mortillet 1881; Sandars 1957; Milotte 1963; Gaucher & Robert 1967; Mozsolics 1967: 190 *Abb.* 41; Audouze & Courtois 1970: pl. 20; Abels 1972: *Taf.* 45; Nicolardot & Gaucher 1975; Guilaine 1976; Petrescu-Dîmbovița 1978: *Taf.* 228; Coffyn 1983: 195; Blanchet 1984; Kubach 1984: *Taf.* 31; Primas 1986: *Taf.* 124-125; Audouze & Courtois 1970; Říhový 1989: *Taf.* 54-55; Sommerfeld 1994: 209 *Abb.* 64; Vasić 1994: *Taf.* 32-36; Gedl 1995: *Taf.* 38-39; Kobal' 2000: *Taf.* 104; Laux 2000: *Taf.* 74; Furmánek & Novotná 2002: *Taf.* 36-37; König 2004: 60; Jahn 2012: 191 *Abb.* 1; 193 *Abb.* 3; Boughton 2013). Drawing S. Arnoldussen, RUG/GIA.

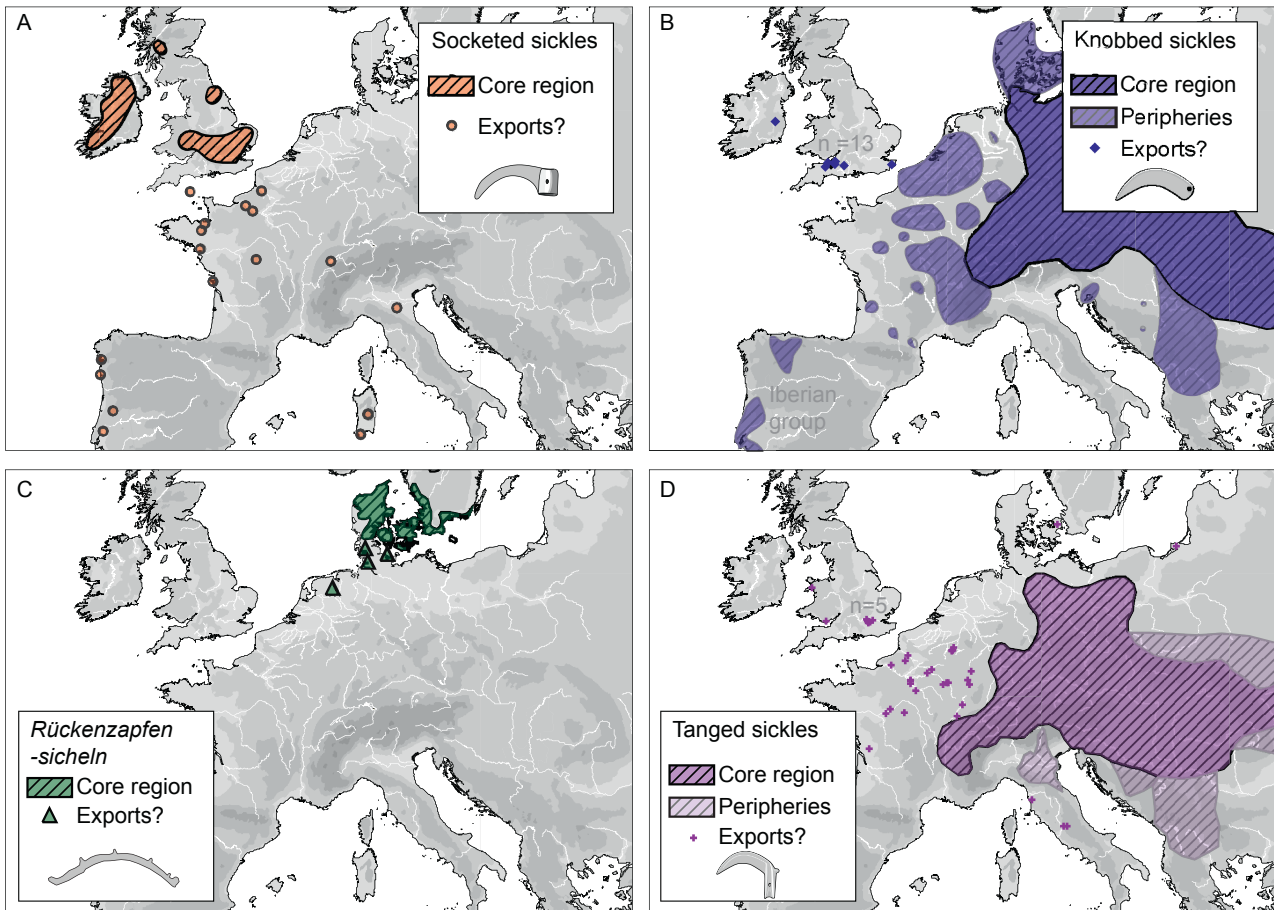


Fig. 8. Core regions and distribution patterns (peripheries and possible exports) for socketed sickles (A: after Fox 1941; Maggi & Faye 1991: 100 fig. 1), knobbed sickles (B: see Fig. 7 for references), *Rückenzapfensicheln* (C: after Baudou 1960: 46 and *Karte* 27; Butler 1986; Sommerfeld 1994: 199 and 201 *Karte* 2), and tanged sickles (D: see Fig. 7 for references). Drawing S. Arnoldussen, RUG/GIA.

The main distribution areas (as known through incorporation in hoards – an important proviso) for different Bronze Age sickle types show some regional differentiation. Both socketed sickles and hooked sickles have distinctly regional affinities; the former is native to the British Isles (fig. 8, A: Evans 1881: 202; Fox 1941; O'Connor 1980: 329) and the latter to Siebenbürgen/Transylvania (Petrescu-Dîmbovița 1978: 57-71; *Taf.* 289B) and eastern Hungary (Říhový 1989: 95). Tanged and knobbed sickles have a much wider and largely overlapping distribution (fig. 7). Knobbed sickles, the type most commonly found in the Lausitz and Püliny culture zones of northern central Europe (Říhový 1989: 13; 73), yet also occur in large numbers in Romania (Petrescu-Dîmbovița 1978: 13). From this main distribution (fig. 7, B; fig. 8, B), a general decrease towards the west is observable, yet with still considerable numbers of knobbed sickles recorded in the *palafitte* area and southern Germany (Primas 1986: *Taf.* 124-125, *cf.* fig. 20). In Iberia, the different placement of the knobs and raised blade base – together with a concentration of moulds in Asturia (Coffyn 1983: 195 *carte* 5) – is indicative of a regional knobbed-sickle tradition (fig. 8, B). In Denmark

and southern Sweden, the group of *Rückenzapfensicheln* (fig. 8, C) presents a similarly regional variation (Baudou 1960: 46; *Karte* 27; Sommerfeld 1994: 199; 201 *Karte* 2).

Whereas Harding (2000: 191) argued that supra-regional contacts are difficult to distil from the distribution of Bronze Age sickles, several instances of sickle blades of types uncommon in their regions of recovery suggest otherwise. For example, the distribution of continental knobbed sickles in the United Kingdom is focussed on the Somerset, Kent and Wiltshire regions (fig. 8, B), suggesting that these sickles were imported through maritime cross-Channel contacts and did not stray far inland from their landfall sites. Similarly, the few tanged sickles from the United Kingdom concentrate in the Thames valley and coastal areas (Gwynedd, Glamorgan) of Wales. Conversely, the socketed sickles of the British Isles only rarely strayed into the European mainland, with one specimen at Grandson-Corcelettes (Primas 1986: 192 no. 2051), four in Atlantic Iberian hoards (Coffyn 1983: 184), less than ten French examples (Herity & Eogan 1977: 191 fig. 76; Maggi & Faye 1991: 100 fig. 1) and two from Corsica (Maggi & Faye 1991: 100 fig. 1). Their distribution too reflects an Atlantic cross-Channel interaction zone, extended inland through riverine transport.

Tanged sickles show a comparable, albeit less clear-cut, riverborne distribution away from their core area. Their distribution outside the core regions in western Europe (fig. 8, D) seems in no small part to have been shaped by the rivers Loire, Seine, Somme and Thames.

The above examples show that both in the context of deposition (hoards, settlements, funerary contexts) as well as in the types of Bronze Age sickle blades used and/or produced, ample regional differentiation – and inter-regional contacts – can be demonstrated. With this in mind, a detailed review of the Dutch Bronze Age sickle blades is warranted, to spot any similar patterns in the Dutch data set. In the following, the sickle blades (reportedly) found in the Netherlands are discussed by typological group (sections 3.2-3.5), but first a series of allegedly Dutch sickles are discussed whose recovery in the Low Countries is a matter of considerable doubt.

3. THE DUTCH BRONZE AGE SICKLES

In the sections below, the various Bronze Age sickle blades reportedly found in the Netherlands are discussed. We have distinguished four major groups within the wider corpus of Dutch Bronze Age sickle blades: sickles with a single knob and blade ribs (Group 1), sickles with a single knob and blade grooves (Group 2), sickles with an elongated knob (*Wulst*; Group 3), and sickles without knobs (Group 4). Nevertheless, several items could not be assigned to any of these groups with certainty. In part, this is due to the small size or fragmented state of the items (fragments discussed as ‘Group 5 - other’), yet for other – more intact – sickle blades there are considerable reservations as to the precision or probability of a Dutch origin. Therefore, we shall first discuss a number of finds whose Dutch provenance cannot be ascertained with precision, or even at all.

3.1 Weeding out: antique dealer’s finds with poor provenance

Amongst the 43 sickle blades reportedly found in the Netherlands, six have a poor provenance. For the sickle known as DB 716 (other codes ‘RMO NS 576/Felix506’), it is unclear when exactly it entered the Dutch National Museum of Antiquities (RMO), but it was described by Felix (1945: 230) in the war years as ‘not inventoried’. Four other sickles, including two tanged(!) sickles, were acquired by the RMO through mediation of the antique dealer J.N. Esser. There is considerable doubt about whether these objects were found in the Netherlands to begin with (*cf.* Fontijn 2003: 40; Butler & Steegstra 2005/2006: 226). The Dutch provenances attributed to such finds (“Drenthe”, “St. Oedenrode”, “Katwijk aan de Maas” and “Wijchen”) and alleged contexts (frequently “dredging find”) presumably encouraged acquisition by the RMO, but need not reflect their original context. The

sickle supposedly found at Nijmegen (DB 446), comes from the collection of P.A. Gildemeester – an Amsterdam merchant who in 1931 bequeathed his collection of antiquities to the RMO. We know that Gildemeester acquired various antiquities through the mediation of Nijmegen antique dealer J. Grandjean. Hence there is no way of establishing at what point (and whether truthfully, *supra*) the “Nijmegen” origin was ascribed to this find.

3.1.1 Knobbed sickles

(DB 716) PROVENANCE UNKNOWN

L. 15.5 cm; w. 3.3-2.2 cm; th. at ribs 0.4 cm, th. at knob 1.25 cm. Blade and base too abraded to allow classification, cylindrical knob (h. 0.7 cm) placed near back of blade. Wide blade rib parallel to back, and very faint second wide blade rib possibly diverging from the other near the blade base. Middle section wrapped with thin bronze sheet with incised decoration. Patina: mottled green. Sheet: bronze colour. Museum: RMO, Inv. No. NS 576. (Felix 506, No. 132).

Parallels: The wrapping of a tanged sickle blade (its decoration comparable to that on DB 522) with sheet bronze was also observed in the hoard of Grabice (Gedl 1995: 78 no. 499; *Taf.* 67.A2). It possibly marked the decommissioning of the sickle to be deposited (*cf.* Sommerfeld 1994: *Taf.* 12 no. 23). From the hoard placed in a pot at Glienicke, Kr. Beeskow, a sickle with a similar placement of the knob is known (yet with a blade groove; Sommerfeld 1994: 332; *Taf.* 13 no. 26). The convergence of two blade ribs towards the knob is also seen on the blade from Müschen, Kr. Cottbus (Sommerfeld 1994: *Taf.* 52 no. 16).

Dating: Dated by RMO to Early Iron Age, probably erroneously. The association with winged axes and palstaves in the Glienicke hoard suggests a Middle Bronze Age date (c. 1300-1000 cal. BC; Sommerfeld 1994: 332; Fontijn 2003: 117 fig. 7.2).

(DB 530) DRENTHÉ? (dealer’s provenance).

L. 15.7 cm; w. 3.8 cm; th. at middle (ribs) 0.9 and 0.3 cm; th. of blade 0.2 cm; th. at knob 2.4 cm. High-arched blade with straight base (D1), high conical knob (h. 1.7 cm) placed at base/back transition. High narrow back rib and two low back ribs that converge towards the tip of the blade. Near the base, a raised base rib and the two blade ribs curve downward, forming or mimicking *Basisrippchen*. V-shaped blade mark near base, pendant from lowermost blade rib. Patina: dark green with black patches. Museum: RMO Inv.no. c 1950/2.5, purchased from antique dealer Esser as a dredging find.

Parallels: Several comparable examples from Germany, classified as *Typ Bösel*, concentrate in Mecklenburg-Vorpommern (Sommerfeld 1994: 204 *Karte* 8) and are also known from Niedersachsen (mainly as part of the Bösel hoard; Sommerfeld 1994: 304, no. 13; *Taf.* 6, no. 3; *Taf.* 8, nos. 6, 9; *Taf.* 10, no. 2), a stray find from “Schleswig-Holstein” (Sommerfeld 1994: 389; *Taf.* 12, no. 6), from a grave near Dannenberg, Kr. Lüchow-Dannenberg, Niedersachsen (Sommerfeld 1994: 405; *Taf.* 12, no. 15) and a stray find from the Mühlenberg, Müschen, Kr. Cottbus, Brandenburg (Sommerfeld 1994: *Taf.* 52-13; 396 no. 92). The shape and decoration of the Dutch example is an exact match to the sickle known as Bösel-Dannenberg (fig. 9), which, Sommerfeld (1994: 302) argues, may originally have been part of the Bösel hoard. Possibly the Drenthe sickle once belonged to the Bösel hoard as well.

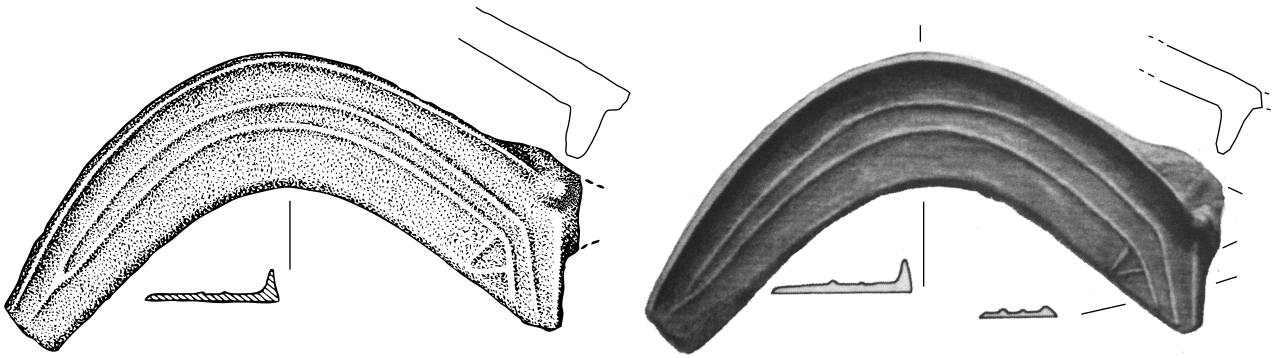


Fig. 9. Comparison of the DB 530 sickle (left) with the sickle known as Bösel-Dannenberg (right), thought to have been part of the Bösel hoard, Cloppenburg, Niedersachsen (Sommerfeld 1994: *Taf.* 8, no. 9).

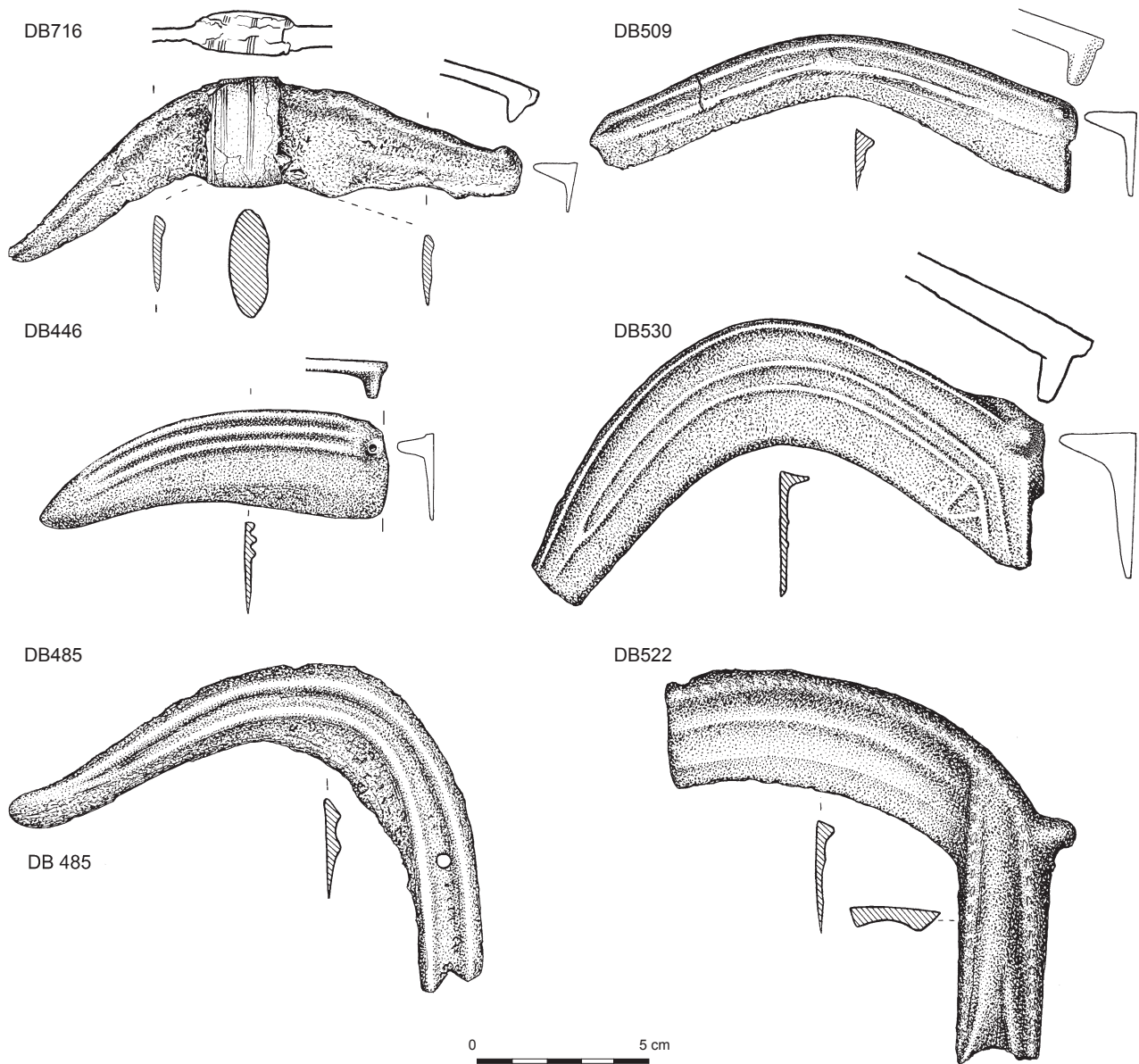


Fig. 10. Sickles whose Dutch provenance is unclear or doubtful (all to the same scale, drawings Groningen Institute of Archaeology/H. Steegstra).

Dating: *Frühe Urnenfelderzeit* (Sommerfeld 1988: 140), contemporary to Ha.A1, c. 1200-1125 (Kubach 1984: *Taf.* 1; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 509) WIJCHEN, *GEMEENTE* WIJCHEN, GELDERLAND? (dealer's provenance).

L. 14.3 cm; w. 1.8 cm; th. at middle (ribs) 0.5 and 0.35 cm, th. blade 0.3 cm; th. at knob: 1.6 cm. Low-arched blade with straight base (C1), with back rib and one blade rib parallel to blade's back. Conical knob at base/back transtition. Notch in base could represent a peg hole near the base. Ancient break at 3.5 cm from tip. Museum: RMO Inv.no. e 1948/3.4, purchased from antique dealer Esser as a "dredging find".

Parallels: Main distribution area for sickles of this general form is Wielkopolska/Greater Poland, Pommerania, Lausitz and Lower Silesia (Gedl 1995: 31, *cf.* Sommerfeld 1994: *Taf.* 55), yet they occur throughout central Europe (Řihovský 1989: 266). The shape is too generic to allow a more precise localisation. In Gedl's (1995: 38; 43) typology these are '*hochgewölbte Knopfsicheln mit schräger Basis*' or '*Knopfsicheln mit leicht geschwungenem Rücken und schräger Basis*', both types concentrating on the middle and lower stretches of the river Wisla. Following Řihovský (1989: 19; 29) it could either be '*Gruppe II, Typ 2, Var. b*' or '*Gruppe IV, Typ 2, Var. A/B*', with four examples quite rare in Moravia. Primas (1986: 63-66) classifies these as '*Große Knopfsicheln mit durchgehenden Rippen (Typ Penkhof II)*' common to the upper Danube/upper Rhine area (Primas 1986: *Taf.* 127A). Remarkably, several very similarly shaped sickles (also sharing the peculiar thick cross-section) are known from the Transcarpathian area (Kobal' 2000: *Taf.* 52). An east-European rather than a Dutch origin seems plausible.

Dating: Comparable types are present in foreign hoards dated to the '*späte Hügelgräberzeit bis frühe Urnenfelderzeit*' (Kubach 1984: *Taf.* 1; Řihovský 1989: 25, Gedl 1995: 31 (Polish Per. III-IV)), contemporary to Br.D to Ha.A1, or 1325-1125 cal. BC (Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 446) NIJMEGEN, *GEMEENTE* NIJMEGEN?, GELDERLAND (dealer's provenance)

L. 10.45 cm; w. 2.75cm; th. at middle (ribs) 0.3, 0.35, 0.3 cm, at blade 0.2 cm; th. at knob 1.0 cm. Wide blade with straight, slightly chamfered, base (B1). Back rib and two parallel blade ribs, closely set. Single, conical, round knob (diam. at base 0.65 cm, height 0.8 cm) placed where blade ribs meet the base. The wide blade is heavily sharpened from both faces. Patina: partly black. Encrustation of greyish sand. Museum: RMO Leiden, Inv.no. e.1931/2.295, ex coll. Gildemeester.

Parallels: Exact parallels for such a short, broad blade with two blade ribs are rare outside the Netherlands (*cf.* DB 906). We can list slightly larger and slightly more curved examples, such as the small sickle from Offleben, Kr. Helmstedt, Niedersachsen (Sommerfeld 1994: 388; *Taf.* 1:5), one from Załachowo (Gedl 1995: *Taf.* 2 no. 18), one from Gorsewice (Gedl 1995: *Taf.* 5 no. 74), and two examples from the Miłosław hoard, Woiw. Poznań (found together with a socketed chisel; Gedl 1995: 22-24; *Taf.* 1:11, *Taf.* 53A). Primas (1986: 78-79; *Taf.* 19 nos. 300-307) lists comparable sickles as '*Flachgewölbte Knopfsicheln vom Typ Ockstadt*', known from the German hoards of Friedberg-Ockstadt (nos. 304-305; *op.cit.*), Bad Homburg (Primas 1986: nos. 300, 303, 307) and Weinheim-Nächstenbach (Primas 1986: no. 306). These

concentrate in Hessen (Germany) and also occur in eastern France (Primas 1986: 79).

Dating: Primas places her '*Flachgewölbte Knopfsicheln vom Typ Ockstadt*' in the end phase of the '*Späte Bronzezeit*', Gedl (1995: 24) dates the "*breiten, leicht geschwungenen Sicheln mit gerader Basis*" to Polish Per. II and III (c. 1600-1100 cal. BC; Chwalba & Poleski 1999: 8).

3.1.2 Tanged sickles

(DB 485) ST. OEDENRODE, NOORD-BRABANT? (dealer's provenance)

L. 14.8 cm; w. 3.0 cm; th. at ribs: 0.45 cm; th. blade: 0.3 cm; diam. round perforation 0.5 cm. Tanged sickle with two blade ribs converging near the blade's tip, concave base of tang. Patina: green with brown patches, sandy encrustation. Museum: RMO Inv.no. k 1939/5.2. Dredging find (?), purchased from antique dealer Esser.

Parallels: Good parallels are known from the areas around the upper and middle Wisla river (Gedl 1995: *Taf.* 45A), where they are known as '*Zungensicheln mit einer rückenparallelen Rippe*' (*op.cit.*, 80-82, nos. 515-545; *Taf.* 26-28). They are also well-known from the Rhine-Main area, where they are known as the Homborg or Reupelsdorf type, depending on their size (Primas 1986: 167; 169; *Taf.* 96-99), yet these rarely show peg holes.

Dating: Most sickles of the type '*Zungensicheln mit einer rückenparallelen Rippe*' originate from Polish Per. V hoards (Gedl 1995: 82, c. 900-700 cal. BC; Chwalba & Poleski 1999: 8). Primas (1986: 180-81) dates Homborg- and Reupelsdorf-type sickles to *Stufe Wallstadt* (*i.e.* Ha.B3, c. 925-800 cal. BC; Kubach 1984: *Taf.* 1; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 522) KATWIJK AAN DE MAAS, *GEMEENTE* CUYK EN ST. AGATHA, NOORD-BRABANT? (dealer's provenance)

L. +15.5 cm; w. 3.4 cm; th. blade 0.45 cm. Tanged sickle with spur, concave base of tang and pair of V-shaped ribs at the tang's base. The outer ribs of the tang are decorated by nicking, which continues across the blade's back rib. The tip is missing (broken off). Patina: mottled green and light brown, corroded. Museum: RMO Inv.no. k 1949/5.1, purchased from antique dealer Esser as a dredging(?) find.

Parallels: The nicking/denting decoration on ribs of tanged sickles is common to central Europe (*e.g.* Petrescu-Dîmbovița 1978: *Taf.* 2; 15; Řihovský's 1989: *Gruppe* III/IV, Furmánek & Novotná's (2006) types Uioara and Josani, Vasić (1994: 26-38), Sommerfeld (1994: *Taf.* 54) or Jahn (2012: 195 *Abb.* 6)). The V-shaped motif at the tang's base is known (albeit in a closed, *i.e.* triangular form) on sickles in Moravia (Řihovský's 1989: *Taf.* 12; 14; 17) and Romania (Petrescu-Dîmbovița 1978: *Taf.* 2). The Wöllersdorf hoard contained two (undecorated) tanged sickles with similar V-shaped tang ribs (Müller-Karpe 1959: *Taf.* 135B). Whereas we doubt that DB 522 travelled from central Europe to the Netherlands in prehistory (considering its provenance), reliable finds such as the similarly decorated fragment of a tanged sickle from Sinsin-Trou de Leuve in Belgium (Warmenbol 1985: 222 fig. 4 no. 1) indicate that such long-distance displacements are far from impossible (*cf.* fig. 7, B). Moreover, similarly decorated tanged sickles can be found in southern/eastern Germany (*e.g.* Müller-Karpe 1959 (II), *Taf.* 138; 146; 149; 151).

Dating: The comparably decorated fragment from Sinsin is dated to Ha.A2-B1 (Warmenbol 1985: 223, c. 1125-925 cal. BC; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4), yet central-European examples may be older (e.g. Br.D-Ha.A2; Řihovský 1989: 75; Furmánek & Novotná 2006: 81).

3.2 Group 1 – Knobbed sickles with back rib and one or more blade ribs

Within the wider corpus of Dutch Bronze Age sickle blades, a group of knobbed sickles can be identified that show a conical to cylindrical, or round to sub-rectangular, knob or button placed near the transition of the blade's base and back (fig. 11). Sickles that have a distinctly elongated knob (*i.e.* spanning more than one-third of the blade's original width) have been classified as a separate group (Group 3; section 3.4). Sickles assigned to Group 1 have a back rib and one or more, frequently parallel, blade ribs. Subdivisions within this group are based on (a) the number (one or two) of knobs, (b) the number (one or two) of blade ribs, (c) the course of the blade ribs (converging blade- and back rib, or converging blade ribs).

3.2.1 Descriptions

(DB 906) OPHEUSDEN, *GEMEENTE* DODEWAARD, GELDERLAND. De Brien.

L. 9.8; w. 2.2 cm; th. at middle (ribs) 0.4 cm, th. blade 0.3 cm, th. at knob 0.65 cm. Knobbed sickle with wide blade and straight base (B1), thin back rib and two equally thin parallel blade ribs. Semi-conical knob (h. 0.35 cm) placed below the blade ribs (mid-blade) near the blade's base. Found in 1981 together with DB 907 in the section of a newly dug drainage ditch at the Tolsestraat, in a cultural layer beneath a vegetation horizon at a depth of c. 1 m (Mulder 1982: 14 *afb.* 2). Cutting edge heavily damaged. Patina: mottled green, laboratory-treated. Collection: HKKO Kesteren.

Map reference: c. 173/438.

References: Mulder 1982: 13-19; Modderman & Montforts 1991: 149, *afb.* 6.

Parallels: Outside the Low Countries, B1 sickles with back rib and two parallel blade ribs are rare (but see Sommerfeld 1994: *Taf.* 12 no. 3; 4; 7; 9; *Taf.* 13, no. 4; *Taf.* 40, no. 10), unlike those with back rib and single blade rib. For example, Primas (1986: 77-79) lists several examples of low-arch ribbed knobbed sickles under her *Typ Grenchen* (e.g. Primas 1986: *Taf.* 4, nos. 66-76; *Taf.* 5, nos. 77-79) and *Typ Beilngries* (e.g. Primas 1986: *Taf.* 5, nos. 80-90) from the southern German/Swiss area. Whilst *Typ Penkhof III* (Primas 1986: 67) can also have two blade ribs, these sickles are decidedly larger and more high-arched (e.g. Primas 1986: 61; *Taf.* 13).

Dating: Given the depth and the drawn section (Mulder 1982: 14 *afb.* 2), in combination with present-day understanding of the Holocene genesis of the Dodewaard crevasse splays (Havinga 1969; Havinga & Op 't Hof 1975; 1983), the sickles were probably recovered from (under) a vegetation horizon datable in general terms to the Middle Bronze Age (Arnoldussen 2008b: 157-162). The association with Middle Bronze Age ceramics ('*Hilversum*' and '*Drakestein*' wares; Modderman & Montforts 1991: 149) strengthens this interpretation. Possibly the

De Brien sickles date to c. 1200-900 cal. BC (Arnoldussen 2008b, 161). Primas' (1986: 22; 60-61) small knobbed sickles with back rib and parallel blade rib are dated – considering their presence in the Bühl and Grenchen hoards – to the Middle Bronze Age (*Stufe 2 Mittlere Bronzezeit; i.e.* Br.C1; c. 1475-1400 cal. BC; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 907) OPHEUSDEN, *GEMEENTE* DODEWAARD, GELDERLAND. De Brien.

L. +7 cm; w. 3 cm; th. at middle (ribs) 0.35 cm, th. at knob 1.1 cm, th. blade 0.3 cm. Knobbed sickle with wide blade, straight – albeit slightly convex – base (B1). Back rib and parallel blade rib are both narrow; ovoid conical knob (h. 0.8 cm) placed at the start of the blade rib, near the base/back transition intersection. Found in 1981 together with DB 906 in the section of a newly dug drainage ditch at the Tolsestraat, in a cultural layer beneath a vegetation horizon at a depth of c. 1 m (Mulder 1982: 14 *afb.* 2). Patina: mottled green, laboratory-treated. Longer at recovery, fragment of tip since lost. Collection: HKKO Kesteren.

Map reference: c. 173/438.

References: Mulder 1982: 13-19; Modderman & Montforts 1991: 149 *afb.* 6.3.

Parallels: See DB 906. Three comparable German examples – yet with elongated rather than ovoid knobs – are known from Ostenfeld, Kr. Rendsburg-Eckernförde Schleswig-Holstein (Sommerfeld 1994: *Taf.* 10, nos. 8-10).

Dating: See DB 906.

(DB 2481) MOSKES, *GEMEENTE* BREDA, NOORD-BRABANT.

L. +10.5 cm; w. 2.6 cm; th. blade 0.4 cm; at middle (ribs) 0.7 and 0.55 cm; th. at knob 1.2 cm. Wide-bladed knobbed sickle with straight, slightly chamfered and convex (B1) base. Rounded back rib and parallel blade rib (at least along part of the blade). Round conical knob (diam. 0.8 cm, 0.8 cm high - erroneously described as being 3.8 cm high; Koster, Taayke & Berkvens 2004: 79) placed on upper half of blade base, near the back. Patina: mottled, dark, glossy green, laboratory-treated. The sickle was recovered from a pit situated 32 m to the southwest of a Middle Bronze Age-B house plan (Berkvens, Brandenburgh & Coot 2004: 56 fig. 4.1). The dimensions of this pit were 0.8 by 1.8 m; it was 24 cm deep and oval in shape (*op.cit.*, 67). The pit also contained a whetstone or grinding stone (Koster, Taayke & Berkvens 2004: 87; or three fragments of one: Berkvens, Brandenburgh & Koot 2004: 70) and seven small, undated sherds (possibly incorporated through bioturbation; Berkvens, Brandenburgh & Koot 2004: 70). The shape of the pit might suggest an inhumation grave, but supporting evidence is absent.

Map reference: c. 108/402.

Reference: Berkvens, Brandenburgh & Coot 2004; Koster, Taayke & Berkvens 2004: 79 fig. 5.1.

Parallels: DB 907, DB 998; DB 2375. Outside of the Low Countries, in northwestern Poland and adjacent northeastern Germany, ample examples of wide-bladed, short knobbed sickles with a relatively straight base (B1) are known ('*Knopfsichel vom kleinen geraden Typus*' (Sommerfeld 1994: 187-188; 204 *Karte* 8) and '*Kurze Knopfsicheln vom Pommerschen Typ*' (Gedl 1995: 65-72; *Taf.* 21-23; 44). Remarkable is that for the latter type, a dating in Polish Per. V, c. 900-700 cal. BC is advocated (Gedl 1995: 67-72; Chwalba & Poleski 1999: 8, *cf.* Sommerfeld (1994: *Taf.* 43 no. 8 dated to Mont. V)), whereas similarly shaped examples in the Netherlands are reliably dated from the 15th

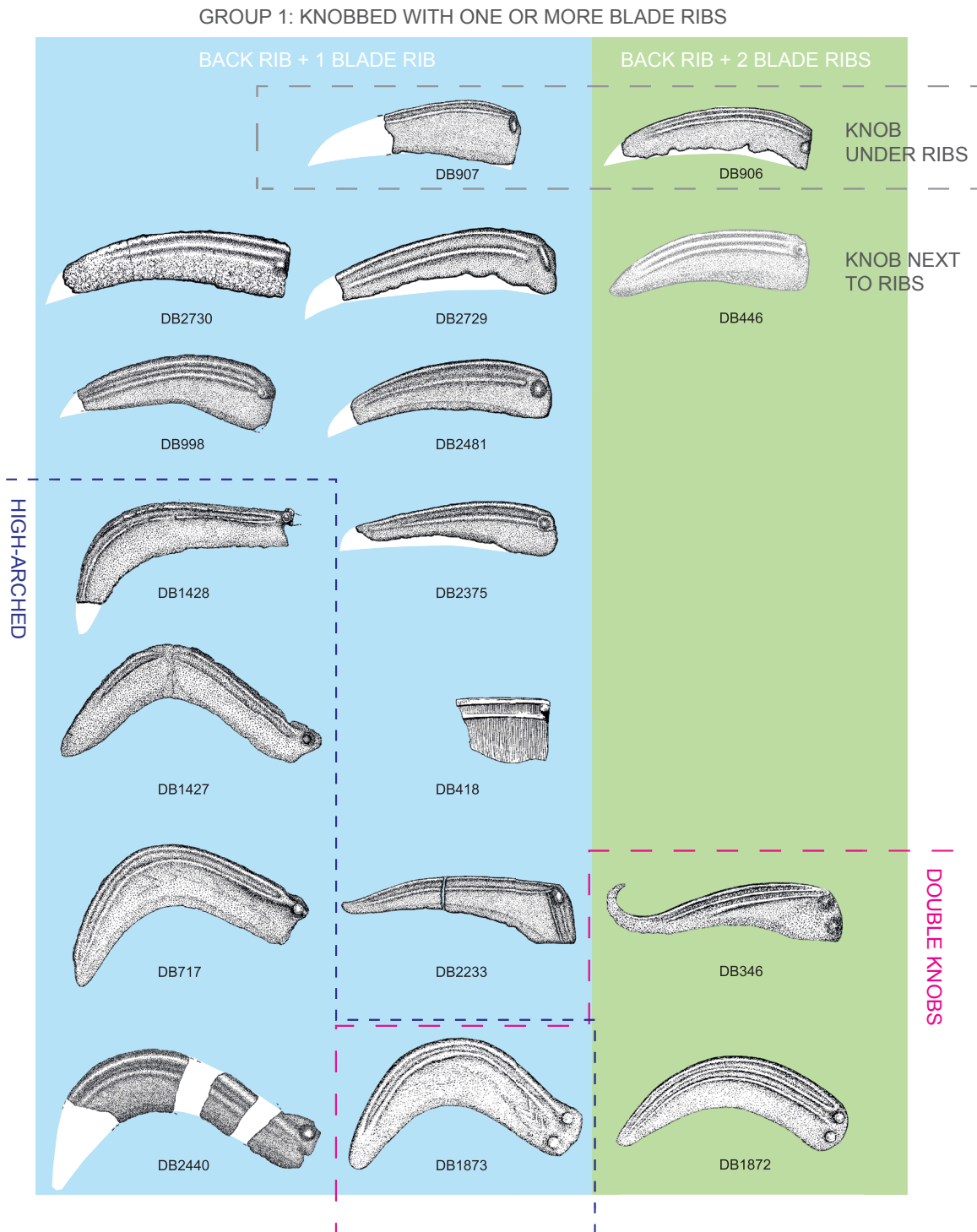


Fig. 11. Group 1 – Knobbed sickles with back rib and one or more blade ribs (no fixed scale, drawings Groningen Institute of Archaeology/H. Steegstra).

century BC onwards (see DB 2375). For the Moskes sickle, with its large knob placed at the beginning of the blade rib, Gedl provides some good parallels (Gedl 1995: *Taf.* 21 no. 378; *Taf.* 22 nos. 391; 402).

Dating: The Moskes sickle cannot be dated through contextual evidence. Parallels within the Low Countries suggest a Middle Bronze Age to Late Bronze Age date (c. 1400-900 cal. BC); dates for foreign parallels suggest that similarly shaped sickles were current between c. 1025-900 cal. BC (*supra*).

(DB 2375) EIGENBLOK WEST, *GEMEENTE* GELDERMALSEN, GELDERLAND. Site 5.

L. 10.4 cm; w. 2.4 cm; th. blade 0.2 cm; at middle (ribs) 0.5 and 0.4 cm; th. at knob 1.2 cm. Originally wide blade, and straight, slightly chamfered, base (B1). Back rib and one parallel blade rib from knob to halfway along the blade. Single conical knob where blade rib and back rib meet the blade base. Lightly curved back; very worn, concave cutting edge with honing facets on both sides, slightly battered. Excavated

(metal-detector find) 20 May 1998 by ROB at settlement site (ROB Inv. no. 2105; Jongste & Van Wijngaarden 2002), c. 1 m to the west of the side wall of House 5.1, and presumably belonging to it (Hielkema 2002: 328; 333), although not stratigraphically associated. Patina: brown, well preserved.

Map reference: c. 141/429.

References: Hielkema 2002: 327-333; 328 fig. 6.1 no. 2105; 333 fig. 6.3.

Parallels: DB 907, DB 998; DB 2481. For foreign parallels, see DB 2481.

Dating: The nearby house can be dated to 1495-1400 cal. BC (Arnoldussen 2008a, 90; Jongste 2002a, 35); the sickle was dated to between 1550 and 1200 BC (Hielkema 2002: 332).

(DB 998) WIJK BIJ DUURSTEDEN, *GEMEENTE* WIJK BIJ DUURSTEDEN, UTRECHT. De Geer.

L. +10.2 cm; w. 2.7 cm; th. at blade 0.25 cm; th. at middle (ribs) 0.5 and 0.4 cm; th. at knob 0.95 cm. Originally wide blade, and straight, slightly chamfered, base (B1). Back rib and one parallel blade rib from knob to tip of blade. Conical knob (h. 0.8 cm) placed at the transition of the blade's base and back, at the level of the blade rib. Fragments broken off in antiquity, as breaks are patinated. Found during ROB excavation (trench 796, level 3, find no. 18), close to two Middle Bronze Age-B house sites (Arnoldussen 2008b, 117-119; J. v. Doesburg, pers. comm. Febr. 2016). From the same site also a bronze pegged spearhead and a chisel are known (Drenth 1996: 33 nt. 3). Patina: partly dark green, partly dark brown.

Map reference: c. 151/443.

References: Drenth 1996: 33 nt. 3; Arnoldussen 2008b, 117-119.

Parallels: DB 907, DB 2375; DB 2481. For foreign parallels see DB 2481.

Dating: In general terms, given the original context and association (Arnoldussen 2008b, 117-119), a dating in the Middle Bronze Age-B (ca. 1500-1000) or beginning of the Late Bronze Age may be assumed (Van Es *et al.* 1992: 44; Drenth 1996: 33 nt. 3; Fontijn 2003: 334; 345).

(DB 418) VEENENBURG, *GEMEENTEN* HILLEGOM AND LISSE, ZUID-HOLLAND. From the hoard.

L. +4.9 cm; w. +3.5 cm; th. blade 0.2 cm; th. at middle (ribs) 0.5 and 0.45 cm; th. at knob 1.2 cm. Wide-bladed knobbed sickle with straight base (B1). Narrow back rib of distinctly rectangular cross-section, and similarly shaped, parallel blade rib 0.9 cm below it. Round (diam. 0.6 cm) and cylindrical (h. 0.7 cm) knob placed between the ribs at the base of the blade. Base fragment of probably large sickle blade. Found in a sand-extraction pit for the railway on the Veenenburg estate, together with other bronze items including a tanged chisel (*Ledermesser*), various (pen)annular rings, two pins with flattened biconical heads and another sickle (DB 416, *infra*), at Hillegom in 1897 (Butler 1990: 97-98). The assemblage was recovered ca. 40 cm deep from within a 1-1.5 m thick layer of peat, which hints at a votive character of this deposit (Butler 1990: 97-98).

Map reference: c. 99.2/476.7.

References: Butler 1990: 96-97; fig. 26 (and references therein).

Parallels: In view of the crisp definition of the ribs, its original size and the straightness (perpendicularity) of the blade's base, no Dutch sickle qualifies as an adequate parallel. The 'De Brienens' sickles (DB 906-907) have similarly sharply defined ribs, yet lack the width and angularity of DB 418's blade base.

Dating: Given the association with the pins with flattened biconical heads, the Veenenburg hoard is dated by Butler (1990: 98) to Br.D, or c.

1325-1200 cal. BC (Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 2730) CUIJK, *GEMEENTE* CUIJK, GELDERLAND. De Nielt.

L. 11.0 cm; w. +2.4 cm; th. 0.25 cm. Knobbed sickle with rounded back rib (h. 0.5 cm) and parallel, sub-rectangular to rounded blade rib (h. 0.4 cm). Blade presumably originally wider (cutting edge now worn and blistered) and with a straight base (B1), with a knob of trapezoidal shape placed at the transition between the blade's back and base. Tip possibly worn or broken off in antiquity; blade broken in antiquity into two fragments (now restored). Found together with a single-edged bronze knife and a possible second sickle (DB 2731; *infra*) at the Cuijk - De Nielt archaeological excavation (trench 37, level 53, square 14, V37.13517b) (Habermehl & Van Renswoude, in press). Although Bronze Age features were found nearby, no feature associated with the bronzes could be identified. The close proximity of two other sickles and a knife nevertheless suggests a depositional context.

Map reference: c. 187/417.

References: Habermehl & Van Renswoude, in press, 398-402; 399 *afb.* 10.2; 400 *afb.* 10.3

Parallels: DB 2841, DB 2375, DB 907

Dating: Dated by Habermehl and Van Renswoude (in press, 398) to c. 1500-1200 cal BC, on the basis of similarity to the Eigenblok (DB 2375) sickle.

(DB 2729) OOSTERHOUT, *GEMEENTE* NIJMEGEN, GELDERLAND. Park 15.

L. 8.7 cm; w. +1.4-2.3 cm; th. 0.5-0.3 cm. Knobbed sickle with high back rib of sub-rectangular cross-section, and a parallel blade rib of similar cross-section. Blade presumably wide originally (but heavily worn); a straight base (B1), with a knob of ovoid conical form placed at the transition between the blade's back and base. Tip broken off in antiquity (break patinated). Found with a metal detector in a vegetation horizon at an archaeological excavation, some metres from a Neolithic axe, and within 40 m of several Middle Bronze Age buildings (and an Early Iron Age structure) and a Middle Bronze Age well. Patina: black to greenish.

Map reference: c. 184/433.

References: -

Parallels: DB 907; DB 2375; DB 2481 and references there.

(DB 2233) MUNNIKEVELD, *GEMEENTE* WIJCHEN, GELDERLAND.

L. +12.1 cm. L. butt part: 7.1 cm; L. tip part: 5.2 cm; w. 2.15 cm; th. at middle (ribs) 0.45 and 0.4 cm, th. blade 0.3 cm; th. at knob 1.2 cm. Knobbed sickle with originally wide blade and straight (if slightly convex) blade base (B1). Well-defined narrow back rib and parallel, narrow blade rib, both of rounded cross-section. Ovoid, conical knob (0.5x0.9 cm, h. 0.9 cm) placed at the transition of blade back and base, below the back rib and next to the blade rib. Two base ribs (*Basisrippchen*) placed directly in front of the knob and running downwards from the knob, parallel to the blade's base. Base ribs have been variously interpreted as makers' marks, as aids to facilitate the casting into the mould, as numerical mould-identifiers or as a device to increase friction in the blade-haft connection (Petrescu-Dîmbovița 1978: 23-23; Sommerfeld 1994: 161). Found with a metal detector in two instances (base in April, tip in May

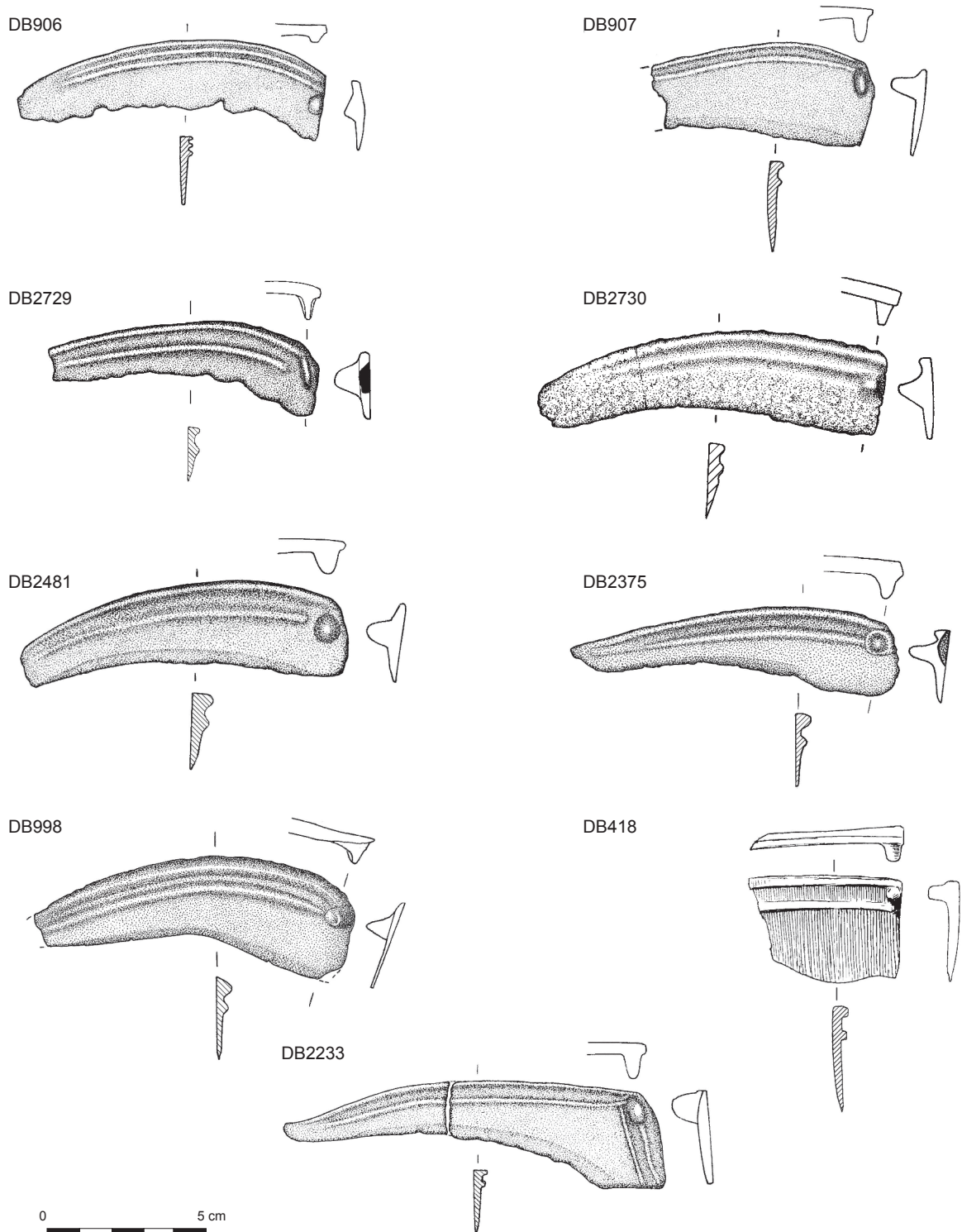


Fig. 12a. Knobbed sickles with back rib and one or two blade ribs (Group 1), all to same scale (drawings Groningen Institute of Archaeology/H. Steegstra).

of 2014). Patina: glossy mottled green, laboratory-treated. Collection: Museum Wijchen (Inv.no. MKW.V.84.1)

Map reference: c. 181/423.

References: -

Parallels: Gedl (1995: *Taf.* 22, nos. 387 and 389) notes two B1 knobbed sickles with two base ribs from Szczecin - Kłęskowo, yet with different junction of base and blade ribs. A third potential parallel (yet of

unknown origin and known through archival studies) of a B1 blade with two base ribs was published by Gedl (1995: *Taf.* 21 no. 373). A comparable junction of base and blade ribs is seen on the (high-arched) sickle from Gemer (Furmánek & Novotná 2006: *Taf.* 8 no. 133). Several examples of low-arched (D4) sickles with two base ribs in this position are known from the Weissig hoard (Kleemann 1942: 86 *Abb.* 21).

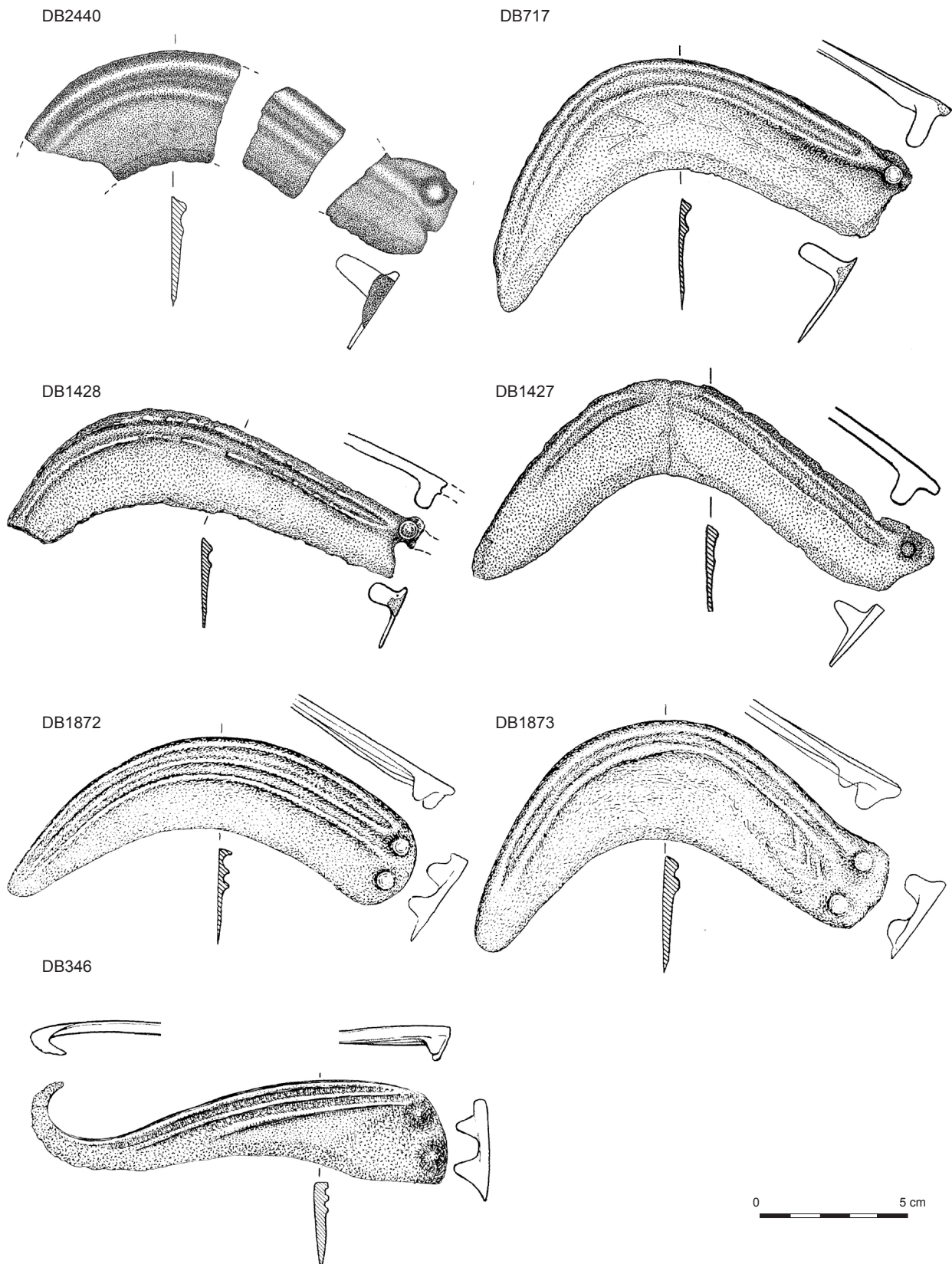


Fig. 12b. Knobbed sickles with back rib and one or two blade ribs (Group 1), all to same scale (drawings Groningen Institute of Archaeology/ H. Steegstra).

Dating: There is no contextual evidence to date the Munnikeveld sickle. The parallels from the Szczecin - Klęskowo hoard are dated by Gedl (1995: 67) to Polish Per. V, *i.e.* 900-700 cal. BC; Chwalba & Poleski

1999: 8). The high-arched (E3) sickle from Gemer referred to above is dated to Ha.B3 (Furmánek & Novotná 2006: 33), *i.e.* ca. 925-800 cal. BC (Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10

fig. 1.4). The Weissig hoard was probably buried in Mont. Per. IV (Kleemann 1942: 92), *i.e.* ca. 1125-925 cal. BC (Lanting & Van der Plicht 2001/2002: 134).

(DB 2440) POSTERHOLT, *GEMEENTE* AMBT MONTFORT, LIMBURG. Zwarte Berg.

Three fragments of a high-arched knobbed sickle with straight or extended base (D1/D3).

W. 3.3 cm; th. at knob 1.8 cm, middle (rib) 0.45 and 0.35 cm, th. of blade 0.25 cm. Rounded back; and wide, rounded, parallel blade rib with concave interspace. Edge sharpened from both sides. High (h. 1.7 cm) knob placed above the back rib on a small extrusion. Location of casting funnel indicated by break surface on the butt, adjacent to the knob. Patina: dark, glossy green, but mostly covered with sandy encrustation. Broken into several pieces. Found with metal detector in maize field, near the crossing of the Provinciale weg/Kalkenerweg and Holsterweg, between Posterholt and St. Odiliënberg.

Map reference: c. 199/349.

References: -

Parallels: High-arched sickles with rounded backs and wide, rounded, parallel blade ribs with concave interspace and their knobs placed high on protrusions are known from western Poland (*e.g.* Sommerfeld 1994: *Taf.* 55 nos. 2; 12) and southern Germany (*e.g.* Primas 1986: *Taf.* 10 no. 165).

Dating: The Posterholt example cannot be dated by contextual means. The cited parallels date to Br.D or c. 1325-1200 cal. BC (Primas 1986: 72; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4) or Polish Per. III, c. 1350-1100 cal. BC (Gedl 1995: 37; Chwalba & Poleski 1999: 8).

(DB 717) VILT, *GEMEENTE* BERG EN TERBLIJT, LIMBURG. From the hoard.

L. 12.6 cm; w. 3.3 cm; th. at knob 1.6 cm, middle (rib) 0.35 and 0.3 cm, th. of blade 0.2 cm. High-arched knobbed sickle with extended base (D3). Back rib and parallel blade rib (placed 0.8 cm lower), which converge near the knob into a single rib connecting with the knob. Unusually high, cylindrical knob (1.4 cm) placed in a protrusion at the blade's back and base intersection. Hammer marks on face of blade. Edge sharp (Museum Brussels, Inv.no. 2129). The Berg en Terblijt sickles are part of a large assemblage found partly through ploughing in the Vilt - Geulgracht area (Butler & Steegstra 1999/2000: 137 fig. 5a; 138 fig. 5b). The finds presumably represent a votive deposit placed in a periodically wet part of the landscape (possibly near a spring), from which items have been recovered over a period of no less than 13 years. Therefore assessing its full original content is difficult, yet the hoard minimally comprised two socketed axes, four winged axes, three knobbed sickles (DB 717, DB 1427, DB 1428; *infra*), two spearheads, two socketed chisels, one 'sword pommel' (identification uncertain), one twisted neck-ring fragment, one wire bracelet of D-shaped cross-section, one bracelet of wire of triangular cross-section, plus a series of spiral-wound wire ornaments (five spirals preserved, many more lost). The axes and other inventory have been summarily published previously (Butler & Steegstra 1999/2000: 136-138), yet still await integral publication. Patina: glossy, dark green, no sign of oxidation.

Map reference: c. 184/318.

References: Butler 1973: 338-339, Figs 14a-b; Butler & Steegstra 1999/2000: 136-139, Figs 5a-b (and references therein).

Parallels: DB 1427, DB 1428. High-arched knobbed sickles have also been found at Holset (DB 1872-1873) and Posterholt (DB 2240), yet these sickles are dissimilar in their placement of the knobs, lack of rib convergence and number of knobs. A sickle base with similar rib convergence (albeit of two blade ribs, instead of a blade and back rib) and continuation as a single rib is known from the Gärnersdorf - Penkhof hoard (Primas 1986: *Taf.* 14 no. 236), datable to Br.C/Br.D or c. 1470-1200 cal. BC (Gerloff 2007:145; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4). In the river Oder near Kamieniec, a knobbed sickle was found with converging blade and back ribs (Gedl 1995: *Taf.* 4 no. 53), yet these do not continue as a single rib towards the knob.

Dating: Kibbert (1984: 68) dates the Berg en Terblijt hoard to his *Stufe Oberbeck* (=Ha.B1), parallel to earlier Period V in the north European chronology. Warmenbol (1985: 230) allows for a somewhat earlier start, from the end of Ha.A2 or the beginning of Ha.B1 (*i.e.* ca. 1075-950 cal. BC; Lanting & Van der Plicht 2001/2002: 134).

(DB 1428) VILT, *GEMEENTE* BERG EN TERBLIJT (now *GEMEENTE* Valkenburg aan de Geul), LIMBURG. From the hoard.

L. +12.0 cm; w. 2.6 cm; th. at knob 1.1 cm, middle (ribs) 0.35 cm, blade 0.2 cm. High-arched knobbed sickle with extended base (D3). Back rib and parallel blade rib of rounded cross-section that converge near the knob. Conical knob (h. 0.8 cm) placed on a protrusion at the back to base transition. Tip broken off in antiquity. For find context, see DB 717. Patina: not so glossy, blackish (as also seen on a mid-winged axe from the same findspot; Butler & Steegstra 2001/2002: 138 Cat.no. 456), loamy encrustation. Museum Maastricht, Inv.no. 209, on loan to Museum Venlo, Inv.no. L29045.

Map reference: c. 184/318.

References: See DB 717.

Parallels: See DB 717. The relatively long straight part near the handle and sharp curvature towards the point is known from several 'Typ Penkhof II' sickles studied by Primas (*e.g.* Primas 1986: *Taf.* 8, no. 124; *Taf.* 10 no. 163; *Taf.* 14, no. 237). Converging back and blade ribs near the knob were also seen on the sickle from Rotselaar-Heikant (Van Impe & Creemers 1993: 46 fig. 5 no. 2).

Dating: See DB 717.

(DB 1427) VILT, *GEMEENTE* BERG EN TERBLIJT (now *GEMEENTE* Valkenburg aan de Geul), LIMBURG. From the hoard.

L. 13.6 cm; w. 2.8 cm; th. at knob 1.3 cm, th. at middle (ribs) 0.4 and 0.3 cm, th. blade 0.25 cm. High-arched knobbed sickle with oblique base (D5). Back rib and parallel blade rib both of rounded cross-section, which converge near the knob. Blade broken in antiquity (breaks patinated). For find context see DB 717. Patina: glossy dark green, with black patches. Museum Maastricht, Inv.no. 208.

Map reference: c. 184/318.

References: See DB 717.

Parallels: See DB 717. Note that this shape of the base rarely occurs in Gedl's (1995) or Primas' (1986) data sets.

Dating: See DB 717.

(DB 1872) HOLSET, *GEMEENTE* VAALS, LIMBURG. From tumulus.

L. 12 cm; w. 2.85 cm, th. at middle (ribs) 0.4 and 0.35 cm (2 x), th. blade 0.2 cm, th. at knobs 0.95 and 0.9 cm. High-arched double-knobbed sickle with rounded base (D2). Two blade ribs run parallel to the blade's

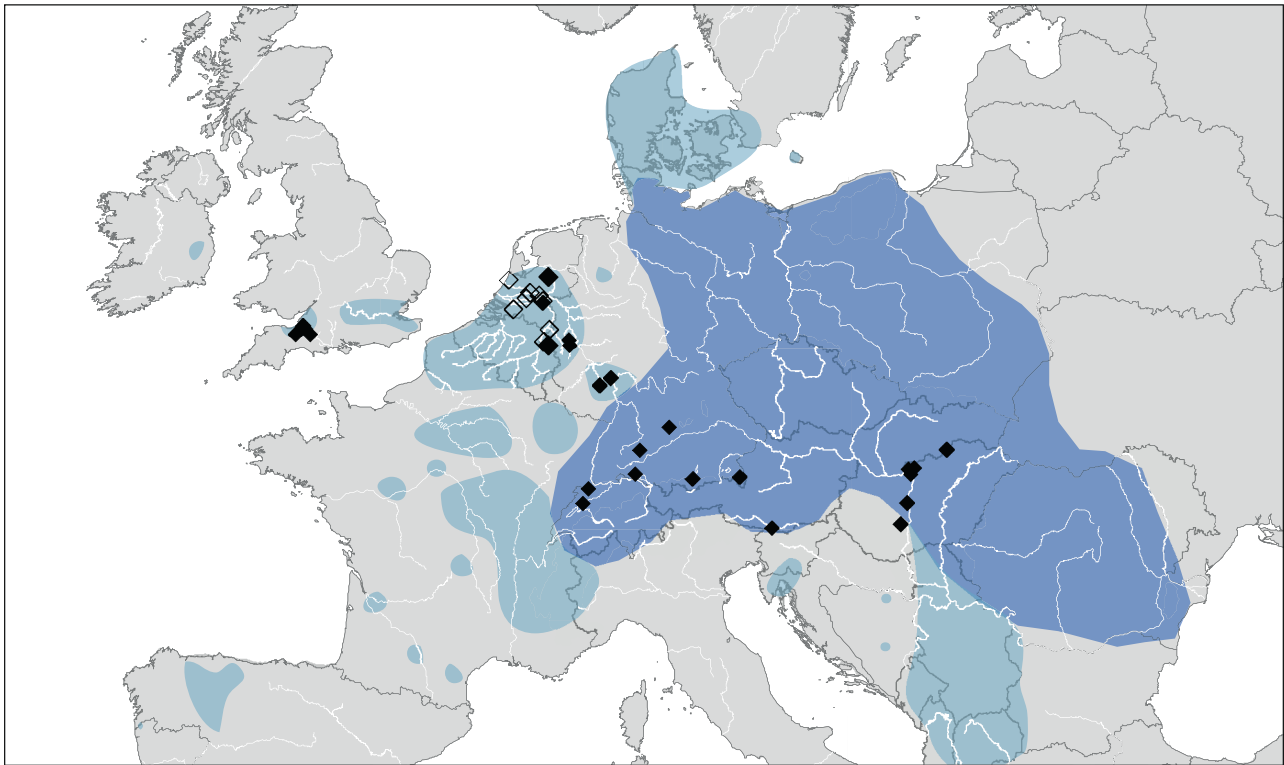


Fig. 13. Main distribution area of knobbed sickles (dark blue) and peripheries (light blue); outlined diamonds are the Dutch Group 1 knobbed sickles; solid black diamonds are double-knobbed sickles (after: Poste 1858; Smith 1958; 1959; Mozsolics 1967; O'Connor 1980; Primas 1986; Furmanek & Novotná 2006; Weber 2008). Drawing S. Arnoldussen, RUG/GIA.

back, with the upper blade rib converging with the blade's back near the upper knob (*cf.* DB 1428; DB 717). Found, probably between 1925 and 1928: during excavation of tumulus Malensbosch by J. Liese (originally in his collection, later in museum Aachen). This sickle was recovered – as was a pegged spearhead – from beneath drystone walling that presumably formed part of a funerary chamber later capped by a barrow (Butler 1990: 99 fig. 28, no. 2). Originals destroyed in WW II, only lead copies remain (Museum: Brussels, Inv.no. B005879).

Map reference: c. 196/308.

References: Hooijer 1961; Butler 1990: 98-100; fig. 28:2.

Parallels: DB 1873, DB 346. Just 55 km to the east, from Kerpen-Sindorf, another high-arched double-knobbed sickle with two blade ribs is known (Weber 2008: 43 *Abb.* 2 no. 1), yet this has a different base (oblique 1) and the upper blade rib and back rib do not converge. Circa 15 km south of Kerpen, at Vettweiß-Luxheim another double-knobbed sickle with a single blade rib was found (Weber 2008: 43 *Abb.* 2 no. 2).

Dating: Contextually, the pegged socketed spearhead can only provide a crude MBA-LBA date range (Fontijn 2003: 117 fig. 7.2), and no direct dates are available for this barrow (*cf.* Theunissen 1999: 61). Circumstantially, their presence in hoards such as those of Bühl (Br. A2/B, *i.e.* c. 1757-1475 cal. BC; O'Connor 1980: 62; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4) and Somersset (placed in the Taunton phase, *i.e.* c. 1400-1275 cal. BC (Butler 1990: 100; Fontijn 2003: 10 fig. 1.4) and hoards of Kosziderpadlás and Uzd (Primas 1986: 22; 59) suggest they may date from an early phase of our Middle Bronze Age-B.

(DB 1873) HOLSET, *GEMEENTE VAALS*, LIMBURG. From tumulus L. 12.3 cm; w. 3.4 cm; th. at middle (ribs) 0.45 and 0.5 cm; th. blade 0.35 cm; th. at knob 1.1 and 0.7 cm. High-arched double knobbed sickle with irregular to rounded base (D2?). Rounded back rib, and parallel, rounded blade rib, which converge near the tip. Marks: three caret-shaped ribs below blade rib, near the base. Found, probably between 1925 and 1928: in the excavation of tumulus Malensbosch by J. Liese (originally in his collection, later in museum Aachen). This sickle was recovered to the east of a drystone wall (under which DB 1872 was found) that presumably formed part of a funerary chamber later capped by a barrow (Butler 1990: 99 fig. 28, no. 2). It may have been part of a funerary assemblage or may have been placed in the mound. Originals destroyed in WW II, only lead copies remain (Museum: Brussels, Inv. no. B005880).

Map reference: c. 196/308.

References: See DB 1872.

Parallels: See DB 1872. Blade marks are rare on sickle blades from the Netherlands. For DB 530, with its embellished blade, we have already argued that it may originate from easternmost Niedersachsen (*supra*), an area where such blade marks would not be out of place (*cf.* Sommerfeld 1994: *Taf.* 26 no. 5; *Taf.* 27 nos. 2-3; *Taf.* 45, no. 3 for carets in combination with blade ribs as marks). A sickle with elongated knobs, back rib and two blade ribs from Včelince showed comparable caret decoration, albeit in this case pointing towards the tip (Furmanek & Novotna 2006: *Taf.* 1, no. 6, *cf.* Říhový 1989: *Taf.* 1 no. 3). Caret motifs may also occur on the tangs of tanged sickles (*e.g.* Primas 1986: *taf.* 62. no. 1082).

Dating: See DB 1872.

(DB 346) EPE, *GEMEENTE* EPE, GELDERLAND (from the hoard)
L. 12.2 cm, w. 2.5 cm, th. at middle (ribs) 0.45 cm, th. blade 0.35 cm, th. at knobs 1.0 and 1.1 cm. Double-knobbed sickle of sinuous blade shape with rounded base (G2). Back rib that extends towards the tip, with two parallel, yet progressively shorter, blade ribs beneath. The upper blade rib taps into the back rib near the blade's base to back transition, where the topmost of two conical knobs is also situated. The second knob is placed 1.2 cm down. Tip curved upwards, presumably owing to frequent resharpening by peening (Butler 1990: 92; *supra*). Cutting edge heavily worn/resharpened. Found in 1875 by workmen on the slope of 'a hill' (unknown whether this should be taken to mean 'barrow?') at 2 m depth under an iron pan (soil formation; Butler 1990: 91). Wrapped together in an organic substance, possibly a linen cloth, a double knobbed sickle (DB346), a stopridge axe and a palstave were recovered (*op.cit.*, 91-92). Patina: patchy bright green to almost black. Museum RMO: Inv. no. WE 7.

Map reference: c. 195/484.

References: Butler 1990: 91-92; fig. 23, no. 3 (and references therein); Butler 1995/1996: 233.

Parallels: DB 1873, DB 1872 and parallels discussed there. Note that none of the currently known double-knobbed sickles from outside the Low Countries display such a sinuous blade.

Dating: Given the association with an Oxford-type palstave (Schmidt & Burgess 1981: 132; Butler 1990: 91) and a local Vlagtwedde-type stopridge axe (Butler 1995/1996: 233) – both correlated with the Taunton period (Butler 1990: 91) – a date range of c. 1400-1200 cal. BC is plausible (Fontijn 2003: 10 fig. 1.4).

3.2.2 Distribution & supra-regional affinities

The sickles classified as our Group 1 sickles (*i.e.* with a back rib and one or more, frequently parallel, blade ribs) show considerable homogeneity. Typological outliers are the subset of high-arched sickles (found at Posterholt, Berg en Terblijt and Holset), the three sickles with double knobs (*Knopfenpaar*; Holset and Epe) and the blade with two base ribs from Wijchen - Munnikveld. The remaining sickles represent a quite homogenous group of short, broad-bladed knobbed sickles with a straight to chamfered base, and mostly two and sometimes three ribs. The well-dated find of Eigenblok shows that sickles of this form may date from the 15th century BC onwards. This is important, as the closest parallels to sickles of this type are Sommerfeld's (1994: 18-188) '*Knopfsicheln vom kleinen geraden Typus*' and Gedl's (1995: 65-72) '*Kurze Knopfsicheln vom Pommerschen Typ*' (Gedl 1995: 65-72; *Taf.* 21-23; 44), dated there to c. 900-700 cal. BC. Considering the large distance in time between the Dutch Group 1 sickles and the quoted foreign parallels, it is plausible that the observed homogeneity reflects a regional Low Countries tradition. Along similar lines, the fact that all high-arched sickles are from the extreme southernmost part of the Netherlands could suggest another regional tradition. The latter case is moreover strengthened by the observation that several sickles in adjacent Belgium (*e.g.* at Rotem and Namur; Van Impe & Creemers 1993: 39 fig. 2 no. 5; Warmenbol 1985: 220

fig. 3) are also high-arched. For the small set of double-knobbed sickles, we suspect a central-European origin (*contra* O'Connor (1980: 329) in Butler (1990: 91)). Several sickles with double knobs are known from both the upper (and middle) Danube and Rhine areas (fig. 13). Their wider distribution into northwestern Europe suggests that the rivers Daube and Rhine acted as the main arteries for their dispersal, with concentrations around Mainz and the Erft-Rur area. Their very limited distribution in the United Kingdom to our minds reflects maritime cross-Channel interaction, through which sickles of continental types ended up in Somerset depositions (Smith 1958; 1959: *cf.* fig. 8, B; D).

3.3 Group 2 – Knobbed sickles with grooves

In addition to a group of seventeen knobbed sickles with blade ribs (Group 1; *supra*), seven Bronze Age knobbed sickles are characterised by their blades being embellished with narrow grooves (Group 2; fig. 14). Superficially, particularly those sickle blades with two parallel grooves have strong visual affinity with the Group-1 sickles, yet the distinction is important. Whereas the ribs of Group-1 sickles could have actually helped to counter blade deformation resulting from peening (*cf.* Gedl 1995: 3; Sommerfeld 1994: 170), the grooves have no such reinforcing effect. The double grooves merely suggest the presence of a rib which is not there, whilst single grooves only help to visually define the blade's back, neither actually contributing to the sickle's functional strength. Morphological diversity *within* Group-2 sickles is mainly based on the number (one or two) and placement of the knobs (in line with the grooves, or below the groove(s)). Whereas in the Netherlands narrow grooves of sub-rectangular cross-section dominate, sickle blades with grooves of narrow semi-circular cross-section (*i.e.* *cannelures* or flutes) and wide semi-circular cross-section (*i.e.* wide grooves) are known across Europe (fig. 15)

3.3.1 Descriptions

(DB 2472) KESSEL, *GEMEENTE* LITH, NOORD-BRABANT.

L. 11.3 cm; w. 2.5 cm; th. 0.4 cm; th. at knob: 1.3 cm. Knobbed sickle with a wide blade and straight base (B1); oval knob, h. 0.8 cm. Parallel to the blade's back, two grooves run from the oval knob at the base-to-back transition and three quarters along the blade towards the tip. Found during dredging in the floodplain of the river Maas. Patina: river patina. *Map reference:* c. 155/423.

References: Verwers & Ypey 1975; Verwers 1983: 21 *afb.* 12.

Parallels: DB 416, DB 2728, DB 2277, Warmenbol 1985: 226 fig. 8 no. 5. Outside the Low Countries, narrow grooves similarly appear to act as substitutes for ribs on sickles of variable blade morphology (*e.g.* Primas 1986: *Taf.* 20 nos. 321; 347; Gedl 1995: *Taf.* 15 no. 248; *Taf.* 13 no. 209; *Taf.* 14 nos. 214-215; *Taf.* 19 no. 332; *Taf.* 22, no. 394), which suggests that – rather than 'sickles with grooves' as a distinct type – there too, the phenomenon reflects iconographic linkage or skeuomorphism to sickle ribs. Put more simply, in some cases the technological

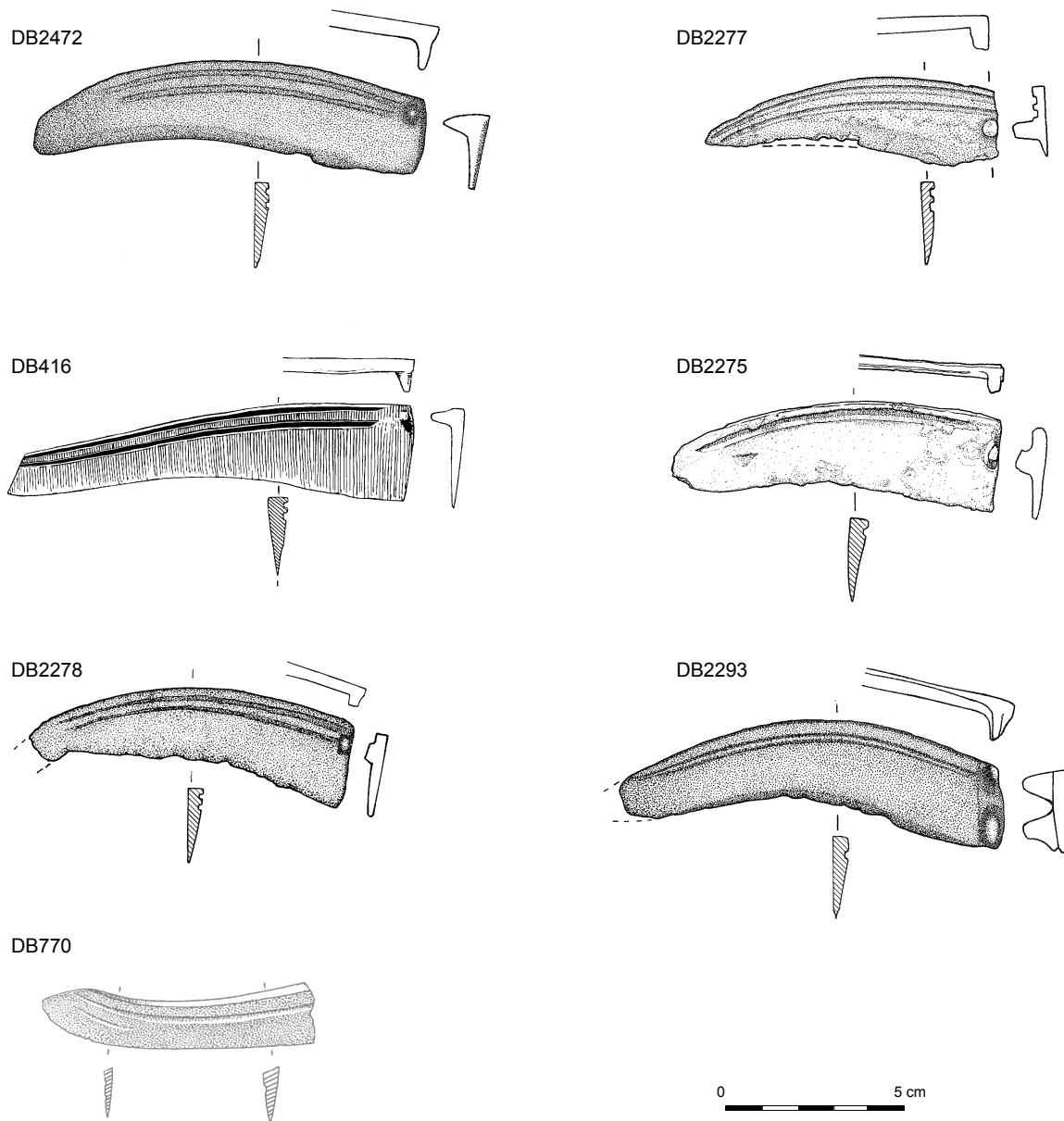


Fig. 14. Knobbed sickles with one or two blade grooves, all to same scale (drawings Groningen Institute of Archaeology/H. Steegstra).

choice was made to apply narrow grooves to parts of sickles that normally exhibited ribs. Two southern German examples known from a barrow at Harthausen auf der Scher (Primas 1986: *Taf.* 20 nos. 321) and Gärmersdorf - Penkhof (Primas 1986: *Taf.* 21 nos. 372-373) also have double grooves, albeit that these are wider and more semicircular in cross-section. A sickle tip from Kličevac II has two narrow (semicircular) grooves, yet like those of Harthausen and Gärmersdorf they are distributed longitudinally across the blade's width, almost segmenting it into thirds (*cf.* Gedl 1995: *Taf.* 14 no. 216). Therefore, despite being double narrow grooves, these do not provide the visual suggestion of a rib in the way the Dutch examples do. An exception may be the knobbed sickle of Kamieniec (Gedl 1995: *Taf.* 23, no. 438), which displays two narrow grooves in a position similar to those on the Dutch specimens.

Dating: As this sickle was found during dredging, it is devoid of contextual information that could help date it. As the sickles from Dodewaard

(DB 2275) and Venray (DB 2277) were both recovered during systematic excavation of settlement sites datable to the Middle Bronze Age-B (*infra*); a similar age is likely for the Kessel example. The sickle with double narrow grooves from the Gärmersdorf - Penkhof hoard (Primas 1986: *Taf.* 372-373) may date to c. 1470-1200 cal. BC (*supra*; Gerloff 2007:145). The cited examples from the Harthausen auf der Scher barrow can be dated through a presumably associated dagger to Ha.D, *i.e.* c. 625-480 cal. BC (Sievers 1982: 134; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4). The Kamieniec knobbed sickle with two high-placed, narrow grooves, in a position similar to those seen in the Netherlands, is placed by Gedl (1995: 71) in his group of 'Kurze Knopfsicheln vom Pommerischen Typ', dated to Polish. Per. V and continuing into the Early Iron Age (Ha.C/D), *i.e.* 900-480 cal. BC (Gedl 1995: 72; Chwalba & Poleski 1999: 8; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4).

(DB 416) VEENENBURG, *GEMEENTEN HILLEGOM AND LISSE, ZUID-HOLLAND*. From the hoard.

L. 11.7 cm; w. 2.3 cm; th. 0.55 cm; th. at knob 1.0 cm. Knobbed sickle with originally wide blade and straight (to slightly concave) base (B1). Parallel to the back, two narrow grooves run from 0.4 cm (upper groove) to 0.8 cm (lower groove) from the cylindrical round knob (h. 0.6 cm) towards the (missing) tip. The blade's tip is broken off, and the break subsequently (in antiquity) was ground smooth. Both faces of the sharp cutting edge are hollowed-out due to whetting and/or peening. From the Veenenburg multiple-object hoard described under DB 418 (*supra*) a tanged chisel (*Ledermesser*), various (pen)annular rings, two pins with flattened biconical heads and a knobbed sickle with blade ribs (DB 418) were also recovered. Patina: well-preserved surface, of bronze colour, with remains of original black patina, with a few spots of green. Museum: RMO Inv.no. h.1930/7.35. Present location unknown.

Map reference: c. 99/476.

Reference: See DB 418.

Parallels: DB 2472, DB 2728, DB 2277, Warmenbol 1985: 226 fig. 8 no. 5. See DB 2472 for parallels outside the Low Countries.

Dating: See DB 418 for the dating of the Veenenburg hoard and DB 2472 for sickles with double grooves outside the Netherlands.

(DB 2728) GROESBEEK, *GEMEENTE NIJMEGEN, GELDERLAND, KLEIN AMERIKA*.

L. + 9.2 cm; w. 2.1 cm; th. 0.45 cm; th. at knob 0.55 cm. Knobbed sickle with wide blade and straight base (B1). Parallel to the back, two narrow grooves are found, of which the upper one starts from the blade's base and the lower one starts from the rectangular knob (h. 0.55 cm). Both grooves run towards, but do not reach, the blade's tip. Metal-detector find. Patina: pale, powdery green with blue patches. Private collection.

Map reference: c. 192/418.

Reference: Den Hartog 2012: 11-12; 11 *afb.* 1.

Parallels: DB 2472, DB 416, DB 2277. See DB 2472 for sickles with double grooves outside the Netherlands.

Dating: Being a metal-detector find, contextual evidence regarding its possible age is absent. For a general overview, see DB 2472.

(DB 2277) HOOGRIBROEK, *GEMEENTE VENRAY, LIMBURG*.

L. 8.3 cm; w. 2.4 cm; th. 0.45 cm; th. at knob 1.0 cm. Knobbed sickle with originally wide blade and (very) straight base (B1). Parallel to and close to the blade's back, two narrow grooves are placed, starting from the base and running towards the tip. A single, cylindrical knob (h. 0.7 cm) is placed below the lower groove and at the blade's base. Found during archaeological excavations at Hoogriebroek-Noordoost, in advance of Motorway A73 construction, in woodland on the east side of the Venray-Venlo road, north of the Hoogriebroekse Weg (Stoepker *et al.* 2000). The sickle was found with cordoned pottery (resembling Middle Bronze Age *Drakenstein* ware) in the fill of a pit, which itself was cut by a post of an aisled Bronze Age house (house A; Krist 2000: 21). Museum: Venlo, Inv.no. L11816 (loan from PDB Maastricht (3746)). Patina mostly black, with dark green in corroded patches (laboratory-treated at the then ROB, Amersfoort).

Map reference: c. 198/390.

References: Krist 1997: 19-20; Krist 2000: 19-24

Parallels: DB 2472, DB 416, DB 2778. See DB 2472 for sickles with double grooves outside the Netherlands.

Dating: Dutch cordon-decorated Middle Bronze Age pottery can be dated between 1890/1750 to 1390/1120 cal. BC (Arnoldussen 2008a, 178 *tab.* 5.1).

(DB 2275) DODEWAARD, *GEMEENTE DODEWAARD, GELDERLAND*.

L. 9.2 cm; w. 2.5 cm; th. at back 0.5 cm; th. at knob 1.0 cm. Knobbed sickle with wide blade and (very) straight base. Parallel to the blade's back, a narrow groove runs from 0.6 cm from the base almost to the tip of the blade. Beneath this groove, a slightly ovoid knob (h. 0.5 cm) is placed centrally on the blade at the base. Found in 1997 during archaeological excavation by the ROB (Amersfoort) in anticipation of the construction of the Betuweroute freight railway (Site 38; Bulten *et al.* 1998). From the cultural layer from which the sickle originated, ample Middle Bronze Age ceramics were recovered (Bulten 1998: 18-20; 22-29; 31), as well as a broken bronze rivet and two perforated stone pendants (Arnoldussen 2008b, 161). Formerly in collection ROB, Amersfoort: Inv.no. 715.2.34. Present location unknown. Patina: mostly grey-green; partly pale, powdery green.

Map reference: c. 172/437.

References: Bulten *et al.* 1998: 26; fig. 24-25.

Parallels: DB 2472, DB 2728, DB 2277, DB 416 (albeit with single grooves). Several foreign sickles in the areas studied by Gedl and Sommerfeld also show a groove that appears to accentuate the blade's back (suggesting a rib?) in the way that the Dodewaard example does (fig. 15). Particularly the sickles from Egelu (Sommerfeld 1994: *Taf.* 53 no. 10), Thaden (*op.cit.*, *Taf.* 13 no. 5), Kraków-Pleżsów (Gedl 1995: *Taf.* 13 no. 209), Wilenko (*op.cit.*, *Taf.* 14 nos. 214-215) and Kłęskowo, Szczecin (*op.cit.*, *Taf.* 22, no. 394) spring to mind.

Dating: Given the palaeogeographical setting of the site (Arnoldussen 2008b, 154-165) and the ceramics recovered, a dating in the Middle Bronze Age-B (c. 1500-1000 cal. BC) is assumed (Arnoldussen 2008b, 161).

(DB 2293) GASSEL, *GEMEENTE BEERS, NOORD-BRABANT*.

L. 9.9 cm; w. 2.5 cm; th. 0.6 cm. Double-knobbed sickle, with a low-arched wide blade with straight to slightly convex base (B1/C1). Two prominent knobs, oval in shape (h. 0.8 cm): one placed in the upper corner, of the base, at the back, and the other in the lower corner, of the base, at the cutting edge. Found in 1991 with a metal detector in dredged sediments at a sand-extraction site (Verwers 1992b, 149). Private collection. Patina: very dark green, almost black, rough surface. Cutting edge sharpened but battered. Point battered; c. 1 cm of tip missing.

Map reference: c. 182/417.

Reference: Verwers 1992b, 149 fig. 15.

Parallels: DB 2275 (for the single narrow groove) and DB 1872, DB 1873 and DB 346 for their double knobs. Notably, no form of groove (narrow or wide) is known from any of the blades within the wider group of double-knobbed sickles (*cf.* fig. 13) (see Primas 1986: *Taf.* 1 no. 19 for faint delineation of the back of a double-knobbed sickle).

Dating: Owing to the find circumstances, no contextual information is available that could aid in dating the Gassel sickle. See DB 1872, DB 1873 and DB 346 for the arguments for dating the Dutch double-knobbed sickles to c. 1400-1200 cal. BC (*supra*).

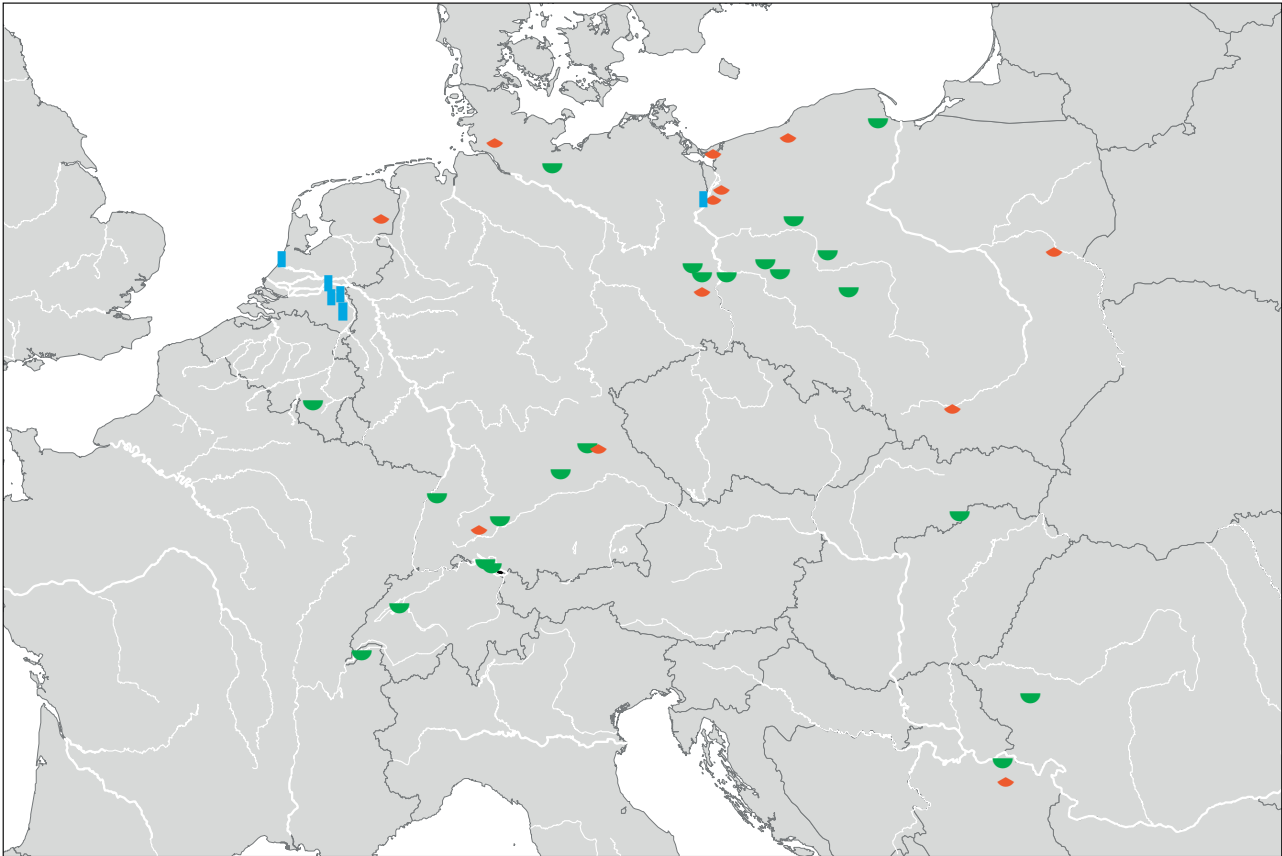


Fig. 15. Distribution pattern of sickle blades with narrow, sub-rectangular grooves (blue rectangles), narrow to medium-wide semicircular grooves (cannelures/flutes; red circle segments) and sickles with broad, shallow semicircular grooves (green semicircles). Drawing S. Arnoldussen, RUG/GIA.

3.3.2 Distribution & supra-regional affinities

The custom of placing grooves rather than ribs on the blades of Bronze Age sickles is widely distributed (fig. 15), yet concentrations in southern Germany and the *palafitte* area, the Low Countries and along the Oder are suggested. It is important to stress that in these areas, similarly shaped sickles with ribs predominate – perhaps indicating that this is a rarer variety (skeuomorph?) of the ribbed sickles of these particular areas rather than a distinct, regionally specific type of sickle. Consequently, the Dutch sickles with grooved blades (Group 2) show strong similarities in blade shape, as well as form and positioning of the knobs, to their ribbed (Group-1) counterparts. The sole Dutch example of a sickle with narrow to medium-wide semicircular grooves (cannelures/flutes) is a fragment from the Drouwenerveld hoard (fig. 14 (*supra*); DB 770 (*infra*)), of which it is clear that most of the objects have a southern Scandinavian to Lower/Middle Elbe origin (Arnoldussen 2015: 20; Butler 1986: 138-140; 146). In this light, the higher density of sickle blades with cannelures/flutes around the Oder estuary corroborates the non-local origin of the Drouwenerveld hoard (Arnoldussen 2015: 19-22).

3.4 Group 3 – Knobbed sickles with elongated knobs

Within the corpus of Dutch Bronze Age sickle blades, creating a rigid fixation between sickle blade and organic haft was mostly achieved by using round to ovoid knobs that presumably slotted into the haft (fig. 4, C). Yet for a few sickles – those with elongated knobs – hafting may (but need not) have been different. In those case where knobs extend across more than one third of the blade width, these are labelled ‘elongated knobs’ (Group 3; fig. 16). On some sickles, such an elongated knob merges into the blade’s base, creating the appearance of a ‘heightened’ (e.g. DB 2029) or ‘lipped’ base (*Endwulst*; e.g. DB 477; DB 1883, DB 2731 and DB 2508).

3.4.1 Descriptions

(DB 2670) LINNE, *GEMEENTE ROERMOND*, LIMBURG.

L. 9.9 cm; w. 2.2 cm; th. at middle (ribs) 0.4 cm, th. blade 0.3 cm, th. at knob 0.65 cm Sickle with a wide blade and rounded base (B2). At 0.4 cm from the base, near the transition between the blade’s back and base, an ovoid to teardrop-shaped elongated knob is placed (h. 0.4 cm). The blade has a pronounced rounded back rib that merges into the elongated knob. A horizontal blade rib runs along the sickle’s longitudinal axis from halfway along the elongated knob to where it links up with the back rib. Found with a metal detector in a field northeast of Linne, east

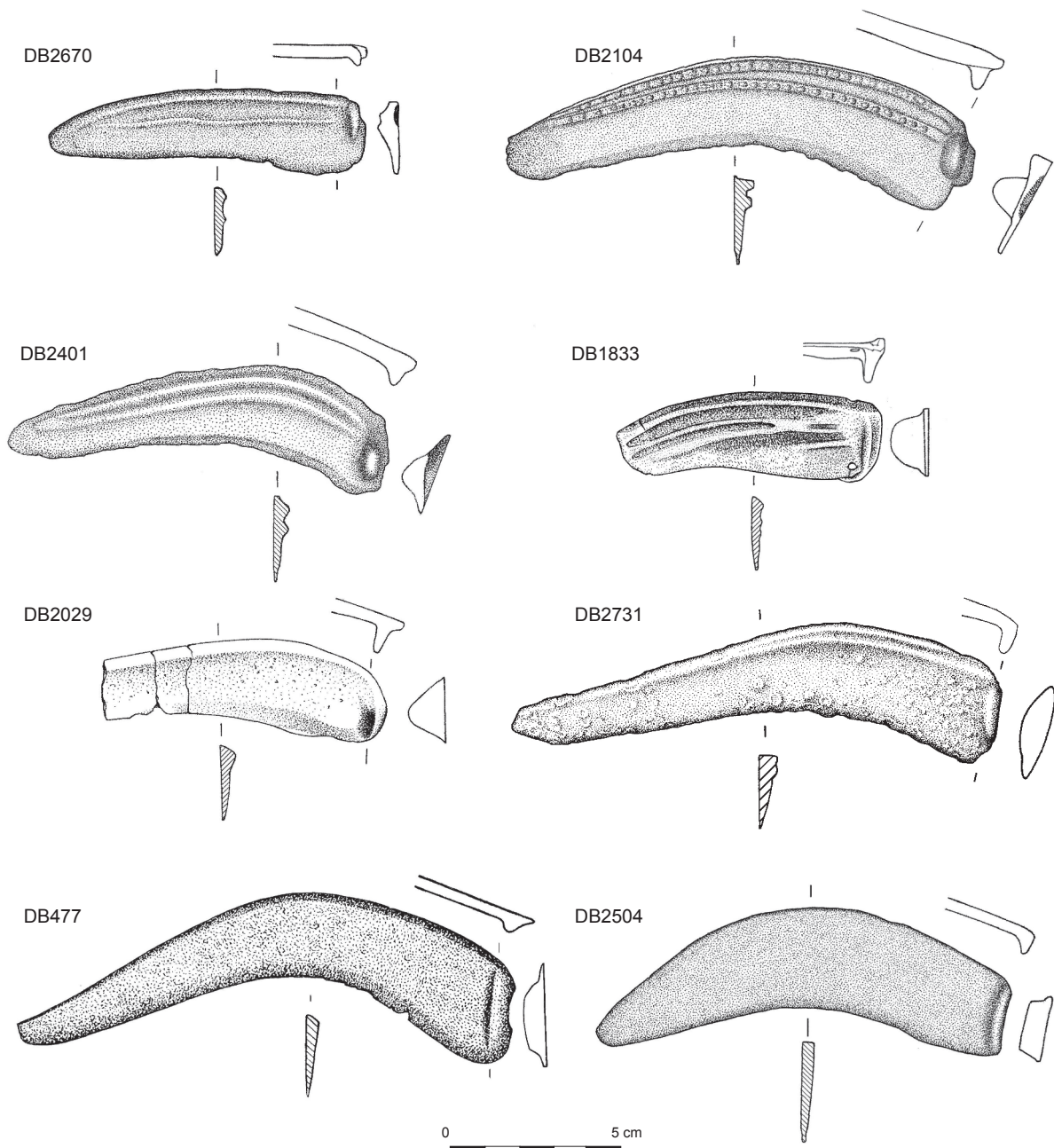


Fig. 16. Dutch Bronze Age sickle blades with elongated knobs, all to the same scale (drawings: Groningen Institute of Archaeology/H. Steegstra).

of the railway. Patina: mostly black; greenish bronze colour along the edges. Private collection, sold on-line, location unknown.

Map reference: c. 194/352.

References: -

Parallels: DB 907? One could legitimately argue that the difference in dimensions of the knob on the De Brienen sickle versus that of Linne is a gradual rather than a categorical one, yet the blade's back of DB 907 – unlike that of DB2670 – does not merge with the knob. From Będargowo a sickle is known that shares this combination of horizontal blade rib and back rib that extends towards the base (yet this is a *rib*, not an elongated knob; Gedl

1995: *Taf.* 21 no. 371).

Dating: Owing to the find circumstances, no contextual evidence that might help date this sickle is available.

(DB 2401) BEEGDEN, *GEMEENTE BEEGDEN*, LIMBURG.

L. 11.9 cm; w. 2.7 cm; th. at middle (rib) 0.55 cm; th. blade 0.35 cm, th. at knob 1.0 cm. Moderately arched sickle with ovoid, elongated knob (h. 0.6 cm) placed 0.3 cm from the base in the middle third of the blade's width. At 0.5 cm from the elongated knob, a back rib starts that continues towards the tip. Below and parallel to the back rib, a blade rib is situated that converges with the back rib near the tip. The blade's edge was sharpened from both sides. Found in 1991 with a metal detector. Museum: Venlo, Inv.no. L08451. Patina: glossy dark green; profiled side severely pitted; reverse less so.

Map reference: c. 191/355.

References: -

Parallels: DB 2104 (for its elongated knob and blade shape), DB 2375 (for its blade shape and convergent blade and back ribs).

Dating: Owing to the find circumstances, no contextual evidence that might help date this sickle is available.

(DB 2104) MAANEN, *GEMEENTE* EDE, GELDERLAND. Mandebuurt.

L. 14.5 cm; w. 3.1 cm; th. at middle (rib) 0.65 cm; th. blade 0.4 cm; th. at knob 1.2 cm. Sickle with moderately-arched blade and (apparently intended-to-be) straight, albeit chamfered) base (C1). On the upper half of the base, at the intended base's edge, a prominent, oval, elongated knob (h. 0.9 cm) is placed. Along the back runs a rib of subrectangular cross-section, which tapers out near the tip. At 0.4 cm below this rib, a similarly shaped rib is placed which tapers out slightly further towards the tip. Both ribs are decorated with circular to oval (punched-in or cast) indentations. At the base of this sickle, a stump of the pouring gate has not been removed. Cutting edge concave, with sharpening facets on both faces. Found in 1971 in a spoil dump (at a sand extraction site; Hulst 1971: 77), that also contained settlement debris, a barbed-and-tanged flint arrowhead, a flint arrowhead with concave base and sherds of Hilversum-type pottery, including cord-ornamented sherds. An excavation of an adjacent site was undertaken by the ROB in 1971 (see for an overview of the Ede - Maanen data: Taayke *et al.* 2012: 27; 21-286). Museum: RMO Leiden, Inv.no. e 2010/2.QHG 3. Patina mostly black, with malachite-green mottling. Very well preserved, but the cutting edge is slightly battered.

Map reference: c. 172/448.

References: Hulst 1971: 77; Modderman & Montforts 1991: 149; 154 *afb.* 6, no. 4; Taayke *et al.* 2012: 258-259; 258 fig. 11.1.

Parallels: DB 2401 (for its blade shape and 'blade rib to back rib' convergence). In the Gärnersdorf - Penkhof hoard, several blade fragments show decoration of the back rib with elongated notches, nicks or punch marks (Primas, 1986: *Taf.* 22 nos. 389; 399-400; 408, *cf.* Aner & Kersten 1976: *Taf.* 36 no. 825; Blanchet 1984: 251 no. 6; Řihovský 1989: *Taf.* 8 nos. 108-110), but are more oval and less round than the Ede depressions, and occur on blade ribs rather than on back ribs. Three fragments from Asperg, Drassburg and Ehingen-Badfeld show such decorations on both back and blade ribs (Primas 1986: *Taf.* 114 nos. 1888-1889; 1891: *cf.* Schauer 1971: *Taf.* 147 no. 7; *Taf.* 148 no. 12; Vasić 1994: *Taf.* 30 no. 529).

Dating: Given the find circumstances, the relevance of the associated finds for dating the sickle is limited. As various of the items described date to either the Early Bronze Age (arrowheads) or Middle Bronze Age-A (the cord-decorated Hilversum sherds; Arnoldussen 2014: 22), they would – if originally associated – predate the oldest reliably dated knobbed sickle in the Netherlands by several centuries. The Gärnersdorf - Penkhof hoard (Primas 1986: *Taf.* 372-373) referred to above, however, dates to c. 1470-1200 cal. BC (DB 717; *supra*). Moreover, the similarly decorated blade ribs on the Ehingen-Badfeld fragment are dated by Primas (1986: 141) to the 'zweite Phase der Jungbronzezeit', or Br.D, albeit that she notes that this decorative (*Alveolen*) tradition runs into the 'beginnende Spätbronzezeit', which suggests a date range of c. 1325 to 1000 cal. BC. We therefore tentatively assign a Middle Bronze Age-B age to the Ede - Maanen sickle.

(DB 1833) MONTFORT, *GEMEENTE* MONTFORT, LIMBURG

L. +7.7 cm; w. 2.4 cm; th. at middle (ribs) 0.4, 0.35 and 0.3 cm; th. blade 0.3 cm, th. at knob 1.3 cm. Sickle blade fragment with wide blade and straight, but chamfered, base (B1). Protruding from the base is an

elongated knob (*Endwulst*; h. 0.65 cm), that extends from the back rib to the blade's cutting edge. Below this knob, a small ridge at the blade's base continues as an extrusion that curves (was hammered?) inward, encloses a rivet hole and rejoins the cutting edge. Both on the front of the blade and the back this extrusion covers (encloses) the blade near the cutting edge. It is unclear whether this was part of the intended hafting design or an *ad hoc* solution of a blacksmith later on in the blade's use life. Opposite this enclosed rivet hole, at the blade's back, the remainder of a second rivet hole is visible. Possibly this one too was once enclosed by a – now broken-off – protrusion extending from the blade's base. On the blade, two faint blade ribs parallel to the back are visible, as is a faint fragment of a third blade rib positioned closer to the base. Tip broken off in antiquity, break ground smooth (patinated). Found during the planting of pines in 1903, on 'the elevations west of the village' at a hand's depth. Museum Venlo, Inv.no. L03975 (on loan from RMO Leiden, Inv. no. 1.1976/11.406., ex coll. Van Zijll de Jong/Van der Noordaa 222). Patina: glossy dark green, with paler green patches where slightly eroded. In cavities, humic dark sand has been preserved.

Map reference: c. 192/348.

References: -

Parallels: Without parallels in the Low Countries.

Dating: As a stray find from the early 20th century, contextual evidence to facilitate dating is lacking.

(DB 2029) BERGHEM, *GEMEENTE* BERGHEM, NOORD-BRABANT. De Waatselaar.

L. +8.9 cm; w. 2.8 cm; th. at middle (rib) 0.5 cm; th. blade 0.3 cm; th. at knob 1.2 cm. Narrow sickle blade with rounded base (A2). The back is raised and in a flowing line merges into the elongated knob (h. 0.95 cm) near the base. Resharpener facets on either side of concave cutting edge. Blade tip broken off and missing. Found in a sand and gravel extraction site, together with remains ranging from the Neolithic to the Roman Period (Jansen *et al.* 2014: 137). Patina: pale, glossy green (laboratory-treated?). Museum: 's-Hertogenbosch, Inv. no. 11030.

Map reference: c. 169/421.

References: Verwers & Beex 1978: 7 *afb.* 7; Jansen *et al.* 2014: 145 fig. 10.

Parallels: No parallel known within the Low Countries. From Morens and Villars-le-Comte in the *palafitte* area, sickles with a similar cross-section and smooth back-knob transition are known (Primas 1986: *Taf.* 3 nos. 57-58), which she groups with her '*Kleine Knopfsicheln mit unregelmäßiger Krümmung, Variante B, mit blattständigem oder endständigem Wulst*' (*Typ Friedberg, op.cit.*, 52-53).

Dating: Owing to the find circumstances, no contextual evidence to facilitate dating is available. The presence of a loop fragment from a socketed axe (Jansen *et al.* 2014: 144) in any case suggests that the site was (also) used during the Late Bronze Age. Primas' *Typ Friedberg* is datable roughly from central-European MDI (Br.A2) to *Stufe 2 Mittlere Bronzezeit*, or c. 1775-1400 cal. BC (Primas 1986: 59-60; Harding 2000: 13 fig. 1.3; Lanting & Van der Plicht 2001/2002: 134). If the same date range should apply to the Berghem sickle, it would represent the oldest known specimen.

(DB 2731) CUIJK, *GEMEENTE* CUIJK, GELDERLAND. De Nielt.

L. 14.5 cm; w. +2.4 cm; th. 0.4 cm. Moderately-arched blade with originally straight base, decentral apex and straight tip (H1). A rib with a rounded cross-section runs parallel to the blade's back. The elongated

knob measures 2.25 cm in length (w. 0.7 cm) and is 0.9 cm high. The blade corrosion is similar to that of DB 2730 (*supra*). Found within 2 m of sickle DB 2730 and single-edged bronze knife at the Cuijk - De Nielt (Habermehl & Van Renswoude *in press*) archaeological excavation (trench 37, level 52, square 14, V37.13516). Possibly all three bronze items were originally part of the same votive deposit (Habermehl & Van Renswoude *in press*, 402).

Map reference: c. 187/417.

References: Habermehl & Van Renswoude *in press*, 398-402; 399 *afb.* 10.2; 400 *afb.* 10.3

Parallels: No close parallels (DB 477 for blade shape, DB 1833 also similar, yet this sickle has two blade ribs).

Dating: Dated by Habermehl and Van Renswoude (*in press*, 399) to the Middle Bronze Age on the basis of similarity to Primas' (1986: 52-60) *Typ Friedberg* - B/C (*cf.* DB 2029).

(DB 477) BEEK EN DONK, *GEMEENTE* BEEK EN DONK, NOORD-BRABANT.

L. 15.4 cm, w. 2.6 cm; th. at knob 0.65 cm, at middle 0.45 cm. High-arched (tip almost sinuous) sickle, with a single elongated knob (*Endwulst*) near the straight base. Blade (D1/F1) of triangular cross-section (thickness of back 0.45 cm), tapering towards the cutting edge. Concave central part of base, probably due to removal of the stump of the pouring gate. Find circumstances unknown. Possibly from a stream valley near 'De Kampe' (Arts & Van de Wijdeven 2011: 44 no. 100). RMO Leiden, Inv.no. k 1938/7.5. Patina: brown, with reddish patches.

Map reference: c. 171/394.

References: Felix 1945, no. 23; Huybers 1998; Arts & Van de Wijdeven 2011: 44 no. 100; Fontijn 2003: 333.

Parallels: DB 2504. Primas lists two comparable examples (albeit with a higher *Wulst*) from Port (Kt. Bern; Primas 1986: *Taf.* 3 no. 51) and Villars-le-Comte (*op.cit.*, *Taf.* 5 no. 58) which she groups with her '*Kleine Knopsicheln mit unregelmäßiger Krümmung, Variante B, mit blattständigem oder endständigem Wulst*' (*Typ Friedberg*; *op.cit.*, 52-53). Similarly shaped blades with elongated knobs yet with more pronounced back ribs are more widely known (e.g. Jockenhövel 1975: *Abb.* 6C, no. 4-6; *Abb.* 8B, no. 14; *Abb.* 11, no. 16; Primas 1986: *Taf.* 2-4; Sommerfeld 1994: *Taf.* 3 no. 7; *Fig.* 17)

Dating: Find circumstances unknown, hence no contextual dating is possible. Primas' *Typ Friedberg* can be dated to c. 1775-1400 cal. BC (*supra*; Primas 1986: 58-60; Harding 2000: 13 fig. 1.3; Lanting & Van der Plicht 2001/2002: 134). This, however, conflicts with a plausible Ha.C date (*i.e.* 800-600 cal. BC; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4) for the similarly shaped iron sickle from Huissen (DB 2504). We attribute more value to the latter analogy and therefore advocate a dating in Ha.C to Ha.D (*cf.* Gedl 1995: *Taf.* 78).

(DB 2504) HUISSEN, *GEMEENTE* BEMMEL, GELDERLAND. Kamervoort.

L. 12.3 cm; w. 3.0 cm; th. at middle 0.4 cm., th. at butt 0.75 cm. High-arched iron(!) sickle (D1), with a single, elongated knob (*Endwulst*; h. 0.45 cm) near the straight base. Blade of triangular cross-section

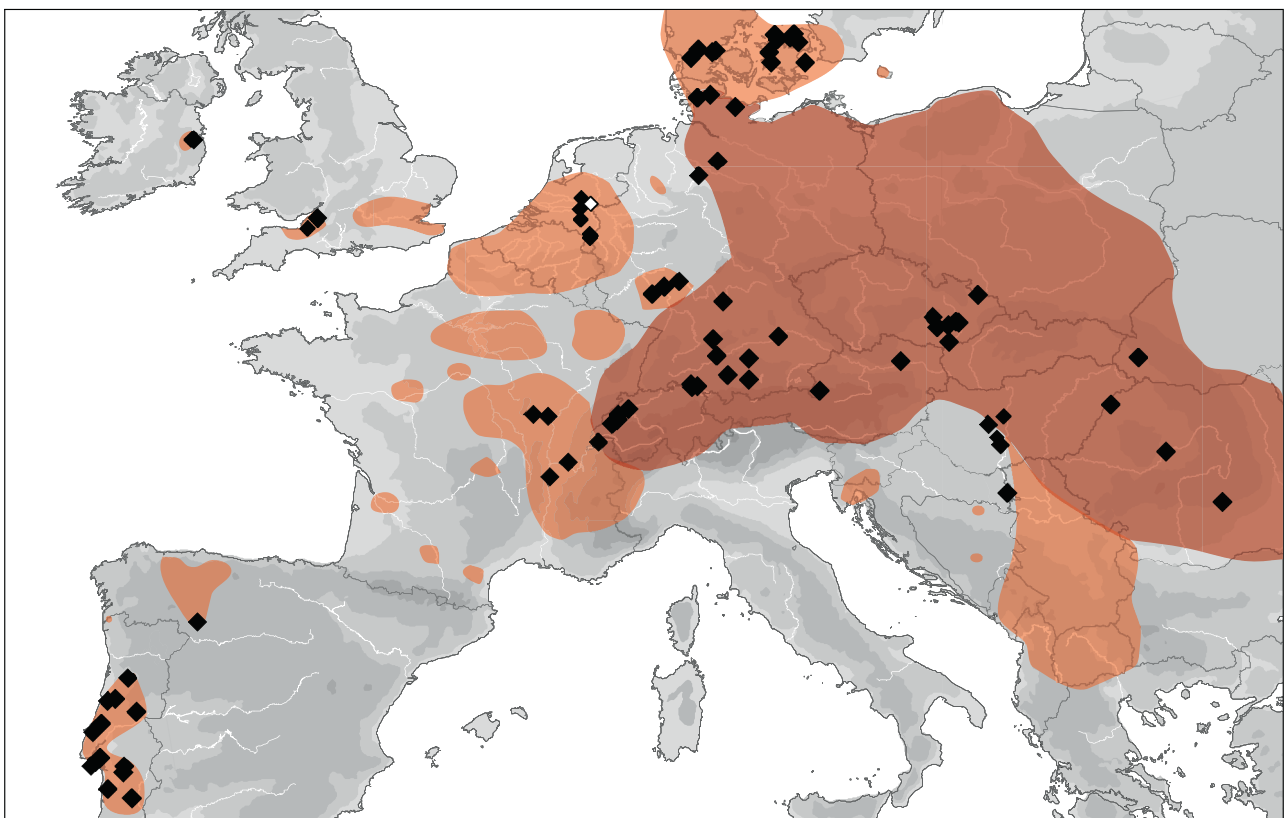


Fig. 17. Distribution of sickles with elongated knobs (black diamonds; the single white diamond is the iron sickle from Huissen) in relation to the main distribution area of knobbed sickles (dark red area) and peripheral zones of knobbed sickles (light red areas). After: De Mortillet 1881; Aner & Kersten 1973; 1976; 1978; 1981; 1990; 2001; Jacob-Friesen 1967; Mozsolics 1967; Hänsel 1968; Audouze & Courtois 1970; Jockenhövel 1975; Wegner 1976; Petrescu-Dîmbovița 1978; Kibbert 1984; Primas 1986; Sommerfeld 1994; Vasić 1994; Gedl 1995. Drawing S. Arnoldussen, RUG/GIA.

(thickness at back 0.4 cm) gradually tapering towards the cutting edge. No back rib. Patina: now black. Has been treated by R. Meijers of the ROB. Light weight. Collection: Historische Kring Huissen, no number. This sickle was found between the factory site and the town of Huissen, during extensive ground works (amongst others garden renovation) in 1982. The sickle was found in a plot where the ploughsoil had been stripped (possibly amidst settlement debris from an Early Iron Age house-site; Fontijn 2003: 219). A watching brief undertaken by amateur archaeologists of the AWN Nijmegen documented various features and finds dating from the Iron Age to the Roman Period (Neijenhuis 1983: 25-26).

Map reference: c. 192/436.

References: Fontijn 2003: 219.

Parallels: DB 477 and references there. Gedl (1995: *Taf.* 33; *Taf.* 36 no. 711) lists several examples of iron sickles with comparable blade shapes and elongated terminal knobs.

Dating: Gedl (1995: 98-99) convincingly argues for a dating to Ha.C and Ha.D (i.e. 800-480 cal. BC; Lanting & Van der Plicht 2001/2002: 134; Fontijn 2003: 10 fig. 1.4) for the similarly shaped iron sickle blades from Poland.

3.4.2 Distribution & supra-regional affinities

The technological alternative of using an elongated knob or *Wulst* instead of a cylindrical or conical knob in hafting the sickle blade, was practised in various parts of Europe (fig. 17). Essentially, the distribution of sickles with elongated knobs appears to centre on the Danube and its tributaries. Remarkably, their distribution appears to be more restricted than that of knobbed sickles in general: the Lausitz area in particular is relatively empty (cf. fig. 15). Also, a cluster in Denmark is shown (fig. 17), hinting at regional popularity of sickles of this type. The Iberian sickles (Coffyn 1983) are mapped as well, but they represent an altogether unrelated tradition. For the remainder, the overlapping main distribution areas of knobbed sickles and of the sickles with elongated knobs *within* it suggest that sickles with elongated knobs are not an unrelated tradition but simply a technological variant. Moreover, one should keep in mind that a large time-span may be represented by the small Dutch group of sickles with elongated knobs. The Berghem sickle could be one of the oldest examples; the Linne, Beegden and Maanen sickles most likely date to the Middle Bronze Age-B. The Beek en Donk and Huissen sickles span into the Early

Iron Age. This broad chronological distribution again warns against assigning too much typo(chrono)logical significance to mere technological variations in hafting technology.

3.5 Group 4 – Sickles without knobs

A ‘group’ is an obvious misnomer for a single sickle blade, but the absence of knobs or elevated ridges (*Wulste*) on the Heiloo sickle justifies its classification as a separate class. While a group defined by the *absence* of easily noticeable features is likely to harbour specimens of widely varying age, the as yet sole example listed may be dated to the Bronze Age - Iron Age transition.

3.5.1 Description

(DB 508) HEILOO - BOLLENDORP, *GEMEENTE* HEILOO, NOORD-HOLLAND (from a hoard with four flint sickles).

L. 16.3 cm; butt 2.5 cm; maximum thickness 0.4 cm; perforation diameter 0.6 cm. Moderately-arched sickle blade with straight (chamfered) base (C1), triangular cross-section, and rivet hole near the base. Cutting edge concave, with a sharpening facet along c. three-quarters of its length. Found around 1932 in a dune landscape at 3.5 m depth during levelling works, together with four flint sickles (Butler 1990: 92, see Van Gijn (1988: 215; 1999: 256) for their use as sod-cutting knives rather than harvesting implements). The placement of the items (in a row, points facing upwards with the bronze sickle in the middle; Butler 1990: 92) suggests a deliberate depositional act. Museum RMO, Inv. no. g1947/12.14. For more information, parallels and dating, see Butler (1990: 92-94; 23 fig. 24). Patina: brown with some green patches.

Map reference: c. 108/511.

References: Brunsting 1962; Butler 1990: 92-94, 23 fig. 24, no. 1; Van Gijn 2010a, 193; Van Gijn 2010b, 55.

Parallels: No parallels in the Low Countries. A blade with a (secondary?) peg hole is known from Winklsass, Germany (Primas 1986: *Taf.* 55 no. 970). Votive deposits comprising sickles of bronze as well as flint are rare, yet Butler (1990: 94) could cite the hoard of Renz, Kr. Rügen, consisting of one bronze knobbed sickle and three flint sickles (Keiling 1989: pl. 34). Deposits comprising several flint sickles in the Netherlands are known from Bourtange, Rolde/Nijland, Onstwedde (Schinning 2012: 10 and references there) and Bolsward (Boeles 1951: 84; pl. 10; Halbertsma 1963: pl. 1). At Norddorf (Germany), the grave in a barrow contained a ‘skull-sized’ stone beneath which three flint sickles had been placed (Aner & Kersten 1979: *Taf.* 18 no. 2621A).

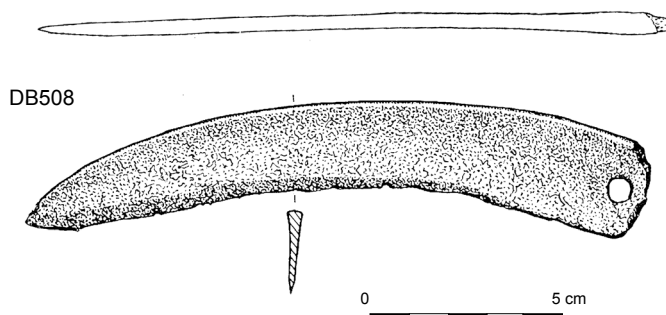


Fig. 18. Group 4: The Heiloo-Bollendorp sickle (drawing Groningen Institute of Archaeology).

Dating: The 13th-century BC dating advocated by Butler in 1990 is ultimately derived on too superficial and too distant (Mycenean!) parallels. In the northern Netherlands, flint sickles like those found at Heiloo are generally dated to c. 600-400 cal. BC (Waterbolk & Boersma 1976; Boersma 1988: 31), but since most are stray finds (Schinning 2012), proper dating remains speculative. In 2015: a hoard was found at the Westfrisiaweg site that comprises a flint sickle and bronze items (rings, omega bracelets, two (belt?)spacer plates, a pin and three spectacle brooches of the Oerel type (Fontijn & Knippenberg 2015: cf. Butler & Steegstra 2007/2008: 338; Laux 1973: 48-50) which is firmly datable to the 9th century BC (Fontijn & Knippenberg 2015: 7). The latter find uniquely proves that flint sickles may date even from the Late Bronze Age to Iron Age transition (Ha.B2/3-Ha.C or Gündlingen phase; Fontijn 2003: 171).

3.6 Group 5 – Others

Like with group 4 (*supra*), the size of group 5 is limited. Like Group 4 (*supra*), Group 5 is limited in size, but in this case it entails a mixed bag of sickles or sickle fragments that either display (rare) characteristics distinctly unlike those of groups 1-4 (DB 771), or have come down to us too fragmentary to allow detailed classification (DB 770-773; DB 2291; DB 2328).

3.6.1 Descriptions

((DB 2291) TETERINGEN, *GEMEENTE* TETERINGEN, NOORD-BRABANT

Fragment (tip and part of base missing) of a narrow bronze sickle blade. Well-developed back rib that runs towards the base. At least four base ribs (*Basisrippchen*), which are markedly lower than the back rib descend – near-vertically – from the back rib near the base. Thick blade that tapers towards the cutting edge from c. 0.8-0.6 cm from the cutting edge. Presumably a knobbed sickle (knob and base missing). Found with a metal detector in topsoil in an arable field that also yielded part of a bronze spearhead (DB 2292).

Map reference: c. 115/403.

References: Verwers 1992a, 202; Verwers 1992b, 149, fig. 14:1.

Parallels: The Frankleben I (Kr. Merseburg) hoard contains many examples of sickles with four or more vertical base ribs (*e.g.* Sommerfeld 1994: *Taf.* 2 no. 1), yet these are high-arched blades frequently also sporting blade ribs (*e.g. op.cit.*, *Taf.* 11 nos. 1; 14; 16; *Taf.* 13 no. 18, *cf.* Müller-Karpe 1959: *Taf.* 161 nos. 11-12; Kubach 1984: *Taf.* 31 nos. 13-14; Primas 1986: *Taf.* 16 nos. 255-257; Gedl 1995: *Taf.* 22 nos. 386; 397). Two (high-arched) blades from Brauns-Bedra (Germany) lack blade ribs, yet do show vertical base ribs (Sommerfeld 1994: *Taf.* 14 no. 6; *Taf.* 16 no. 11, *cf.* Gedl 1995: *Taf.* 11 no. 176), albeit that these do not drop from the back rib like those on the Teteringen blade.

Dating: The Frankleben I hoard is dated to c. 1200 cal. BC (Von Brunn 1958: 57-58; Sommerfeld 1994: 180-181) or somewhat earlier

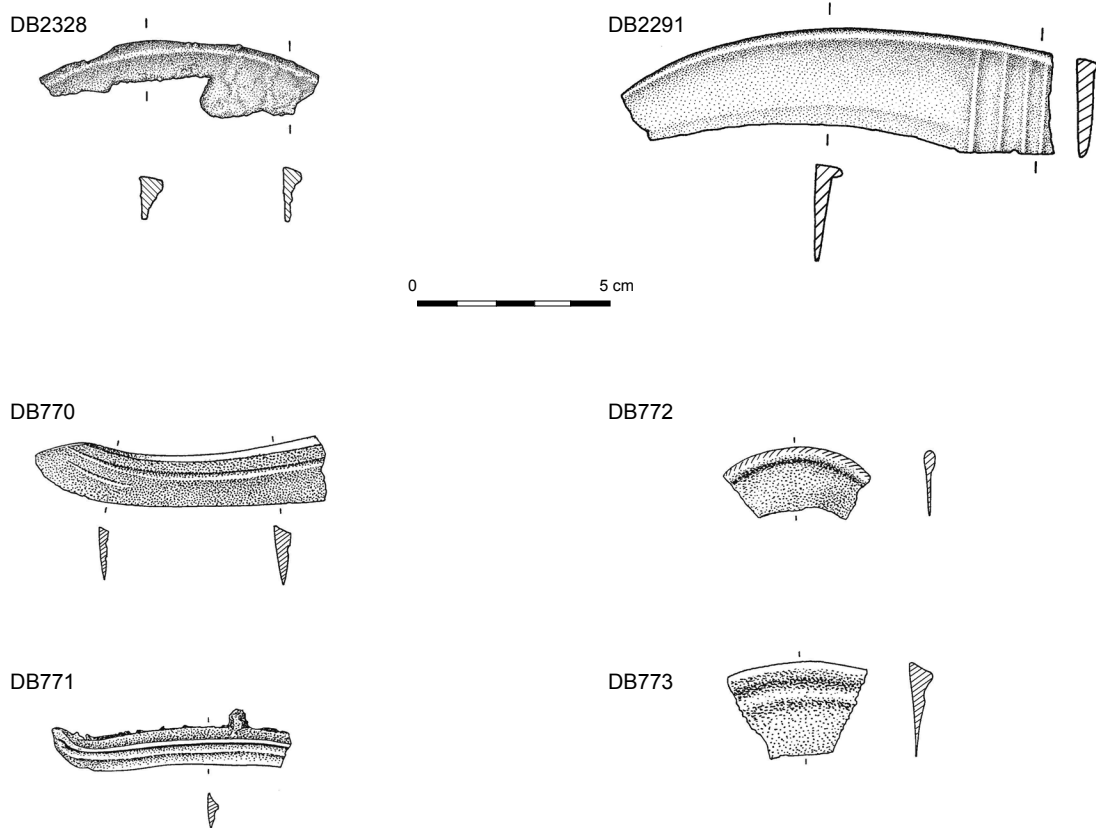


Fig. 19. Group 5: Non-local (DB 770, DB 771, DB 772 and DB 773) and fragmentarily preserved sickle blades (all to same scale, drawings: Groningen Institute of Archaeology).

(1500-1250 cal. BC; Stoll-Tucker 2001: 178), but contained no close parallel for the Teteringen sickle fragment.

(DB 2328) BEESEL, *GEMEENTE* REUVER, LIMBURG. Het Haselt. L. +7.4 cm, w. +1.9 cm, th. 0.6 cm. Fragment of a bronze sickle with a back rib. Found in 1997 with a metal detector. Private collection. Patina mottled green, severely corroded.

Map reference: c. 201/363.

References: -

Parallels: -

Dating: Unknown, MBA or LBA.

Sickle fragments DB 770-773 all were part of the Drouwenerveld multiple-object hoard (1.1 kg of bronze) recovered from a pot in 1984 (Butler 1986; Butler & Steegstra 2005: 269, fig. 91a; Arnoldussen 2015: 19-22). This hoard comprised scrap metal, primarily of Lower and/or Middle Elbe origin (Butler 1986: 133), but presumably also intentionally (*cf.* Arnoldussen 2015: 19-22) incorporated local items and items from the *palafitte* region and southern Scandinavia. Amongst the 70 – mostly broken – bronze items, four sickle fragments were identified (DB 770, DB 771, DB 772 and DB 773). Because these fragments are part of one hoard assemblage, and because of their small size (limiting the possibility of finding parallels), they are discussed below as a group.

(DB 770-773) DROUWENERVELD, *GEMEENTE* BORGER, DRENTH

Sickle fragments from the Drouwenerveld pot hoard 1984 (see References). Museum Assen, Inv.nos. resp. 1984/XII.9, 1984.XII.66; 1984/XII.21; 1984/XII.27.

(DB 770) Blade fragment of sinuous shape (G) with acute triangular cross-section. Length of fragment 7.6 cm; width 1.7 cm; thickness 0.5 cm. Parallel to the blade's back a medium-wide hemi-circular groove (cannelure) is found (*cf.* fig. 15) with near the tip a second groove. For a discussion of sickles with grooved blades, see §3.2 (*supra*). Whereas in some case the sinuous shapes of blades may result from hammering, Řihovský (1989, 26-26; Taf. 5 no. 61-68; Taf. 50; no. 117) argues that some types were already cast like this. The fact that several of the Brauns-Bedra sickles show sinuous outlines without traces of hammering (Sommerfeld 1994, 170) lends support to this. Sickle blades with medium-wide hemi-circular grooves appear non-local to the Low Countries, yet are found in some numbers in both *palafitte* and Lausitzer area (fig. 15). A similar fragment is present in the hoard from Bäk, Kr. Lauenburg (Hundt 1951, Taf. 5, no. 12).

(DB 771) Blade fragment with recurved tip (shape G) and possible groove on the blade face. Distinct lug on the blade's back. L. +6.3 cm; w. 1.0 to 1.5 cm; th. 0.2 cm. Broken in antiquity (breaks patinated). Due to the remarkable lug, the blade fragment is identifiable as a Southern Scandinavian *Rückenzapfensichel* (Butler 1986, 145; Baudou 1960, 47; Karte 27). These sickles are native to Denmark, Scania and occasionally venture into Schleswig-Holstein and Norway (fig. 8, C: Baudou 1960, 46; Karte 27; Taf. 8; Taf. 24, A2; Butler 1986; Sommerfeld 1994, 199; 201 Karte 2).

(DB 772) Fragment from middle of high-arched blade with rounded back rib. L. +3.85 cm; w. +1.6 cm; th. 0.3 cm. Broken in antiquity (breaks patinated). Pattern of diagonal nicks or notches on the back. Parallels for this type of decoration on knobbed sickles are rare. Gedl (1995, Taf. 30 no. 600) lists one example from Ryńsk, and Furmánek and Novotná (2006, Taf. 33 no. 520 - findspot unknown) list another, but in both cases the nicking is more on the frontal face of the back rib than on its top like with the Drouwenerveld fragment. This nicking motif is also known from tanged sickles (*e.g.* Gedl 1995, Taf. 25 no. 504).

(DB 773) Fragment of moderate to high-arched blade. Pronounced back rib of triangular cross-section and one parallel faint blade rib. L. +3.65 cm; w. 2.4 cm; th. 0.6 cm. Broken in antiquity (breaks patinated). Morphology too generic to merit parallels.

Map reference: c. 248/552.

References: Butler 1986, 133-168; fig. 7 nos. 9; 21; 27; 66; Butler & Steegstra 2005, 269; fig. 91a; Arnoldussen 2015, 19-22.

Dating: Various of the items in the Drouwenerveld hoard, such as the tutuli buttons, ribbed collar, Bunsöh knife, socketed knife and axe types occur in hoards of late Mont. per IV and Mont. Per.V (Butler 1986, 135; 138), or Ha.B1 to Ha.B2/3 transition (*i.e.* c. 925-850 cal. BC).

4. COMPOSITION OF DUTCH BRONZE AGE SICKLES

In order to investigate the composition of the Dutch Bronze Age sickles, pXRF analysis was undertaken of 11 Dutch sickle blades kept in the National Museum of Antiquities (RMO). For one sickle (DB 717; Berg en Terblijt) an early-20th-century chemical analysis was available (Jacobsen 1904, 24). For the Dodewaard sickle (DB 2275), an ICP-AES analysis was already available (Drenth & Joosten 2004). The pXRF analyses were undertaken with a Thermo Scientific Niton XL3t hand-held XRF, capable of simultaneously detecting 25 elements in the analytical range between sulphur and uranium, as well as light elements (Mg, Al, Si, P, S and Cl). Readings were taken in mining mode and electronic mode during 35 seconds (table 1).

4.1 Sickles with provenances assigned by antiques dealers

The composition of tanged sickle DB 522, with its high values for lead (Pb 3-4%) and tin (Sn 9-10%) has good parallels in the tanged sickles from Auvernier, Switzerland (table 1; Rychner 1981: 111; Rychner & Stos-Gale 1998: 172). The values for antimony, arsenic, zinc and nickel are similar enough to suggest the *palafitte* area as a possible area of origin for DB 522. For knobbed sickle DB 530, we have argued that it may very well have originated from the Bösel hoard in Niedersachsen (fig. 9). Its composition suggests a low-impurity type or bronze, with tin as the main admixture (table 1; Sn 11.2%). This is similar to that of the Veenenburg fragment (DB 418), yet in the latter blade arsenic is notably higher (As 3.51% (DB 418)

Table 1. Alloy composition for bronze sickle blades. Sickles described in the present data-set are printed in black; possible comparanda are added underneath in grey.

Object	Date	Place	Area	Context	Sample	Technique	Value	Item	Cu	Sn	Pb	Zn	As	Ag	Sb	Ni	Fe	Bi	Mn	References	Remarks
sickle, tanged, spurr	LBA	?Katwijk a/d Maas?	SE/C Europe?	antiq. dealer	DB522	pXRF	%wt	1	81.574	9.976	3.722	0.099	0.227	0.066	0.652	0.104	2.983	<0.000	0.830	measurement 15-10-15 RMO	
sickle, tanged	LBA	Auvernier-Nord	Switzerland	palafitte	8	spec-trom.	%wt	27	86.549	8.440	3.125	0.004	0.321	0.145	0.788	0.225	0.207	0.052	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvernier-Nord	Switzerland	palafitte	12	spectro-gr.	%wt	31	85.467	10.140	3.210	0.007	0.304	0.101	0.536	0.141	0.000	0.005	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvernier-Nord	Switzerland	palafitte	12	spectro-gr.	%wt	32	86.304	9.470	3.050	0.008	0.299	0.086	0.549	0.142	0.000	0.003	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvernier-Nord	Switzerland	palafitte	12	spectro-gr.	%wt	33	86.460	9.600	2.910	0.030	0.280	0.010	0.510	0.130	0.000	0.010	-	Rychner 1981, 111	Copper calculated value
sickle, tanged, fragment	MBA, HaB2	Auvernier	Switzerland	palafitte	1	spectro-gr.	%wt	69	85.206	10.600	2.940	0.020	0.280	0.290	0.510	0.107	0.046	0.001	-	Rychner & Stos-Gale 1998, 172	Copper calculated value
sickle, knob	LBA	?Drenthe?	N-Germany?	antiq. dealer	DB530	pXRF	%wt	3	88.554	11.217	<0.0255	<0.0543	0.049	<0.0342	<0.0149	0.121	0.076	<0.0000	<0.0270	measurement 15-10-15 RMO	
sickle, unknown type	MBA	Roesen, Kr. Jerichow II	Germany	unknown	Ber II	spec-trom.	%wt	66	93.630	5.920	0.100	tr	0.100	-	0.060	0.190	tr.	-	-	Northover 1982, 81	Copper calculated value
sickle, knob	MBA	Neuchatel	Switzerland	palafitte	16	spec-trom.	%wt	67	91.513	7.160	0.047	0.000	0.220	0.000	0.080	0.380	0.600	0.000	-	Rychner & Stos-Gale 1998, 172	Copper calculated value
sickle, knob, elongated sickle, knob	MBA	Neuchatel	Switzerland	palafitte	19	spec-trom.	%wt	71	86.838	12.560	0.005	0.016	0.025	0.000	0.088	0.048	0.420	0.000	-	Rychner & Stos-Gale 1998, 173	Copper calculated value
sickle, knob	MBA	Schwarza	Germany	barrow	11	spec-trom.	%wt	72	90.900	8.000	0.000	0.000	0.200	0.100	0.200	0.500	0.100	-	-	Leuna 1958 (in Feustel), 42	
sickle, knob	LBA	?Wijchen?	Carpathian?	antiq. dealer	DB590	pXRF	%wt	10	90.754	4.752	0.823	<0.06	2.963	0.899	2.370	0.145	0.164	0.047	<0.03	measurement 15-10-15 RMO	
sickle, knob	MBA/LBA	Koszider-padlás II	Hungary	hoard	13865	spec-trom.	%wt	59	90.570	5.500	<0.01	0.000	1.350	0.080	1.500	1.000	tr.	0.000	-	Mozsolics 1967, 194-195	Copper calculated value
sickle, knob	MBA/LBA	Koszider-padlás II	Hungary	hoard	13857	spec-trom.	%wt	49	92.510	5.500	tr.	0.000	1.050	0.070	0.170	0.700	tr.	0.000	-	Mozsolics 1967, 194-195	Copper calculated value
sickle, knob	MBA/LBA	Koszider-padlás II	Hungary	hoard	13863	spec-trom.	%wt	55	88.490	8.500	<0.01	0.000	1.250	0.100	0.700	0.960	tr.	0.000	-	Mozsolics 1967, 194-195	Copper calculated value
sickle, groove, fragment	MBA/LBA	giga 1923.x.142	S/C-Europe	unknown	4186	pXRF	%wt	13	58.845	39.093	0.548	0.052	2.857	<0.0547	0.977	0.539	0.321	<0.0174	<0.0547	measurements 3-3-2015	Bodensee, Slovenia/Hungary

Object	Date	Place	Area	Context	Sample	Technique	Value	Item	Cu	Sn	Pb	Zn	As	Ag	Sb	Ni	Fe	Bi	Mn	References	Remarks
sickle, keyhole slot	MBA/LBA	1951. iv.10	Bayern	unknown	4189	pXRF	%wt	15	87.821	8.940	0.328	<0.0743	1.186	1.723	0.945	<0.0279	0.229	<0.0170	<0.0302	measurements 3-3-2015	
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	22	spec-trom.	%wt	45	89.325	7.430	0.201	0.001	1.106	0.784	0.950	0.110	0.009	0.063	-	Rychner 1981, 111	Copper calculated value
sickle, tanged, peghole	LBA	?St. Oedenrode?	C-European?	antiq. dealer	DB458	pXRF	%wt	4	92.232	4.155	0.945	<0.06	0.119	0.253	0.482	0.055	1.780	<0.0000	0.085	measurement 15-10-15 RMO	
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	4	spec-trom.	%wt	23	92.810	5.000	1.090	0.020	0.250	0.010	0.380	0.290	0.000	0.100	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	2	spec-trom.	%wt	21	90.110	7.600	1.120	0.000	0.290	0.020	0.450	0.270	0.000	0.060	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	11	spec-trom.	%wt	30	88.682	8.810	0.839	0.005	0.519	0.077	0.612	0.179	0.165	0.030	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	17	spec-trom.	%wt	38	87.860	9.500	1.080	0.040	0.450	0.020	0.590	0.170	0.000	0.180	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	18	spec-trom.	%wt	39	87.507	9.230	1.255	0.002	0.537	0.206	0.678	0.338	0.021	0.057	-	Rychner 1981, 111	Copper calculated value
sickle, knob	MBA	Dodewaard	Netherlands	settlement?	DB2275	ICP-AES/XRF	%wt		85.00	10.00	0.18	0.01	-	>0.02	-	0.07	3.05	-	0.02	Drenth & Joosten 2004, 3 tab. 1	No As, Sb and Bi analysed?
sickle, knob	LBA	Unknown (felix 506)	Unknown	unknown	DB716	pXRF	%wt	7	84.492	13.566	0.990	<0.0481	0.402	0.185	0.103	<0.0440	0.568	<0.0000	<0.0359	measurement 15-10-15 RMO	
sickle, knob	LBA	Nijmegen	Netherlands?	river?	DB446	pXRF	%wt	9	86.557	11.969	0.689	<0.06	0.207	0.086	0.133	0.168	0.306	0.031	<0.0325	measurement 15-10-15 RMO	
sickle, tanged, spur	LBA	Auvermiers Nord	Switzerland	palafitte	14	spec-trom.	%wt	35	89.922	8.020	0.824	0.007	0.534	0.083	0.089	0.163	0.017	0.108	-	Rychner 1981, 111	Copper calculated value
sickle, tanged	LBA	Auvermiers Nord	Switzerland	palafitte	21	spec-trom.	%wt	44	89.330	7.460	1.123	0.002	0.460	0.133	0.757	0.266	0.051	0.055	-	Rychner 1981, 111	Copper calculated value
sickle, knob	LBA	Berg en Terblijt	Netherlands	hoard	DB717	Chemical	%wt	12	88.500	9.150	0.800	0.000	0.000	0.375	0.000	0.000	0.300	0.000	0.000	Jacobsen 1904, 24	
sickle, 2 knobs	LBA	Epe	Netherlands	hoard	DB346	pXRF	%wt	5	76.160	22.026	0.317	0.072	1.141	0.058	0.297	0.928	0.155	<0.0000	<0.06	measurement 15-10-15 RMO	
sickle, knob	MBA/LBA	Kosziderpadlás II	Hungary	hoard	13860	spec-trom.	%wt	56	93.420	4.500	0.000	0.000	0.580	0.050	0.560	0.890	tr.	0.000	-	Mozsolics 1967, 194-195	Copper calculated value

Table 1. continued.

Object	Date	Place	Area	Context	Sample	Technique	Value	Item	Cu	Sn	Pb	Zn	As	Ag	Sb	Ni	Fe	Bi	Mn	References	Remarks
sickle, tanged, fragment	MBA, Hab2	Auvenier	Switzerland	palafitte	2	spec-trom.	%wt	70	89.385	7.780	0.210	0.000	0.810	0.690	0.990	0.106	0.017	0.012	-	Rychner & Stos-Gale 1998, 172	Copper calculated value
sickle, knob	LBA	Veenenburg	Netherlands	hoard	DB418	pXRF	%wt	11	85.507	13.450	0.197	<0.07	0.351	0.098	0.096	0.119	0.553	<0.0000	<0.04	measurement 15-10-15 RMO	
sickle, knob, fragment	MBA/LBA	Alsonémedi	Hungary	hoard	12952	spec-trom.	%wt	47	90.180	8.500	0.000	0.000	0.770	0.020	0.290	0.240	tr.	0.000	-	Mozsolics 1967, 192-193	Copper calculated value
sickle, unknown type	MBA	Roesen, Kr. Jerichow II	Deutschland	unknown	Ber II	spec-trom.	%wt	66	93.69	5.920	0.100	tr	0.100	-	0.060	0.190	tr.	-	-	Northover 1982, 81	Copper calculated value
sickle, knob, elongated	MBA	Neuchatel	Switzerland	palafitte	19	spec-trom.	%wt	71	86.838	12.560	0.005	0.016	0.025	0.000	0.088	0.048	0.420	0.000	-	Rychner & Stos-Gale 1998, 173	Copper calculated value
sickle, endwulst	LBA	Beek en donk	Netherlands	stream valley?	DB477	pXRF	%wt	2	63.068	22.586	0.836	<0.0521	0.277	<0.0345	0.964	0.184	12.275	<0.0000	<0.0594	measurement 15-10-15 RMO	
sickle, tip curved-up	MBA/LBA	gia 1923.x.142	S/C-Europe	unknown	4186	pXRF	%wt	13	58.845	39.093	0.548	0.052	2.857	<0.0547	0.977	0.539	0.321	<0.0174	<0.0547	measurements 3-3-2015	Bodensee, Slovenia/Hungary
sickle, tanged, spur	MBA/LBA	gia 1923.x.117	S/C-Europe	unknown	4190	pXRF	%wt	16	82.290	14.146	0.807	0.084	0.259	0.090	0.447	0.200	2.077	<0.0179	<0.0276	measurements 3-3-2015	Bodensee, Slovenia/Hungary
sickle, tanged, spur	MBA/LBA	gia 1920. IV/68	Hungary	unknown	4192	pXRF	%wt	18	82.358	14.581	0.853	0.086	0.374	0.110	0.443	0.172	1.508	0.094	<0.0336	measurements 3-3-2015	Gift Hungarian museum
sickle, knob	MBA/LBA	Store Valby	Denmark	hoard	B953	unknown	%wt	19	77.400	22.000	0.310	-	-	-	-	0.150	0.110	-	-	Steensbergen 1943, 88	
sickle, peghole	LBA	Hciloo	depot	hoard	DB508	pXRF	%wt	6	22.122	30.259	27.965	0.051	<0.05	0.496	0.892	<0.10	18.108	<0.0000	<0.10	measurement 15-10-15 RMO	

versus As 0.049% (DB 530)). Outside the Low Countries, knobbed sickles from Roesen and the Schwarza barrow are made from comparable low-impurity alloys (table 1; Leuna 1958: 42; Northover 1982: 81). Two sickles from the *palafitte* area also show a similar composition, albeit in one case with lower tin and higher nickel content (Rychner & Stos-Gale 1998: 172-173).

The sickle labelled “Wijchen” (DB509) has a remarkable composition characterized by high arsenic and high antimony (both > 1%; table 1). Whereas sickles with high antimony content are known, the combination of high antimony and high arsenic is rare. The best parallel known to us is from the hoard of Kosiderpadlás (As 1.35%, Sb 1.5%; table 1; Mozsolics 1967, 194-195). This similarity could support the east-central European or (trans-)Carpathian origin suspected on the basis of its morphology (section 3.1; DB 509). The tanged sickle labelled “St. Oedenrode” (DB 485) has a signature of c. 1% lead with low (<0.2%) Zn, As, Ni and c. 0.5% antimony (table 1). Sickles of comparable signature are known from Auvernier-Nord (table 1; Rychner 1981: 111) albeit that there is no perfect fit (e.g. differences in Ni).

The sickle found in the RMO with no known provenance (Felix506; DB 716) contains ca. 1% lead with low (<0.2%) Zn and Ni, 0.4% arsenic and c. 0.1% antimony (table 1). This is matched most closely by the blade known as “Nijmegen” DB 446. For the latter, we have argued that its morphology (shape of blade, base, ribs) fits well within the corpus of (local; section 5.5) Group-1 and Group 2 blades. The similarity in composition of DB 716 to that of DB 446 could in that case support the hypothesis that DB 716’s composition fits alloys known from the Low Countries, hinting at a local origin. For the sake of completeness, it should be noted that some blades from Auvernier-Nord have similar compositions, albeit that their antimony and nickel may vary (table 1; Rychner 1981: 111).

4.2 Sickles with reliable Dutch provenance

For the Dodewaard sickle (DB 2275), a compositional analysis with ICP-AES and XRF was undertaken (Drenth & Joosten 2004), but as no information on arsenic and antimony is available, this hampers a comparison on levels beyond the very general. Its composition of c. 10% tin and small amounts (<0.2%) of lead and nickel is in any case matched by various sickles across Europe (table 1). One of the three high-arched sickles (DB 717) of the Late Bronze Age Berg en Terblijt hoard was subjected to a chemical analysis in the early 20th century, which only indicated that it contained c. 9% tin, 0.8% lead and 0.375 % silver (table 1; Jacobsen 1904, 24). Absence of information on antimony, zinc and arsenic hamper comparison with other sickles, yet allowing for this, the similarities to the composition of DB485 should be noted. Could it be that high-arched sickles originated from – or had been crafted from scrap derived from – the *palafitte* areas?

The double-knobbed sickle from the Epe hoard (DB 346) is of peculiar composition. Measured in four different spots, its tin content as established by pXRF averages about 22% (table 1). Above 8% Sn, there is no functional advantage to adding tin in such high amounts (there are no effects in terms of increased hardening or lowering of smelting point²⁵), except that it can give objects a more silvery appearance (Ingo *et al.* 2006: 611; 614; Butler *et al.* 2014: 21). Whilst we are fully aware of the possibility of so-called “tin-sweat” (*i.e.* migration towards the surface and therefore overrepresentation of tin (and lead) during oxidation)²⁶ and separation effects during slow cooling (Ingo *et al.* 2006: 613-615), it remains unexplained why it should affect this blade (and DB 477) more severely than others. Moreover, the Beek en Donk (DB 477) blade yielded an equally high percentage of tin (table 1), yet their patina differs (DB346: patchy bright green to almost black, as against DB 477: brown with reddish patches). To err on the side of caution, we assume that the higher tin percentage is primarily related to cassiterite formation in the oxidized surface of both sickles, but could reflect an originally higher tin content too. This question can only be resolved with more invasive (*e.g.* cleaning of artefacts, drilling for sample) or different (*e.g.* neutron resonance analysis; Postma *et al.* 2005) techniques. The tin content aside, the Epe double-knobbed sickle is characterised by significant (c. 1%) amounts of arsenic and nickel (table 1). This sets it apart from (high-tin) sickles DB 477 and DB 418, whose values for these two elements are much lower. Comparably alloyed (*e.g.* Ni > Sb) sickles are known from Hungary (Mozsolics 1967, 194-195) and the *palafitte* area (Rychner & Stos-Gale 1998: 172), but no exact matches are known. The higher arsenic content could suggest that their bronze had not undergone many cycles of melting-down and casting, as arsenic loss will occur during these processes.²⁷

The composition of the sickle fragment from the Veenenburg hoard (DB 418) can be characterised as a low-impurity Cu-Sn alloy (table 1; Sn 13.45%, As 0.3%, Pb 0.179%, Ni 0.119 %), for which comparanda are known in central Europe and the *palafitte* area.²⁸ The Beek en Donk sickle (DB 477) is not categorically dissimilar, yet shows higher iron values (Fe 12.27%; corroborating its proposed origin from a stream valley?) and almost one percent of antimony and lead (table 1). In addition to the axe from Store Valby quoted for its similarly high tin content (yet otherwise composed too differently to merit inclusion; Steensberg 1943, 88), three parallels from Hungary and central Europe could be listed (table 1).

The sickle blade with peg hole from Heiloo (DB 508) shows extremely high values for iron (Fe 18.11%), lead (Pb 30.26%) and tin (Sn 22.12 %; table 1). Whereas we are cautious as to the interpretation of the high tin content (see discussion of DB 477, above), the values for iron and lead need an explanation. The high iron content in any case is consistent with the observed brown patina (*supra*)

and could tie in well with an original findspot in a (water-logged) dune slack or near-coastal mudflat. However, the high lead content in all probability is not a surface effect but instead reflects a significant (> 20%) amount of lead in the original alloy. Similar high amounts of lead and tin are not known for other sickle blades, but are noted for three Ha.B. hoards in western Slovenia (Trampuž Orel, Heath & Hudnik 1998: 232), where 12% of the objects have a lead content of 10-75% (Trampuž Orel, Heath & Hudnik 1998: 232). Also in Britain, particularly chapes and sheet metal from Wilberton-period hoards display high (>15%) percentages of both tin and lead (Northover 1982: 73-75). From Auvernier-Nord, a sword tip with 18% lead and 7% tin is known (Rychner 1981: 112). Closer to home, several of the Plainseau axes from the Belgian Heppeneert hoard have proportions of tin and lead over 15% (Wouters 1994: 42 table 2; Van Impe 1994), as do the spearheads from Denderleeuw and Turnhout (Wouters 1990: 3.14 table 3.5b) and the leaf-shaped sword from Melle (*op.cit.* 3.11 table 3.4a). In the Netherlands, a button from the Late Bronze Age-Early Iron Age urnfield at Zutphen contained 16.4% Pb and 45.56% Sn (Van Straten & Fermin 2012: 63-68). Evidently, in the Late Bronze Age lead-rich alloys were found right across continental Europe.

5. SICKLES IN CONTEXT: WHAT WE DO KNOW ABOUT DUTCH BRONZE AGE SICKLES

5.1 Production

The production of Dutch Bronze Age sickle blades can only be addressed very obliquely. The observed differences in alloy composition suggest various phases of melting-down and reworking, yet it remains unproven – though plausible – that such remelting and casting took place in the Low Countries. Evidence for bronze workshops in general, miscast sickles or sickle moulds from the Netherlands are lacking. Nevertheless, the presence of a large body of sickles that share blade forms (*i.e.* short, straight, wide blades with a straight or somewhat chamfered base (B1)), hafting method (knobs or elongated knobs) and blade embellishments (blade ribs or narrow blade grooves) suggests a local tradition. The scarcity of sickles bearing such traits *outside* the Low Countries moreover suggests that these traits reflect regional production rather than regional exchange preferences.

5.2 Use and use-life

No actual remains of sickle handles have been identified in the Low Countries, so that ideas on how hafting was achieved must remain tentative. We can, however, confidently state that after initial production and removal of casting jets and casting seams, most sickles were used intensively. Some sickles have preserved traces of hammering (*e.g.* DB 346; DB 717) and show repeated

resharpening by peening and/or honing, often resulting in cutting edges worked from both sides of the blade (*e.g.* DB 416; DB 2104; DB 2401; DB 2227). Noteworthy is that the most worn-down examples, with concave cutting edges severely eating into the width of the blade (*e.g.* DB 1833; DB 2375; DB 2277; DB 2729) in three cases originated from settlement sites (*cf.* Fontijn 2003: 137; Primas 1986: 10) of the Middle Bronze Age B (*i.e.* 1500-1000 cal. BC). Presumably, their worn-down state had not inhibited their usefulness and appreciation, as these items were (still) spared the crucible. Moreover, rare repairs of broken sickles abroad (*e.g.* Petrescu-Dîmbovița 1978: *Taf.* 3 no. 390) suggest that curation may have been favoured over remelting, which hints at limited availability of the craftsmanship or raw materials required. Alternatively, sickle fragments could be reworked into knives (*e.g.* Sommerfeld 1994: 406; *Taf.* 13 no. 5; Butler, Arnoldussen & Steegstra 2012: 85; Hohlbein 2006: 355-356).

Conversely, sickle blades in as-cast or near-mint condition are rare. For the relatively untouched blade from “Drenthe” (DB 530), we have argued that it presumably belonged to a hoard assemblage comprising more as-cast blades, and that a Dutch provenance was questionable. Amongst the blades that show limited degrees of use, intentional depositions figure prominently (*infra*; DB 508; DB 717; DB 1872; DB 1873; DB 2472; DB 2731), yet none of these blades are in pristine, as-cast, condition. Evidently, actual usage may have actually been required prior to – or at any rate did not inhibit – deposition, as worn sickle blades too were deposited (*e.g.* DB 346; DB 416; DB 2277).

Unfortunately, the sickle blades recovered from the Netherlands do not allow us to reconstruct what kinds of cutting tasks (*e.g.* reaping, pruning, coppicing, weeding, sod-cutting) were undertaken. No use-wear analysis has been undertaken, and considering the often poor preservation of the once thinly honed cutting edge and the relative hardness of the blade versus that of the things cut by it, such analysis is unlikely to yield results anytime soon (but see McClendon 2015: 58-88). There is the tantalizing association of four flint sickle blades with the bronze (pegged) sickle blade from Heiloo (DB 508). For these flint sickles, it has been argued that their use-wear traces in large part may derive from siliceous contact during sod-cutting rather than harvesting.²⁹ Could bronze sickle blades have had similar (additional) functions? If one looks at the more common patterns of breakage, it is remarkable how many sickles have lost their tips. That this is a genuinely prehistoric pattern is shown by the sickles from Montfort (DB 1833) and Veenenburg (DB 416), as their blades show that fractures from broken-off tips were ground smooth again in prehistory. Whereas we acknowledge that – particularly much-hammered – tips may fracture if dropped, it is equally imaginable that striking stones during sod-cutting could result in the loss of tips. Put otherwise, the additional function of

busheling/gathering of ears that long-tipped Neolithic sickles had (fig. 1, *cf.* Petrescu-Dîmbovița 1978: 22) seems improbable for the stout, short, Dutch blades, but indeed it seems improbable that the tips broke off in the course of cereal harvesting. The preserved sickle handles from the *palafitte* area all seem designed to apply, and deal with, significant momentum of pull (protruding grip butts; fig. 4, E), yet it remains unknown whether this should be extrapolated to our part of the world or whether this shape favours a particular function within the spectrum of harvesting cereals, fodder procurement, weeding, pruning, or sod-cutting.³⁰

A final observation on the usage of the sickle blades is that the grips from the *palafitte* area and the placement of the knobs on the Dutch examples seem to indicate right-hand usage. As some left-handed examples are known outside our study area³¹, this is a meaningful observation. Even allowing for a higher prevalence of left-handedness in prehistory (up to 35%; Furmánek & Novotná 2006: 26-27), normative remelting in combination with small overall preserved numbers of surviving sickle blades sufficiently explains the rarity of preserved left-handed examples.

5.3 The dating of Dutch bronze sickle blades

As the majority of Dutch bronze sickle blades were found as stray finds with metal detectors, or in secondary contexts (dredge spoil heaps, sand and gravel quarries, building sites), these cannot be dated contextually. A few examples, however, have been found during archaeological excavations. Due to its recovery from stratified and well-dated sediments, the Eigenblok sickle (DB 2375) can be dated with the greatest precision, to ca. 1495-1400 cal. BC. Similarly, the geological context of the De Brien, Dodewaard and Oosterhout sickles (DB 907-907; DB 2275; DB 2729) supports a Middle Bronze Age date. Although the Venray sickle (DB 2277) was also recovered during controlled excavation of a Middle Bronze Age-B settlement, the associated ceramics cannot be dated with great precision and the stratigraphic evidence only suggests that it could date from early in the Middle Bronze Age. Additionally, associations of sickles in hoards allow closer dating. The two sickles from the Veenenburg hoard (DB 416; DB 418) and the Epe sickle (DB 346) in all probability date to c. 1400/1325-1000 cal. BC. The De Nielt Group-1 sickle (DB 2730) was found with a tanged knife, which suggests a date around the Middle to Late Bronze Age transition (c. 1300-900 cal. BC).

For most sickles, however, their dating relies on the strength of similarity and dates available for published parallels. Mostly, these dates fall within the Middle Bronze Age-B, but a few indications for a dating relatively late in this period are available (but see DB 717; DB 1427-1428). An evidently Late Bronze Age date can only be proven for the (imported) sickle fragments in the Drouwenerveld hoard (DB 700-773) and the Heiloo sickle

(DB 508). An Early Iron Age date may be proposed for the similarly shaped bronze and iron sickles with *Endwulst* from Huissen (DB 2504) and Beek en Donk (DB 477). Interestingly, there is no evident chronological aspect to our proposed groups. Middle Bronze Age-B dates apply to Group-1 and Group-2 sickles equally (strengthening the above interpretation that these are stylistic variations rather than distinct groups). Amongst Group 1, there are faint indications that high-arched sickles (*e.g.* DB 717; DB 1427-1428; DB 1872-1873; DB 2440) date to the final two centuries of the Middle Bronze Age-B. Group 3 seems to have the least chronological consistency: Berghem (DB 2029) looks archaic (*cf.* Petrescu-Dîmbovița 1978: *Taf* 1, no.1), but is essentially undated. The Ede - Maanen example (DB2104), even if of non-local origin, seems to fit well within the corpus of Middle Bronze Age-B sickles. Nevertheless, the group of sickles with elongated knobs also comprises obvious Iron Age examples. Even if we assume a 9th-century BC date for the flint sickles from Heiloo (DB 508), there are too few specimens in group 4 to propose that hafting with (elongated) knobs had become rare towards the Iron Age.

5.4 Contexts: hoards, graves, depositions and chance losses?

Both the state and the recovery context of Dutch sickle blades can inform us on whether and in what states sickle blades were deemed suitable elements in votive depositions, or alternatively, whether they were regarded primarily as practical tools. For slightly over half of the Dutch sickles, some or detailed information on their original context is known. Remarkably, the otherwise well-known tradition of placing bronze items in rivers and wet parts of the landscape (Essink & Hielkema 1997/1998; Fontijn 2003) is hardly represented. Only for the Gassel (DB 2293) and Kessel (DB 2472) sickles do provenances suggest that they may have originally been deposited in rivers. For the Beek en Donk example (DB 477), an origin from a stream valley has been suggested. Dismissing the antique dealers' (ascribed) provenances, fewer than four sickles may have originated from wet contexts (*contra* Fontijn 2003: 144, who lists eight). Evidently, sickles might intentionally be allotted different biographies (Fontijn 2003: 218). In the Netherlands, evidence for the presence of sickles in funerary contexts is equally rare (Fontijn 2003: 215). Although in various parts of Europe sickles feature as grave goods (fig. 7, A-B), this is no standing tradition in the Low Countries. Only for the two sickles from Holset (D1872-1873) and tentatively for the Breda - Moskes sickle, may a funerary context be assumed. At Holset, a sickle (DB 1872) was found beneath the drystone walling within a mound. Whilst this may seem peculiar, it ties in with a more widely known tradition of "burying" sickles in barrows. At Lille-Lyngby (Aner & Kersten 1973: *Taf.* 40 no. 232), a bronze sickle was found with cremated bones underneath stone

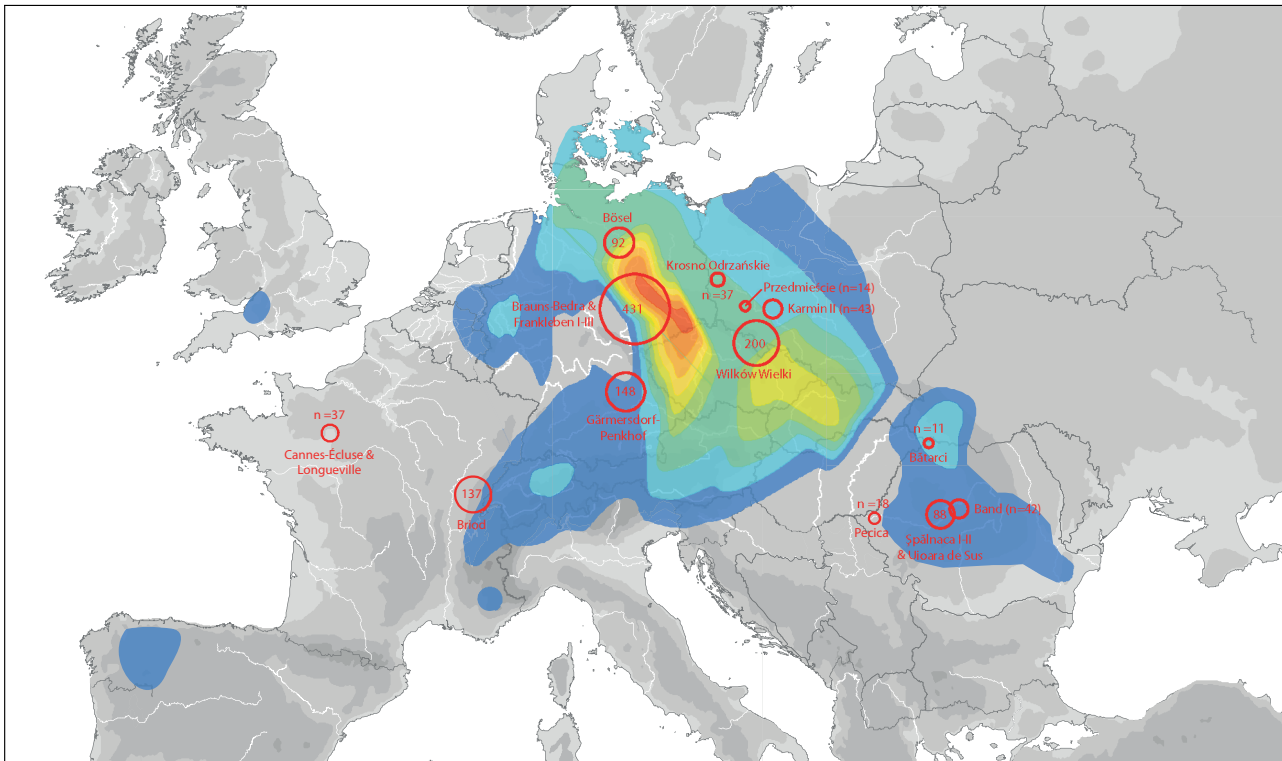


Fig. 20. Schematic distribution map for European knobbed sickles. Contours pertain to the approximation of numbers of knobbed sickles above 2 per 1000 sq km (blue) to max. 9.3 knobbed sickles per 1000 sq km (red). Plotted in red circles are the numbers of knobbed sickles from hoards with over ten sickles (after: Millotte 1963; Gauchier & Robert 1967; Petrescu-Dîmbovița 1978; Blanchet 1984; Primas 1986; Sommerfeld 1988; 1994; Gedl 1995). Drawing: S. Arnoldussen, RUG/GIA.

paving at the base of the barrow. It recalls the case of the Norddorf barrow, whose grave contained a ‘skull-sized’ stone underneath which three flint sickles were placed (Aner & Kersten 1979: *Taf.* 18 no. 2621A). Primas (1986: 18-19) lists fourteen barrows with sickles as grave goods and four examples of sickle depositions *under* or *in* mound bodies. Tumulus Sb.17 at Gørlev yielded a deposit of spiral and tubular ornaments and two bronze sickles (Aner & Kersten 1976: *Taf.* 14 no. 669). During the excavation of grave Sb. No. 89 at Nygård, a deposit of eleven poorly cast and broken sickles was discovered (Kersten, Koch & Willroth 2001: *Taf.* 49 no. 5170).

Assessing the significance of these sickles from graves is difficult, as both intact blades and fragments occur. In the latter case, their functional significance appears to be limited (regardless of their symbolic significance). For example, the sickle from Schwarza (Kr. Bühl) was placed near the lower leg, has indications for an intact handle (Sommerfeld 1994: 160-161) and may represent a ‘classic’ funerary gift of a functional tool (*cf.* DB 2481). At Bremelau, only the tip of a sickle was placed underneath the skull (Primas 1986: 81 no. 319, *cf.* Furmánek and Novotná 2006: 51; 55). From the central interment in the Neuwühren (Kr. Plön) barrow, a leather bivalve case wound with leather cord contained three fragments of an (incomplete) sickle (Sommerfeld 1994: 406; *Taf.* 12 no. 23). Evidently, fragments of sickles might retain a symbolic significance beyond their functional use (Primas

1986: 17-20; Gedl 1995: 17-18). One can only speculate as to what contributed to this significance, but here we would like to suggest that sickles might have been used to cut the turves for barrow construction. This highly significant act may have required their decommissioning (*i.e.* rendered them taboo for more mundane agricultural tasks), after which they were (destroyed and/or) placed underneath and in the barrows they helped to create. The Holset (D1872, DB 1873) and Lille-Lynby sickle finds (Aner & Kersten 1973: *Taf.* 40: 232) are perhaps to be understood along these lines of interpretation.

Ten to twelve of our sickles and sickle fragments were recovered from multiple-object hoards. In the Drouwenerveld hoard, four fragments of imported sickles were part of a deposit which may have served as a votive deposit that allowed the conversion (melting and recasting) of a much larger batch of non-local scrap metal into locally current forms (Arnoldussen 2015: *cf.* Fontijn 2008: 14-15). The Epe hoard, comprising a palstave, stop-ridge axe and sickle (DB 346), all wrapped in an organic (linen?) receptacle (Butler 1990: 90-92) was found in a hill that may or may not have been a barrow. In either case, it entails the deposition of the business ends of originally composite agricultural tools and provides substance to Fontijn’s (2003: 218) observation that the “deposition of sickles generally follows the depositional patterns of axes” (but also see *op.cit.*, 250). The Veenenburg hoard has been interpreted as a votive deposit, which – in view

of the prominence of ornaments and pins – may reflect more female associations (Butler 1990: 98). Remarkable is the fact that – in addition to mostly complete and intact items – this assemblage includes a presumably still functional sickle (DB 416), but also a small fragment (DB 418) of another sickle. This may signal that fragments of sickles would, as was shown above for sickle fragments in graves, retain a symbolic significance even when broken. Indeed, their fragmented state may be the result of intention rather than abuse or accident. Primas (1986: 37) already aptly stated that, despite innate breakability, sickle bronze is no glass. The often small fragmentation of sickles in hoards requires deliberate intervention (*cf.* Sommerfeld 1994: 29). It should therefore come as no surprise that some sickle blades display traces of sawing and chiselling that facilitated the breaking of the otherwise resilient blade backs (Sommerfeld 1994: 21-22; 34-35). In this light, the ancient break on the De Nielt Group-1 sickle (DB 2730) could reflect a destructive decommissioning act prior to deposition.

Eleven sickles have been recovered from evident (DB 998; DB 2375; DB 2729; DB 2277), plausible (DB 906-907; DB 2275; DB 2730-2731) or possible settlement sites (DB 2104; DB 2401). These sickles are generally quite worn, often resharpened and frequently devoid of their tips (fig. 12; fig. 14). For several of these sickles, arguments against a scenario of chance loss can be put forward (Fontijn 2003: 144-147). For the Eigenblok sickle, given its proximity to a Middle Bronze Age farmhouse and its stratigraphic position, an interpretation as an abandonment deposit has been suggested (Jongste 2002b, 105-106). At De Brien, the very fact that *two* sickles were found together (DB 706-907), argues against a scenario of chance loss (Fontijn 2003: 144). The two sickles from Cuijk - De Nielt (DB 2730-2731) were possibly once interred together with a tanged knife in a settlement area. At Venray (DB 2277) and Moskes (DB 2481), the finds were recovered from pits; in the former case, one cut by a Middle Bronze Age-B house plan – hinting at a possible foundation deposit (*op.cit.*, 146). Considering the perhaps more economical choice of having worn sickles end up in the crucible, their presence in settlements such as Dodewaard (DB 2275), De Geer (DB 998) and Oosterhout (DB 2729) could reflect curation and (invisible or unrecognised) deposition rather than chance loss. The visibly frequent resharpening and very worn state may in prehistory have signalled economic prosperity (many seasons of successful harvesting for the owner's household) rather than material poverty.³² To Bronze Age households, worn-down sickles may have signalled abundance as much as labour, or put more simply: the more worn, the better.

5.5 Supra-regional affinities

From a European perspective, the knobbed sickle blades from the Low Countries represent a periphery to

central European concentrations (fig. 7, A; fig. 20). From a numerical point of view, this indeed may hold true, yet such an approach is inclined to overlook patterns even within a data set as small as the present 43 sickle blades. Quantitatively, the 43 Dutch sickle blades are dwarfed by regions such as Poland (217 knobbed sickles, excluding hoards; Gedl 1995), Sachsen-Anhalt (163), Sachsen (163), Brandenburg (108) and Bavaria (131 knobbed sickles, excluding hoards; Sommerfeld 1994). The Czech Republic holds 327 knobbed sickles (Říhový 1989; Kytlicová 2007), Slovakia 244 (Furmánek and Novotná 2006), Austria 285 (Primas 1986) and Romania 202 (Petrescu-Dîmbovița 1978). Even if compensated for surface area (fig. 20), it is clear that the fringes of the Lower Rhine basin never saw similar densities of sickles.

However, if we take the numerically restricted Dutch data set as our point of departure, various local and supra-regional affinities come to the fore. The Drouwenerveld hoard, with its four sickle-blade fragments of southern Scandinavian / northern German origin, testifies to the contacts of the northern Netherlands with the *Nordische Kreis* (fig. 8, C; Fig. 15; Butler 1986). The sickles with double knobs (*Knopfenpaar*) represent a minor group in the Netherlands (fig. 13), yet these presumably reflect an axis of contacts along the rivers Danube and Rhine that, through maritime links, extended into ports of trade on the British Isles. This being said, such supra-regional affinities can only be outlined against a more regional or local body of metalwork. For example, the clustering of high-arched blades in the southern Netherlands and adjacent parts of Germany and Belgium (section 3.2) strongly suggests that these, if not produced regionally, were preferentially acquired in some numbers by the communities of these areas. Secondly, the fairly substantial group of short, relatively straight and wide-bladed knobbed sickles indicates that this was a common, or even the most common, form of Bronze Age sickle in the Netherlands (fig. 12; fig. 14). From this perspective, even the modest data set on Dutch sickle blades presents itself as a rich bronze harvest.

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- 5 *E.g.* Butler 1965; Fontijn 2003: 239-246; Butler & Steegstra 2007/2008; Jansen *et al.* 2011; Van Alphen & Theunissen 2015.
- 6 *Cf.* Louwe Kooijmans 2000: 324; Bewley 2003: 7; 15; Yates 2007: 13; Kuijpers 2008: 16; Fontijn 2011: 429-430; 441; Jahn 2012: 191.
- 7 At Cuijk - De Nielt, two more fragments of iron sickle blades (one from a possible abandonment deposit) have been found (Habermehl & Van Renswoude *in press*: 403), but as these are securely dated to the Early and Middle Iron Age respectively, they are not discussed here.
- 8 Gurova 2014: 342; 345 fig. 10.5; Clark 1952: 110; Vardi & Gileat 2013: 377; 381 fig. 4.
- 9 Gibaja, Ibáñez & Urquijor 2014: 115 fig. 4.38, *cf.* Clark 1952: 110.
- 10 For sandstone see Gedl 1995: 2; *Taf.* 77; Říhový 1989: *Taf.* 31; Furmánek & Novotná 2006: 47; 54, for diabase see Primas 1986: 76 no. 289, for clay see Gedl 1984: 3; Sommerfeld 1994: 162, for talcose schist see Aner & Kersten 1990: no. 4408, for bronze see Sommerfeld 1994: 161, for *Formsand*/moulding clay see Gedl 1995: 94 no. 65, *cf.* Primas 1986: 6; Sommerfeld 1994: 37-38; 162-163.
- 11 *E.g.* the mould hoard of Heilbronn-Neckergartach (Probst 1999: 288; *Taf.* 39), the moulds from graves at Moravičany (Říhový 1989: 83 no. 458-459) or Vyšný Kubín (Furmánek & Novotná 2007: 47) or barrows such as that at Brandholm (Aner & Kersten 1990: no. 4408).
- 12 Steensberg 1943: 160; Sommerfeld 1994: 34; Gedl 1995: 3.
- 13 Primas 1986: 3; Sommerfeld 1994: 38 note 191; 170; Kytlicová 2007: 144.
- 14 Butler & Steegstra 1997/1998: 227; 2001/2002: 303; 2005/2006: 209; Fontijn 2003: 138; Fontijn *et al.* 2002; Drenth *et al.* 2007: 117-120; Kuijpers 2008: 145-146; Janssens 2015.
- 15 *Cf.* Petrescu-Dimbovița 1978: 24; Vasić 1994: 8; Gedl 1995: 2.
- 16 *E.g.* Schmidt 1904: 416; Primas 1986: 2; Říhový 1989: 2-3; 13.
- 17 *E.g.* Primas 1986: 49-72; Sommerfeld 1994: 179-181; Vasić 1994: 19-26.
- 18 Wegner 1976: *Taf.* 40, no. 5; Primas 1986: 3; Sommerfeld 1994: 170; Kytlicová 2007: 144. Implied is a 50% reduction of the original blade angle (*i.e.* curved blades are becoming more straight).
- 19 *E.g.* Říhový 1989: 26-27; *Taf.* 5, nos. 61-68; *Taf.* 50, no. 1117; Gedl 1995: 46.
- 20 *E.g.* Primas 1986: 14-15; Van Impe & Creemers 1993: 44; Gedl 1995: 15-17; Furmánek & Novotná 2006: 52-53; Jahn 2012: 191; 193.
- 21 *E.g.* Aner & Kersten 1973; 1976; 1977; 1981; 1986; 1990; 2001; 1991; 1993.
- 22 *E.g.* the hoard from Briod with 137 knobbed sickles, 119 tanged sickles, a socketed gouge, knife and chisel, knife blade, spearhead blade and part of a chape (Millotte 1963: 275-276; Primas 1986: 78 nt. 59), the three Frankleben I hoards with 241 knobbed sickles and 12 winged axes (Von Brunn 1957: 1; Sommerfeld 1994: 326-331) or the 200-plus sickles from the Wilków Wielki hoard (unfortunately melted down by the local blacksmith in the 19th century; Gedl 1995: 15).
- 23 *E.g.* Primas 1986: 14-15; Sommerfeld 1994: 38; 301-302; 318-319; Gedl 1995: 15-17; Furmánek & Novotná 2006: 52-53.
- 24 *E.g.* Steensberg 1943: 77, 79, 93; Aner & Kersten 1973: no. 232; 1976: no. 278; no. 669; 1978: no. 2224c; 1979: no. 2621; 1990: no.

NOTES

- 1 Butler 1996; 1998; Butler & Steegstra 2001/2002; 2003/2004; 2006/2006; Butler, Theunissen & Van Os 2014.
- 2 *E.g.* Brandt 1967; Kibbert 1980; 1984; Harbison 1969; Abels 1972; Novotná 1970; Schmidt & Burgess 1981; Mayer 1979; Říhový 1992; Kuśnierz 1998; Eogan 2000; Laux 2000; 2005; Gedl 2004.
- 3 *E.g.* Essink & Hielkema 1997/1998; Fontijn 2003; Hulst 2010, but see Butler 1965; 1979; 2002.
- 4 *E.g.* Van Giffen 1937; Elzinga 1957/1958; Butler 1964; Butler & Sarfatij 1970/1971; Hulst 1971; Fontijn 2001; 2003: 221-263; 2008; Butler & Hielkema 2002; Fontijn, Jansen & Fokkens 2004; Butler & Fontijn 2007; Fontijn *et al.* 2012; Arnoldussen & Visser 2014.

- 4483; no. 4493A; no. 5381; 2001: no. 5170; Primas 1986: 19, Tab. 8; Van Impe & Creemers 1993: 45.
- 25 Tylecote 1987; Mohen 1990; Harding 2000: 203; Arnoldussen 2013: 122-123.
- 26 Arnoldussen 2013: 122; Wouters 1994: 46; Meeks 1986: 133.
- 27 McKerrell & Tylecote 1972; Bray & Pollard 2012; Park & Gelegdorj 2015.
- 28 Mozsolics 1967: 194-195; Northover 1982: 75; Rychner & Stos-Gale 1998: 17.
- 29 Van Gijn 1988: 215; 1999: 256; 2010a: 195.
- 30 *Cf.* Evans 1881: 194-195; Steensberg 1943: 25; Petrescu-Dîmbovița 1978: 22; 56; Van Impe & Creemers 1993: 44; Gedl 1995: 2; Fontijn 2003: 137; Kytlicová 2007: 143.
- 31 *E.g.* Mozsolics 1967: 135; *Taf.* 49 no. 10; Gedl 1995: *Taf.* 14 nos. 200; 228; Furmánek & Novotná 2006: no. 66, *cf.* Steensberg 1943: 161.
- 32 *Cf.* Primas 1986: 18, nt. 49; Jongste 2002b: 106; Jahn 2012: 193-194.

