Travelling Objects : Changing Values

Trade, exchange, and cultural influences for the decline of the lake-dwelling tradition in the northern Circum-Alpine region during the Late Bronze Age

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Abbreviations

Countries

AL	Albania
AT	Austria
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
CH	Switzerland
CZ	Czech Republic
D	Germany
DK	Denmark
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IL	Israel
IT	Italy
LA	Latvia
LI	Lichtenstein
LT	Lithuania
MO	Moldova
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Republic of Serbia
RU	Russia
SE	Sweden
SI	Slovenia
SK	Slovakia
SY	Syria
TR	Turkey
UA	Ukraine

General

Cty	Country
Dendro	Dendrochronology
Dendro-dated	Dendrochronologically dated
EBA	Early Bronze Age
EIA	early Iron Age[1]
LBA	Late Bronze Age
LTA	La Tène A
MBA	Middle Bronze Age
MCA	Multiple Correspondence Analysis
MRV	Middle Rhine Valley
nCA	northern Circum-Alpine region
PBF	Prähistorische Bronzefunde
Qty	Quantity
sCA	southern Circum-Alpine region
SNM	Swiss National Museum, Zurich

MCA Variables

A	Small metal work
B	Beads
BV	Bronze vessels
C	Ceramics
D	Domestic
F	Fasteners
H	Horse
I	Inorganics
K	Keys
L	Large jewellery
M	Metal working
O	Small jewellery
R	Organics
T	Tools
U	Utensils
V	Vessels
W	Weapons

[1] Acronym 'EIA' is always in capital letters but in full text 'early' is spelt with lower case 'e'.

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Preface

For the past few decades a model for the abandonment of the lake-dwelling tradition in the northern Circum-Alpine region (nCA) at the end of the Bronze Age has focussed on the role of climatic change directly influencing the communities through lake water-level rise, with little attention given to cultural factors.

Through a combination of material culture studies, archaeobotanical, archaeozoological, dendrochronological and micromorphological analyses, the SNF project "The end of the lake-dwelling phenomenon: cultural vs. environmental change" (no. PP00P1_123336) has recently attempted to redress that balance and consider cultural influences in addition to climatic effects.

This dissertation (divided into 3 parts, see below) covers the material culture studies portion of the research, and is primarily concerned with the routes of trade, exchange and communication, in which lake-dwelling communities of the northern Circum-Alpine region were incorporated during the Late Bronze Age. Part 1 (Chapters 1, 2, and 3) addresses the region of study, source material, theoretical background, and previous proposals of long-distance trade routes spanning across Europe. Part 2 (Chapters 4, 5, and 6) provides an overview of different forms of material culture: immovable (Chapter 4) and moveable (Chapter 5) material culture, and 'religious' (Chapter 6) objects and practices. Chapters 5 and 6 are also divided into Sub-Chapters and Sections, and each of them deals with a specific class of artefacts. Finally, Part 3 (Chapters 7, 8, and 9) provides the main discussion, reflections, and conclusions.

Chapter 1 introduces the main regions of Europe included in the study, provides a brief overview of archaeological and literature resources available for those regions, and discusses some of the main problems with the available data, before clearly stating the aim of research (Section 1.6). A general chronological comparison is provided in Section 1.4, not only to demonstrate the continuing debate regarding the calendrical dating of typological-chronologies (especially in northern Italy), but also to provide the reader with a comparative chronological chart for reference when reading Chapter 5.

In order to interpret cultural change through the circulation of objects between various regions of Europe, a robust theoretical approach must be adopted (Chapter 2). This has been achieved through a combination of the Relational Theory (Section 2.3) and the principle of Object Biographies (Section 2.4). In Section 2.3, a model under which societies/communities can be seen as being composed of the interaction of numerous factors, including trade and exchange with other communities, is proposed. That objects may have formed a more interactive and symbiotic relationship with individuals during the prehistory of Europe than modern Western society is well documented in many object biography studies (Section 2.4), but such studies have rarely attempted to incorporate the biographical approach to trade and exchange research, or to suggest how goods moved as gifts or commodities (Section 2.7).

Chapter 3 provides an overview of previous suggestions of trade routes flowing through Europe, many of which have been proposed utilising the distribution of artefacts. Artefact distribution studies largely fell out of fashion during the Post-Processual phase in archaeological theoretical development, as can be seen by the reduced quantity of volumes published in the *Prähistorische Bronzefunde* series (PBF). However, such typological and artefact distribution analyses can provide a significant level of information and privilege novel insights to the studies of cultural change, especially when combined with a sufficient theoretical background.

Chapter 4, on the other hand, considers the structure of settlements themselves as a form of immovable material culture, and draws a comparison between settlements in the northern Circum-Alpine region and those of the eastern Baltic/Poland. Furthermore, drawing upon the excellent dendrochronological dating of some sites, a 'biography of settlement' has been proposed for the lake-dwellings of the nCA (Section 4.5) in an attempt to combine sociological influences for the decline and abandonment of the lacustrine environment, with the traditional climatic model.

As often pointed out in Chapter 5, the PBF series have provided the background information for many of the material culture groups studied here. However, some objects do not qualify for publication in this series due to the fact that they are not made of metal: for example amber, glass, and ceramics. Section 5.1 considers the distribution of amber, which is one of the best identifiable objects to traverse Europe, and one of the favourite materials when considering long-distance trade routes. Glass beads, and specifically *Pfahlbauperlen,* are studied in Section 5.2, illustrating their movement in the opposite direction to amber. Section 5.3 summarizes ceramic objects from the lake-dwellings, and also imported ceramics (Attic ware) and technological innovations (wheel thrown pottery) north of the Alps during the Iron Age. Distribution maps of objects discussed are available in the Appendix (along with lists for the sites plotted on each map), creating, for the first time, a collection of maps in a single volume showing the European wide distribution of many forms of material culture present in the LBA lake-dwellings of the northern Circum-Alpine region. Section 5.4 details many forms of metalwork material culture, and also addresses issues of

object deposition and the process of bronze-working. Figures illustrate the various objects being discussed in each region, and while objects are not all illustrated at the same scale, references are provided in the figure captions and the provenance of objects are indicated by square brackets, e.g. [Mörigen]. Two artefact groups are not discussed in great detail – jewellery pins or needles (*Schmucknadeln*) and various forms of axes (*Beile*) – though they are mentioned in other areas of the discussion. These objects are omitted from the main distribution analysis because of an absence of extensive catalouge publication, particularly for Switzerland. However, the literature from other regions and isolated sites (e.g. Zurich-Alpenquai) is sufficient to suggest that the exchange links which may be observed through the distribution of jewellery needles and axes will not significantly differ from the pattern seen in the many other goups of material culture charted.

Throughout recent studies of material culture from lake-settlements of the nCA, it has become apparent that the LBA communities residing there were responsible for the manufacture and circulation of many items of bronze-work to other regions of northern Europe, but imported relatively few objects. However, possible 'religious' objects, such as *Stangentrichter* and bird-shaped vessels, linked the region to southern Germany and the Carpathian Basin, as pointed out in Chapter 6 (in particular section 6.2).

Chapters 7 and 8 provide the main discussions and conclusions of the thesis, drawing together many concluding remarks from each of the previous Chapters and Sections, to suggest biographies of material culture groups and routes/points of communication and exchange.

Many past distribution studies simply plotted the distribution of objects; clearly this is not enough to provide substantial inferences of exchange networks or cultural change. As a way of elucidating more information from the distribution of objects, density maps (available in the Appendix) have been produced using a GIS programme (Chapter 7). This provides a significant improvement on the plotting of find locations, as the decreasing occurrence of objects with increasing distance from their source is clearly demonstrated, and also higher densities outside of main distributions are visible. Combining the density distributions of multiple object groups has also allowed the proposal of several nodal regions on the exchange routes connecting northern and southern Europe (Chapter 8).

Furthermore, Multiple Correspondence Analysis (MCA) of object groups from different regions of Europe has been used as a method to suggest changing value associations of objects as they travelled between areas (Chapter 7). These value associations show a portion of the biography of specific object groups, and how this biography changed as the objects were circulated along exchange routes (MCA charts available in the Appendix).

Combining all of the evidence of immovable and moveable material culture (Chapters 4 and 5) and burial practices (Section 6.1), a progressive sequence of events linking the decline of the lake-dwelling tradition to not only climatic change, but also shifting trade routes, cultural change, and re-organized social rights to access the lake resources during the early Iron Age is proposed in Chapter 8 (especially Section 8.2).

Finally, Chapter 9 provides a summary of results obtained from two of the main questions addressed in the thesis: the identification of, a) possible cultural connections between the nCA and eastern Baltic lake-settlements (Section 9.1); and, most importantly, b) the detection of cultural influences in the final abandonment of the lake-dwelling tradition in the northern Circum-Alpine region (Section 9.2). Various avenues for future research (Section 9.3) have been identified through the study of material culture from the lake-dwellings, for example: 1) a number of razors apparently manufactured from arm-/leg-ring jewellery (see Section 5.4.2.1), suggest that jewellery was deliberately fragmented to create such objects – further research is necessary to identify the motivations behind such transformations; and, 2) the identification of objects cast in the same mould, or from the same bronze ingot (Section 5.4.3), provide indications of personal and object mobility – further investigation of these aspects would offer a greater understanding of the movement and biography of lake-settlements.

Part I: Region, Source Criticism, Problem and Theoretical Approach

1: The Area of Study

The spatial and temporal range of the current study is wide-ranging and diverse, from the Mediterranean to the Baltic, and from the Bronze Age to the Iron Age. Each of the regions covered in the study have different chronological scales and periods. For instance in the Circum-Alpine area, it is clear that the individual Alpine regions have their own chronology (Menotti 2001a: 33-37). The following chapter will begin with a description of the spatial extent of the study, before describing the temporal and chronological issues requiring definition and comparison for a successful material culture study to be undertaken. The study area for this thesis can be divided into three spatially distinct areas of Europe (Figure 1): the central Mediterranean, the Circum-Alpine region, and the Baltic region (mainly the central-eastern part).

First of all, it is necessary to remember that trade, exchange, and communication relationships occur between zones and regions; more important than the regions themselves are the connections between the regions and the applications to which material culture groups were applied as they travelled across Europe. It is also important to consider that the regions discussed are not exclusive, objects discussed throughout this study may have originated from different regions to the main three discussed here, or they may have travelled through these regions on their way to other areas, for example north-west Europe, the eastern Mediterranean, or Africa. The central Mediterranean and Baltic regions have been chosen for study as they were connected to the Circum-Alpine region by the 'Alpine route' between 1600-1300 BC and 900-500 BC (Sherratt, A 1998). To conduct a material culture study of 'travelling objects' through the Circum-Alpine it is necessary to study object values at different points along not only their use-life and social trajectory, but also their physical and spatial journey.

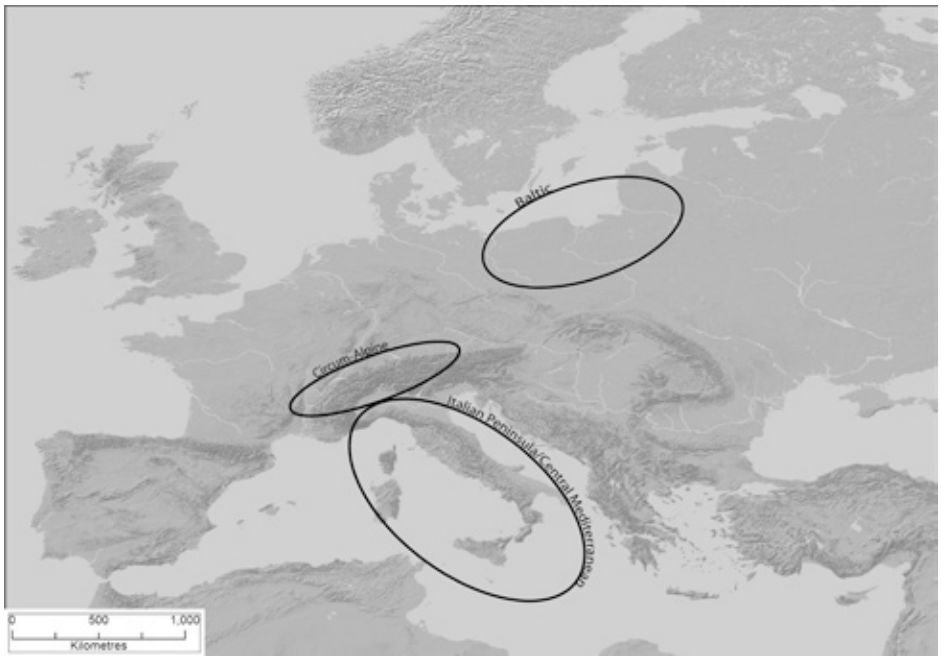

Figure 1: The three main regions of study: the Circum-Alpine region; the Baltic region; and the central-Mediterranean region.

1.1: The Circum-Alpine region

The Circum-Alpine region, centred on the Alpine mountain range, covers a broad swathe of land across the heart of Europe extending from south-eastern France in the west to Slovenia in the east (Figure 2). Constrained by the Po Plain to the south and the Rhône, Rhine and Danube valleys to the north and east and west, the area covers a variety of different landscapes and environments.

1.1.2: Physical and climatic environment

The physical geography of the Circum-Alpine region can be separated into geography and hydrology. Concerning the geographical aspects of the region it is self-evident that there are vast areas of mountainous terrain with interspersed valleys, and hilly areas and plains in the Alpine foreland and the Pre-Alps (Figure 2). Reaching heights of over 4800 metres (Mont Blanc), and with a general height of c. 2000 metres, the Alps appear to create a formidable physical and psychological boundary

to trading routes linking northern and southern Europe through the region. However, it is well known from archaeological finds of 'foreign' elements of material culture (e.g. Köninger and Schlichtherle 2001), spectacular finds such as Ötzi the 'Iceman' (Spindler 2001), and from classical accounts, such as that of Hannibal's crossing of the Alps (e.g. Proctor 1971), that this was not the case. In fact, archaeological evidence attests to extensive communication and trading networks existing across the Alps, most likely crossing at areas such as the Val d'Adige and Valle d'Aosta (Bietti Sestieri 1997) or the San Bernardino, St. Gotthard and Simplon passes (Della Casa 2007; Pearce 1995).

In terms of hydrology, the Circum-Alpine region consists of a mixture of riverine, glacial, and lacustrine systems. The major rivers in the region (the Rhône, Rhine, and Danube) are fed by a number of tributaries, originating from springs or melt-water. Lakes in the region can be divided into three categories: 1) large lakes, 2) medium to small lakes, and 3) mountain lakes. Medium to small lakes (e.g. Totensee, Greifensee) occur at within the mountain region and in the Pre-Alps, whereas the large lakes (e.g. Constance, Lake Geneva, and Lake Neuchâtel, Lake Maggiore, Lake Garda) are situated in the Pre-Alps and are much greater in size. Mountain lakes (such as Klöntalersee) are a cross between mountain and border lakes, and have aspects of both, such as a larger than usual surface area for high altitude lakes. From an archaeological perspective the most important lakes are those in the 'large' (in particular) and medium/small categories, as these lakes were extensively utilized and occupied during prehistory.

The climate of the Circum-Alpine region is generally temperate, but further definition has been provided by some scholars into regions with specific attributes, such as dry seasons in the 'Mediterranean zone', warm and wet in the 'External Southern Alps', cold and wet in the 'External Northern Alps' and 'Internal Eastern Alps', and dry in the 'Intra Alpine Valleys' (Aeschimann and Guisan 1995). The prehistoric climate of the Circum-Alpine region, and indeed for the central Mediterranean and Baltic regions, should be seen against the backdrop of rapid climate change events during the Holocene, with a significant period of global climate change between 3500 and 2500 cal. BP, and specifically a cooling phase in the northern hemisphere (Mayewski *et al.* 2004).

Paleoclimatic reconstruction of the Alpine region began in the 1960's and 70's with the works of, amongst others, Schindler (1971), Zoller (1974), and Patzel (1977), and has continued more recently through the work of Magny (e.g. 2004b, 1992). While this reconstruction accurately covers the last 10,000 years, the most relevant period is that covering the Sub-Boreal[2] and the Sub-Atlantic[3]. The Sub-boreal phase began with a relatively mild climate, with the most favourable conditions between c. 4400 and 3600 cal. BP (Gamper 1981; Burga, Conradin A. 1991), but finished with the coldest phase (c. 3340 to 3175 cal. BP) of the post glacial period, with glacial expansion, increased precipitation, and falling treelines across the Circum-Alpine region (e.g. Van Geel and Magny 2000; Magny 2004b; Magny *et al.* 1998; Renner 1982; Burga, C. A. 1988). A brief climatic improvement marked the beginning of the Sub-Atlantic, but this was only short lived, and dendrochronology suggests further cold periods, glacial expansion, and widespread climatic deterioration between 2700 and 2640 cal. BP and from 2570 to 2490 cal. BP, with warmer, favourable, climatic conditions prevalent between 2640 and 2570 cal. BP (Van Geel *et al.* 1996; Holzhauser *et al.* 2005). From 2490 cal. BP until the present the prominent climatic trend has been one of fluctuation, with a tendency towards cooler conditions than in the Sub-boreal (e.g. Leemann and Niessen 1994).

While evidence from peat humidification profiles in Switzerland (Roos-Barraclough *et al.* 2004) suggests a broad period of climatic decline and increased precipitation levels between c. 1050 and 550 BC, dendro-archaeological analyses (Billamboz 2003) from south-western Germany have provided greater definition and illustrated intermittent climatic decline during the Late Bronze Age, and prolonged decline during the early Iron Age (800-750 BC), with an increasingly more favourable climate from 730 BC, as also suggested by Alpine glacial recessions (Hormes *et al.* 2001). Changing climatic regimes influenced the water levels of lakes in the Circum-Alpine region, with the variation between colder/wetter and warmer/drier climates causing variation between, respectively, higher and lower lake water levels across the whole region (e.g. Magny *et al.* 2009a; Magny 2004b; Maise 1999).

Present climatic effects on the hydrology of the Alpine region have been observed over short term annual cycles, and patterns can be seen through studying the annual records (e.g. Menotti 2001a: 131). Monitoring of lake water levels by administrative departments (e.g. Landesanstalt für Umweltschutz Baden-Württemberg Institut für Seenforschung; Amt für Umwelt des Kantons Thurgau; Kantonsarchäologie Zürich) has allowed the study of patterns of, and influences on, modern lake water level change (e.g. Menotti 2001a: 122). Annual and seasonal effects cause lake level variations depending upon the level of precipitation and the 'sensitivity' of the lakes concerned (Magny 1992). In opposition to what may seem logical, it is apparent that (some) lake levels are actually lower in the winter months and higher during the summer months. Lake levels can be significantly influenced by melt water

[2] 4700-2700 cal BP (Magny 1995: 48).

[3] 2700 cal BP to present (Magny 1995: 48).

during the summer, while during the winter water is stored in the mountains as ice, and thus prevented from entering the riverine and lacustrine system.

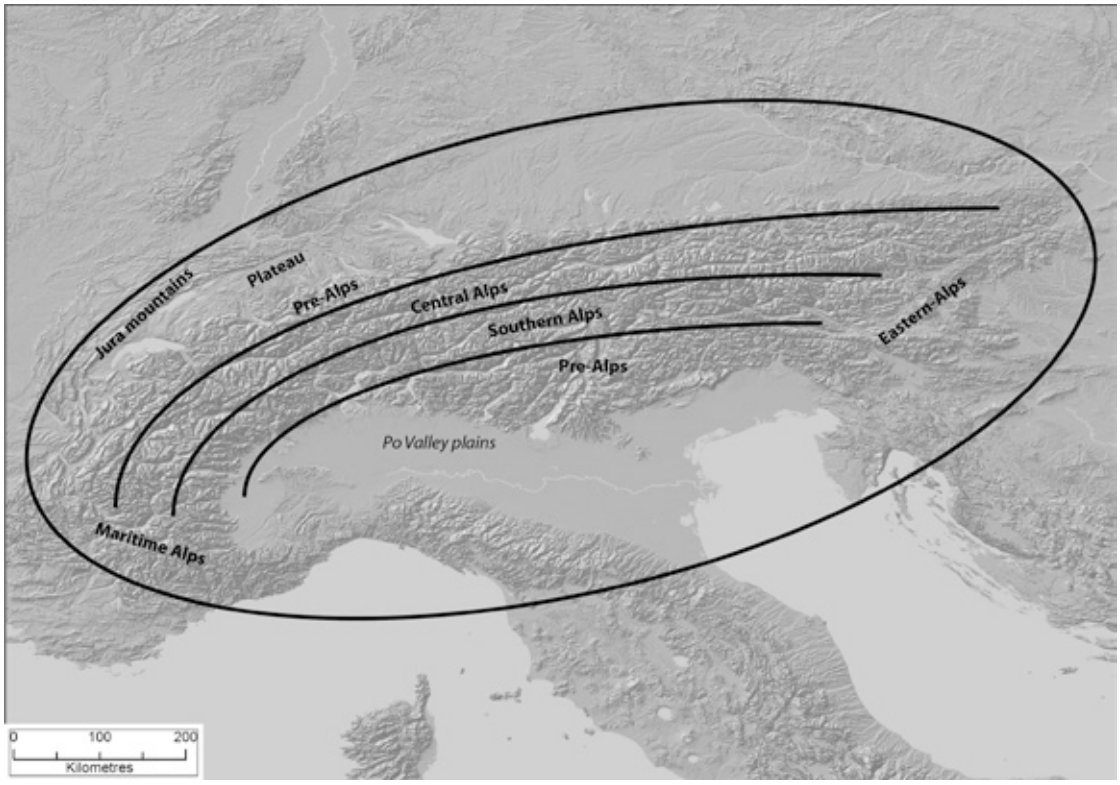

Figure 2: The Circum-Alpine region is not only about mountains; the Pre-Alps area covers broad swathes of foothills and plateau flatlands. The Po Plain forms the border between the Circum-Alpine region and the central Mediterranean.

1.1.3: Archaeology

The first study, by Ferdinand Keller (1854), of a lake-dwelling on Lake Zurich in 1854, fostered widespread interest in lake-dwellings, and created a search for them across Europe. However, this interest quickly degenerated into instances of treasure hunting and looting in some locations (Altorfer 2004a,b; Menotti 2004c, Leuzinger 2010: 86-89). Fortunately, with legislation, protection, and the increasing professionalization of archaeology the situation improved and archaeological investigation and excavation in the lakes of the Circum-Alpine region continued, and recognized that 'lake-dwellings' not only occur in the lake water, but also around lakeshores, marshes, and other wetland environments. During the 1960s and 70s, a number of lake-dwellings were discovered in Switzerland as a result of road building and water level correction projects (Menotti 2001a; Ruoff 2004); and discoveries are in fact still being made, see for instance the settlement recently found during the construction of a new car park for the Zurich Opera house (Bleicher *et al.* 2011). Presently, over 1000 lake-dwelling sites have been identified and recorded in the Circum-Alpine region, many of which have been accurately dated using either dendrochronology or radiocarbon dating (Suter and Schlichtherle 2009). The history of lake-dwelling research, method of excavation and dating used is not homogenous, and the percentage of lake-dwellings dated, varies between the nations in the Circum-Alpine region (see Menotti 2001a, 2004c).

Although seasonal and sporadic occupation of lake-shores (e.g. Lake Feder, Lake Constance) occurred during the Mesolithic, the first 'proper' lake-dwellings in the region appeared during the Neolithic (e.g. Egolzwil, c. 4300 BC (CH) (Vogt 1951)). The most likely theory, supported by evidence of the so-called 'lake-dwelling wheat' (*triticum durum/turgidum*) suggests an influence from the southern Europe for the development of these settlements. This wheat has a Mediterranean origin and has been found in the Iberian peninsula and central Italy, and also many lake-settlements in the Alpine region from the 6th millennium BC (Menotti 2004b; Schlichtherle 1997). The final 'proper' lake-dwelling in the Circum-Alpine region, Ürschhausen-Horn (final occupation), dates to the 7th century BC (Gollnisch-Moos 1999). The duration between the first and final lake-dwellings suggest a tradition of constructing settlements on the lakeshore lasting over 3500 years. However, in the Circum-Alpine region lacustrine occupation was far

from continuous, as a number of hiatuses occurred throughout the entire lake-dwelling period (Menotti 2001a; Gross and Ritzmann 1990).

1.1.3.1: Lake-dwelling hiatus

Large-scale hiatuses occurred in the northern Circum-Alpine region (nCA) between c.3600 and 3300 BC (Neolithic (N)), c.2500 and 2000 BC (the Early Bronze Age (EBA) hiatus), and c.1500 and 1200 BC (the Middle Bronze Age (MBA) hiatus) (Figure 3). In the southern part of the Alps, a lack of dendro-dates makes the identification of hiatuses more complicated, though it is known for certain that the lake-dwelling phenomenon there ended earlier than in the north, e.g. during the 12th century cal. BC (see De Marinis 2009; Menotti 2004a). Influences for abandonment can be cultural, as for the 2400-2000 BC abandonment (Menotti 2001a: 118; Magny 1995, 2004b), and/or environmental, as is the case for the 1500-1200 BC hiatus (Menotti 2001a, 2003, 2004a). The MBA hiatus was directly influenced by climatic deterioration in the Circum-Alpine region, which led to higher lake water levels and possible transgressions at a number of lake-dwelling sites. However, it is important not to over-emphasize the role of climate change and produce climatically deterministic models to the neglect of cultural factors (cf. Leary 2009; De Marinis 2009). Climatic changes can also indirectly effect lake-settlements, through their influence on economic and subsistence systems (Arbogast *et al.* 2006); the effects of this can be seen in the material culture (e.g. Gross-Klee and Schibler 1995; Schibler and Chaix 1995: 117-18).

The direct and indirect influence of climatic change on lake-dwellings does not seem enough, on its own, to cause the widespread abandonment of lake-dwellings across the Alpine region. This widespread abandonment is more culturally related, as the water transgression threat would have quickly been communicated through the local and regional trade networks, attaching a negative stigma to lake-dwellings, and thus influencing their abandonment (Menotti 2001a). The influence of 'negative' attitudes and perceptions of an area in the face of climatic and environmental change have recently been illustrated by Leary (2009: 233; also Arenstam Gibbons and Nicholls 2006) through discussion of the early 20th century abandonment of Holland Island (Chesapeake Bay, Maryland, USA) as a result of sea level rise, which created negative attitudes towards the future of the island, despite the fact that the island remained habitable for significantly longer. After the MBA hiatus (i.e. from 1200 BC onwards) lakes were re-occupied across the Circum-Alpine region, although the number of lake-dwellings never reached the level of the earlier occupations, and they began to disappear at the very end of the Bronze Age (9th - 8th century BC).

Smaller, localized hiatuses also occurred, such as between 3500 and 3450 BC and 3300 to 3250 BC in the northern Alpine region , representing the abandonment of specific lakes or regions. Influences for short-term abandonment could again be climatic and/or cultural. The brevity of abandonment may suggest a greater climatic influence as opposed to cultural. For instance short term exoduses could be caused by rising lake levels, with an immediate return once the lake levels were stabilized. However, some of these short abandonments, such as 3500-3450 and 3300-3250 BC, occurred during favourable climatic periods (Hafner and Suter 2000). There are also instances where wetlands were occupied during unfavourable climatic conditions, such as between 3700 and 3500 BC, and, particularly in western Switzerland, during the 34th century BC (Menotti 2009: 62), suggesting that the link between a positive or negative climate and lake-dwelling occupation is not always conclusive (Pétrequin and Bailly 2004; Magny 2004a,b). The synchronicity of lake water level changes across the nCA has recently been debated (Bleicher 2013), creating further doubt as to how accurate a climatically driven abandonment model is for the whole region.

The long-term tradition of lake-dwellings in the Circum-Alpine region masks the transitory nature of individual lake-dwelling occupations. For instance, the Zurich-Mozartstrasse site shows cultural occupation over 24 centuries between the Neolithic and the Late Bronze Age, with at least 15 phases of occupation and hiatuses (Schmidheiny 2006; Conscience 2001; Gross *et al.* 1987). The site of Zurich-Kleiner Hafner (Suter *et al.* 1987), covers a period from the 4th to 2nd millennium BC, with five distinct phases of settlement and occupation. Shorter cycles of abandonment and re-occupation also occurred, for example at Bodman-Schachen 1 (Lake Constance, D (Köninger 2006)). Some settlements, for instance Unteruhldingen-Stollenwiesen (D (Schöbel 1992)), Cortaillod-Est/-Plage/-Les Esserts (CH (Arnold 1986)) and Auvernier-Nord (CH (Arnold 1983)), were re-occupied, but underwent a spatial shift, and were gradually moved with each phase of re-occupation and new building activity. This may be indicative of changing climatic conditions and the lake water level, as settlement structures were relocated to shallower areas less likely to experience inundation in the event of lake-water level rise. In a process similar to that described by Menotti (2001a, 2003, 2004a), when faced with rising lake water levels, communities may have relocated to safer areas of the shoreline, but without severing their ancestral and traditional links to the lake. There are also lake-dwellings which show only a single short occupation, such as Arbon-Bleiche 3 (Jacomet *et al.* 2004; Leuzinger 2000, 2001). These settlements are interesting as they may represent a brief attempt by a community to access traditional and ancestral links or

legitimisation through the construction and occupation of lake-dwellings (see Section 2.5).

The wide spread occurrence of the lake-dwelling tradition across the Circum-Alpine region suggests that there was cultural homogeneity throughout the region. However, the material cultural evidence does not support this; instead, the Circum-Alpine region consisted of a patchwork of many different cultural groupings and societies.

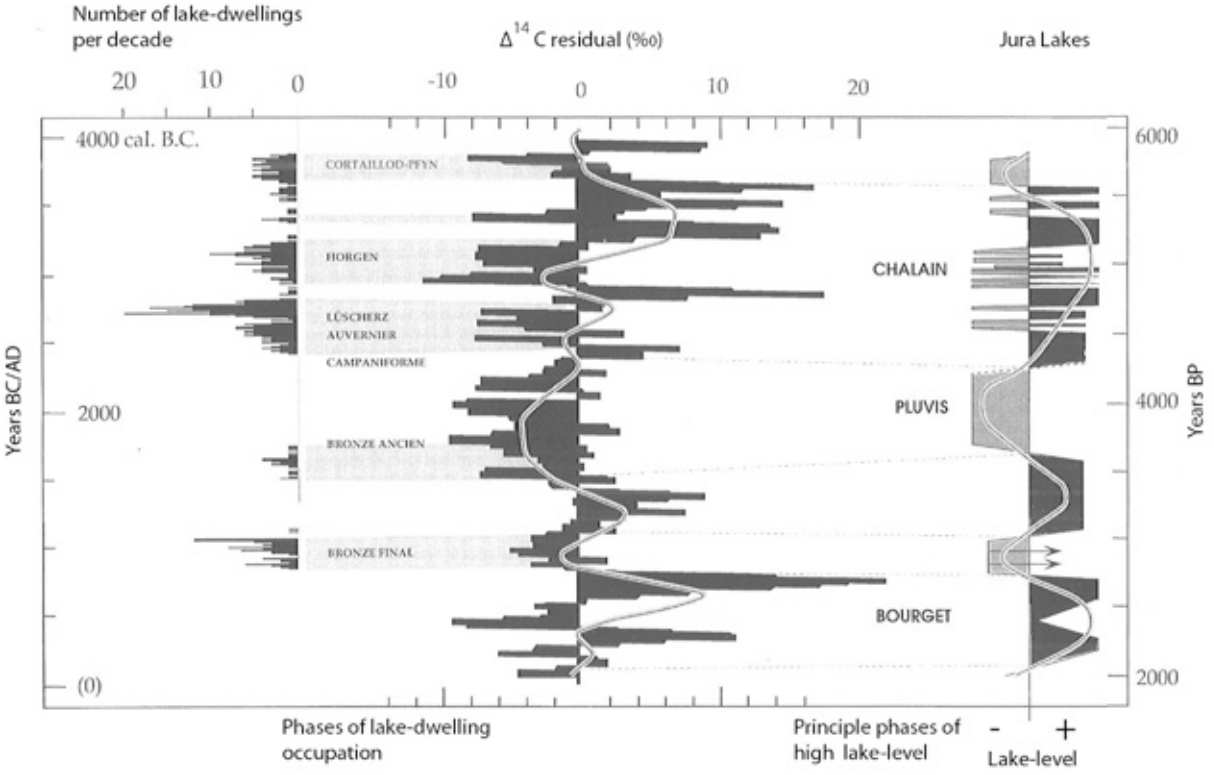

Figure 3: Periods of lake-dwelling occupation in the northern Circum-Alpine region, plotted against atmospheric ^{14}C, and lake levels in the Jura region. Periods of high levels of atmospheric ^{14}C are representative of periods of climatic deterioration and higher lake levels. There is a clear link between the phases of lake-dwelling occupation and more favourable climatic conditions with lower lake water levels (after Magny 1998: Fig. 46).

1.1.3.2: The Late Bronze – Early Iron Age abandonment

While some consideration has been given to *why lake-dwellings were constructed* and inhabited (e.g.Menotti and Pranckėnaitė 2008; Pétrequin and Bailly 2004; Coles, B and Coles 1992), a more interesting question to address is *why were the lake-dwellings abandoned?* Both cultural and climatic factors have been argued for the final abandonment of the lake-dwellings at the end of the Bronze Age, c. 800-700 BC, in the northern Circum-Alpine region (c. 1200 BC in northern Italy (De Marinis 2009). For instance, Menotti (2001a: 119; also Magny *et al.* 2009b; Van Geel and Magny 2000) argues that there was a strictly climatic influence for the final abandonment of the lake-dwellings. Contrastingly, it has been suggested (see Härke 1979: 32, 65; Pétrequin and Bailly 2004: 40-44) that the abandonment could have also been due to cultural factors, and that although the beginning of the Iron Age was marked by a slight climatic deterioration there were actually several periods of favourable lake water levels during the Iron Age (Figure 4). Further disagreement concerning the climatically driven abandonment of the lake-dwellings is provided by the assertion that "… the Late Holocene appears to be punctuated by two major phases of higher lake level at 1550-1150 and 800-400 BC … and two *periods of pronounced lowering at 1150-800* and 250-600 BC." (Holzhauser *et al.* 2005: 796). The exact period when lake-dwellings were being abandoned across the Circum-Alpine region appears to correspond to a prolonged period of lower lake water levels and a more favourable climatic regime – with the exception of two brief episodes of higher lake levels between 1050-1000 and 950-900 BC (ibid.: 795, Fig. 4; though see Bleicher 2013).

The Bronze Age to Iron Age transition in Europe is a complex time period, which can in, many respects, be seen as the expansion of cultural systems and processes that existed during the Late Bronze Age (Thurston 2009:

351). While this is not the place to conduct an analysis of the European Bronze Age to Iron Age transition (e.g. Thurston 2009; Sørensen and Thomas 1989; Ruoff 1974), it is evident that Late Bronze Age (LBA) and early Iron Age (EIA) cultures of the Circum-Alpine region gradually rejected a tradition of lake-dwelling occupation in favour of open lowland and 'highland'[4] settlements, defended hillforts, and later princely residences or *Fürstensitze* (Härke 1989, 1979; Benkert *et al.* 1998).

As previously mentioned, the last lake-dwelling in the Alpine region to be abandoned was Ürschhausen-Horn, with occupation during the latter half of the 9th century BC, followed by an occupational break of roughly 130 years, before being finally abandoned by 630 BC (Billamboz and Gollnisch 1998; Gollnisch-Moos 1999). Unlike the MBA hiatus (see above) the LBA/EIA abandonment process occurred over an extended period of time, with lake-dwellings gradually being abandoned and not reoccupied. In the northern Circum-Alpine region this long phase of abandonment can be seen to have begun immediately following the MBA hiatus, as many former lake-dwelling sites were never re-occupied, and the number of lake-dwellings known within the Circum-Alpine region are significantly less after the MBA hiatus than before. Clearly there is a significant reduction in the number of lake-dwellings that were occupied during the early Iron Age, i.e. Ürschhausen-Horn (Lake Nussbaum), when compared to the number occupied during the Late Bronze Age (see Palafittes 2009). A number of the Late Bronze Age settlements show no indication of previous site occupation such as Greifensee-Böschen (CH) and Konstanz-Raue (D), and others, such as Steckborn and Kreuzlingen (Lake Constance) and Mörigen (CH), show re-occupation from the Neolithic or Early Bronze Age.

1.2: The central Mediterranean

The central Mediterranean region covered by this study is primarily the Italian peninsula (Figure 1) which has variously been labelled as the "western Mediterranean" (e.g. Hodder 1992a: 46), "central Mediterranean" (e.g. Skeates 1995), and "Southern Europe" (e.g. Coles, J M and Harding 1979). Modern Italy extends into the Alps in the north, and thus part of the Italian peninsula has been incorporated within the Circum-Alpine region. A natural division point between the southern Circum-Alpine region (sCA) and the northern central Mediterranean region (i.e. northern Italy) is the Po Plain. Running west to east across the top of Italy, this valley feature effectively cuts a ribbon of flat land across Italy from Venice in the east to Genoa in the west, with the exception of a narrow mountainous coastal strip between Nice and Genoa which connects the Alpine and Apennine ranges.

1.2.1: Physical and climatic environment

With the Po Plain in the north, and encircled by the Tyrrhenian and Adriatic seas (constituent water bodies of the Mediterranean Sea) the Italian peninsula incorporates a wide variety of geographical environments. The physical landscape of the peninsula is predominantly hilly, though varies from the Apennine mountains running along the spine, to low lands around river valleys and the coast in west and south east, and in the Po Plain in the north. The western and Po valley flatlands provide rich and fertile soils for arable agriculture, while the hillier areas are more productive for pastoral farming use.

The waterscape of the central Mediterranean/Italian peninsula is predominantly riverine, the largest of which is the River Po. Running from Pian del Re in the western Alps, the river flows to the eastern coast where it drains in to the Adriatic Sea through a large delta c.20 km south of Venice. Other large rivers are to be found towards the centre of the peninsula, and include the Tiber and the Arno.

The are some large lakes in central Italy, such as Lake Bolsena and Lake Trasimeno, but predominantly lakes are small or at higher altitudes in both the Alpine and Apennine ranges, for example; Lake Accesa, Lake Monticchio, Lago Cecita, and Lago del Salto. The majority of these lakes are dependent upon melt water, glaciers, and mountain streams/rivers for the maintenance of their water levels. However, both Lake Bolsena and Lake Trasimeno were formed in an unusual manner; Lake Bolsena has a volcanic origin and the water level is dependent upon rainfall, surface run off water, and an underground aquifer (Mosello *et al.* 2004). Lake Trasimeno is a geological depression in an otherwise flat area, which has a no in- or outlet, and the lake water level is entirely influenced by rainfall and surface run off water (Burzigotti *et al.* 2003).

The climate of the Mediterranean is influenced by the interaction of north African tropical climate and the North Atlantic climate systems (Zolitschka *et al.* 2000). Water level evidence from Lake Accesa suggests that the climate during the Holocene (and particularly for this study the final two millennia BC) in the central Mediterranean region was broadly similar to that of the Circum-Alpine region, with lake levels varyingly lower and higher during periods of climatic favourability and decline (Magny *et al.* 2007; Magny *et al.* 2009a; Giraudi *et al.* 2011).

[4] By 'highland' is meant settlement elevated on visible hills in the landscape, and not mountainous areas.

1.2.2: Archaeology

Prehistoric Italy cannot be seen as a homogenous region, but as a collection of regions with varying potential and cultures with different trajectories (Bietti Sestieri 1997; Peroni 1979; Barfield 1994; Bietti Sestieri 1981). Even considering sections of the peninsula – such as northern Italy – becomes problematic when attempting to reconcile chronologies and cultural variation in these regions (see De Marinis 2009, 1999).

Lake-dwellings in northern Italy were occupied during the Bronze Age – c. 2200-1100 cal. BC (De Marinis 2009: 535; Marzatico 2004; Aspes *et al.* 1992). Extensive links between the lake-dwellings of northern Italy and those north of the Alps have been identified, including construction methods and material culture types (e.g. Köninger and Schlichtherle 2001; De Marinis 2009). Despite these cultural connections it is clear that the lake-dwellings of northern Italy were in decline and a process of abandonment just as these settlement types were due to undergo a revival north of the Alps.

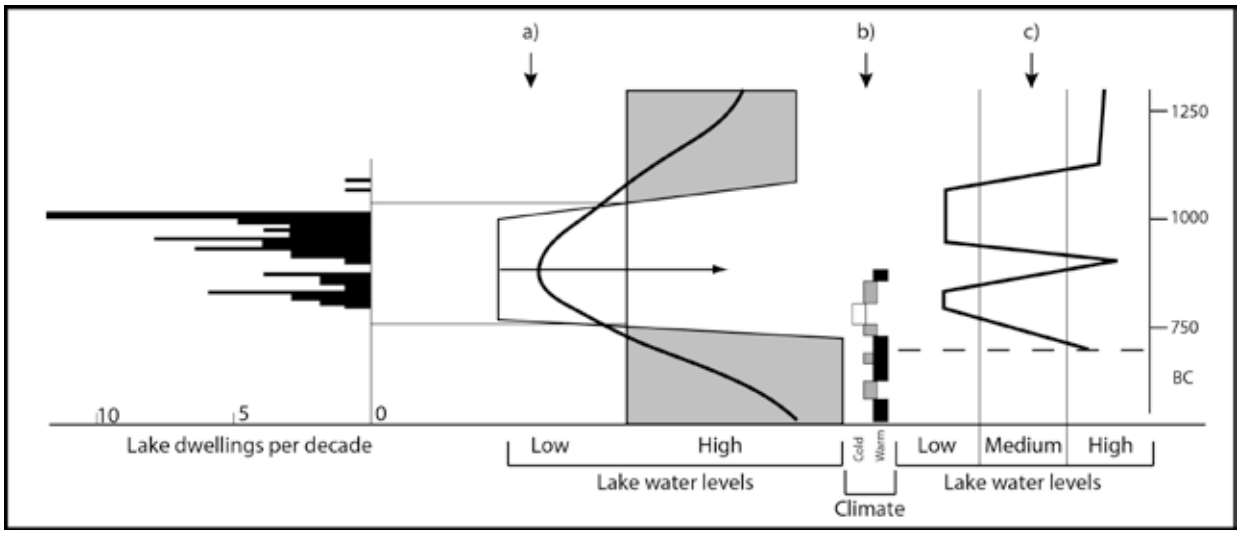

Figure 4: Lake level reconstruction's from the Jura region (a; b) and Lake Zurich (c) show generally synchronous lake water level changes during the Bronze Age - Iron Age transition. It is clearly illustrated that lake-dwellings in the Circum-Alpine region were being abandoned before significant lake water level increase and inferred climatic decline, suggesting that cultural factors may have had significant influence in the final abandonment of lake-dwellings in the region (re-drawn from a) Magny et al 1998; b) Maise 1999; c) Gross and Ritzmann 1990).

The abandonment of lake-dwellings in northern Italy occurred at a time (or just before) when the region was undergoing a general depopulation and abandonment of other settlement types, particularly the *terramare* of the Po Plain. *Terramare*, dating to the Middle and Late Bronze Age (c. 1650-1200 cal. BC) have been described as '*Palafitte a secco*' (pile-dwellings on land) (De Marinis 2000: 187; Marzatico 2009: 216; Strobel 1874) These sites were essentially compact villages with surrounding embankments and moats, situated close to water courses (Cardarelli and Accorsi 2004: 43; Marzatico 2004: 84). The surrounding moats performed more than defensive functions; they were also manipulated for use in agricultural production. The site Terramare di Montale suggests that the surrounding moat was filled with water by diverting a nearby river, and that water level was actively maintained (Cardarelli and Accorsi 2004; Mercuri *et al.* 2006: 56-57). The *terramare* Santa Rosa (Poviglio, Reggio Emilia) also indicates the maintenance of moat water levels using systems of wells (Cremaschi *et al.* 2006).

The group of *terramare* sites forming the Valli Grandi Veronesi (Fondo Paviani (Salzani 1976); Castello del Tartaro; Fabbrica dei Soci) show evidence of being a regional, and inter-regional, manufacturing centre, with metalwork, glass, and amber production (Pearce 1997: 111; De Guio 1991; Nicosia *et al.*). Inter-regional contacts are further attested by the presence of Mycenaean style pottery at the sites (Bettelli and Vagnetti 1997). The recent discovery of the amber working site Grignano (Salzani 2009) provides further indication of the role played by communities of the Po Plain in manufacturing and exchange relationships during the MBA and LBA, and, particularly through those of Frattesina (12^{th}-9^{th} centuries cal. BC) and Montagnana (11^{th}-8^{th} centuries cal. BC) continuing into the EIA.

Four phases of settlement have been proposed for Frattesina, with the most important phase of occupation between the 11^{th} and 10^{th} centuries (Pearce 1997: 109), and two nearby cemeteries at Narde and Fondo Zanotto

(see Salzani and Colonna 2010). The site has extensive evidence of manufacturing, including metalwork, amber (see Section 5.1), glass (see Section 5.2), and other objects such as ostrich egg-shell, bone combs, and Mycenaean style pottery attesting to long-distance contacts (Pearce 1997; Barbarić 2006: 318; Jones, R E *et al.* 2004; Bellato and Bellintani 1984; Bellintani, G F and Peretto 1984). The Trentino region has been proposed as a source for copper utilized in the metalwork industry at Frattesina, which may have been replaced by an Etruscan source during the 11th and 10th centuries cal. BC (Pearce 1997). It is interesting to note that artefact distribution suggests the manufacturing and industrial areas of the Frattesina settlement were not segregated from domestic areas (Bietti Sestieri 1981: 146). The mingling of industrial and domestic activities suggests that technical processes had become, to an extent, normalized in society, where individuals possessed knowledge about manufacturing processes relating to both their own products, and the various products of their neighbours (Towle 2002: 343-44).

In southern Italy the canalized riverside settlement of Poggiomarino (Albore Livadie *et al.* 2005; Albore Livadie and Cicirelli 2003; Cicirelli *et al.* 2007) suggests involvement in long-distance relationships during the Bronze Age and Iron Age, with both Baltic and local varieties of amber present (Angelini and Bellintani 2004). The settlement may represent an important location on trade routes to the south of Italy and also to the Tyrrhenian Sea.

Climatic decline (e.g. flooding, but possibly too dry periods as well), decreasing agricultural production, regional resource over-exploitation, and population migrations have been proposed for influencing the abandonment of the lake-dwellings and *terramare*. While climatic deterioration does not appear to be temporally synchronized with the abandonment of the settlements, the cause of abandonment is currently unknown (see De Marinis 2009; Marzatico 2009). Increasing aridification and a corresponding decline in agricultural productivity would suggest a possible scenario leading to abandonment (Cremaschi *et al.* 2006), though it should be noted that not all *terramare* were abandoned. In fact, at some sites occupation continued and expanded, such as Fondo Paviani, which remained a centre of trade and exchange during the Late Bronze Age (Nicosia *et al.* 2011; also Pearce 1998). This settlement continued to be occupied until the early 10th century cal. BC, though during the latter stages underwent de-population, at which point some areas of the settlement were turned over to agricultural production (Nicosia *et al.* 2011). Conversion of former settlement areas to agricultural production is also seen at the site of Gaggio di Castelfranco Emilia (Balista *et al.* 2003). Turning over former areas of occupation in settlements to agricultural production has interesting implications concerning the acceptable social biographies of dwelling areas, and suggests somewhat of a pragmatic view to land use in the settlements.

Poggiomarino: an important wetland 'port of trade' on the Mediterranean

The settlement Poggiomarino, located on an ancient channel of the Sarno River, is not a lake-dwelling, but rather a canalised (Venice-like) settlement spread along the riverbanks. Consisting of piles driven into the sediment with close spacing to retain infilling sediment and material, artificial islands were created with interweaving canals (see Figure 18). Such structures are apparently without parallel in other areas of Europe for the late Bronze Age and early Iron Age, and represent a novel solution to the requirements of constructing on the riverbank. Some comparison may be drawn to the Terramare settlements of the Po Plain, but those sites were constructed on dry land with water courses diverted around the settlement (see Section 4.1), as opposed to the deliberate construction of multiple islands in a semi-wetland.

Material culture from the site does, however, show that the settlement was well connected to other areas of Europe. For example, Allumiere type amber beads (see Section 5.1) and fibulae (see Section 5.4.2.5) indicate links to Central Italy, and particularly the Po Plain (cf. Cicirelli and Albore Livadi 2012). Some Sicilian amber is also recorded from the site, suggesting that attempts to exploit local sources of amber were occurring in the vicinity of the site during the late Bronze Age and early Iron Age. While the regional importance of the site is unknown, a dugout canoe laden with stone ballast from the island of Ischia (cf. Cicirelli and Albore Livadi 2008) hints that the occupants were in contact with communities at not inconsiderable distances. However, there is no evidence to link this settlement to the lake-dwelling settlements of the northern Circum-Alpine region, even though it may have formed a link in the long-distance exchange route between northern Europe and the Mediterranean.

1.3: The eastern Baltic region

For the purpose of this research, the eastern Baltic region (hereafter also termed Baltic)[5] is taken to include Poland, Lithuania, and Latvia, and thus covers a very large area of the southern and eastern Baltic coastline and adjoining regions. However, lake-dwellings are predominantly present in Poland, with fewer in Lithuania

[5] It is acknowledged that Denmark and northern Germany also form part of the Baltic region, but for clarity this these areas will be termed Southern Scandinavia and northern Germany respectively.

and Latvia, and so the majority of the following discussion is based on research from Poland.

1.3.1: Physical and climatic environment

The Baltic region taken into account for this study covers a wide area, stretching from the western edge of Poland (which may also been termed central Europe) to Latvia in the east. The majority of this area is included within the European Plain, and so the regional topography is generally flat, with hilly regions occurring in Lithuania and Latvia. northern and eastern Poland is very rich in lakes, formed from glacial melt water in moraine basins and sub-glacial channels, which are now incorporated into the riverine system, running northwards to the Baltic Sea. In Lithuania and Latvia, a lake district extends across their eastern border, and continues into Belarus and Russia. The Polish and Lithuanian/Latvian lake districts are generally characterized by smaller lakes, though there are some larger ones, such as Lake Sniardwy (PL, surface area of over 100 km^2), and Lake Drysviaty or Drūkšiai (LT/BLR, surface area over 50 km^2). In addition to the linked lacustrine/riverine system, the Vistula and Oder rivers are major waterways running through the western half of the Baltic region area (i.e. Poland) and would have been used as important communication links to central Europe.

Climate research and reconstruction for the Baltic region is not as advanced as that undertaken for the Circum-Alpine region. However, some publications are available, mostly with relevance to Poland. For instance, Marciniak (1998) used diatom records from Lakes Błędowo and Stelkin to suggest a regional series of lake level changes for the central Polish lowlands, in which the lakes underwent a phase of "distinct lowering" during the Sub-boreal. This was taken to be illustrative of a period of climatic aridification in the region, which is also supported by pollen records from the area.

Lake level rises and increased flooding between 3000 BC and AD 1000, have been linked to climatic fluctuations (Korolec 1968; Starkel 1995). As has already been detailed, such changes are also seen in the records from the central Mediterranean and Circum-Alpine regions and generally central Europe. However, other researchers have linked the lake level rises around 3000 cal. BP to anthropogenic influences, such as forest clearance and increasing land exploitation (e.g. Pawlikowski *et al.* 1982; Hjelmroos-Ericsson 1981).

Evidence of wooden floor raising from the Biskupin fortified settlement (Kostrzewski 1936) suggests that the water level of Lake Biskupin was rising during the occupation of the settlement (possibly leading to the abandonment of the settlement), and continued after the settlement was deserted to cover the entire peninsular (Niewiarowski *et al.* 1991: 88; Niewiarowski *et al.* 1995). These water level changes were not confined to Lake Biskupin and are evident in a number of nearby lakes, such as Lake Packoskie (Niewiarowski 1976), and Lake Wolskie (Nowaczyk *et al.* 1982), suggesting that a climatic influence on lake level changes is more likely than localized anthropogenic influence.

1.3.2: Archaeology

During the latter half of the 19th Century a number of pile dwellings were 'excavated' in the regions formerly termed West Prussia and Pomerania, now part of modern Poland, such as those on Lake Orzysz (Heydeck 1888, 1889), and Lake Parsęcko (Kasiski 1869). In the early 20th century 1933) produced a summary of lake-dwellings from East Prussia (now divided between Poland and Lithuania). Following the discovery of increasing numbers of lake-dwellings around the Alps, Hering (1866) suggested analogies could be made between the lake-dwellings of the Baltic and of the Alpine regions. Initial attempts to date these settlements used toolmark evidence as indications for the type/form of axe used to work the timber (Heydeck 1909), but the dating of many sites remains unclear (see Gackowski 2000: 9-13 for a summary). Radiocarbon and dendrochronological techniques were slow to be applied in the lake-dwelling research in the Baltic region, with the first application at the site on Lake Piłanko in the 1960s (Odoj 1962). More recently systematic excavation and research with the application of dendrochronology, radiocarbon dating and a multidisciplinary approach have been undertaken at lake-dwellings such as Mołtajny (Wilke 1991) Pieczarki (Gackowski 1995; see also Kola 2000), and Luokesas (Menotti *et al.* 2005).

Although evidence suggests that there are prehistoric lake-dwellings/wetland sites from Poland and the Baltic region which date to the Neolithic (e.g. Janits 1959; Loze 1988; Butrimas 1998), the late 1st millennium AD (Urtans and Rains 2004; Apals 2004/05) and Medieval times (Gackowski and Jabłoński 1993), the majority of Polish and Baltic region lake-dwellings date to the Late Bronze Age and Iron Age (Pydyn 2007). Pydyn (2007: 323) defined three broad regions in which lake-dwellings are found within Poland: a) the Masuria Lake District, where sites can be compared to those from Lithuania and Estonia; b) Pomerania; c) the Wielkopolska Lake District (Figure 5).

Despite the significant number of lake-dwellings which are known in the Baltic region (over 50 from Masuria and 25 from Pomerania in Poland alone (see Gackowski 1993a,b), very few sites have been comprehensively excavated and published (Pydyn 2007: 323-24). While Gackowski (2000) and Pydyn (2007) have summarized data for some Polish lake-dwellings, and the Luokesas lake-dwelling (Lithuania) has recently been published (Menotti *et al.* 2005; Lewis 2007; Pranckėnaitė 2011),

there is generally little recent literature which concerns Baltic lake-dwellings when compared to the records concerning the Circum-Alpine region.

Many of the Baltic lake-dwellings of the LBA-EIA appear to have been constructed contemporaneously to, or shortly after, the decline of this tradition in the northern Circum-Alpine region. For example:

- Mołtajny (PL), in use for c. 40 years from around 2535-20 BP[6] (Gackowski 2000: 46-47; Krąpiec 2000: 72; for typological dating see Wilke 1996/97: 23; and Sosnowska 1995)
- Pieczarki (PL), from between c. 2560±40 and 2370±40 BP[7] (Gackowski 2000: 47), also used and repaired over a 40 year, and possibly longer, period (Krąpiec 2000: 73)
- Bogaczewo (PL), from 440 – 400 cal. BC, and occupied for at least 20 years (Krąpiec 2000: 74; see also Goslar 2000)
- Rybical (PL), also constructed between c. 440-400 cal. BC (Krąpiec 2000: 74)
- Several settlements from Lake Orzysz (PL) (Heydeck 1909)
- Lake Luokesas (LT), constructed between 800-400 BC (Menotti *et al.* 2005) consisting of a village and a platform area.
- Recent research by at Lake Powidz (PL) has discovered two contemporaneous settlements from the early 6th century cal. BC (Pydyn 2005).

Gackowski (2000: 48-49) has argued for the beginning of the 'packwerk', or 'grid', method of lake-dwelling construction, and wetland occupation by the West Baltic Barrow culture in eastern Masuria, before spreading to the western region. The technique may have been introduced to eastern Masuria by communities of the Miłograd culture, who had comparable settlements in the Polesye (in southern Belarus and northern Ukraine) (Figure 5).

In addition to considering 'traditional' lake-dwellings, fortified settlements of the Lusatian culture in western Poland may represent another form of lake-settlement. Despite the obvious differences between these types of site, and it is not suggested that the settlement forms are equivalent or should be grouped together, it is hard to deny that the inhabitants deliberately constructed their settlements in water dominated, liminal environments. In some respects these settlements are reminiscent of the *terramare* of the Po Plain and of some Circum-Alpine lake-dwellings, such as Wasserburg-Buchau (D). The most famous of these fortified sites, Biskupin (Kostrzewski 1950), is a large fortification with high building density and grid like organisation of houses, built on a peninsular extending into Biskupin Lake. Dendrochronological analysis suggests that the fortification was built around 740 BC, was partially destroyed by fire, rebuilt and occupied until around 708 BC (Ważny 1994, 2009). The settlement was subsequently used in an unfortified, open state until the end of the 5th century cal. BC (Babiński *et al.* 2007). Other fortified sites of the 'Biskupin type' include:

- Sobiejuchy, with a main phase of occupation between the 8th and 7th centuries BC and constructed on an island above the lake water level (Harding and Locker 2004)
- Smuszewo (Durczewski 1960, 1985; Rajewski 1963; Harding and Rączkowski 2010)
- Izdenbo (Romanowska-Grabowska 1982; Harding and Rączkowski 2010), with a wooden road encircling the stronghold dated to between 840 and 520 BC[8] (Nowaczyk *et al.* 1982)
- Jankowo (Ostoja-Zagórski 1978)
- Słupca (Malinowski, T 1958)

An open lakeside settlement of the Lusatian culture has been found at the site of Grzybiany (Lower Silesia, PL), with settlement phases in the EIA, between the 7th and 5th centuries cal BC (Brzeziński 1991: 76). Cemeteries are often associated with the Lusatian fortified settlements, such as that at Sobiejuchy (see Ostoja-Zagórski and Strzałko 1984) and Komorow fortified settlement/Gorszewice cemetery (see Malinowski, T 1974, 2005; Kruszynski 1991).

Biskupin type settlements have also been interpreted as the culmination of fortified settlement tradition in the Lusatian culture, which was represented by many large terrestrial sites being occupied, particularly during the Late Bronze Age (Kristiansen 1998: 295-99; Niesiołowska-Wędzka 1989; Chochorowski *et al.* 2000). It has been suggested elsewhere that a southern (Mediterranean) influence may be evident in the organized layout of the Biskupin type settlements (e.g. Gedl 1991: 110-11; and Niesiołowska-Wędzka 1989).

The decline of fortified, and also lake-dwelling, settlements may have been influenced by lake water level rise, particularly at Sobiejuchy (Harding and Locker 2004: 20) and Biskupin. As in the Circum-Alpine region, the effects of rising lake water levels would not only have been felt directly by fortified and lake-settlements, but also indirectly through the loss of agricultural land around the settlements, forcing economic and nutritional stress on the inhabitants and possibly inducing a decline of the populations 'biological condition' (see Ostoja-Zagórski and Strzałko 1984).

[6] Calibrated by author using OxCal 4.1 to 794-538 BC

[7] Calibrated by author using OxCal 4.1 to 809-544 / 735-382 BC

[8] Calibrated by author using OxCal4.1 from quoted 2580 ±55 BP.

One hypothesis proposed for the decline of fortified sites during the early Iron Age has been invasion and warfare, supported by frequent finds of Scythian style artefacts (e.g. arrowheads and other weapons) and widespread fire horizons in settlements (e.g. Malinowski, T 1974: 196; Kruszynski 1991: 15-16). While the idea of invading communities has largely been dismissed, with the distribution of Scythian artefacts being the result of exchange and influence relationships (e.g. Pydyn 1999: 51), there remains the possibility that internal and regional group conflict contributed to the abandonment, and destruction, of fortified settlements (Harding and Locker 2004: 198). It is also possible that social factors connected to the density of population within fortified sites contributed to their decline. Considering the density of buildings in Biskupin, close contact between individuals within the settlement and the apparent lack of space for segregation, separation, and individualisation may have placed significant stresses upon social relations (ibid.: 198; cf. Chapman 2000: 207). Social and economic conditions related to overused agricultural soils are Kristiansen's (1998: 295-98) explanation for the decline of the Biskupin type fortified settlements, though he also interprets the founding of these settlements as indicative of social crisis in the Lusatian region.

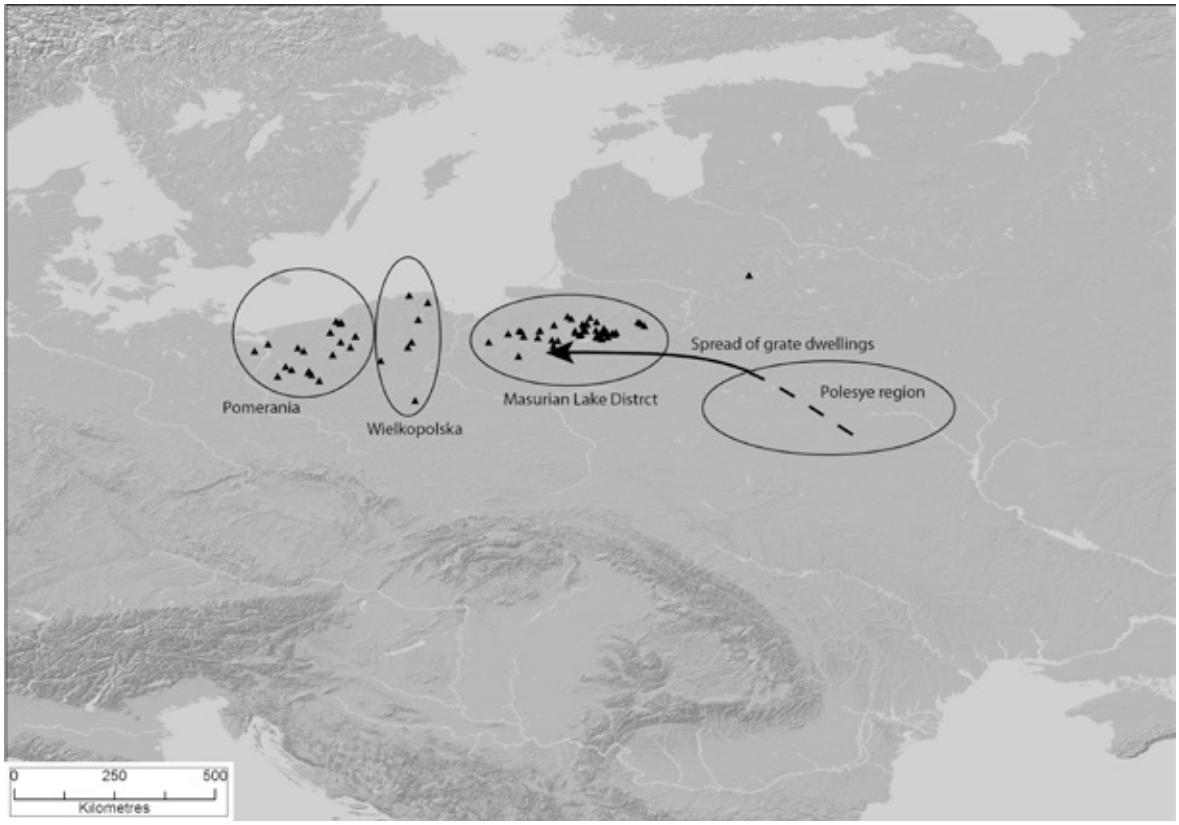

Figure 5: Lake-dwellings of the Baltic region (triangles) can be divided into three broad regions: Pomerania; Wielkopolska; Masuria. Platform grating construction may have spread from the Polesye region (Ukraine and Belarus) initially to eastern Masuria, and subsequently further to the west.

1.4: Chronologies and cultures

Given the wide range of the current study, a brief consideration of the varying cultural settings (Figure 6) and chronologies involved is beneficial (Figure 7). This is not to underestimate the cultural and chronological variation which can occur in small areas; the Circum-Alpine region is an excellent indicator of this. Culturally the Circum-Alpine region displays a high level of complexity during the Neolithic and Early Bronze Age, becoming somewhat simpler and more homogenous during the Late Bronze Age (Strahm 1997; von Freeden and von Schnurbein 2002). However, these 'cultures', e.g. Urnfield culture, can still be divided into regional groupings, such as the Rhine-Swiss-Eastern French group (Figure 6). The Late Bronze Age - early Iron Age transition in Switzerland can be seen as an archaeological construct, defined largely through the cessation of lake-dwelling occupation by 800 BC, and a reduction in the archaeological evidence thereafter. An earlier date for the beginning of the Iron Age, to c. 850 BC, may be indicated by burial evidence from the region (Seifert 1997), though it must be remembered that the boundaries between archaeological ages are simply

categorical constructs used to define ages whose boundaries were blurred and occurred over extended periods of time (Childe 2003: 43).

The northern Circum-Alpine region has the benefit of dendrochronological dating for many sites, particularly lake-dwellings, which have allowed the construction of absolute chronologies. Moving south of the Alps, lack of reliable dendrochronology sequences have contributed to continue the still ongoing debate concerning relative and typological chronologies in the area, which vary between the north-western, north-eastern, and northern/southern Po Plain areas (De Marinis 2009, 1999; Rubat Borel 2006a; Bietti Sestieri 1997; also Bietti Sestieri and Macnamara 2007: 27-30). Although the difficulty of relating absolute and relative chronologies has been clearly demonstrated by a comparison between central European and Aegean chronologies (Trachsel 2004), the transition to the Iron Age in northern Italy has been variously dated to between c.1100 BC (De Marinis 2009) and 900 BC (Rubat Borel 2006a), or in terms of the central European chronologies between the phases HaA2 and HaB2.

Future excavation and investigation will serve to modify or confirm chronological schemes, but it must be repeated that, from a material culture perspective, the chronological periods were not defined and rigidly bound, but blurred with objects continuing in use and circulation between typological periods. 'Cultures', defined by their material assemblage, present a way to examine prehistoric societies on a larger, collective scale. However, archaeology should also attempt a smaller scale analysis at the level of communities, examining how they interacted and utilized material culture to their own ends, without continual reference to abstract 'cultures' – of which communities and individuals may, or may not, have considered themselves members.

1.5: Archaeological and literature source criticism

Incorporating material culture from many areas of Europe will highlight differing standards and aims of research between the various regions. For instance, while significantly more research has been conducted on the lake-dwellings of the northern Circum-Alpine region than those in the Baltic region, hoards and deposition are well recognized in central and northern Europe, but less frequently known from the Alpine forelands. This may be a reflection of varying cultural deposition practices, or techniques and methods employed at the time of excavation. Although recent excavations of lake-dwellings in the nCA have produced excellent research results (e.g. Eberschweiler *et al.* 2007; Jacomet *et al.* 2004; Leuzinger 2000; Köninger 2006; Siedlungsarchäologie im Alpenvorland XI 2009), a number of the Late Bronze Age settlements were excavated during the 19th century (e.g. Mörigen (Bernatzky-Goetze 1987)) or by dredging during the early 20th century (e.g. Zurich-Alpenquai (Mäder 2001a)). These early excavations recovered many of the artefacts which are utilized in the comparative distribution maps to identify trade and communication networks in which the lake-dwelling communities were involved. Although these objects are sufficient for comprehending the exchange routes, a lack of contextual information (other than 'lake-settlement' find) somewhat hinders the interpretation of ritual deposition practices employed by the lake-dwellers. Such practices are easier to identify in central and northern Europe (e.g. France, Germany, Poland, Denmark), where contextual information is available for objects. Even if hoards or burials were excavated in the 19th century, they are still relatively well recorded and understood in terms of their contextual associations. One of the main problems with materials recovered from lake-dwellings during these early 'excavations' is that they do not record or recognize structured depositions (e.g. hoards) that may have been placed within the vicinity of the settlement (e.g. Fischer, V 2012), as are well recorded from terrestrial and 'highland' settlements (for example the Bullenheimerberg (Hagl 2008)).

Research agendas and environmental conditions have also influenced the excavation and publication rates for many types of archaeological site. For example, the many lake-dwellings in the nCA can be seen as a result of the 19th and early 20th century interest, but lowland Alpine valley settlements remain to some extent largely unknown. Many of the finds recorded from the Italian peninsula are from burials, reflecting not only regional research priorities, but also the importance of burial practices to the communities of this region. North of the Alps, burials and cemeteries associated with the lake-settlements are currently under-represented when compared to the apparent population of the area, causing their burial practices to remain an enigma.

Lake-dwellings from the nCA have been extensively, and accurately, dated through dendrochronology (dendro), allowing, in some cases, the identification of individual phases of occupation and abandonment (see Section 4.5). However, many of the artefacts do not have such associated absolute dates; instead they have typological dating with relatively low time resolution, typically of c. 100-year divisions. Artefacts from the Italian peninsula are also dated through typological association, and it is necessary to relate the Italian chronology to that north of the Alps; this correlation will be undertaken using published chronologies (Figure 7).

To conduct an extensive material culture study of forms present in the nCA lake-dwellings, a range of appropriate literature sources will be utilized. Many lake-settlements in the nCA were excavated prior to the final quarter of

the 20th century, and vast quantities of metal artefacts recovered during those excavations have been categorized in the *Prähistorische Bronzefunde* series. This series covers broad areas of Europe for numerous types of Late Bronze Age metalwork, allowing a good comparison of material across not only the main regions of study, but also central Europe in general. These volumes also provide details of find contexts, items found in association with the objects, and typological dating. However, not all of the material culture groups are covered in this series (e.g. ceramics, glass), and some excavations/findings have occurred post publication of the relevant volume. In these cases other literature sources have been utilized.

1.6: The issue of disappearance

The problem can be simply posed as: is it possible to observe any cultural influences for the final abandonment of the lake-dwelling tradition in the northern Circum-Alpine region during the Late Bronze Age and Early Iron Age?. Current models for the abandonment are reliant upon proposals of climatic change influencing the lake environment, and directly affecting the lake-dwelling communities through inundation or economic degradation. However, recent studies have questioned how synchronous such changes were across the whole of the northern Circum-Alpine region (Bleicher 2013). It is well recognized that the Alpine region was incorporated in exchange and communication networks flowing between northern and southern Europe, and it may be possible that inclusion in these networks influenced cultural change in the lake-dwelling communities. Furthermore, the lake-settlement occupation in the Baltic region intensified at the same time as those settlements in the Alpine region were terminally abandoned. Exchange and communication routes may have spread the concept of lake-dwelling between the two regions.

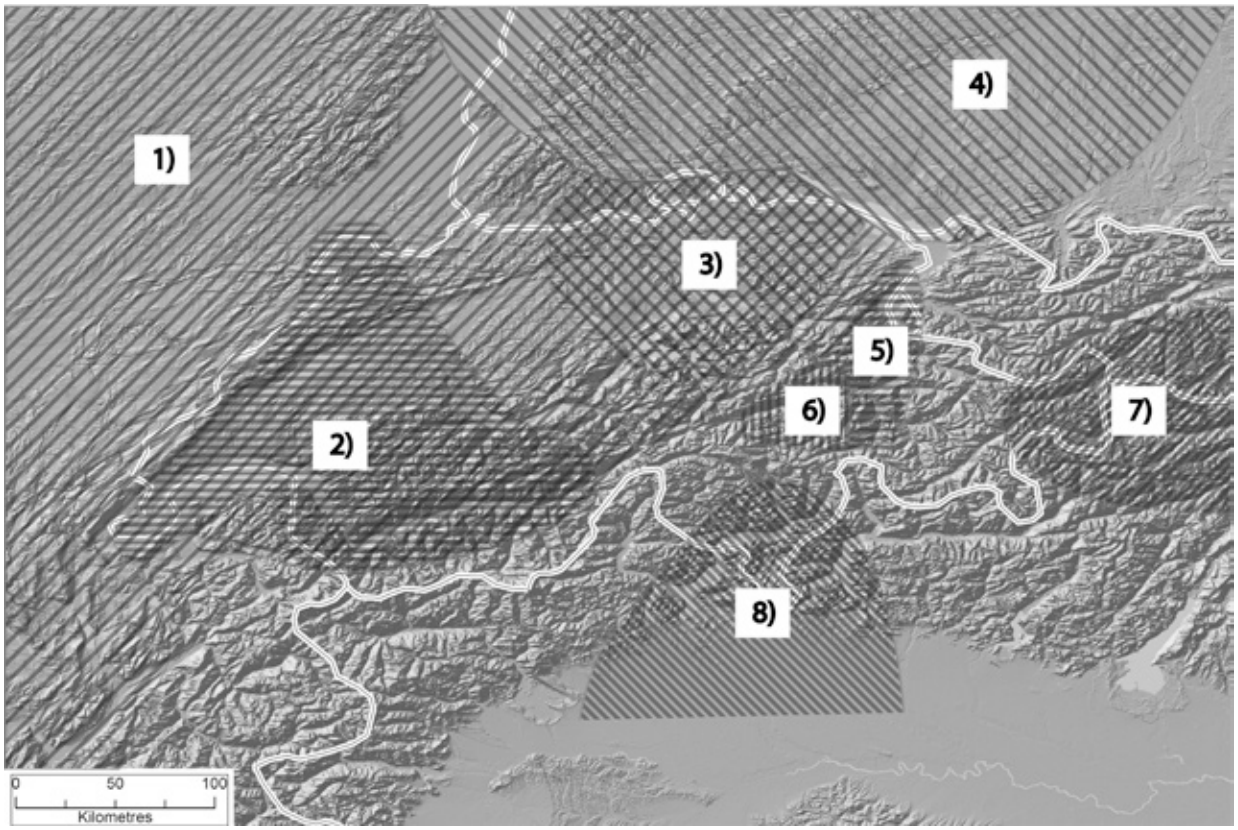

Figure 6: Urnfield cultural variant regions of Switzerland during the Late Bronze Age. 1: Rhine-Swiss-East France (RSFO); 2: RSFO - west Switzerland group; 3: RSFO - east and central Switzerland group; 4: Main-Schwabian group (MS); 5: mixture of RSFO and MS attributes with Laugen-Melauen elements; 6: North Alpine zone with RSFO and MS cultural attributes; 7: Laugen-Melauen Culture; 8: Proto-Golasecca culture (re-drawn from Rychner 1998: Fig. 39).

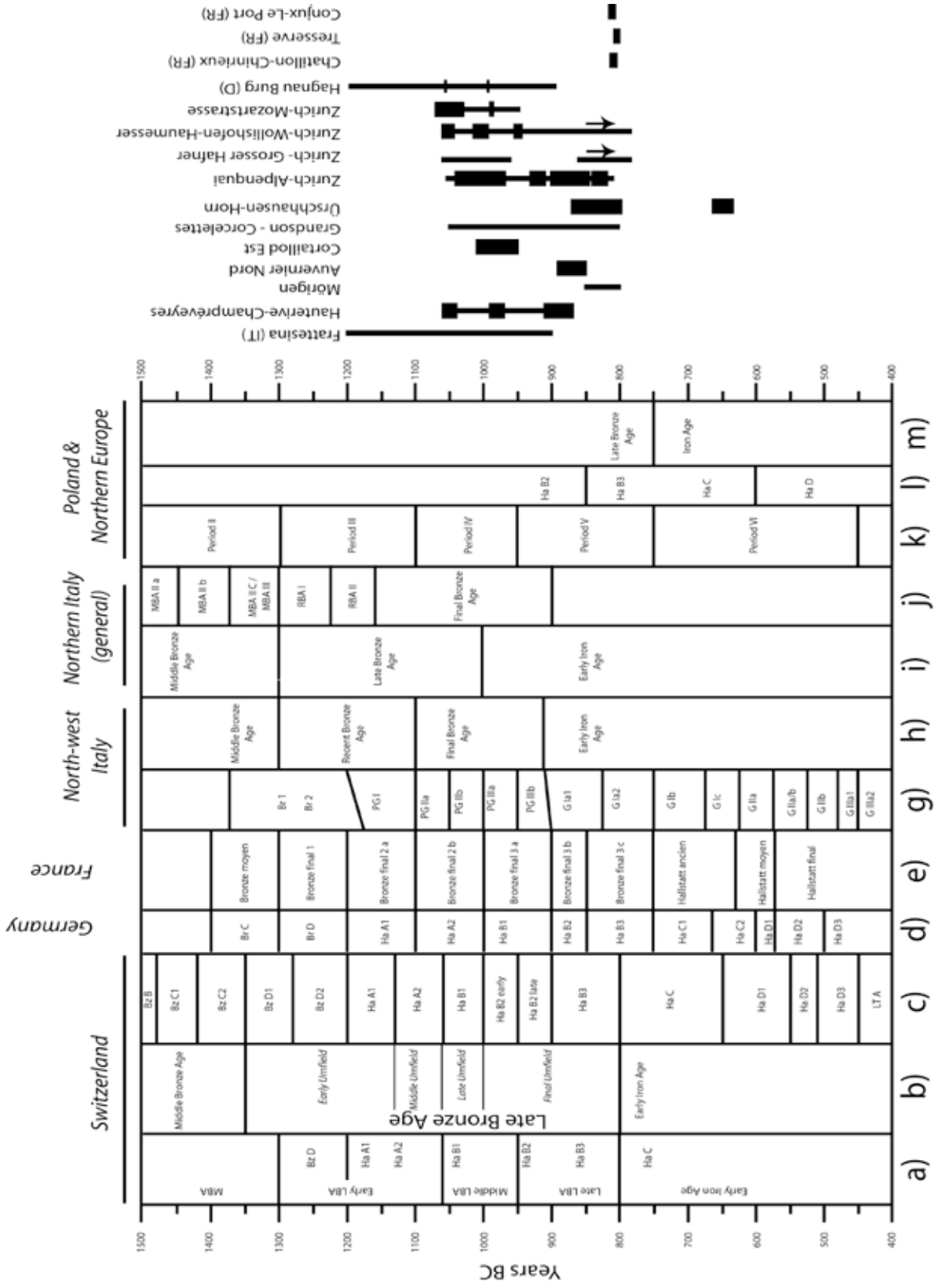

Figure 7: Different chronological systems used in the regions of study, and dating for selected lake-dwellings (dendro-dates in thick line, typological narrow). (Data from: a) Seifert 1997; b, c) Müller et al 1999; Hochuli et al 1998; d, e) Vital, 1993; j, k, l) Pydyn 1999, Harding 1998; f, g) Borel 2006; h, i) de Marinis 2009).

2: Theoretical Development

2.1: A brief history of archaeological theory

Theory has always had a presence in 'archaeological' research, from the historical interest of renaissance intellectuals, through the peak of northern European antiquarianism in the 18th century, to the first systematic archaeological excavations in the 19th century (Boast 2009; Trigger 1989: 35-45). Theoretical positions varied throughout the early history of archaeology, at varying times from nationalism to cultural evolutionism, cultural diffusion, and culminating in a 'cultural-historical' approach in the early 20th century (Trigger 1989: 148-206) with the publication of *The Dawn of European Civilization* (Childe 1925).

The development of 'New Archaeology' or 'processual archaeology' in the 1960s grew out of a general dissatisfaction with the way that archaeology seemed to be generating ever increasing levels of physical data, without developing new interpretations of ideas; simply maintaining the interpretative status quo (e.g. Trigger 1989: 294-303; Johnson 1999: 16; Renfrew and Bahn 2008: 40-42). The theoretical movement was also an attempt to make archaeology "more scientific and more anthropological" (Johnson 1999: 20), and to use generalising laws to better understand the societies behind the archaeological remains which were being excavated. Subsequent critiques of 'processual archaeology' and theoretical reactions or developments during the 1980s (see Johnson 2009) drew influence from sociology and individuals such as Anthony Giddens and Pierre Bourdieu. These developments signified an attempt to move away from purely scientific methods of interpretation and to address the social and cultural choices that were the cause of archaeological remains and material culture; they crystallized an emphasis on understanding the cognitive factors of past societies (Johnson 1999: 85-97; Trigger 1989: 329-69).

Two of the most influential modes of thought and contributions to 'post-processual' or 'interpretative archaeology' (Shanks 1998: 15; Hodder 1991a) were: a) *(post-) structuralism*, the belief that material culture is governed by a set of rules and oppositions of particular artefact types; and b) *Marxism*, which uses inequalities between artefact groups to question how the material culture relates to social systems and practices (Johnson 1999: 85-97). Some of the key aims of 'interpretative archaeology' were to re-enable material culture (Shanks 1998: 15), to recognize that objects/things/artefacts do not always have the same meaning, and to observe the *individual* within archaeology (Johnson 1989: 189). However, this is unreservedly an oversimplification of an eclectic, varied, and diffuse theoretical movement with archaeology.

A significant recognition in post-processual archaeology, though also a continuation of the processual position of bias acknowledgement (Johnson 2009: 82), was that when we interpret, or '(re)create' the past, we do so with our own "culturally constituted behavioural environment" (Hallowell 1955: 87; Tilley 1989: 191-93). This influences not only our interpretation of objects/things/artefacts (Hodder 1991b; Trigger 1989: 379-82; Hallowell 1955: 86-87), but also social identity (Merriman 1987), social relationships (Strathern 1988: 3-4) and conceptions of time (Derevenski 2000: 401). Our inability to interpret objects/things/artefacts from anything other than our contemporary culturally subjective viewpoint would seem to provide a problem through which we are unable to progress; if objects/things/artefacts do not always have the same meaning, how can we interpret them? The solution to this problem proposed by Ian Hodder (1986) is to consider the objects/things/artefacts in context, to look at the 'bigger picture', to accept that the differing context of objects/things/artefacts can illustrate differing meanings (see Section 2.2).

Other theoretical positions drew influence from social anthropologists such as Igor Kopytoff (1986) and Arjun Appadurai (1986), in asserting that commodities (things/objects/artefacts) have social lives; a tangible biography similar to individual persons. Object biographies/life histories have been used within archaeology to help explain and analyse cultural change through the changing attitudes towards objects/things/artefacts (Chapman 2000; Skeates 1995; Jones, A 2002; Chapman and Gaydarska 2007) (see Section 2.4).

During 1990s it was widely accepted that there is no right or wrong way of looking at materiality, that "no one position, or any present of future combination of them, could ever provide a comprehensive understanding of either materiality in general, or particular sub-sets of material forms" (Tilley 2006: 11; Bintliff 1998). In the same manner that it has become common practice to approach archaeological investigation from a multidisciplinary perspective, there could also be a 'multi-theoretical approach', though it is also necessary to recognize the danger of theoretical eclecticism (Chapman and Gaydarska 2007: 2).

2.2: Contextual theory

During the early 1980s Ian Hodder, becoming increasingly doubtful of the ability of 'processual archaeology' to test or prove hypotheses, began suggesting an alternative theoretical framework for approaching archaeology; 'contextual archaeology'

(Hodder 1986). One of the key definition publications for 'contextual archaeology' is *Reading the Past* (Hodder 1986), though there are clear precursors to this volume in his earlier publications. Hodder also acknowledges that "it would be misleading to claim that the aims of a contextual or cultural approach are altogether new" (Hodder 2000: 50), and that earlier British prehistorians, such as Childe, Clark, Daniel and Piggott, perceived many of the same issues which he attempts to address. Over the next decade Hodder would develop and refine the principles of 'contextual archaeology', and embrace the wider influence of hermeneutics (Johnsen and Olsen 1992) in his work, and by which "The introduction of hermeneutics into archaeology has been almost single-handedly accomplished" (Preucel 1991: 22).

Contextual archaeology, and more broadly 'post-processual archaeology', has many themes and perspectives, some of which are:

a) The Ricoeurian concept of 'textual' interpretation (see Ricoeur 1971), and that material culture can be read as a 'text' if we understand the contextual 'grammatical rules' (Buchli 2000) though there is a longer tradition of interpreting material culture as a text in archaeology (Hodder 1989: 250).
b) Using the principles of (post-) structuralism to create dual oppositions and similarities between classes of objects, such as "pure/impure = cattle/pig = male/female = clean/dirty = life/death" (Hodder 1982a: 216) and incorporating structural linguistics and Saussurean semiotics, using the principles of signifier, signified, and referent (Hodder 1992b; Preucel 2010).
c) Addressing the actions of the individual - "Adequate explanations of social systems and social change must involve the individual's assessments and goals" (Hodder 1982b: 5).
d) Addressing the fact that material culture is active, it constructs society through its being, and is not simply a product of social actors (Hodder 1982b; Tilley 1982: 32; Gosden 2005).

While these principles are undoubtedly interesting and can contribute to archaeological interpretation, the key aspect of contextual archaeology which will be of use to this study is the assertion that "The practical meaning of an item of material culture varies according to the context in which it is used … the use of an item in one context is not independent of its use in others." (Hodder 1985: 14). Many 'contextual' studies, covering widely different time periods and locations, have been undertaken in archaeology, which serve to highlight how the meanings of objects change with the context in which they were used, displayed, and deposited (e.g. Hodder 1987a; also Fletcher 2007: 36-39). The concept that meanings of an object change with the context in which it was used and displayed is important to the intended study of artefacts from the Mediterranean, the Alpine region, and the Baltic area, as it must be expected that objects did not convey the same meaning in these culturally and spatially separated locations. On a localized intra-cultural scale, the objects will have been imbued with, constructed, and portrayed different meanings dependent upon their context of use.

It is undoubtedly important to address hermeneutic notions of the past and present being mutually constructive (Hodder 1991a: 10-13), and the difficulty of understanding the past through a "fourfold hermeneutic" (Shanks and Tilley 1992: 107-08), and it must be noted that our contemporary cultural interpretations are in part constructed by our cultural history. However, for this study of interpreting the role of cultural change influencing the final abandonment of the Alpine lake-dwellings, it may provide greater insight to consider that the hermeneutic dialectic can be applied to past societies. *Their view* of *their past* was partly created and influenced by *their present* context, while *their present* was partly created by *their past*. The decision to abandon lake-dwellings as a form of settlement was made with the knowledge that they were ceasing utilisation of a method of settlement, and environmental zone, which had been utilized extensively by their ancestors and throughout their cultural history.

Johnson (1989) criticized the apparent failure of 'post-processual', 'contextual' and 'structural and symbolic' archaeology to address the role of the individual in practice instead of just theory. Through a study of medieval, transitional, and post-medieval houses in Suffolk (UK), he illustrates how individuals constructed houses in the transitional period according to their own individual goals, ambitions, and beliefs. Through house design, construction, and floor plan, the house owners asserted their interpretation of social interactions upon the other members of their household, and clearly demonstrated this to society through the form of the house and its location. Although the actions and the intentions of individuals are not of great concern in the intended study here, Johnson proposes that, in contrast to the 'total history' approach (Hodder 1987b: 2), the "… archaeologist must be prepared to describe the antecedent historical conditions in a normative way …" (Johnson 1989: 207). While acknowledging that "… that moment is itself the product of changing historical forces" (Johnson 1989: 205), it is possible to take the fictional, analytic, normative stance that the moment is stable, stationary, unchanging. In the study of lake-settlement abandonment, it is important to recognize the historical context of lake-settlements, to understand the varying sequences of occupation and temporary abandonment that had occurred in the previous centuries. In order to interpret the impetus of cultural change which led to the final abandonment of the lake-dwelling tradition in these societies, it may be necessary

to view the 'present' in a normative manner; to view the construction and occupation of lake-dwellings as the normal social structure, and the move away from this norm as a transformation of the values that the tradition signified and enabled.

According to Hodder "The focus of interest in the contextual approach is precisely on the comparison of information from different spheres within the same cultural frame" (1982a: 219-20). Thus, a contextual analysis will allow the charting of meanings and associations of objects within a single cultural location through time, i.e. the Mediterranean region *or* the Alpine region lake-dwellings *or* the Baltic area. This analysis will highlight changes in the social attitude towards objects of varying types in each of the three regions to be studied, with a particular emphasis on objects that may have been acquired through long-distance trade. However, in order to generate comparisons between areas with markedly different cultural contexts and traditions, to observe the changing meanings and associations of objects between *different cultural frames* a greater 'Relational Theory' is required.

2.3: Relational theory

Relational theory stems from the anthropological work of Gell (1998) and Strathern (1988; see also 1999, 1997) with concern, respectively, to human/art/object agency and personhood in Melanesia. Strathern describes Melanesian personhood, contrary to Western notions of personhood and the individual, to be *dividual* and *partible*; persons are perceived to be a culmination of social relationships, inalienable possessions, and enchainment's (see also Weiner 1992; Fowler 2004; Whittle 2003; Wagner 1991; Strathern 1991). Trifković (2005: 42) describes the interaction of relationships through the metaphor of the diffraction of light through a prism, whereby the prism redirects the beam of light, while also attaining new properties. In the case of persons this represents their ability to engage and transform relationships through which they attain their own defining properties (Trifković 2005: 43-45). Strathern (1988) argues that all relationships are gendered, that all relationships are exchange relationships, and that relationships are visible only through their indexes – their material manifestations. Thus, it is possible to perceive persons as indexes of the relationships between other persons; they are not only the result of relationships between their contemporaries, or their direct parents and ancestors, but also of relationships between their parents (ancestors) and other persons, which contributed to the growth of their parents (ancestors). Sahlin's (1974: 186) statement that "If friends make gifts, gifts make friends." can be rephrased as: *if people make relationships, relationships make people*.

Under Peircean semiotics (see Preucel and Bauer 2001; Preucel 2010) there are three modes or relations by which objects can represent meanings:

1) Iconic relations, in which an object evokes another through similarities of form or shape, though not necessarily in its function or context of use or deposition.
2) Indexical relations, where an object can represent the actions or objects which are used in its production or procurement, or be a relationship between two things such as lightning and thunder, or a weather vane and wind direction.
3) Symbolic relations, which refer to abstract ideas or objects, with no physical similarities to the symbol, but which are culturally equivalent.

There is no need to differentiate here between these modes of representation through objects (or people), though it is important to be aware of the differences between the three modes and the way in which Gell and Strathern have used the terms.

As shall be discussed further in Section 2.4, it is possible to place people and objects as equals; people can be objects and objects can be people, in what Strathern terms "mediated relationships" (Strathern 1988: 177-79), and Gell states "… 'objects' merge with 'people' by virtue of the existence of social relationships between persons and things, and persons and persons *via* things." (1998: 12 original emphasis). Through the principle of dividual personhood objects can presence and symbolize people (or their attributes), and the relationships that they objectify, in locations distanced from the actual persons. Gurevich (1968: 131) provides an example of this in his study of the Scandinavian Medieval period, when it was common for persons to accept gifts from their chieftain, as they would hope to acquire good luck and success through ownership of the objects – a quality which the chieftain was seen to possess and had been absorbed into the object/gift. Similarly, Gosden and Marshall (1999: 170-72) have noted that sawn sperm whale tooth necklaces are significant for Fijian people, as once possessed and touched by chiefs they become powerful and dangerous; properties of the chief become incorporated with, and are seen to reside in, the necklace (or other such object).

With a marked similarity to 'contextual archaeology' Gell asserts that the meaning, and agency, of objects/persons depends upon their position in their wider network of relationships:

> *… artworks [or objects/persons] are never just singular entities; they are members of categories of artworks, and their significance is crucially affected by the relations which exist between them, as individuals, and other members of the same category*

> *of artworks, and the relationships that exist between this category and other categories of artworks within a stylistic whole…*
> (Gell 1998: 153).

If it is accepted that Stranthern's and Gell's principles of dividual personhood can be equated, fundamentally, to Hodder's contextual archaeology, there appears to be little benefit to adopting the notion of 'relational theory'. However, returning to Hodder's statement that contextual archaeology is concerned with the changing meanings of objects in the 'same cultural frame' (Hodder 1982a: 219-20), there appear to be no such limitations on the changing meanings of objects/persons within relational theory – relationships can be created between different cultural frames. The Kula exchange ring, for instance, is conducted between a number of different cultural frames, but the cultural frames share a common relationship and valuation system in the principle of the Kula ring (Malinowski, B 1922). Thus, through the use of relational theory it will be possible to link the changing notions of the meaning of objects between a single cultural frame, e.g. the Circum-Alpine region, to a different cultural frame, such as the Baltic region.

A possible greater use of relational theory is to utilize the theory in the macro scale, instead of the micro scale. Following the assertion that persons in Melanesia are a result of connected relationships, is it possible, without drastically over-generalising, to say that *cultures* are similarly a product of interconnected relationships? This is not to enter a diffusionist stance, implying that cultural change is instigated through the migration of people and ideas into cultures from an advanced 'core', but instead to theorize that cultures would not take the form that they do, if it were not for the wider network of relationships in which individuals within that culture are incorporated. In a discussion of the Hallstatt to Early La Tène transition in Europe, Parzinger (1995) provides brief glimpses of this proposal, but does not develop them, preferring to continue with the traditional notions of object diffusion, the exchange and 'immigration' of ideas, and the 'influence' of foreign regions. Gell (1998: 153) termed the overarching collective 'culture' as 'style' and interpreted it as a "the harmonic principle which unites works of art into groups, into collectives".

Della Casa (2001), in some ways reminiscent of 'culture systems' (Renfrew 1984a), proposed that the movement of people through, and settlement of, a landscape is dependent upon the interaction between internal and external factors. Using the broad categories which Della Casa detailed, (internal factors: natural environment / economy / social-cultural context; external factors: density of population / the search for metal minerals / the opening of new trade routes) and the concept of relational theory, it is proposed that 'cultures' are the composite of the relations between these internal and external factors (Figure 8), and their relationships with other 'cultures' (see also Moore, T 2007: 95-97 for ideas of 'social networks' and cf. Harris 2013).

With reference to Tilley's (Tilley 1982: 34) statement that "… the social formation is a totality of human experience and action, the entire ensemble of the relations between individuals and groups and of their relationships with their natural and social environment." we can see that society is the sum of its constituent parts. Thus, society is partly influenced by its connections to other societies. Changes to those connections will produce readily apparent changes in the societies. However, this is not a suggestion of Renfrew's (1975: 32) notions of "exogenous" growth, in which societies centralized and developed due to contact with more advanced cultures and civilizations. In the proposed relational model there is no hierarchical structure or concept of transition of 'advanced' ideas, simply the proposal that contact with 'another'/'other' cultures will result in social changes in a given community, society, or culture. These changes may be small, or they may be large, sometimes they may be temporary and quickly forgotten, other times they may be cumulative or long lasting. In this sense the model is similar to Chapman's (2008: 340) assertion that "… exchange contexts, … developed enchained social relations, opening the way to increased sociability, information exchange and perhaps eventually new ways of creating personhood.". Thus, changing external (and internal) networks of relationship, and access that these relations to products and individuals, will cause and influence cultural change. As Jones (2007: 84) states: "Cultural practices are components of networks of referentiality, and as such change can occur by drawing on any other component of the network."

2.4: Biography of objects

W. H. R. Rivers (1910: 7) suggested that a method of elucidating inheritance laws in anthropological studies would be to chart the ownership of land by charting land plot movements on a genealogical type tree, effectively creating an ownership history of the land plots; a land plot biography. Malinowski (1922: 89-99), in his study of the Kula exchange network, suggests that participants in Kula exchange can gain prestige by possessing famous Kula objects or objects that have been previously possessed by prominent or renowned individuals (see also Campbell 1983a,b; Damon 1983; Munn 1983, 1986). The history of the arm-shell or decorated necklace remains with the object as it is traded through the Kula system; the shell/necklace creates and retains a biography of ownership, that participants in the Kula ring may draw upon and manipulate, and through which they can define and create both object and social value (Gosden and Marshall 1999: 170; Appadurai 1986). Both of these early recognitions of the biographies, or life

histories, of objects are fundamentally limited to the recognition of ownership or possession.

Igor Kopytoff (1986) developed these ideas of object ownership biography to consider the reflexive nature of the relationship between humans and objects, and suggested a series of questions which may be asked of objects in order to establish social attitudes towards, and social networks surrounding, them:

What, sociologically, are the biographical possibilities inherent in its 'status' and in the period and culture, and how are these possibilities realized? Where does the thing come from and who made it? What had been its career so far, and what do people consider to be an ideal career for such things? What are the recognized 'ages' or periods it the things life, and what happens to it when it reaches the end of its usefulness?
(Kopytoff 1986: 66-7).

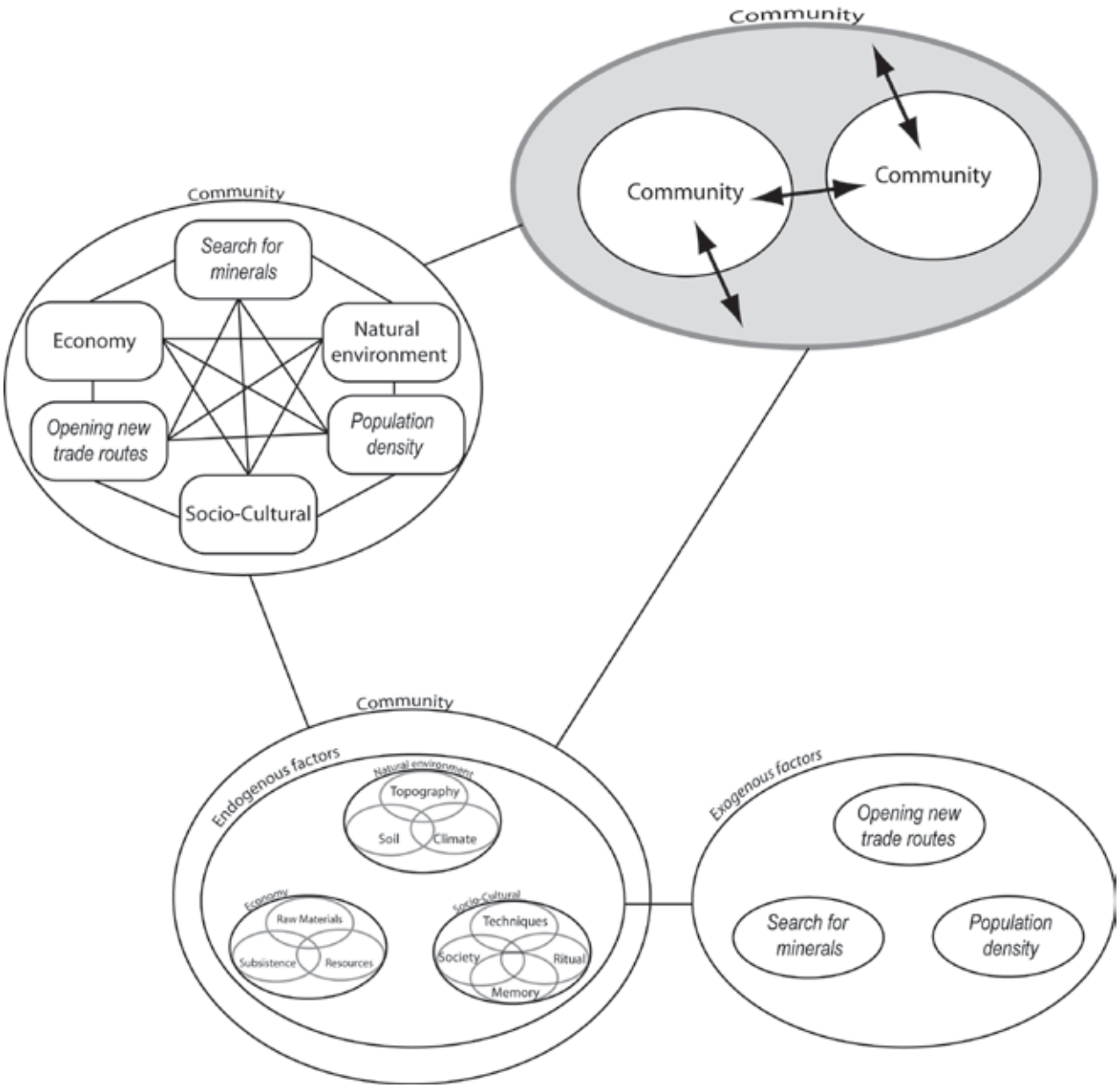

Figure 8: Relational model of the influences of cultural change. Social and cultural change is a result of the interaction between factors both endogenous and exogenous to a cultural entity. The cultural entity is composed of, and affected by, the relationships between these endogenous and factors, including the relationships between separate cultural groups (after Jennings 2012b)

Through the examples of a Suku hut Kopytoff (1986: 67) shows that buildings in Suku society have a distinct life pattern, as a buildings age and deteriorate they are utilized, and are culturally expected to be utilized, in a series of different manners, varying from use as a family house to a chicken hut. The incorrect function of a hut at the incorrect stage of its life provides a socially visible indication of the status of the huts owner/occupier.

Appadurai (1986: 34) attested that the 'biography' approach to the history of an object is well suited to the study of individual items whether those items were of a general category of objects, such as Kopytoff's (1986: 73) Suku hut, or "singularized objects" unique/exclusive items, e.g. Kopytoff's (ibid: 82) example of a Picasso painting. However, if we wish to consider a category of artefacts, as opposed to an individual or singularized object, for instance all of the Suku huts in a village or all of the existing Suku huts, then, Appadurai (1986: 34) suggests that we should instead consider the 'social history' of the object group. This social history transcends the separate object biographies of an object group or class; object social histories are a composite of many object biographies.

By considering object social histories to be a composite of individual object biographies, there is the danger that differences between those individual object biographies could be amalgamated and neglected by creating what is essentially the "ideal career" (Kopytoff 1986: 66-67). Yet, it is the differences between individual biographies that provide the essence of the *social* biographies of objects. Appadurai (1986) developed upon Kopytoff's biography proposal to show that, particularly in Western society but also in pre-modern non-capitalist societies, the commodity status of an object can vary through its biography/social history depending upon the context in which it is placed by individuals or society. In modern Western society there is a high potential for differing opinions of the value of objects, with individuals attesting a higher value for objects (or removing them from commodity status entirely) because of their personal sentimentality towards a specific object (Kopytoff 1986: 80-81). Individuals have differing interests in the regime value of objects, which are a direct indication of their relationship with the object (Appadurai 1986: 57). Shanks (1998: 19-20) approaches singularization and differing regimes of value from Benjamin's (1999) concept of 'aura'; the linking of people and objects through a shared life and the creation/accumulation of object value throughout their life course.

It is essential to avoid constructing the object biography/social life history simply as a "use of life" as defined by Gosden and Marshall (1999), or a literal "life cycle" (Shanks 1998) created from the physical processes and changes that occur to an object during its life, such as Sullivans' 'mapping' (1978), and Schiffer's 'object life history' (1996: 13-23; LaMotta and Schiffer 2001: 21-24). If we become too concerned with the materialistic properties of an objects biography/life history, we risk losing interpretation of the objects social meaning.

Object biographies have been successfully examined in anthropology (for example Hoskins 1998; Miller 1998), and, as has already been shown, the object biography principle was first proposed by anthropologists. It is evident that the questioning nature of the biography approach is well suited to anthropological research where objects can be charted or examined throughout their life course. Hoskins (1998) illustrates how human lives can become entwined with those of objects, how people can impose aspects of themselves onto objects, how objects can come to symbolize people, and how people can depict their life stories through those objects. This returns to the principles of object biographies hinted by Malinowski and Munn with reference to the Kula, and also the principles of dividual personhood developed by Strathern (1988) and Gell (1998).

But how can we recreate object biographies for archaeological material? There is not the opportunity to ask individuals about their objects and note their responses, just as there is no way to know how 'individualized' many objects were. There are some instances where objects were/are certainly individualized, and biographies can be created for these, for example Peers' (1999) study of the S. Black bag, Gosden and Marshall's (1999) account of object 1940.10.54 from the Pitt Rivers Museum, and Hamilakis' (1999) discussion of the cultural life of the Parthenon/Elgin marbles.

However, the fact that very few examples, or only one example, of an object have been found archaeologically does not mean that only a few, or one, existed. There is a significant potential for object destruction or loss post deposition (see Schiffer 1996) before one even begins to consider the issue of probability of discovery. Consider for example the Nebra Sky Disc, a copper plate with gold symbol additions dated to the 16th century BC (Meller 2004a,b). This is believed to be a unique object of high prestige value because of the materials from which it is made, and the location in which it was found. Hypothetically, as the object is made of metals, which are believed to have been considered of a high value, it is possible that there may have been other, similar, contemporary objects, but these were not deposited at the end of their use life. Rather they were converted (through melting) into another object of value, or recycled at the end of one use life stage, and re-entered into another use life as a different object (e.g. Needham 1996). Similarly, Skeates (1995: 285) has suggested that the contrast between the prevalence of 'axe-amulets' and scarcity of hard stone axes discovered in Copper Age

sites of the Maltese Islands may be a result of the transformation of axe blades into axe amulets; one object is recycled into another, creating a disproportion in the archaeological record.

If one considers organic materials, such as wood, bone, or cloth, then the potential for depositional preservation is further reduced due to the specific environmental requirements need to preserve such organic materials. Again, there is also potential for the object to be destroyed before deposition or object re-use. Consider for instance a broken wooden tool or bowl, this may be re-worked into a new object or simply thrown into a fire and burned, leaving nothing but ash or, occasionally, where burning was not complete, charred remains (e.g. Hastorf and Johannessen 1991: 144). With larger, worked, structural timbers there is the possibility that timber was re-used as structures were re-built and modified, as possibly suggested by dendrochronological evidence from Gachnang-Niederwil (Ebersbach 2009) and Alleshausen-Grundwiesen (Bleicher 2009: 125, Fig. 85), where some timbers are clearly earlier than others used in individual structures.

Despite the potential problems with the archaeological interpretation of object biographies, a number of biographical studies of archaeological material have been undertaken (e.g. Chapman 2008, 2000; Chapman and Gaydarska 2007; Moore, T 2007; Sheridan and Davis 2002; Woodward 2002; Sheridan and Davis 1998; Skeates 1995; Tilley 1996; Renfrew 1986; Frieman 2012). The fundamental basis of understanding the social biography of objects is to consider the biography of the object in association with the context in which it was found, linking the principle of object biography to 'contextual archaeology'. This is not to suggest that the (re)construction of object biographies is achieved through reading the material culture as per Hodder's (1986) 'contextual archaeology' (see Jones, A 2007: 76-84), but to insist that an awareness of context is essential to the understanding of object associations and changes to those associations. Through the concept of the relational theory, it has been shown that persons and objects are mutually reflexive, and that objects reference (index/icon/symbol) other concepts, materials and ideas. Objects themselves can become contexts! The aim of the biographical approach is to understand the myriad concepts which an object can signify during its life; this can be achieved by perceiving 'contexts' as 'frozen moments', singular points of reference, throughout the life of the object (Jones, A 2007: 82).

Jones (2007: 141-61) draws significant influence from Gell (1998) in suggesting that we should consider artefacts as part of an *oeuvre* and use the principles of 'protenation', 'retention', and 'citation' as a way of interpreting the wider networks within which objects are components, and as a method of understanding how classes of objects relate to each other, and the social relationships between artefact groups. The principle of 'citation' is a method of conceptualising similarities between objects and observing relationships between separate objects in a group, or objects in differing spatial or temporal locations, and how they evoke associations through the inclusion (or exclusion) of specific aspects or features. The object itself is not 'read' through the understanding of context, rather the changing cultural association of object value through spatial and temporal separation is conceptualized.

Archaeologically excavated objects can only ever be found in a single context, unless there is the rare occasion where a single object can be shown be to have been fragmented and distributed to two different locations (see Chapman 2000: 54 for an example). To avoid a materialistic biography it is necessary to consider, in Appadurai's (1986) terms, the 'social history' of an object class, privileging the examination of a number of individual object biographies from many differing contexts (Chapman 2000), changing associations, and interactions (Skeates 2009: 567). The examination of object classes or categories will produce an *idealized* biography for the objects (Tilley 1996: 248), incorporating the most frequently observed associations within the object category, and undoubtedly ignoring the most rarely seen occurrences, which may be *individualized* objects and perceived as exceptional instances of association.

Fowler (2004: 65), drawing influence from, and paraphrasing Jones (2002: Chapter 5) states that: "Biographical approaches are only effective when the whole story is considered, from the extraction of natural substances, to the conception and construction of the object, through various stages of use and modification, repeated acts of consumption, destruction, and the reuse of fragmented components.". While this clearly refers to the construction of idealized biographies, the statement goes too far in suggesting that biographical approaches can only be successful if they cover an artefact (group) from their very conception to their final destruction. The benefit of a biographical approach is in the multi-contextual analysis of changing culturally ascribed values, and this can be achieved without considering the initial manufacture of an object. In a present-day office it would be possible to understand the changing values which people associate to their morning coffee mugs. Some mugs are decorated, old and chipped, but still curated, in use, and valued for sentimental reasons. Other mugs are new and plain, suggesting that people have little attachment to these mugs and simply discard them once they are chipped or perceived as too old. It is not necessary to consider the manufacture of these mugs, though a greater understanding would be privileged if we knew how mugs

were acquired – gifts, promotional items, self-purchases, or even communal use mugs.

In a prehistoric context, it may not be necessary to know the original source location and manufacturing site or the amber beads found at some of the Swiss lake-dwellings (see Section 5.1), but a multi-contextual analysis of amber beads at these sites, and other local contemporary sites, will allow changing notions of value to be interpreted. The entire conception-to-death biography of an object does not need to be reconstructed to view how objects were alternately valued through time and space, biographical 'windows' are capable of doing this. Through a process of a multi contextual examination the biographies of (archaeological) objects can "… make salient what might otherwise remain obscure" as "…what is significant about the adoption of alien objects – as of alien ideas – is not the fact that they were adopted, but the way they were culturally redefined and put to use." (Kopytoff 1986: 67).

It is not only objects which can have biographies or life histories, it is also possible for places and landscapes[9] to have complex biographies or life histories, as Chapman (2000: 183-221; see also Chapman 1998) illustrated with his study of Vinča-Belo Brdo, and Küchler (1993: 102) suggested for Malangan clan migration. Chapman (2000: 211) suggests that places can accrue (or lose) 'place value' (see also Bowser 2004 for further discussions of 'place') through the presence of (or removal of) objects which have renowned biographies. The 'value' of place can have a mutually constructive (or destructive) relationship with the inhabitants, users, or place creators. Thus, an increase in a locations 'place value' may create positive increase the social perception of its inhabitants or users (Chapman 2000: 211-20), while a decrease in 'place value' may cause a social decline of those inhabitants or users. Utilising the principle of 'place value' it is possible to conceive the biography of landscapes as a cycle of increasing or declining value, created through objects, inhabitants, users, and creators of that place (ibid.: 220). As places become older and accumulate more 'value' they will also generate differing place perceptions due to increasing numbers of inhabitants, users, and objects found at the location; in the same way that individuals can have differing perceptions of an objects value (Appadurai 1986; Kopytoff 1986), they can have differing perceptions of 'place value'.

[9] The term 'landscape' is here used as a term for the environmental surrounding, and while being aware of the politically charged Western notions and origins of 'landscape' (see Bender 2002), there is no reason to pursue them further.

Linked to the conceptions of place 'value' and the biography of objects/landscapes is the notion of memory and how the social/cultural memory of places can influence the location of settlements, attributions of value, and mediate social relationships (see Küchler 1993; Gerritsen 2008; Jones, A 2010).

2.5: Cultural memory

In recent years an increasing number of works concerning the role of memory in material culture and the landscape have been published (e.g. Lillios and Tsamis 2010; Borić 2009; Georgiadis and Gallou 2009; Jones, A 2007; Bender 2002; Bradley and Williams 1998; Gosden and Lock 1998; Küchler 1993), while the connection between place/landscape and memory has been the subject of broader theoretical discussions (see Van Dyke and Alcock 2003: 5). A principle, which has been widely utilized in these studies, is that of "embodied" and "inscribed" memories (Connerton 1989), where by material objects become focal points for remembrance and memories.

The theoretical position that 'landscapes' can have 'place values' and biographies may have relevance when considering the periodic abandonment and re-occupation of lake-dwellings in the Circum-Alpine region. As detailed previously (see Section 1.1.3), some lake-dwelling occupations were very brief, lasting only a decade or so before the site was abandoned and another dwelling established elsewhere. One obvious question here is why were the settlements abandoned? But possibly more importantly, we should be asking why were the sites re-occupied, or why were these sites not re-occupied? The re-occupation of former lake-dwelling sites occurred both directly, where new structures are built directly above previous structures (e.g. Wasserburg-Buchau; D), and adjacently, where the new-/re-occupation occurs at a low spatial separation from the original site (e.g. Sutz-Lattrigen Rütte; CH (Hafner and Suter 2000)). Other sites, for example Greifensee-Böschen (CH), were never re-occupied. The decision whether or not to re-occupy a former lake-dwelling site is interesting given the significant visual presence that the former dwellings will have left on the lake-scape. Even today it is possible to see wooden piles protruding from the lake bed, and so they must have been visible to communities who utilized the lake in the time period following a lake-dwelling abandonment.

One aspect, which may have been significant in the return to, and re-occupation of, previous lake-dwelling sites, is the notion of re-settling a previously successful site (e.g. Kohl 1981: 112); the return to a location know to have been inhabited in the past through visual remnants and social memory. It is important to consider also two other factors: 1) that places can have negative properties (Chapman 1998: 112), negative values, and

negative associations that may act to prevent the re-occupation of a lake-dwelling; and 2) that memories do not have to be direct memories, they can be of other places and other times; "People relate to place and time through memory, but the memories may be of other places and other times." (Bender 2002: 107). The Middle Bronze Age lake-dwelling hiatus may be seen as a good example of this (see page 5); during a period of climatic deterioration a number of lake-dwellings were affected by rising lake water levels, which triggered a negative association with lake-shore occupation and led to the wide spread abandonment of lake-dwellings in the alpine region. Following a return to more favourable climatic conditions and more stable lake water levels, communities returned to the lakeshore, re-occupying former lake-dwelling sites, possibly through social memories of lake-dwellings and the visual recognition of former lake-dwelling structures (Menotti 2001a).

Did the sight and recognition of piles in the lake bed act as a cue for remembrance of past dwellings and act as an attractive force encouraging the re-occupation of a traditional/ancestral site? Or did they act as repulsive forces in periods of social change with societies actively trying to break associations with the past? Chapman (1998: 110) suggested that societies use historical, traditional or ancestral places as a method of reproducing, or changing, cultural value and meaning:

> *… based on the establishment of difference from the past, which constitutes itself through spatial strategies in relation to re-use of previous monuments, abandonment or continuity of occupation. By contrast, the continued use of traditional practices at the same monument will act as the ritualised context for the maintenance of habitus, the reproduction of value and meaning.*

From this perspective, we can see that the continued use, and re-occupation of, lake-dwellings may be an attempt to maintain the social status quo; to retain links to ancestral practices, beliefs, values, creating and continuing a sense of community identity. Contrastingly, the decision not to re-occupy a former lake-dwelling site may represent a break with tradition, an attempt to change social structures, an attempt to 'forget' the past (cf. Gerritsen 2008: 157-58). However, the process of forgetting is simply a different form of remembering; to forget something through relocating is to acknowledge the existence of the past and to move away from it, to actively differentiate from the previous social identities (cf. Jones, A 2007). Furthermore, the construction of a new dwelling can still be seen as a continuation of the past as it is still built upon social memories, upon learned principles and memories of knowledge, building, and skills based in the past (Gerritsen 2008: 148-49).

The cyclic abandonment and re-occupation of lake-dwellings suggests that they were constructed with temporal considerations in mind (see Gerritsen 2008: 151); they were built with an intended life span before they were abandoned and moved to a new location. This temporal duration may have been dictated by the durability of construction materials used, by agricultural concerns, or related to the life cycle of the community (see Section 4.5).

2.6: Trade and cultural change theory

Aside from general archaeological theory, there are two other areas that require consideration: a) theories of trade and exchange, and b) theories of cultural change. These are two of the key aspects which archaeological investigation seeks to understand: where objects came from and how did they circulate, as well as why and how did cultures change and develop. These two areas have traditionally been linked in archaeological research, with theories of trade and exchange being used to support ideas of cultural change.

2.6.1: Trade and exchange

The differences between 'trade' and 'exchange', 'gift' and 'commodity', the development of a 'prestige economy', 'alienable' or 'inalienable' objects have been well covered in the published literature (e.g. Oka and Kusimba 2008: 340-42; Strathern 1988; Weiner 1992; Skeates 2009; Sahlins 1974). Suffice to say that exchanges can occur through two different regimes: that of the inalienable (non-)reciprocal gift, intended to create social ties; and the alienable commodity which creates no social contract or obligations. As described previously, objects can move between the two categories, and both types of exchange occur in societies for different categories of objects (see Section 2.4). Following Chapman (2008: 334), no distinction will be made between the terms 'trade' and 'exchange' as methods of transferring possession of goods and objects. The terms are hereafter used indiscriminately and assumed to be interchangeable.

Chapman (2008) provides a brief and succinct history of the research of trade networks, from Renfrew's (1975) ten modes of resource attainment, through Hodder's (1984) dismissal of the testing of these trade types through fall off patterns, a general decline in the interest of trade and exchange studies, to the recent reconciliation between 'processual' and 'post-processual' views of the benefits of trade and exchange studies to an interpretive archaeology. Chapman suggests that the role of exchange network studies in an 'interpretive archaeology' is less about discovering modes of trade and exchange than discovering the social implications of trade and exchange; that the meanings of trade and exchange were more important than the

trade/exchange of objects themselves, that; "…communities emphasized exotic things to the neglect of comparable and adequate local sources. By travelling far, a hitherto mundane object was transformed into something special, whatever the means of movement." (ibid: 2008: 335). Earle (2010) sees a possibility of fulfilling this ambition through the use of 'Commodity Chain Analysis', an extrapolation and extension of the object biography approach.

In their introductory book to archaeology Renfrew and Bahn (2008: 375) re-list the ten methods of access and interaction to materials and goods (Figure 9) which were initially proposed by Renfrew in *Trade as Action at a Distance* (1975). These different types of access and interaction would leave differing impacts on the number and the variety or quality of objects found at locations (Renfrew 1975). Thus, through distribution studies it would be possible to distinguish between the different modes of exchange that were utilized in a given area, or for types of object. However, the demonstration that different types of exchange method could produce similar fall off patterns (e.g. Hodder and Orton 1976; Hodder and Lane 1982), led to Hodder's rejection of the hypothesis, stating that: "it is simply not possible to test whether historic artefacts moved from source to destination by exchange from person to person or whether, on the other hand, individuals went directly to the source" (Hodder 1984: 26).

For long-distance trade during the European LBA and EIA it is possible to reduce the variety of exchange methods that may have been utilized; direct access, colonial enclave, port of trade, and emissary trading can be removed as methods of procurement. This leaves the exchange methods of 'reciprocity' (home base and boundary), 'down-the-line' trade (though see Skeates 2009: 566), 'central place redistribution', 'central place market' exchange, and 'freelance trading'. Through the comparative study of material culture from the Circum-Alpine region, the Baltic, and the Italian peninsula, trade routes exchange can be proposed and suggestions for the modes of exchange between these regions will be advanced.

These proposals will not occur through simple distribution patterns, but through the forms of objects exchanged, and the meanings and associations that these objects were given in new contexts. For instance, if the contextual meanings of objects are similar in two separate regions, this may be an indication of direct cultural contact between the two areas, thus reducing the likelihood of 'down-the-line' exchange for that object category, and increasing the probability of a direct form of exchange such as reciprocity, possibly under the control of elite individuals (Chapman 2008: 348-52). If there is a gradual shift of object contexts and associations from one region to another, this may suggest the 'down-the-line' mode exchange, under which the association, meanings, and values of specific objects gradually changed as they are passed further down-the-line. In this situation differing object meanings can be interpreted through the number of 'translations' that an object has gone through between source and destination, or in Renfrew's (1975: 46) terms of the exchange of 'information' and the 'noise' introduced by the number of steps between an object source and its final destination.

Chapman (2008: 352) seems to propose that objects possess inherent value: "… because of the inherent value and aesthetic attractions of the things themselves.". However, objects do not have inherent universal value, and it is surprising that Chapman appears to suggest this, given his previous proposals of translation (2000; see below). Appadurai (1986: 3-4), building upon Simmel's (1978: 73) principle that value is a subjective judgement, proposed that value is not an inherent property of objects, and not the cause of why they are/were exchanged, but rather an object's value is socially created through its exchange. Similarly, Renfrew has argued that "… interaction is possible only when the traded commodity *achieves a value* of importance in the social system, often in terms of prestige." (1975: 37; also Renfrew 1992: 8). Value is a social construct dependent upon cultural setting and emphasis, and is negotiated between individuals according to temporal and spatial requirements and beliefs.

Using the example of Saunders' (1999) biographical study of pearls, it is clear that some objects can drastically increase in value as they are traded, either through; a) changing cultural contexts, for instance the 'worthless' European glass to Amerindian symbolic items; or b) through distance from its original source and the associated aspects of acquiring objects from great distances, such as pearls from the Americas. From this understanding, it is easy to progress to the principle that the status of individuals can be increased (or decreased) through their active participation in trade and exchange, and the display and consumption of objects of value. It is not a given that people have high value objects because they have high status, high status can be acquired through the ownership of high value objects (Renfrew 1986: 144).

Chapman (2000: 32) discussed how material objects come to be accepted into new cultural settings, using the principle of 'translation' and 'translators' (see also Babić 2005; Maran 2013), which is, in some ways, similar to Latour's use of 'translation' as "… displacement, drift, invention, mediation, *the creation of a link that did not exist before and that to some degree modifies the original two.*" (Latour 1999: 179) and also Lévi-Strauss' (1989) principles of 'bricolage' and the 'bricoleur'. In Chapman's proposal, individuals (translators) at cultural

contact zones fulfilled a social role similar to that of Helms' (1988) 'long-distance specialist', and also influenced social organisation. As the long-distance specialist's knowledge of the distant 'other', 'foreign', 'alien' or 'strange' (Chapman 2008: 336; also Neustupný 1998) may have provided increased social status and power (Helms 1988: 263; Broodbank 1993: 326-27). Thus the role of the 'translator' with knowledge of foreign products, and more importantly, the ability to relate them to equivalents in the new cultural setting, may have accorded increased (or decreased) social status to the 'translator' (Chapman 2000: 32). The role of translation in the adoption of foreign goods into new cultural situations is clearly evident; if goods cannot be made to fit into pre-existing social structures there will be no place for them in the society. The adoption of goods or material objects is more likely to occur where they have contemporary parallels.

An example of this can be seen in Saunders' (1999) previously discussed pearl trade between Amerindians and Europeans. It is evident that the objects which Europeans traded (glass, mirrors, etc.) were easily translatable to the Amerindian worldview as they possessed an iridescent property which was already present in their social belief system, and so these objects required little translation. Similarly, pearls were easily reconcilable with the European displays of prestige of wealth and power through foreign goods, gems, and stones.

In a proposal of 'emulation', Miller (1982) effectively describes the impact of successful or unsuccessful translation of objects into society. Discussing the innovations of potters in Dangwara, Central India, he notes (ibid.: 93) that some success occurred with the introduction of new forms of pottery which are fundamentally similar to forms already in social use, e.g. the *kunda* (new) and *gumla* (traditional) forms of flower pot. However, attempts to introduce pottery to areas in which it has no traditional use, such as musical instruments, were unsuccessful. This can be analysed in terms of the potter's ability to translate their products into local cultural forms and structures; the new flowerpot has similarities to traditional forms, and the link between the new product and a social use is evident, enabling successful translation. Contrastingly, the use of pottery to create musical instruments has no social precedence, making translation more difficult and thus un-acceptable to local customs.

Once materials or new object types have been successfully translated into a new cultural area, the exchange methods may shift from manufactured goods to raw materials. A corresponding shift in the area of translation from the 'translator' to the 'craftsman' may occur, with associated changes in social status (Helms 1988: 114-16). The 'craftsman' has the ability to transform the raw material, which has already been translated into social use in the form or pre-made objects, into more culturally specific, relevant, or desirable forms, e.g. amber circulation (e.g. Sections 5.1 and 5.2.4). The social impact of the exchange of new items and materials into cultures can thus be seen to have two scales: 1) over the long term the introduction of new objects and material forms may lead to social structure changes, and 2) over the short term the role and status of 'translators' and craftsman in society may increase, causing hierarchical changes in the social order.

Incorporation of objects into society through the action of translation is in distinct opposition to Schiffer's (1996; also LaMotta and Schiffer 2001: 38-40) principle of material based 'adoption', where communities "acquire products whose performance characteristics are better suited to specific activities – current and anticipated – than are alternative products" (LaMotta and Schiffer 2001: 39). Adoption based models of object incorporation are founded on the material/physical properties of objects, which must be self-evident in order for the product to be adopted into societies. However, as has been detailed elsewhere (e.g. Renfrew 1986), the adoption of technologies or goods was not only for functional purposes. In the case of Chalcolithic Europe and the adoption of copper technology Renfrew (1986: 146) states that "… early copper metallurgy does not produce anything decisively useful at all. The artefacts that can be produced from native copper by an annealing process have very few properties to recommend them in comparison to well-chosen stones, and many that are lacking." It is clear that there are numerous reasons for the incorporation of objects in society, not solely materialistic considerations based upon 'performance characteristics'.

An example of object rejection around the Circum-Alpine region during the La Tène period is given by (Kunter 1994; also Venclová 1983) in a discussion of stratified eye-beads, noting that although these yellow and blue-green beads were widely distributed throughout Europe, they are conspicuously absent in Switzerland. Instead, a local variant of blue glass beads is common in this region. The apparent rejection of beads because of their colouring is a clear indication that there was more to the successful translation, incorporation, and utilisation of objects than simply technological considerations.

Since the beginning of systematic petrological classification during the 1920s and 1930s a wide variety of material types have been chemically analysed and scientifically and 'fingerprinted' (Skeates 2009: 560), allowing the source of their component raw material(s), and inferential manufacture, to be identified. This has been accomplished for various types of metals, pottery, glass, amber, and stone and more recently organic materials, enabling source areas to be identified for

some objects and materials (e.g. Hodder and Lane 1982; Beck and Stout 2000; Angelini *et al.* 2004; Angelini and Bellintani 2005; Balassone *et al.* 2009; Ambrose *et al.* 2009; Santi *et al.* 2009; Arletti *et al.* 2010; Jackson and Nicholson 2010; Frei, K M *et al.* 2009). The impact of this analysis on the reconstruction of trading patterns is clearly significant in that it is possible to suggest where an object originated, and where it was finally deposited. Some studies have used fingerprints to infer trade links between the place of origin and deposition, while other studies have shown that over time foreign goods were imitated in local materials (Jones, R E *et al.* 1999; Sheridan and Davis 2002, 1998; also Biehl and Rassamakin 2008).

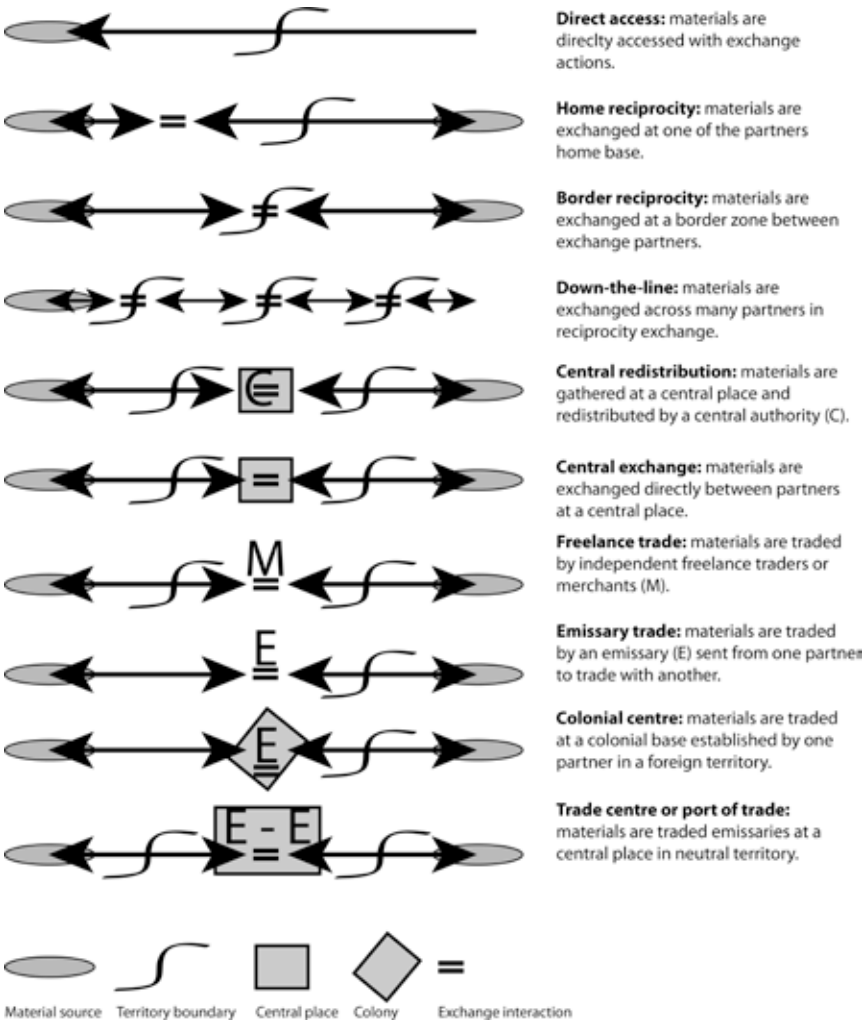

Figure 9: Ten possible modes of exchange and interaction used during prehistory (modified from Renfrew and Bahn 2008: 375).

A significant issue with addressing the social aspects of trade and exchange is the actual identification, and recognition, of what is an 'import' in a pre-state society with fluid cultural, economic and political boundaries, with dynamic cultural contacts and interactions. Pydyn (1999: 11) addressed this issue by suggesting that an 'import' is "… a material object or idea which moved out of its original cultural 'universe', in which practical (technical) and symbolic (religious) knowledge united 'producers' and 'customers', and for a mixture [of] practical and ideological reasons this material object or idea was then redefined in a 'new universe'". While this definition of an 'import' seems adequate, there is an issue which requires attention: 'imports' do not always need redefining when they enter a 'new universe', objects do not always require complex cultural translation when they are introduced to new cultural environs. As has already been illustrated in the discussion of 'translation' objects can be easily adopted into new cultural settings if there are similar equivalents in the contemporary social setting (see 'translation' above). It is also suggested that the associations and 'definitions' of objects may change gradually over distance dependent upon the trade and exchange

mechanisms used in the transmission of objects/ideas. In the case of long-distance exchange objects, there may be a gradual change of the associations and definitions of objects from their source area to distant 'new universe'. From the benefit of our overviewing position, we can observe the difference between the 'universe' and 'new universe'. But what of the (pre-)historic situation?

Did contemporary societies see these goods as 'foreign', or were there simply local goods and ideas, exchanged through a series of local connections, with no concept of their distant origin and 'identity', other than they were 'out of this universe' (cf. Gosden 2005: 198-99, 207-08; Williams 2010: 162)? Surely the correct interpretation should be that there was no '*origin* universe' and '*new* universe' – there was only the '*universe*', a spatio-temporal continuum consisting of the myriad networks and connections of varied object and idea associations and definitions, in which objects were referenced back to items and materials already understood, known, and experienced.

The manufacture and 'imitation' of objects in localized materials is a subject extensively discussed in *Import and Imitation in Archaeology* (Biehl and Rassamakin 2008; also Kristiansen and Larsson 2005b: 16-20). With reference to the earlier discussion of 'translation' (see page 25), the term 'imitation' is overly simplistic and suggests that individuals (within societies/cultures) 'imitate' things because they are there, or because of a self-evident quality of value, superiority, power or technological advantage. Imitation implies an almost passive, un-thinking, copying of new material culture styles, usually as the result of contact with more 'advanced' societies and technologies. Furthermore, it is clear that the concept of 'emulation' (page 26) also implies an inherent attribute in objects which causes persons to try and replicate them (see also Bauer, A A 2008). Such a position is seen in Potrebica's paper (2008: 202), stating that 'imitation' often involves a "limited sense of awareness of the original context of those objects of their conceptual value.".

When objects are 'imitated' in a new cultural locale they become incorporated into a new conceptual and contextual setting. This may be different from their original setting, context, and perception, because 'imitated' objects have been translated and transformed to possess new meanings and values relevant to their new setting; their value and context needs bear no relation to their original cultural setting. This concept is advocated by Vianello (2005: 96; also Stein 2002; Thomas 1991; Kristiansen and Larsson 2005b: 12-13) when stating "… materials had their meaning consciously manipulated in their insertion into the regional cultures.". Objects, materials, and ideas were translated, manipulated, modified, and controlled in a new social setting by individuals in a purposeful manner; not necessarily as functional objects but as symbols to demonstrate power and connectedness or generate legitimacy and identity (Agbe-Davies and Bauer 2010; Bauer, A A 2008). The term 'incorporated' better expresses the process of inclusion and adoption of material culture and styles than 'imitation'.

The concept of 'Skeuomorphism' (e.g. Frieman 2006: 33-38; Hurcombe 2008: 102; Knappett 2002: 108-13) addresses the more social aspects of 'incorporation'; the "meaningful imitation in one material of forms or shapes common to another" (Frieman 2006: 33). While Frieman considers the locations where skeuomorphs occur (2006: 37-38, Fig. 1), the actual process of skeuomorphism is not considered. For skeuomorphs to be created, the process of Translation must already have occurred. Skeuomorphs are not themselves the act of translation of "… a novel object so that it would fit more easily into established social or economic roles" (ibid: 42); rather, they are the product of translation; for a skeuomorph to be created the 'novel object' has already been translated, reconceptualized, and localized into the 'established social or economic roles' by the 'translator' (the manufacturer or producer). Skeuomorphs remain a useful term in this study as it helps to define between translations which have occurred via remanufacture or 'skeuomorphic translation' (e.g. Miller 1982), and those which have occurred via importation or 'importive translation', where the translators are the importing and receiving traders and exchangers (e.g. Saunders 1999).

Potrebica (2008: 199) suggested that "if we perceive culture as cargo, than [sic] objects of prestige present strong conceptual vessels capable of carrying sets of ideas over long-distances and opening more or less stable communication channels for further transfer.". There are two issues with this proposal; firstly that it implies ideas of diffusion, that "culture" was a secondary cargo which was carried along with physical objects and possibly imported/exchange/traded unknowingly, though it may not be intended in this manner. Secondly, it is not only prestige items which can 'contain culture', but any object of exchange can disseminate ideas and views in both directions to the parties involved in exchange; it does not have to be objects of prestige (such as the defensive weapons he discusses) but can be more mundane objects, such as the broken glass studied by Saunders (1999). The extent to which culture was perceived, represented, and maintained in the imported object depends both on the translation of that object into its new social setting, and the views and valuations of the new cultural setting towards the old.

Kristiansen (1996: 338) argues that there is significant ethnographic evidence to link long-distance trade and exchange to cultural change in societies, whether through the ascension to power of new chiefs or the

formation of new elite classes. However, there is undoubtedly a case to be made here for a "chicken or the egg" situation; did long-distance trade cause cultural change, or did cultural change help to influence and propagate long-distance trade?

2.6.2: Cultural change

Tilley (1982) conducted a critique of past approaches to cultural change, and criticized methods of *individualism* and *systems theory* for ascribing, respectively, too much and not enough emphasis to the potential of the individual for instigating social change. He later asserts that material culture is active, in that "It structures and is structured by the perception of actors of their social world and may be a powerful means of legitimating the existing social world. It has a dual effect, as both a creation and a creator of social practice." (Tilley 1982: 32). This is an important consideration for cultural change as it allows the possibility that material objects influence social structures and create social change. A significant point that Tilley generates through this discussion is that "… the social formation is a totality of human experience and action, the entire ensemble of the relations between individuals and groups and of their relationships with their natural and social environment." (Tilley 1982: 34). Thus it is possible to suggest that the relations which exist between cultures/societies, through the medium of individuals, influence and generate cultural change in societies (see Section 2.3).

Three broad forms of impetus for cultural change can be defined: diffusion, evolutionary independent or autonomous innovation, and acculturation. Proposals of cultural diffusion rely upon the principles that "… the transference of cultural traits smaller than the totality of a culture occurs" (Odner 1983: 6), and that "… ideas, values, and technological innovations are being transmitted from the parent society" (Renfrew 1975: 33), or that peoples migrate to, and populate, new areas or take over older societies (cf. Kristiansen and Larsson 2005b: 25-31). Renfrew's early criticism, and perhaps the most fundamental, of the diffusion approach in archaeology is that it provides little interpretation (Renfrew 1975: 21). Other criticisms of the diffusion approach (e.g. Skeates 2009) have remarked that (amongst other points) the notion ideas, values, and technological innovations are transmitted from a 'parent' society to a 'new' society implies a degree of autonomy and inevitability – this is certainly not the case.

There are situations where cultural contact has occurred and 'advanced' technologies have not been immediately transferred; the technology has not 'diffused' from the parent society into a new society. The manufacture of flint daggers in southern Scandinavia/Denmark during the Late Neolithic and Early Bronze age is a good example of this (Frieman 2006); despite contact with metal using communities traditional materials were utilized in new and novel manners to fulfil a social function. The diffusion approach implies a directionality of advanced, developed, or civilized traits emanating from a developed society to a less developed society, and pays little attention to the active social adoption or rejection of technologies, ideas, and values.

During the Late Bronze Age and early Iron Age of Europe cultural connections and communication were prevalent to the extent that it is possible to remove the concept of independent or autonomous innovation as a method of cultural change. This is not to suggest that social or technological innovations did not occur, but to argue that it is not plausible to suggest that innovations could have occurred in a native environment which did not in some manner draw upon influences from external contacts. An example of 'independent invention' provided by Kottak (2009: 40) is that of the development of agriculture in Mexico and the Middle East. On a large scale analysis the spatial and temporal separation is a clear indication of the independent development of agriculture in these two areas. But what about the smaller scale? Was the development of agriculture in either the Middle East or Mexico an independent innovation in the region, or was it in fact a development that took some influence from the intra-regional cultural contacts between various localized communities? It is clear that the concept of independent innovation is applicable to a broad scale analysis, but not smaller, regional level of analysis.

A third approach to cultural change is through the principle of 'acculturation'. In 1936 Redfield, Linton, and Herskovits issued a memorandum for the study of acculturation, and issued the following definition:

> *Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups.*
> (Redfield et al. 1936: 149)

with the condition:

> *Under this definition, acculturation is to be distinguished from culture-change, of which it is but one aspect…. It is also to be differentiated from diffusion, which, while occurring in all instances of acculturation, is not only a phenomenon which frequently takes place without the occurrence of the type of contact between people specified in the definition given above, but also constitutes only one aspect of the process of acculturation.*
> (Redfield et al. 1936: 149-50).

In the proposal of Redfield *et al.*, diffusion is clearly seen as simply a constituent part of acculturation. Clearly, under this definition there are many components to, and modes of acculturation, such as: colonisation, migration, and forced or voluntary adoption.

Moore (1987: 86) states that 'acculturation' as a principle is ill defined, but that it includes a number of principles including: a) inter-cultural contact between two or more different groups; b) the emulation, borrowing, adoption, or absorption of one group by the other; c) a principle of cultural hierarchy, where one cultural group is seen as inferior, or less developed than the other, and it is usually the inferior or less developed which is changed.

More recently Kottak (2009: 39) has defined acculturation as "… the exchange of cultural features that results when groups have continuous first hand contact. The cultures of either or both groups may be changed by this contact. With acculturation parts of the cultures change, but each group remains distinct.". Kristiansen and Larsson (2005b: 26) have also defined acculturation as "… the internal or local process of assimilating foreign cultural traits as a result of diffusion between cultures. In this process the new traits are re-contextualized and given meaning". Different forms of acculturation have also been proposed by some authors (e.g. Moran 2000), for example amensalism and commensalism, which involves the hindrance (or not) of one of the groups involved in exchange/contact by the other.

Unlike diffusion, contemporary (and some older) models of acculturation recognize that there is no given cultural hierarchy and direction of transmission in the process of cultural change, although Stein (2002: 904) has recently argued that acculturation carries "a unidirectional bias in explaining change.". For example Boas (1982: 631) suggested that "there is no people whose customs have developed uninfluenced by foreign culture, that has not borrowed arts and ideas which it has developed in its own way.". Using examples from the Congo and Fiji to illustrate how western tools were incorporated into local culture Boas details how technological innovations can move from a technologically 'advanced' culture to a 'less advanced' one, but provides an example of the reverse situation with the transference of harpoon style from Eskimo culture to British and American whalers. In this sense, acculturation can be seen as an interactive process; there is the active and selective adoption of cultural aspects by societies, dependent upon their pre-existing system of values, beliefs, and material considerations.

Renfrew (1975) discussed some endogenous and exogenous influences for cultural change and urban development, including 'religious predominance', 'population agglomeration', 'intraregional diversity', 'imposition', 'implantation' and 'emulation' (also Green *et al.* 1978 section 1). In this model it is possible for either one of these six factors to cause dramatic social change as the result of a change in their individual weighting. For instance, population agglomeration could lead to the creation of large urban centres, as could a religious domination of the social structure. As a pre-cursor to the notion of 'translation' and 'long-distance specialist' discussed above, Renfrew also suggested that trade and exchange can be a cause of social change, but only when "… the traded commodity achieves a value of importance in the social system, often in terms of prestige." (Renfrew 1975: 37).

In a similar vein, Odner (1983: 6) suggested that one of the significant factors for cultural change and state development on Crete was the external impetus of international trade and long-distance contact and exchange. Similarly, Pydyn (1998: 99), asserted that "… long-distance trade (where knowledge about foreign imports was limited, partial, highly symbolic and restricted to elites) always had a very important position in establishing, maintaining, and changing social, political and economic power.". Thus, it is well acknowledged that long-distance trading contact, and the differential access to such contact, provides a significant impetus for social and cultural change. However, it is also important to consider inter- as well as intra- societal contact, a factor which has often been ignored or minimized in archaeological research (Stein 2002: 903).

In one example of considering intra-societal dynamics, with reference to the communities of the Deh Luran plain (Iran), Hole *et al.* (1969) perceived the most important factors influencing social change as being those internal to societies (not only external contact and exchange), but also suggested that the actual form of changes was partly dependent upon their connection to external factors and other communities:

> *… each regional development must be seen in its own light, and that internal 'adaptive' change was, more often than not, the change that mattered. Each of the prehistoric regional cultures of the Near East developed its own set of behavioural patterns aimed at exploiting the grazing and farming potential of the ecological zone in which it lived. The specific adaptation depended on each group's technology, and its contacts with neighbouring groups who had different techniques to solve their own ecological problems.*
> (Hole et al. 1969: 7).

Of interest here, and particularly to the proposed model of social relations influencing cultural change, is

Renfrew's (1984a,b) proposal of the "multiplier effect" (also Wells 1989):

Changes or innovations occurring in one field of human activity (in one subsystem of a culture) sometimes act so as to favour changes in other fields (in other subsystems). The multiplier effect is said to operate when these induced changes in one or more subsystems themselves act so as to enhance the original changes in the first subsystem. (Renfrew 1984a: 274).

While the "multiplier effect" is clearly linked with cultural systems theory, it is evident that it can also be applied to the relational model of cultural change. Instead of viewing the multiplier effect as a positive feedback scenario with mutual growth induction, it is preferable to interpret the multiplier effect without value. Rather, it should be perceived as simply the 'multiplication of change' where 'sub-systems' (for want of a better term) are both negatively and positively influenced by changes in one 'sub-system', the 'multiplier effect' is an 'inductive effect'. Imagine a rigid box packed full with inflated balloons – at the beginning all of the balloons are the same size, but if one balloon were to be inflated to twice its original size, the remaining balloons would all be compressed and their size reduced. Similarly, if one balloon was deflated to half of its original size, then the other balloons could expand and grow in size. This is the interpretation of the 'multiplier effect' which is proposed here. However, societies are not balloons, and do not respond to changes in pressure in the same manner as air particles, and so, changes in one 'sub-system' will have an inductive effect on the other 'sub-systems', though not all will experience the same level of change. To maintain, or redefine, the social structure some 'sub-systems' may expand, while others may contract, the combination of expansions and contractions will be situation and context dependant.

Particularly since the beginning of the 'post-processual' era, there has been relatively little discussion concerning the explanation of cultural change, when compared to the 'processual era' (e.g. Renfrew 1973; Renfrew and Cooke 1979), although a number of publications discuss cultural change through 'evolution' (e.g. Boyd and Richerson 2005), with the use of statistical modelling (e.g. Shennan 2009; Bentley *et al.* 2004), and Cophylogeny (Tehrani *et al.* 2010). Instead, a greater emphasis has been placed on the actual changes, the influence of trade, interaction, exchange, and the role of the individual in cultural change through notions of 'agency', 'identity', and 'experience' (e.g. Barrett 2000), 'social identity' (e.g. Sherratt, S 2010), gender, and ethnicity (e.g. Stein 2002: 905), object attraction, desirability, and "thurmaticity" (Urban 2010), power (e.g. Kelly 2010), material culture studies (Buchli 2004), communication (e.g. Doonan and Bauer 2010), and the workings of the human mind (Trigger 2004). However, also these notions have been subject to heavy criticism (see e.g. Dobres and Robb 2000). There has also been a recognition that cultural change has multiple influences and that cultures are complex, dynamic systems which differ from society to society, culture to culture, and instance to instance (Sherratt, S 2010: 138).

The notion of 'acculturation' can be seen as a general term, acknowledging many forms of influence for cultural change. Thus there seems little point in debating the relative influential weight of internal or external factors for cultural change, as they change between differing societies. As has been previously detailed, social change, and acculturation, is indeed the product of both endogenous and exogenous factors, but more accurately social/cultural change occurs due to the *interaction and relationships between* endogenous and exogenous factors.

2.7: Application of the theoretical framework

Re-addressing his earlier study of beer can and bottle design (1992: 172-240), Shanks later stated that "There was no object and context, simply networks of connection" (Shanks 2001: 294-95). This recognition encompasses the interaction between contextual theory, relational theory, and the biography of objects; the values placed on material culture objects by society are simply reflections of the wider network of relationships between persons, things, societies, and the environment. The preceding chapter detailed how objects and people can be perceived in a similar manner, and that objects generate a biography in the same manner as persons. Through examining the biographies of different classes of objects in the Baltic, Circum-Alpine, and Mediterranean regions, it will be possible to link the different societies in these regions, through both space and time, by the values ascribed to material culture objects (Figure 10).

It is well known that there were trade routes linking the Baltic to the Mediterranean running through the Alpine region in the prehistory of Europe (see Section 3.1). The interaction between different communities along these trading routes will undoubtedly have affected the social structures within those communities. Any changes that these links induced may be reflected in the material culture record. While the introduction of new materials and adoption of objects may have occurred at sites in the area of study, it is equally probable that social change will manifest in differing interpretations and ascriptions of the value of goods already in use and circulation in a specific region.

Appadurai (1986: 29) discussed these changes of value in terms of 'paths and diversions', where "Change in

cultural construction of commodities is to be sought in the shifting relationship of paths to diversions in the lives of commodities. The diversion of commodities from their customary paths brings in the new." Thus, if we understand the 'normal path' of an object, we can see where and how it has been 'diverted', with an associated change in symbolism or value of that object. These diversions, if observed repetitively, and not as a result of "irregular desires and novel demand" (Appadurai 1986: 29), are a physical representation of cultural change, or continuation through change.

For instance, Shennan (1982; also Beck and Shennan 1991), through a comparative study of amber deposition in burials in Denmark between the middle Neolithic and Middle Bronze Age, has suggested changing notions of values for amber and bronze or copper metalwork. During the Neolithic amber was used extensively as decorative adornments, while at Bronze Age sites it is more commonly found in an un-worked state, e.g. at Bjerre (Bech 1997, 2003; Earle *et al.* 1998), suggesting the value of amber had changed from a social object to a trade object (Earle 2002; also Kristiansen and Larsson 2005b; du Gardin 1993). To use Appadurai's terms, the amber was diverted from its normal regime of value (a prestige or social item) to another (trade commodity), and by bronze and/or copper metalwork.

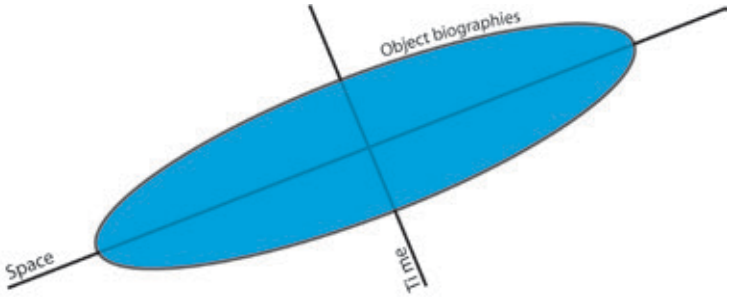

Figure 10: Linking time and space though object biographies. Studying an objects context and associations creates a spatio-temporal reference point. The study of multiple objects in different contexts privileges the creation of an idealized object biography. Through these biographies changes in cultural and contextual value can be perceived concomitantly through both the spatial and temporal axes.

In short, goods become more or less valued as links to external societies and communities increase, with corresponding changing notions of prestige and status, of social or community value, and ancestral or traditional importance.

A biographical study of objects and social technologies (e.g. building construction) travelling through the Circum-Alpine region to the Baltic and will elucidate the changing notions of value attributed to objects/technologies in these societies. The contextualisation of categories of material culture and objects is essential to the creation of a biographical study, as it is important to remember that value cannot be directly observed through the archaeological remains; value can only be inferred from the context and associations of material objects (see Renfrew 1992: 14). In this manner the biographical approach to reconstructing object value through time and space is similar to the 'inter-contextual' theoretical approach proposed by Kristiansen and Larsson (2005b: chapter 1). The identification of 'foreign' elements in a localized material culture will illustrate areas of the 'acceptance' or 'refusal' (Kristiansen 1996: 339) for 'foreign' objects, value, ideas, and concepts, privileging a view of localized attitudes to cultures extraneous to the locality.

Through studying these value changes, it will be possible to observe the impact that the shifting long-distance trade routes had upon the Late Bronze Age Circum-Alpine lake-dwelling societies, and vice versa, while also suggesting the balance between 'local' and 'foreign' elements in regional cultures, directly representing trade, contact, and interaction induced cultural change. It is important to consider that not only the physical objects travelled between the different regions, but also their composite networks of connections, relations, and associations. Interpreting the valuation of objects, instead of attempting to understand the 'meaning' of those objects (cf. Gosden 2005: 208), will assist with assessing the social influence exerted upon the Circum-Alpine lake-dwelling communities by the objects themselves and also by interaction with 'foreign' communities and materials.

Bauer (2008), discussing trade and exchange networks with relation to the Bronze Age Black Sea region, continues Renfrew's (1992) call for trade and exchange studies to look "beyond the material" and study the "social dimensions of interaction and communication" (Bauer, A A 2008: 91), and also to examine how the 'importer' and 'exporter' roles are performed and can

interact to create new cultures in a 'mediative' approach to material culture (Figure 11). A biographical approach to trade and exchange networks will contribute to previous studies in the Circum-Alpine region by providing such a mediative approach and go 'beyond the material' and permit an insight into personal and social attitudes towards value and identity.

2.7.1: The problems of ethnographic analogy

Spriggs (2008) has clearly detailed some issues with the use of ethnographic analogy between prehistoric Europe and the colonial pacific regions, and particularly cites the Kula exchange ring and dividual personhood as being a product of colonial contact with the endogenous cultures in the pacific region (also Küchler 1993; Gosden 1985). The 'relational theory' (see Section 2.3) is primarily based upon research from the Pacific islands into the Kula exchange ring and Melanesian dividual personhood. However, the use of relational theory in this study is not a suggestion that the late Bronze and early Iron Age societies of Europe were similar to the societies discussed in ethnographic studies from the pacific region, or to impose notions of *community*, *communism*, *communality*, or *plurality* on these societies (Van Binsbergen 2005: 19-21). Rather, it is to accept that in modern Western culture there is an acute sense of the individual which has developed though our scientific, political, and cultural history (e.g. Fowler 2004), and that in past societies it is possible (probable) that people viewed themselves more collectively, with relationships between persons assuming greater social significance than they do in the modern Western world.

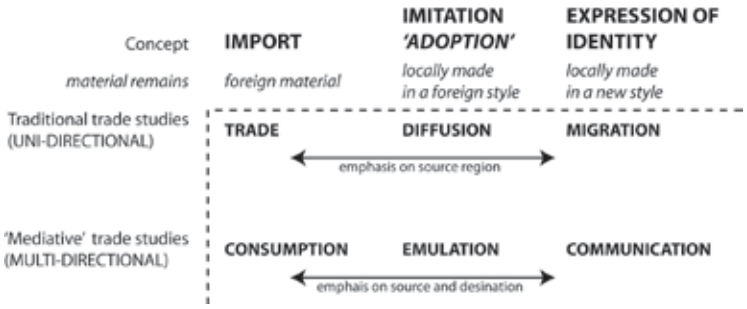

Figure 11: The archaeological interpretation of cultural contact through the interpretation of material culture remains. Traditional approaches to trade and exchange follow a 'uni-directional' model, tracing objects from a source area. Mediative approaches address the destination of objects, and examine the interaction between the source and destination areas (modified from Bauer 2008: 90, Fig 1).

Recently it has been shown that the relational models of people, and *dividual, partible*, or *permeable* (Fowler 2004), personhood are features of spatially and temporally separated cultural locales from pre-Columbian Americas to traditional Greek society (e.g. Busby 1997; Monaghan 1998; Fowler 2004). Even in Western society there are elements (or remnants) of the notion of dividual personhood (see Jones, A 2007: 30-31; Li Puma 1998: 56-61). For instance, when we present relatives gifts at Christmas or birthday times we are presenting them with a symbolic representation of ourselves, an object which will remind the person of ourselves and the relationship between us.

Similarly, when a person moves away from home they will often be presented with a small gift, as a token of good luck but also a mode of representing the absent giver in the possessor's new home and location. Finally, through attendance of funerals and mourning people attempt to reconcile gaps which are left through the absence of people – and the absence of relationships which those people constituted. In this light, and with supporting evidence discussed earlier (e.g. Gurevich 1968), it is not a significant controversy to suggest that Late Bronze Age and early Iron Age European societies may have been more relational and dividual than individual in terms of personhood.

Furthermore, the fact that dividual personhood and the Kula exchange ring can be seen as a creation of colonial contact is not a significant fact in the creation of a world/object viewpoint in relational theory. It does not matter when the Kula ring or notions of dividual personhood were first conceptualized, as they have been utilized to develop a theoretical approach to objects and personhood that can be successfully applied in many different regions of the world through the archaeological notion of object biographies (see Section 2.4). As this work does not attempt to suggest that European prehistoric communities were similar to those of the pacific area, it does not incorporate the problems (Spriggs 2008) suggested that other studies (e.g. Tilley 1996) encountered by creating parallels between prehistoric Europe and ethnographic studies from the pacific area (and other parts of the world).

3: Prehistoric European Trade Routes

Extensive research has been undertaken in the study of prehistoric European trade routes, with particular focus on the Bronze Age Mediterranean and the Bronze Age Aegean (e.g. Whittaker 2008; Crewe 2007; Vianello 2005; Stampolidis 2003; Morgenroth 1999; Cline 1994; Bouzek 1997; Harding 1984; Sherratt, S and Sherratt 1993; Laffineur and Greco 2005). These studies have the benefit of utilising artefactual evidence from shipwrecks (e.g. Jurišić 2000) to provide clear indications of exchange networks and the types of goods exchanged, as goods contained within shipwrecks were literally in transit at the time of deposition (e.g. the Kas/Ulu-Burun shipwreck Pulak 1998). Less research has been specifically focused on the Late Bronze Age and early Iron Age overland trade routes that existed outside of the Mediterranean sphere. Early studies of these routes examined artefacts, particularly metalwork, from southern Europe found in the northern Germany and Denmark (e.g. Cleland 1927; Sprockhoff 1951; Jacob-Friesen 1967; Tackenberg 1971; Thrane 1975). These long-distance trade routes have recently been re-addressed and re-interpreted (e.g. Potrebica 2008; Winter 2008; Baron and Lasak 2007; Della Casa 2007; Galanaki *et al.* 2007; Nash Briggs 2003; Lang and Salač 2002; Szabó and Szónóky 1998; Bietti Sestieri 1997; Stary 1995).

One of the main problems encountered by studies of overland trade and exchange routes, particularly those from the northern to southern Europe, is to understand what was actually exchanged. While objects which have been seen as indicative of trade routes flowing from the south are generally manufactured metal work (e.g. Kristiansen 1998: 162; Struve 1979: Fig. 72; Thrane 1975), many of the goods proposed as exchange objects flowing in the opposite direction are organic materials and consumables. Goods such as textiles, furs and hides, people (either as slaves or through marriage practices), animal stock, sea salt, wax, pitch, resin, honey, timber, wine, olive oil, cereal crops, cheese, herbs, spices, and ointments and perfumes are rarely preserved in the archaeological record and so trade route interpretations are created from only a fraction of the traded material (Kristiansen 1998: 180; Stary 1995; Sherratt, A 1993: 31, 38; Bouzek 1997: 210; Nash Briggs 2003; Artursson and Nicolis 2005: 336). Weiner (1989: 325) provides an excellent example of what he terms "trade without a trace" when citing the tale of a mid-11th century BC trader, moving from Egypt to Byblos to acquire timber in exchange for quantities of linen garments, papyrus, ox hides, ropes, lentils, fish, in addition to the more likely archaeologically preserved materials of gold and silver.

Probably the most archaeologically visible material to have been transported from the north of Europe is amber, for which prehistoric trade routes were first proposed by De Navarro (1925). While these routes receive periodic revivals of interest and reappraisal, (e.g. Galanaki *et al.* 2007; Bouzek 1993; du Gardin 1993; Bukowski 1988), the distribution maps of Baltic amber finds in central Europe still appear to support the same general trade routes (see Stahl 2006: maps 1-4).

A useful starting point from which to consider long-distance trade networks through the Circum-Alpine region is Andrew Sherratt's (1998) text *The Human Geography of Europe: A Prehistoric Perspective*, which details the shifting nature of trade routes in Europe during the Bronze Age.

3.1: European long-distance trade routes

Prehistoric trade routes between the eastern/central Mediterranean and the Baltic regions have been interpreted as flowing along two main routes: the Danubian and the Alpine route (Sherratt, A 1993, 1998). Predominance of the main route utilized varied over time, dependent upon the socio-economic balance of the Mediterranean societies (Figure 12). Primacy of the Mediterranean economy by the societies of the eastern Mediterranean on Cyprus and Crete during the early 2nd millennium BC led to the utilisation and expansion of the Danubian route, flowing between the east Mediterranean and the Baltic region via the Carpathian Basin, the Danube, and central Europe. As the eastern Mediterranean societies explored and interacted with the central and western Mediterranean region the Alpine trade route gradually increased, using either the Italian peninsula or the Aegean Sea and Balkan region as a route to access materials from the north of Europe. With the collapse of the eastern Mediterranean palace economies during the late 2nd millennium BC, economic contraction of the Mediterranean led to a decline, though not complete collapse or abandonment (see Iacono 2013), of the Alpine route and a return to some of the Danubian/Carpathian links. Renewed and intensified communication and exchange links of the early 1st millennium BC (LBA-EIA) between the east and western-central Mediterranean again led to a flourishing of the Alpine route (see Sherratt, A 1998, 1993; Sherratt, S and Sherratt 1993; Kristiansen and Larsson 2005b: 116-84; Kristiansen 1998; Pydyn 1999). While the central focus of this study is on the north-south European connection, it should be noted that during prehistory there were many trade routes and connections crossing Europe, flowing in many directions, including east to west across the continent (e.g. Morgenroth 1999). Regions and communities may have been involved with and incorporated several of these routes at the same time (Pydyn 1999: 21, 56, Map 86).

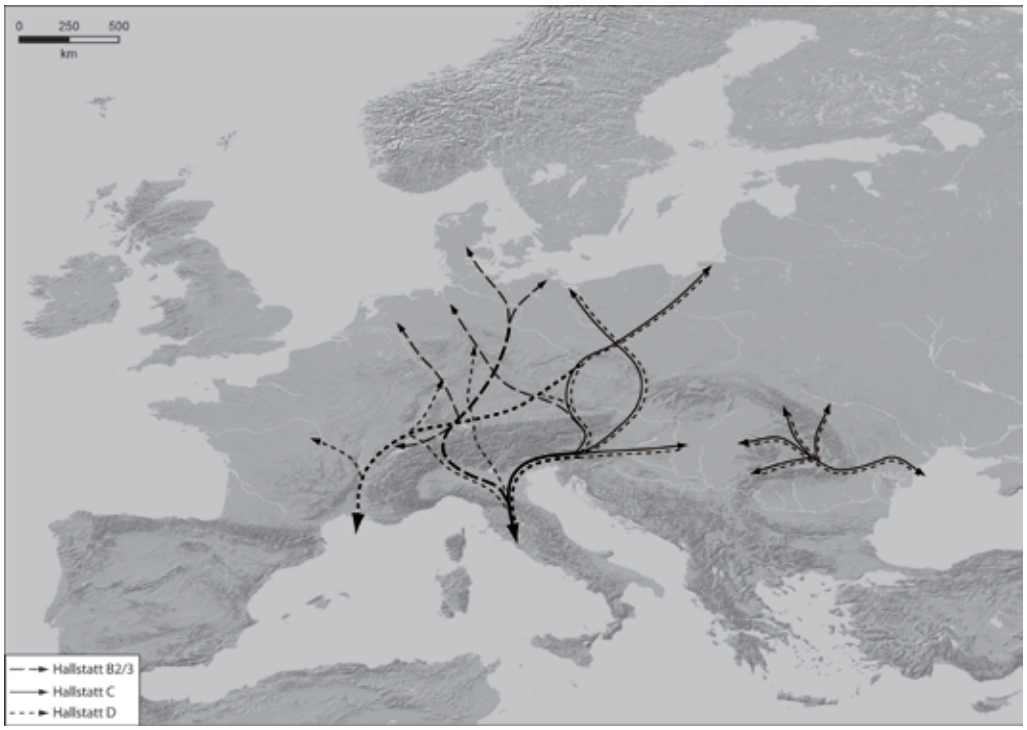

Figure 12: Schematic illustration of European trade routes of the Late Bronze and early Iron Ages. Mediterranean routes have been excluded from the illustration, but centres of manufacture and exchange should be envisaged in the Greek peninsula, southern Italy and in the Turkey (data from Sherratt 1993: Fig. 12).

It is important to consider that these trade and interaction routes were of a polythetic nature, in which many smaller exchange networks transferred goods in the general north-south direction with few objects travelling the entire distance (Sherratt, A 1993); however, amber represents one exception to this rule. Just as the movement of goods along these general routes should be interpreted as moving in smaller circles, so should the actual routes moving those goods. It is probable that communities involved in the exchange of goods did not know where goods ended after they had traded them, or where goods that they acquired originally came from (see Fontijn 2006: 141-42, Fig. 9.7, 9.8). As the distance from a community increases, the community knowledge possessed about the surrounding environment would decrease, fact become merged with fiction, myth, and legend, even though some individuals may have travelled far from their home communities (e.g. the "Amesbury Archer": Fitzpatrick 2006; or "Ötzi" Spindler 2001). Chains of understanding and knowledge could be created through communities that were in regular contact, gradually increasing the world knowledge possessed by them. Groups that were only in secondary, tertiary, or irregular contact would undergo much less knowledge transfer and exchange, leading to a slower rate of knowledge accumulation (Figure 13). Diffusion of knowledge, and subsequent clouding of facts, is illustrated by the classical Greek belief that amber come from the Electridae islands near the mouth of the river Eridanos: many authors have suggested that these refer to the northern Adriatic and the River Po respectively (see Palavestra 2005: 349). From the perspective of ancient Greek communities, unaware of the origin of amber in the Baltic region, the northern Adriatic and River Po may have appeared as the source of amber because that is where they procured (directly or indirectly) it from in trade and exchange relationships.

Such diffusion of knowledge and understanding should be considered in association with the creation of maps. Despite the long cartographic tradition in Western Europe there is little evidence of prehistoric maps (though consider the rock art from Val Camonica, e.g. Anati 1960: Fig. 35). Mental maps would have been created, with individuals forming an understanding of their environment, surroundings, and significant places[10].

[10] The term 'mental map' is used here to refer to visualisation and conception of localities, places, and landscapes, and should not be confused with its usage with reference to technological processes, production sequences, and the social relationships which are negotiated through those processes (see Dobres 1999; Schlanger 1994). Mental landscape – maps would also include, and be influenced by, aspects of social relationships.

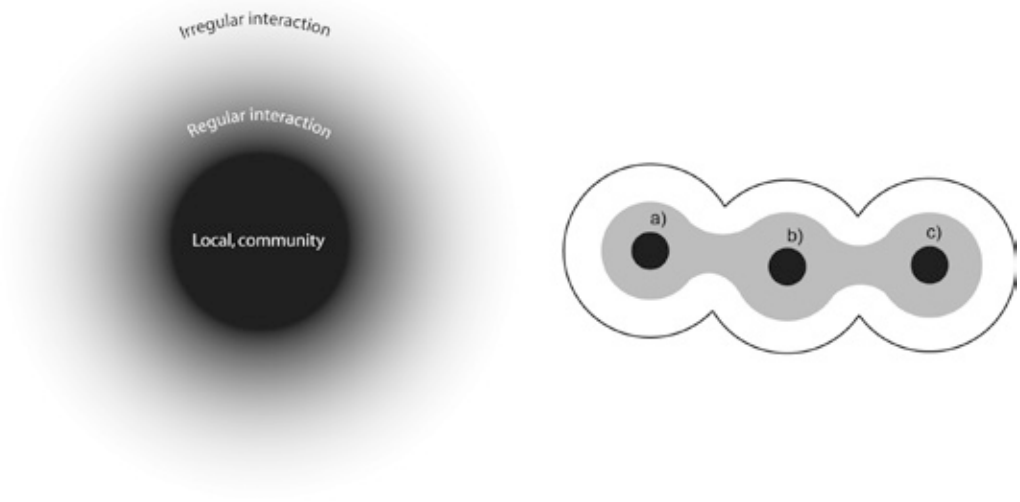

Figure 13: Community knowledge and understanding about the surrounding environment fades as distance and levels of interaction decrease from the community centre (left). Regular interaction may increase the knowledge held by a community of more distant regions (e.g. b to c), while, much like the school yard game 'Chinese whispers' secondary or tertiary contacts will funnel limited levels of knowledge and understanding to the home community, causing fact and fiction to become merged and creating myths and legends (e.g. a to c).

Individuals in positions enabling them to produce mental maps of more distant locations would probably have manipulated that knowledge of distant lands to further their own ends, by providing legitimisation, restricting accesses to such knowledge and the goods acquired from distant locations, and through actively promoting the mingling between reality and myth of distant places (see Helms 1988; Kristiansen and Larsson 2005a).

Effects of these trade networks on the communities involved with them have traditionally been seen as flowing from the more advanced Mediterranean region to the less advanced hinterland and northern regions. In general, the sequence proposed for the early Bronze Age (c. 2200-1600 BC) is that with increasing trade and contact with the Mediterranean a change of settlement structure occurred in association with increased industrial productivity, particularly in the Carpathian basin. Communities began to settle in fortified hilltop sites in order to have a better control over the routes of trade and exchange running through their local regions (Sherratt, A 1993: 26-29; also Jockenhövel 1985; Bader 1985; Bouzek 1994). Some of these fortifications such as Barca, Spišský Štvrtok, and Nitransky Hrádok were constructed with elements of Minoan/Mycenaean influence, attesting to elements of Mediterranean influence in their construction (Kristiansen and Larsson 2005b: 162).

These fortified settlements, sometimes in association with open settlements, would have been able to control the movement of people through the landscape by their strategic placement, often overlooking significant passes, water ways, or path constrictions, thus enabling an element of control to be exercized over trade routes. Further control of trade and exchange systems was provided by centralising the production centres, particularly of metal and textile industries, effectively controlling both the groups who could manufacture objects and groups who could trade objects (Sherratt, A 1993: 29; Kristiansen and Larsson 2005b: 125). Control of the trade routes should not only be seen in an active manner; 'passive' control would also occur once manufacturing centres were created. These centres would effectively become trade magnets, attracting and drawing trade to the manufacturing centre from the surrounding region with little direct control required from the ruling classes. Artefactual evidence, in the form of metalwork and pottery certainly supports the proposed sequence and trade/communication routes through the Carpathian basin in association with fortified settlements (e.g. Bader 1985; Schauer 1985; Kristiansen 1998: Fig. 191; Kadrow 2005). Trade routes flowing between the Baltic and Mediterranean through the Carpathian basin during the later Bronze Age are again attested by artefactual finds, including metalwork, and Aegean references in the Füzesabony culture region (Górski and Makarowicz 2005), as well as many artefact types through the Balkans (Bouzek 1994). The distribution of copper ox-hide ingots shows east-west communication in the Mediterranean, but there is also limited evidence for north-south routes from finds in Germany and Bulgaria (Primas and Pernicka 1998).

With the westwards exploration by, and expansion of, the Mediterranean economies in the Middle Bronze Age, the north-south trade routes also shifted westwards, to utilize the Adriatic and the Italian peninsula (Sherratt, A 1993). It has been suggested that between the 16th and 12th centuries BC, contact between the Aegean and lower Danube was indirect, relying on a chain of imports/exports between the two regions (Palincaş 2005). The effect of the reduction in trade flowing through the Carpathian Basin still has to be shown, but there are clear disruption events around the tell settlements of the region, possibly influenced by expansion of the Tumulus culture into the area (Kristiansen and Larsson 2005a,b: 127, 211).

Many pottery finds attest to the link between eastern Mediterranean societies and the Italian peninsula during the Middle Bronze Age (e.g. Bietti Sestieri 1988; Vagnetti 1996; Marazzi 2003; Jones, R E *et al.* 2004). The fortified settlement of Monkodonja (HR) on the northern Adriatic coast (Hänsel 2005; Teržan *et al.* 1999) illustrates the influence of Aegean communities in one portion of the Alpine long-distance exchange route. Constructed on an 81-metre high hill located 5 km from Rovinj, and occupied between the early and late Middle/Late Bronze Age (2000/1800 to 1400/1200 BC (Hänsel *et al.* 2009: 153; Teržan *et al.* 1999)), the settlement was one of a number of contemporary hillforts in the region (Buršič-Matijašić 1998: 117; Dular 1999). Architectural aspects of the settlement, incorporation of burials into areas of the settlement, and a nearby MBA tholos tomb (Hänsel and Teržan 2000), indicate significant links to the Aegean during the period of occupation. In contrast, pottery decoration attests to local production and links to the central Danubian region (Buršič-Matijašić 1998: 116). As typical with the construction of hill top settlements/forts, one of the reasons proposed for the occupation of Monkodonja is that times were becoming more violent.

However, it is also suggested that the settlement may have only provided a perception of security due to the increased level of organisation and possibility of defence, as occupation of the easily visible hilltop settlement required the abandonment of former dwelling sites in easily defended, well-hidden caves (Buršič-Matijašić 1998: 116). The movement to visible, defended and concentrated sites in control of small areas of the landscape (Hänsel *et al.* 2009), should be seen as part of a development similar to that of the hillforts from the Carpathian region, in that their positioning would have allowed them to both control and attract trade. Interestingly, the move towards fortified hilltop settlements, and away from coastal settlements, in the Istria region correlates to a period of intense commercial activity and interaction with the Aegean world, and not to a withdrawal from such interaction as a movement away from the coastal margin might superficially suggest (Buršič-Matijašić 1998: 40-41). Trade routes between central Europe, the Aegean, and the north during this period, and later, are illustrated by metalwork (e.g. Peroni 1979: 20-21; Müller-Karpe 1962), but also forms of decoration which were transferred between classes of objects in the different regions (Hundt 1978), and associations of Tiryns type amber beads and bow fibulas (Teržan 2005). From around the end of the 2nd and beginning of the 1st millennium BC long lasting exchange routes linking the north of Italy to the Carpathian Basin/Balkan area across the eastern Alps and along the Danube and Sava rivers are also evident (Potrebica 2008; Guštin 2009).

Fortified 'highland' settlements north of the Alpine region during the LBA and EIA often occur at important riverine and terrestrial route confluences, may have been used to control access to metal producing areas and their associated trade routes (e.g. Jockenhövel 1974b; Kuhlmann and Segschneider 2004; Heske 2009; Winghart 1997, 1998). Similarly, fortified settlements constructed in Alpine region during the Early and Middle Bronze Age were possibly connected to copper ore exploitation and metalwork production (Krause 2005; Artursson and Nicolis 2005). Sites such as Wittnauer Horn (Berger, L and Brogli 1980; Bersu 1945) and Montlingerberg (Steinhauser and Primas 1987) particularly attest to their involvement in LBA-EIA exchange networks.

Emergence of the 'Fürstensitze' in the later Iron Age continued the importance and significance of 'highland' fortified settlements in exchange relationships, as particularly shown by the Heuneburg, with a fortification stage of Mediterranean influence and Greek and Etruscan pottery (Kimmig, W and Böhr 2000; Pape 2000; Gersbach 1995; Gersbach and Boom 1996). However, archaeological evidence does not support the concept of these hilltop and fortified settlements as exclusive manufacturing and distribution centres, other open settlements were also involved in these activities (Wells 1995: 236; Sharples 2010: 106 for a British context). The routes by which goods reached the Heuneburg differed somewhat from the north-south routes of the preceding era (Figure 12). The development of Massalia on the French Mediterranean coast encouraged the flow of goods along the rivers Rhône, Saône, and Doubs, before cutting across land to the Rhine and central Europe, as attested by amphorae finds, such as at Châtillon-sur-Glâne (Guggisberg 1991). The distribution of Greek and Etruscan pottery suggests that over Alp routes were utilized at the same time (see Section 5.3.2).

Cultural transmission and exchange of burial practices and disposal of the dead through, though not incorporating, the Circum-Alpine region is evidenced by the occurrence of 'house urns' in the Etruscan region of Italy and southern Scandinavia, northern Germany and

northern Poland (Kristiansen 1998; also Malinowski, T 1971: 109-10; Müller, R 2000). Both the northern and southern regions of house urn distribution commence around the 10th century BC, continuing in circulation until the end of the 8th century BC in the Etruscan zone, and somewhat longer in the northern area (Bradley 2002: 372). Bradley (2002) argues that there is not necessarily a direct connection between the two regions of house urn utilisation as the symbolic associations and apparent significance of the urns differ between the two areas. Given the contemporaneous utilisation of the urns in the two regions it is difficult to argue for an entirely independent innovation, instead the differences in symbolism and significance should be interpreted as the translation of house urn use in Italy to a local context, significance and symbolism in northern Europe. The intriguing question here is what social conditions were prevalent in the north which encouraged and enabled the easy translation and assimilation of a burial practice from the south, while areas of central Europe, such as the Circum-Alpine region, remained closed to the concept and actively rejected the significance of house urns. The urns are indicative of trade, exchange, and communication routes extending from the Italian peninsula to northern Europe and the Baltic. Communication between the Italian peninsula and the north via the Circum-Alpine region, as evidenced through objects such as Nordic belt buckles and *Pfahlbaulanzen*, led Kristiansen to discuss the rise of the "*Pfahlbau* route" between Italy and southern Scandinavia during the earlier 1st millennium BC (Kristiansen 1993: 143, 1998: 161; see also Sprockhoff 1951).

3.2: The lake-dwelling connection

Evidence from the Neolithic and Early Bronze Age suggests that lake-dwellings in the Circum-Alpine region were involved in exchange systems with Italy and the Mediterranean. The distribution of Neolithic flint axes, pintadera and ceramic types clearly suggest exchange routes across the Alps and extending across Europe (Köninger and Schlichtherle 2001; Leuzinger 2010: 100-101; Pétrequin 2011). Objects circulated in the Bronze Age, such as needles, crucibles and pottery, suggest similar axes of communication (Köninger and Schlichtherle 2001; Della Casa *et al.* 1997; Schnekenburger 2002; Primas and Schmid-Sikimić 1994; Wyss 1990). These objects do not relate to material from the eastern Mediterranean, and it should not be expected that such material will be evident in the nCA in polythetic routes (see Section 3.1); with the exception of amber they represent more localized materials. Significantly, a method of lake-dwelling construction – the use a pile grating constructed from small timbers placed through and around piles to provide foundational stability – has been found in Bronze Age settlements at Fiavé (Trentino, IT) and at Bodman-Schachen 1 (Lake Constance, D), suggesting direct, and possibly individual, links between the two regions (Köninger and Schlichtherle 2001: 45). Artefacts from lake-shore settlements in the northern Circum-Alpine region, particularly (but not limited to) those of the Late Bronze Age, are indicative of the region's involvement in interregional exchange systems.

One of the most interesting objects to have been found at Bodman-Schachen I is a '*Brotlaibidole'* ('Loaf-of-bread-idol'/'*tavolette enigmatiche*'), possibly of local manufacture (Köninger and Schlichtherle 2001: 46; Köninger 1997), suggesting that the concept of the idols was communicated from their main region of circulation in the Polada culture of the Italian Alpine foreland and Po Plain, central Europe and the Carpathian Basin (Austria, Hungary, Romania, Slovakia), though some isolated finds also occur in Poland (e.g. Biskupin), and Croatia (Monkodonja) (Fogel and Langer 1999). Interpretations of these 'enigmatic tablets' have varied from talismans or cultic objects (Cornaggia Castiglioni 1976) to implements involved in long-distance trade routes between the Baltic and the Adriatic (Bandi 1974). Their use in trade may have been as counting/recording instruments to record the quantity of items exchanged or as symbolic markers of exchange partnerships. This would be a reasonable explanation for the semi-regular designs and markings that are inscribed/impressed in/on the tablet surface, given that there is an apparent numerical system to the markings (Fogel and Langer 1999; also Piccoli and Zanini 2001). Many of the Brotlaibidole have been excavated in a fragmented state, which has also led to the suggestion that the tablets would be broken once a trading partnership or agreement had been established or concluded.

3.2.1: Riverine and lacustrine network systems

Given the importance that has been attached to riverine routes for trade and exchange during prehistory (Nymoen 2008; Sherratt, A 1996; Haughey 2013; Gambari 2004), it is no surprise that lake-dwellings were involved in the circulation and exchange of materials over longer distances. Trade routes flowing across the Alpine region would find easy paths to follow along the river and lake systems (Della Casa 2007). Certain points along the river/lake route may offer areas of increased control of the trade routes, such as lake inlets and outlets, which is a possible explanation for the number of lake-dwellings found at the outlet of Lake Zurich (Figure 14).

Waterways may have been used as a direct means of transport, as evidenced by dugout canoe finds from the region, a number of which have, unsurprisingly, been recovered from lake-dwelling locations (e.g. Cortaillod Est/Les Esserts, Estavayer le Lac, Grandson-Corcelettes, Hauterive-Champréveyres, Mörigen, Nidau-Steinberg,

Wetzikon-Robenhausen, Zug-Sumpf (Arnold 1995)), and also implied through paddles, (for example from Steinhausen-Chollerpark (Eberschweiler 2004)). Both paddles and canoes could be subject to post-depositional movement in the water, and so caution must be taken in ascribing these objects to particular settlements. There is no evidence from the nCA to directly support the fact that canoes were involved with 'trading expeditions', rather than simply aquatic activities such as fishing and the gathering of resources (though evidence in other parts of Europe does suggest such a use, for example from Poggiomarino (cf. Menotti 2012: 163)). However, it is likely that watercraft would have been used to perform a number of functions during daily life, and the transport of goods over smaller or longer distance must be considered as one of their uses.

Much discussion has taken place around the role of rivers as barriers and borders, or areas of interaction and significance during prehistory (see Haughey 2013, 2007; Mullin 2012). In reality, river, lake and marsh systems would have presented multiple aspects, encouraging interaction and access, while at the same time, presenting boundaries and barriers to physical movement, but though these barriers were not insurmountable and could be crossed with trackways or bridges. The use of trackways to traverse areas of the landscape and marshy ground, such as in the Federsee region (see page 52), would have been particularly important for the use of wagons and carts, identified in the Circum-Alpine region through finds at, for example, Wasserburg-Buchau (see Section 4.3.3), Grandson-Corcelettes, and Cortaillod (Pugin *et al.* 1988). Rivers would also have provided useful guides and markers in the landscape, even when not used directly for transport they may have passively guided land routes along their banks, flood plains and valleys.

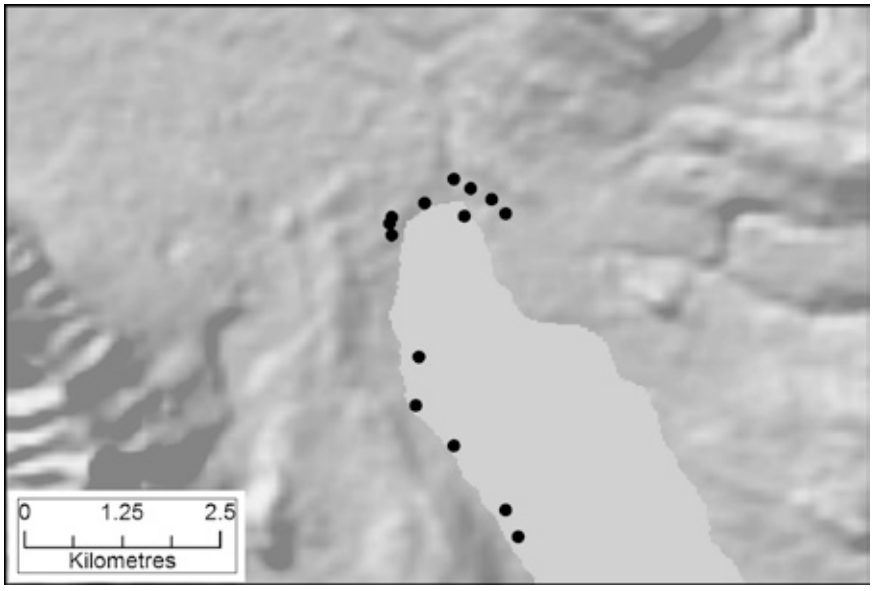

Figure 14: A clustering of lake-settlements around the outflow of Lake Zurich is evident compared to their more dispersed occurrence further around the lake-shore. (Data from database of the Palafittes UNESCO World Heritage Site application 2009).

It is monocausal to interpret lake-dwellings and lake-side settlements as areas of alternation between land- and water-borne systems of communication and exchange, particularly when we consider that some lake-dwellings were not on major river and lake systems, (e.g. Greifensee-Böschen and Ürschhausen-Horn) and so their involvement in significant levels of riverine trade should be questioned – particularly when their relative isolation compared to more densely settled areas (e.g. Zurich Bay) is also considered. Furthermore, river and lake systems are not closed systems; if a lake has a riverine inflow, then it will generally require a reciprocal level of outflow, meaning that there is the possibility for river-following trade to continue along the river course.

In this sense lake-dwellings should not be considered as end-points or end-nodes on a trade system transferring goods from riverine routes to terrestrial routes, but rather as nodes of access for local regions and communities along a longer communication system. Clearly, this presents a 'chicken or the egg' situation that will most likely require research into earlier lake-dwelling and terrestrial settlements: were lake-dwellings constructed and occupied to tap into systems of trade and exchange flowing through the Alpine region (as a

part of a more complex set of influences), or did the trade routes occur or move to incorporate the lake-dwelling communities? Of course, this could also apply to terrestrial settlements, and particularly those in the Alpine valleys, for example Montlingerberg (CH), which may have been influential in controlling the exchange routes flowing through and across the Alps.

At the opposite end of the lake-dwelling tradition, it is also possible to ask if one of the influences for lake-dwelling abandonment was linked to shifting trade routes through the region, or if trade routes were shifting as a result of lake-dwelling abandonment. This can be assessed through an examination of the material culture from Late Bronze and early Iron Age lake-dwellings and the circles in which that material culture moved.

Part II: Material Culture

4: Immovable Material Culture

Late Bronze Age and early Iron Age Lake-Dwellings and Inland Settlements

> It is the pervading law of all things organic and inorganic, of all things physical and metaphysical, of all things human and all things superhuman, of all true manifestations of the head, of the heart, of the soul, that the life is recognizable in its expression, that form ever follows function. *This is the law.*
> (Sullivan, L H 1896: 408)

A logical beginning point for consideration of influential links between the lake-settlements of the Baltic region, so prevalent during the Late Bronze Age and early Iron Age, and the long standing tradition of lake-dwelling occupation in the Circum-Alpine region (including possible influences for their decline), is to examine the construction of the settlements. If the decision to occupy lake margins in the Baltic region is seen as a possible result of influence from the Circum-Alpine region, one could expect to see this influence expressed through similarities in the method of settlement construction. Changes in settlement form in the Circum-Alpine region between the LBA and EIA may also highlight cultural changes within the region itself.

Influences from the Circum-Alpine region could have been spread through long-distance trading networks, not only through the exchange of concepts and ideas, but also through the movement of people. Marriage alliance and exchange, of both female and male individuals, could have (hypothetically) led to individuals from the Circum-Alpine region residing in the Baltic region and initiating the construction of lake-dwellings. A comparable, though later, example may be seen in the early medieval crannog at Lake Llangorse (Wales). This is the only known form of this settlement in Wales, though they are common from contemporary periods in both Scotland and Ireland. The settlement was apparently ruled by individuals of Irish descent who may have used the crannog as a method to display both power and ancestral connections (Redknap 2004: 90). Individual mobility was certainly a feature during prehistory as indicated by, exceptional examples such as the "Amesbury Archer" (Fitzpatrick 2006), burial evidence from central Europe (Jockenhövel 1991; Schmid-Sikimić and Beck 2002)[11], and examples of 'foreign' objects in the northern Circum-Alpine region (e.g. Sub-section HERRNBAUMGARTEN in Section 5.4.2.1, and Sub-section ZONED BOWLS in Section.5.4.2.6).

4.1: What is a lake-Dwelling?

To begin with, what is a 'lake-dwelling'? Quintessentially this would seem a simple question to answer: a dwelling, or settlement, built in (on) or adjacent to a lake. Whilst this is a suitable definition of a lake-settlement, it is not an exhaustive description. A number of prehistoric settlements in Italy were built in/on rivers, or modified water courses, such as Poggiomarino (Albore Livadie *et al.* 2005), Isolone del Mincio (Piccoli and Peroni 1989), and San Pietro Canàr (Balista and Bellintani 1998). Similarly, many lake-dwelling style settlements have been discovered in marsh- and fen-land: the *Moorsiedlungen* (e.g. Gachnang-Niederwil Egelsee (Hasenfratz and Casparie 2006), and Wasserburg-Buchau (Kimmig, W 1992; Reinerth 1928)). In northern Italy, the *terramare* settlements of the Po Valley have been called "*palafitte a secco*" (Strobel 1874; Menotti 2012: 155). Thus, it is clear that lake-dwellings exist in a range of environmental locales, and not only on/in lakes.

If the definition of a lake-dwelling cannot be solely dependent upon its location, can it be further defined by the construction method? Consideration here should be given to the *Pfahlbauproblem* (Menotti 2001b, 2012) and the debate surrounding the methods of construction employed in lake-dwellings. Ferdinand Keller's (1854) original proposal of lake-dwelling settlement structures built directly above water on wooden piles has become the traditional and romanticized view (Figure 15) that instantly springs to people's mind when thinking of a pile-dwelling, and was primarily influenced by pacific island pile-dwellings, after the European colonisation of Australia and exploration of the South Pacific ocean. This view was challenged by Reinerth in the 1920s. Following his excavation at Sipplingen (Reinerth 1932), he suggested that instead of being built above water, the settlements were actually built on stilts on the lake margins, with the intention of protecting the settlement from flooding during seasonal lake transgressions.

During the 1940s, further challenges came from Paret (1942) who asserted that lake-dwellings were built directly onto the ground, and, with further supporting evidence coming from excavations at Egolzwil 3 (Vogt 1951) and Zug-Sumpf (Speck 1955a), the concept of lake-dwellings was changed to lake*side*-dwellings. Increasing numbers of excavations during the latter half of the 20th century have led to a reconciliation between these three views of 'lake-dwelling' construction, with evidence that, at varying times and places throughout prehistory in the

[11] For an archaeometric perspective see also (Evans *et al.* 2006), though for a contradictory point highlighting possible flaws in the assumption that people travelled widely in the Bronze Age, especially where 'foreign' goods are deposited in burials see the research of Oelze *et al.* (Oelze *et al.* 2012) on burials from the Early Bronze Age cemetery of Singen (D).

Circum-Alpine region, each of the methods of construction was used depending upon local environmental conditions (see Menotti 2001b: 324-26, 2012: 132-39).

Figure 15: Romanticized view of lake-dwellings from the 19th century (by Rodolphe-August Bachelin, 1867, Village lacustre, Musée National Suisse - Zurich).

However, the situation is not as simple as this reconciliation would suggest. While these general methods of construction (see Suter and Schlichtherle 2009: 30-31; Menotti 2012: 132-39) remain true for the Circum-Alpine region (also the Republic of Macedonia), there are other areas of Europe in which 'lake-dwellings' were constructed with different methods (Figure 16). The *terramare* of the Po plain have been termed as lake-dwellings on dry land, and while the structures were frequently constructed on piles, they were in a dry environment, often with artificially created ditches and moats surrounding them (Cardarelli and Accorsi 2004), for example at Montale (Figure 17). Some *terramare* settlements were associated with more extensive water management systems to increase agricultural productivity with the surrounding moats and ditches used to feed irrigation systems (Cremaschi *et al.* 2006), such as at Canàr in the Valli Grandi Veronesi (Balista and Leonardi 2000). Poggiomarino is another settlement with extensive water management techniques; a system of islets and canals were constructed adjacent to a river course. This was accomplished by digging canal channels into the ground and linking them to the River Sarno, while the excavated material was used to create artificial islands, which were often extended through the use of wooden retaining piles and further infilling with material (Figure 18).

The construction of artificial islets to create a stable base for the construction of buildings and structures is a method employed at a number of locations across Europe. In Scotland and Ireland these islets are specifically called *crannogs*, and were created and intermittently used from prehistory through to the Medieval era (Cavers 2006: 389-90; Henderson, J C 1998). Many crannogs appear to have been constructed in the *packwerkbau* method, in which earth, stones and other material were deposited in shallow water and secured with vertical piles to create a small island, often with the insertion of wooden piles to create a containing perimeter and reduce the possible erosion and dispersal of the island (see Menotti 2012: 143). Other crannogs were constructed from free standing piles though these may have been constructed on the lake shore rather than as 'true' crannogs, in a manner similar to many of the Circum-Alpine lake-dwellings (ibid: 390-91). Both forms of crannog were often subject to rebuilding and re-use (Cavers 2007; Dixon 2007).

A vast amount of research has been undertaken into the lake-dwellings and crannogs of Ireland and Scotland (e.g. Cavers 2006; Dixon 2004; Fredengren 2002), evidence of which suggests occupation during the Mesolithic (O'Sullivan 1998) and Neolithic (Armit 1996), though they are most commonly found during the Late Bronze Age and Iron Age in Scotland (Henderson, J C 1998), and even in medieval times in Ireland (O'Sullivan 1998). Cavers (2006) has argued that Scottish crannogs were a development from the pile-dwelling variety of settlement in these areas, with a crannog 'event horizon' occurring between 800 and 500 BC (particularly in the Western Isles). The long tradition of lake-dwelling in Scotland, and Ireland, would suggest that the method of construction developed in this region is independent of

that found in the Circum-Alpine area. In other parts of the United Kingdom, lake-dwellings – e.g. Glastonbury lake village – were also built in the packwerk method, with clay floors being placed on a foundation of various materials and timber and utilising revetments to protect against erosion (Coles, J and Minnitt 1995: 99-120).

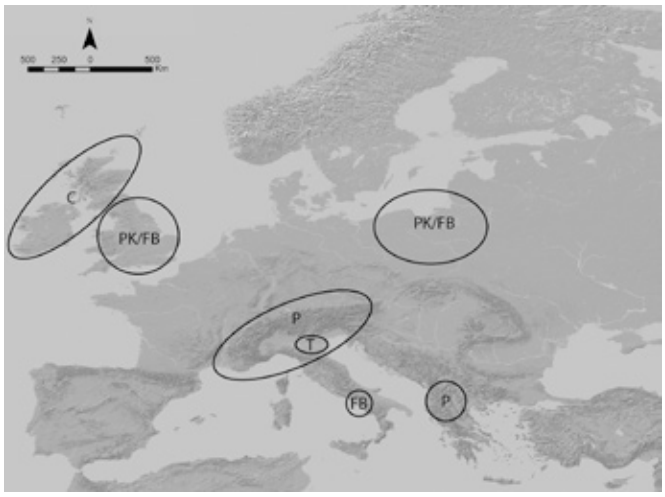

Figure 16: The predominant construction methods utilized in the main 'lake-dwelling' regions of Europe. C = Crannog; FB = *Faschinenbau; P = Pile-dwelling; PK = *Packwerkbau**; T = *Terramare*. (* = supporting structure/ground preparation to build houses on).**

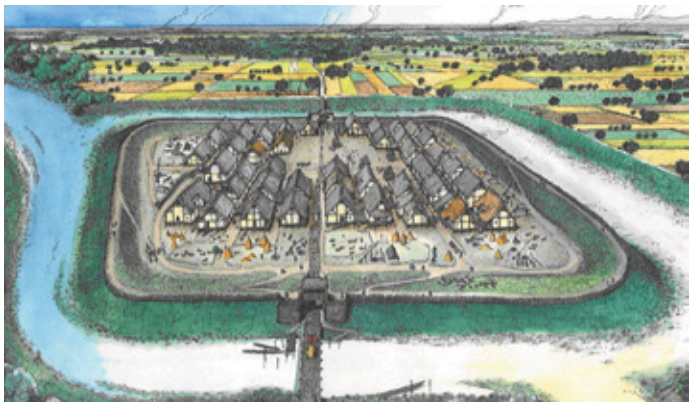

Figure 17: Artistic impression of the Montale *Terramare* settlement. The settlement is constructed on dry land, while a ditch has been dug and linked to a river/stream, forming a flooded area/moat around the settlement (after Cardarelli 2004: 10).

Figure 18: One of the excavated islets from Poggiomarino (photographed by Soprintendenza Archeologica di Pompei). Wooden piles were driven into the ground to prevent the erosion of the islet by the surrounding canal water.

In the Baltic region several different types of lake-dwelling foundation construction have been excavated, chronologically spanning from prehistory to the late Middle Ages. See for instance the *packwerkbau* with regular timber foundations, at lake Orzysz, Poland (Figure 19), and the *faschinenbau* with irregular and less structural mounding of timbers and brushwood (Pydyn 2007: 325), at the lake-settlement of Grzybiany (Brzeziński 1991; Bukowski 1982). The fortified settlement of Biskupin (Babiński *et al.* 2007), built on a lakeshore peninsular of Lake Biskupin, is also a good example of the *packwerkbau* foundation and block house construction method used in Poland.

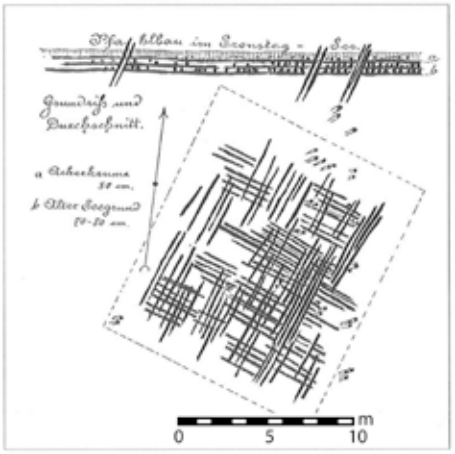

Figure 19: Wooden *packwerkbau* construction of the Skomack Wielki settlement, Lake Orzysz (modified from Heydeck 1909).

Clearly, there were various categories of construction methods used at lake-dwelling sites around Europe, from prehistory to the medieval period (with various methods of construction in the categories themselves). Therefore, lake-dwellings cannot be classified solely through either the construction method used, or the simple location of the settlement in relation to the lake-water.

So, can lake-dwellings be defined by their interaction with the lake then? This is an unlikely proposal, as many settlements which were built some distance from lakes would have utilized the lake as a resource, and Menotti (2001a, 2003) has shown that 'lake-dwelling' communities were occasionally forced inland during periods of climatic deterioration, but they still retained cultural aspects which were related to their former lake-dwelling tradition.

In this case a relatively simple definition of a lake-dwelling will be followed: a lake-dwelling is a settlement that occurs in a humid environment, possibly adjacent to a water-basin, and was built using specifically adapted constructional methods to allow the occupation of that environment.

4.1.1: Why were lake-dwellings occupied?

The decision to inhabit wetland locations was a conscious choice by communities, but the reasons behind this choice remain unclear. Various suggestions, including the potential ease of construction and life, have been proposed for influencing the decision to occupy the lake-shore (cf. Menotti and Pranckėnaitė 2008; Pétrequin and Bailly 2004; Coles, B and Coles 1992; Barfield 1994: 132; Pydyn and Gackowski 2011: 134; Pétrequin 1984: 321).

However, concepts of 'ease' are entirely subjective, and how much influence they had on the choice to settle wetland environments are uncertain; particularly as inhabiting wet/humid environments may have introduced specific problems not encountered by inland communities, for example storing agricultural produce and health issues. It has also been suggested that defensive aspects were one of the reasons for occupation. This may have been true in some, but not all, situations. For example, while the crannogs of Scotland and Ireland, Biskupin (PL), Wasserburg-Buchau (D), and Greifensee-Böschen (CH), show indications of a defensive function, other settlements, such as Hauterive-Champréveyres, Ürschhausen-Horn and Zurich-Alpenquai, and Cortaillod-Est (Arnold *et al.* 2004: Figs. 11, 12) do not appear particularly defensive. The interaction of communities and the environment, and the availability of agriculturally productive land and natural resources may also have been a significant factor influencing where to locate settlements, and the lake-shore would have provided access to both relatively fertile land and aquatic resources (cf. Menotti 2012: 105-06; Pydyn 2010b; Vogt and Guyan 1977). It is also possible that lake-settlements were occupied to access and control marine borne trade routes (e.g. Fischer, V

2011: 1310) (see Section 3.2). Once lake-settlements were established as population centres, they may have grown through attracting artisans, e.g. metalworkers (Fischer, V 2011: 1308) which in turn may have encouraged more people to settle at the site.

Social aspects are more difficult to propose as reasons influencing the decision to settle wetland environments. It is well known that the environment, and special places/features with the landscape, played a significant aspect in the ideology of prehistoric communities (e.g. Earle and Kristiansen 2010: 252; Tilley 2010: 29). Such places are not always apparent today, as they were a specific feature of the cultural milieu of the period of settlement occupation. It is possible that some dwellings were located in relation to specific features of the landscape, or that they were inhabited because similar sites in the region had been previously occupied (see Section 2.5). However, such social aspects are difficult to identify through the archaeological record, and the influences behind a social decision to reside in wetland environments and lake-dwellings largely remains unknown.

4.2: Eastern Baltic region lake-dwellings

As previously mentioned there is relatively little recent literature concerning Baltic/Polish lake-dwellings when compared to the literature available for the Circum-Alpine region (see Section 1.3.2). However, recent works by Jarek Gackowski (e.g. 2000), Andrjez Pydyn (e.g. 2010a; Pydyn and Gackowski 2011), and the slightly older works of Gerard Wilke (e.g. 1996/97), have made more information concerning Polish lake-dwellings available. In particular Pydyn and Gackowski (2011) have discussed three varieties of lake-dwelling in Poland:

1) "Bog dwellings" of the West Baltic Barrow Culture.
2) Defensive settlements of the Lusatian Urnfield Culture.
3) Lakeside settlements of the Lusatian Urnfield Culture.

Of these three types of settlement most investigations have been conducted on the first group, and so these will provide a starting point.

4.2.1: Bog dwellings of the West Baltic Barrow Culture

These lake-settlements, such as Pieczarki, Bogaczewo, Mołtajny, Rybical, Szymonka, and Skomack Wielki, were constructed using a grille platform or 'Rostplattformen'/'Packwerk' (Wilke 1996/97) to create an artificial island upon which dwelling structures were built. The Bogaczewo settlement, for example, built between 440 and 400 BC (Krąpiec 2000), was constructed by layering timber beams in levels perpendicular to each other, to create a stable platform, in this case the layering proceeded to a minimum thickness of 1.5 metres (Łapo and Ossowski 1994). These alternating layers of timber were secured to the lakebed using diagonally driven piles to prevent the timber layers from collapsing or shifting (Figure 20). Platform sizes appear to have been variable, with the site of Mołtajny covering an area of up to 500 m^2 (Gackowski 1995; Wilke 1991) while the platform of Skomack Wielki (Figure 19) appears to be roughly half this size, covering c. 240 m^2 (Ossowski and Łapo 2004: 47). Based on a lack of laminated deposits of alternating anthropogenic/lake origin it has been suggested that the platforms were constructed in a single event, and used for a single period of occupation (Gackowski 2000: 13). Found in association with the artificially created islands are bridges and walkways connecting them to the lakeshore, and surrounding palisades (also Gackowski 1995). The palisades may have served multiple functions, including defensive, breakwater, and wind break aspects (Wilke 1996/97: 27).

The surviving Rostplattformen represent the foundational structures of settlements, and not actual houses or buildings themselves – this is an aspect which remains generally unseen in this form of lake-dwelling of the Baltic region. However, anthropogenic deposits have been used to infer the use of these platforms and islands, and even the possible location of buildings, such as at Skomack (600-300 BC), where possible fireplaces suggest the presence of five buildings on the platform (Ossowski and Łapo 2004: 47; Wilke 1996/97: 14). In other cases timber remains have been interpreted as remains of building structures, for example at Mołtajny a series of closely spaced piles and thick timbers were interpreted as the remains of buildings, suggesting five houses in one portion of the platform, with space for a further 2 or 3 structures in the remaining area (Wilke 1996/97: 20-21; Gackowski 1995). Evidence from the same settlement also suggests some of the activities which occurred on the platform – with half fabricated objects and moulds suggesting that bronze working was occurring in at least one building on the site (ibid.: 21). In general it is assumed that the economic basis of these platform lake-dwellings was similar to that of the inland settlements, and that the general activity zone, or "domesticated landscape", of the lake-dwellers was limited to the immediate surroundings of the lake and forest border lands, with limited long-distance activity (Pydyn and Gackowski 2011: 128).

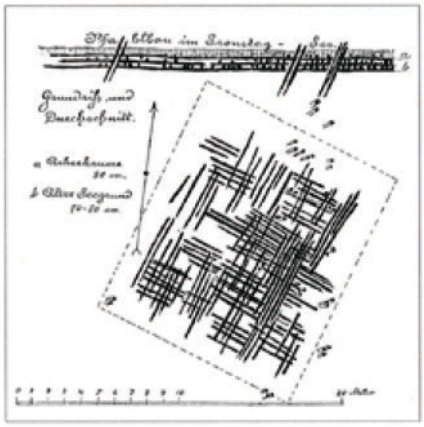

Figure 20: Settlement platform of Szczecinowo. The regular layering of timbers at perpendicular directions to create a platform is evident, as are the upright piles driven through the structure as a stabilising measure (after Wilke 1996/7: 15).

As previously mentioned (see Section 1.3.2) it has been suggested that the concept of lake-dwelling in this form spread from East to West Masuria during the Late Bronze and early Iron Age, supported by artefactual evidence (Gackowski 2000: 48-50). In fact, there are no apparent parallels for these platform structures in the Baltic area of the West Baltic Barrow Culture (Ossowski and Łapo 2004) and the closest comparable settlements, based upon their use of humid environments, are found in the Polesye region of Belarus (Gackowski 2000: 48).

4.2.2: Defensive settlements of the Lusatian Urnfield Culture

These defensive settlements, such as Boguszewo and Grondo (864 - 783 BC), relate to the Late Bronze and early Iron Age, and were constructed on natural islands or peninsula in lakes, covering an area of up to two hectares (Pydyn and Gackowski 2011: 128-30). Both the Boguszewo and Grondo settlements have defensive palisades, and even part of an entrance gate and bridge, indicating that the settlements were intended to fulfil, at least partly, a defensive function. It has been suggested that there is nothing to differentiate these defensive island dwellings from other defensive settlements of the Chelmno Lake region, such as Gzin or Kamieniec, which occur on the sides of high ridges and in river valleys (Pydyn and Gackowski 2011: 131). The development of these settlements has been interpreted as the adoption of Hallstatt influences and ideals, which were manipulated and translated to form a local significance and tradition (Pydyn and Gackowski 2011: 130-31).

As these island settlements were built on land they did not require the construction of a foundational *Rostplattformen* (similar to the *packwerkbau* foundations), but unfortunately there is little discussion of the forms of construction which were employed at the settlement beyond the defensive palisades. Hopefully, future excavations will reveal more information. However, the role of these settlements was not as significant for the creation of cultural space and definition as were the nearby cemeteries, which were used to define and legitimize the landscape in terms of social occupation (Pydyn and Gackowski 2011: 131).

Biskupin type defensive settlements

A second type of defensive settlement (the Biskupin type) is also known through sites such as Biskupin (Kostrzewski 1950), Sobiejuchy, and Jankowo (see Section 1.3.2). Of these fortified sites the excellent preservation and extensive excavation conducted at Biskupin allows an interpretation of the construction methods used at the settlement. The settlement covers an area of 190 x 120 metres, constructed on a boggy peninsular of the Lake Biskupin (Niewiarowski *et al.* 1991: 81), with a defensive (and probably breakwater) palisade surrounding the whole site, made of timbers driven into the ground at an angle (Figure 21). A perimeter rampart, of box construction, up to 6 metres high completely encircled the dwelling structures of the settlement, which were arranged in thirteen parallel rows separated by walkways, with a ring road running around the settlement between the structures and the rampart. The pathways (Figure 22) were constructed by laying round timbers adjacent to each other in a "corduroy" manner (Kostrzewski 1938: 313). The whole of the settlement was constructed on top of a lattice or fascine of timber (Birch), which would have served to raise the main constructions off the ground and help to create a more stable and drier settlement.

Figure 21: Breakwater palisade and encircling rampart of the Biskupin fortified settlement. The breakwater is visible on the right of the image, consisting of angled piles driven into the ground angled towards the settlement (image: the Poznan Archaeological Museum http://www.muzarp.poznan.pl/muzeum/muz_pol/Arena/Biskupin/gal_eng.html).

Figure 22: At Biskupin the circular pathway between the centre of the settlement and the defensive structures is visible as a series of adjacently laid timbers. Walkways run between rows of huts and intersect with the encircling pathway (image: the Poznan Archaeological Museum http://www.muzarp.poznan.pl/muzeum/muz_pol/Arena/Biskupin/gal_eng.html).

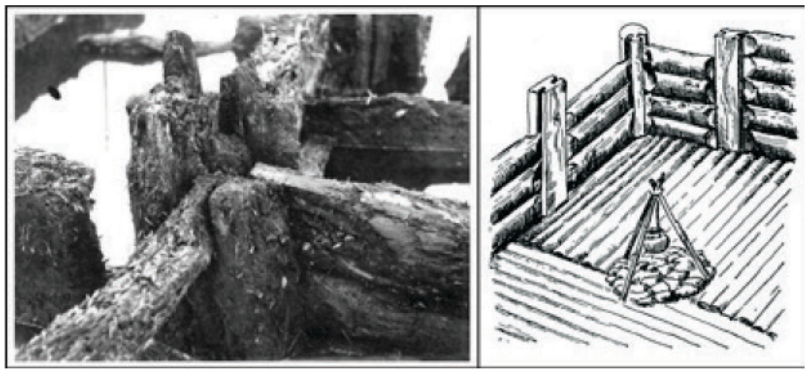

Figure 23: Constructional details of the huts from the Biskupin settlement. Piles and posts with vertical slots running the length of the timber were driven into the ground. Boards and round timbers with shaped ends were slid into the groves of facing posts to form a wall, similar to the plank/pillar technique (left image: the Poznan Archaeological Museum http://www.muzarp.poznan.pl/muzeum/muz_pol/Arena/Biskupin/gal_eng.html; right image: after Kostrzewski 1938: 315).

Houses and buildings in the settlement were constructed to a standardized plan, consisting of two roughly square rooms, with a round hearth in one of them. Construction of the buildings (Figure 23) was in the plank-pillar method, with vertically driven piles having slots/grooves cut along their length to allow the insertion of rough-hewn planks or round beams horizontally between pillars, to create walls (cf. Menotti 2012).

Other sites of the Biskupin type fortification have not been preserved to the same degree (e.g. Sobiejuchy), thus it is difficult to provide any greater constructional specifics for them. However, it is possible to say that the site of Sobiejuchy was larger than that of Biskupin, was constructed on dry land (which has resulted in considerably less timber preservation), was not as densely occupied as Biskupin, and had open places where inhabitants could have interacted (Harding and Locker 2004: 181-85).

Artefactual evidence from both Biskupin (Kostrzewski 1950) and Sobiejuchy (Harding and Locker 2004) indicates that the economy of the fortified sites was probably diverse, and included agriculture and animal husbandry. Craft specialisation in different households and buildings, incorporating metal working and textile production, is suggested through artefact spatial deposition patterns (Harding and Locker 2004: 185-88, 197-98; Niesiołowska-Wędzka 1991).

4.2.3: Lakeside settlements of the Lusatian Urnfield Culture

Within the last decade research and excavation has been conducted at Lake Powidz, resulting in the identification of two Iron Age settlements, Powidz[12] and Polanowo[13] (Pydyn 2010a; Pydyn and Gackowski 2011: 131-35). Construction of these dwellings was directly onto the lakeshore, with buildings made from round timbers laid horizontally, with reinforcement and support provided by vertically driven piles (Pydyn and Gackowski 2011: 134). Upper levels of the structure may have been finished with wickerwork and clay (Pydyn and Rembisz 2010: 115). Direct construction on the lakeshore may have subjected the settlement to periodic or seasonal flooding (Pydyn and Henderson 2010). It is possible that the structures were designed in such a way, with an absence of clay covering at lower levels, so as to accommodate this periodic flooding, as has been suggested for Cortaillod-Est (Arnold 1990a), but this remains to be proven. Economic activities at the Powidz and Polanowo sites are indicated by multidisciplinary analysis, suggesting intensive use of the area surrounding the lake for both agricultural and animal husbandry purposes (Pydyn and Gackowski 2011: 135).

[12] Radiocarbon dated to between 800-540 cal. BC

[13] Radiocarbon dated to between 790 and 540 cal. BC

4.2.4: Summary

In summary, most of the above types of lake-dwelling from the eastern Baltic region (mainly Poland) were occupied from the Late Bronze to early Iron Age (8th to 5th centuries BC), although, as previously mentioned, other lake-dwellings relating to earlier periods are known from the Baltic region. Fortified dwellings represent a larger and more centralized form of society, particularly with Biskupin type of settlement. However, smaller settlements, which appear to have developed outside of the centralized communities and dominated by the fortified sites, are also known, illustrating that reasons for inhabiting lake regions may have been multiple and socially orientated in addition to a functional basis. The abandonment of lake-side dwellings and settlements of each of the four discussed groups is generally seen (but not fully confirmed) as a result of climatic decline and lake level increase (Błaszkiewicz 1995; Ossowski and Łapo 2004; Wilke 1996/97: 27-28; Gackowski 2000: 46-47).

4.3: Northern Circum-Alpine region lake-dwellings

Extensive excavations and a long history of research in the Circum-Alpine region, and particularly north of the Alps, has provided a good understanding of a variety of construction techniques utilized in moor- and lake-dwellings, which varied with both time and location (Menotti 2012: 132-39; Seifert 1996: 168-83; Benkert *et al.* 1998). In general, it is possible to create a division between lakes of the western and eastern parts of the region (Figure 24).

Settlements from the western lakes (e.g. Neuchâtel, Geneva, Biel, Murten, Bourget) were constructed using piles driven into the ground and sediment, which supported superstructures above ground (Arnold 1990a: 66-79). For Cortaillod-Est, and other lake-settlements of western Switzerland, Arnold (1990b) argued for a three aisle construction, in which four rows of posts (two wall posts and two internal posts) supported the roof of the building, which measured up to 15.5 x 6 metres in width. This three aisle plan cannot be observed in eastern Switzerland (1996: 168).

In the eastern part of the northern Alpine region, a variety of different construction techniques have been discovered, including piles driven into the ground through a stabilising plate (*Pfahlschuh*), and piles also without such a stabilising method. Between Lake Constance and Lake Sempach a construction method termed *Schwellenbau* (sleeper beam construction) is observed, in which piles were driven into the ground through stabilising boards or planks (see Benkert *et al.* 1998: 199; Gross *et al.* 1987: 67; Seifert 1996: 168-71). These boards not only provided stabilisation and support

for the building posts, but also formed the base and foundations of walls. At Zug-Sumpf (CH) there is a mixture of construction techniques represented in the excavated remains. Buildings relating to an older occupation phase [14] were constructed of the *Schwellenbau* and *Pfahlschuh* technique (Seifert 1996: 54-80). Buildings from a younger phase [15] were constructed in the block technique (Seifert 1996: 128-38).

The block construction (*blockbau*) method was common to the lake- and moor-settlements east and west of Lake Constance during the Late Bronze Age, evident at sites such as Greifensee-Böschen and Ürschhausen-Horn, and consists of layering round timbers on top of each other, intersecting and overlapping at building corners with notches/recesses to allow timbers to sit flush against each other (Menotti 2012: 134). Clearly, this method of construction is timber intensive.

The Neolithic site Egolzwil (CH) provides an example of the packwerk technique from the Circum-Alpine region (Speck 1981b: 109-10; Wyss 1983). In contrast to the *packwerkbau* method (or '*Rostplattformen*') discussed above (see Section 4.2.1), the platforms in this instance were not used to create an artificial island for the settlement, but to create foundations for individual structures. At Zurich-Mozartstrasse an Early Bronze Age *packwerkbau* platform was found, though there is no evidence that structures (houses) were built upon this area (Gross *et al.* 1987: 70-74). The size of this platform, at roughly 200 m^2 (Gross *et al.* 1987: 70), suggests that if it was intended to be built upon later, it would probably have been used to accommodate more than one structure. Other suggested functions of this unusual feature were for use as a central village place, a workspace, a herding space, a cult place, or for use as a status symbol and creating social differentiation (Gross *et al.* 1987: 70-74).

Although good levels of preservation of structural remains are not standard for the Late Bronze Age (for instance Zurich-Alpenquai has very little constructional timber left and house locations are theorized through areas of clay and/or loam), a brief summary of evidence from some specific settlements will allow a comparison to the Baltic region material.

4.3.1: Ürschhausen-Horn

Ürschhausen-Horn (CH), constructed on a peninsula of Lake Nussbaum provides an insight into a Late Bronze and early Iron Age lake-settlement from eastern Switzerland, with a construction phase between 870 and 850 BC and occupation of varying intensity until around 800 BC (Hasenfratz and Schnyder 1998; Gollnisch-Moos 1999; Nagy 1999). A second occupation of the site is noted during the early Iron Age, between c. 663 and 638 BC (Gollnisch-Moos 1999: 122-27; Billamboz and Gollnisch 1998).

The late Bronze Age settlement shows a mixture of building techniques utilized to construct rectangular buildings of 10 to 25 m^2. Individual buildings were constructed using either the plank-pillar technique or blockbau construction. A number of approaches were taken to the foundation levels of buildings in order to compensate for marshy ground conditions and topographic undulation, varying from loam floors being laid directly on the ground with surrounding timber lintels, to cross-timbers and grid-work timbers being placed within the surrounding lintel structure to provide extra support and foundations for the floor. The most elaborate foundation system involved the raising of buildings on platforms constructed in a simple blockbau technique with the insertion of the floor timbers at an intermediary level of the structure (Gollnisch-Moos 1999: 21-71). Evidence of the structures relating to the early Iron Age settlement are less clear than those of the LBA settlement, meaning little can be interpreted as to the building techniques utilized, but it is clear that new timber constructions were laid (Amt für Archäologie Thurgau 2010: 306).

The settlement sequence (Figure 25) of the site proposed by Gollnisch-Moos (1999: 133-39), although somewhat at odds with that suggested by Nagy (1999), provides an interesting account of the development of this Late Bronze Age village. Initial buildings appear to be dispersed over the settlement area, while further construction events fill in the settlement area, though there appear to remain two fairly distinct areas of the settlement – a more dispersed area in the north, and a more compact, dense, and semi-regularized area to the south. An undeveloped space to the centre-west of the village may have been used as a communal area. No palisade was found around the village, though apparent high-water barriers were observed in areas around the settlement (Gollnisch-Moos 1999: 188), suggesting that some preparations were taken to protect the settlement from inundation.

It is interesting that relatively little metalwork was found at the site, suggesting that some of the buildings were cleared before their deliberate abandonment, and possibly, destruction (Nagy 1999). Furthermore, distribution of the pottery at the settlement indicates that ceramics were placed along the outside of buildings, and that fragments of individual vessels were dispersed amongst several buildings (Nagy 1999; Gollnisch-Moos

[14] Dated from 1056 to 940 BC through dendrochronology and 1210 to 940 cal. BC through radiocarbon dating (Seifert 1996: 46-53)

[15] Radiocarbon dated to between 901 and 815 cal. BC (Seifert 1996: 47)

1999). Ethnographic studies (e.g. Deal 1985; Hayden and Cannon 1983) have demonstrated that ceramics may be temporarily stored along the outside of buildings following breakage, and in the event of building abandonment such vessels are left in situ while intact and useable vessels are removed. These studies also indicate that the dispersal of broken vessels, or vessel sherds, across a site can be the result of children's play activities or the innovative use of ceramic fragments for specific functions. Both the lack of metalwork and distribution of ceramics at the site suggest planned abandonment and destruction of buildings rather than accidental fire or hurried evacuation.

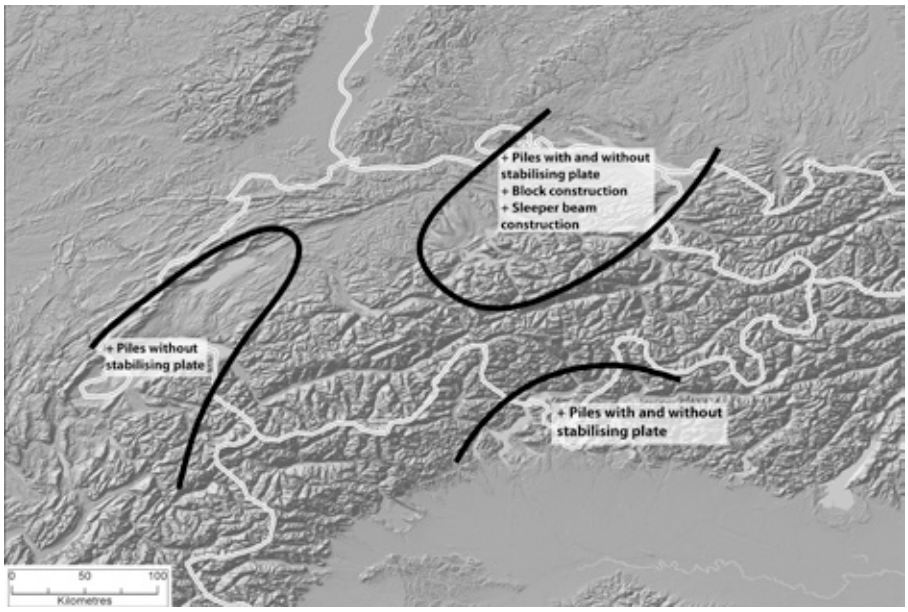

Figure 24: Distribution of different lake-dwelling construction methods in the Swiss Circum-Alpine region during the Neolithic and Bronze Age (re-drawn from Seifert 1996: Fig. 194).

4.3.2: Greifensee-Böschen

The settlement Greifensee-Böschen (CH) is an interesting village from the Late Bronze Age, which was occupied for roughly a decade between 1051 and 1042 BC (Eberschweiler *et al.* 2007: 97-120). Construction of the settlement began with the first structures in 1051 BC, before a complete row of houses was finished around 1049/1048 BC. A surrounding palisade and "hedgehog" structure, built of piles driven into the ground at an angle on the landwards side of the settlement, were constructed around 1047 BC (Eberschweiler *et al.* 2007: 114), would have acted as both defensive measures and wind breaks. Further village expansion occurred in subsequent years, including some structures built outside of the surrounding palisade but within the hedgehog structure, suggesting that the palisade fell into disrepair and disuse or that these buildings were intentionally separated from the main area of settlement. All building work at the site appears to have been completed by 1042 BC (Figure 26).

Structures at Greifensee-Böschen were constructed in an elaborated *blockbau* technique (Eberschweiler *et al.* 2007: 38-96; Eberschweiler 1990a). Instead of simply layering timbers or beams on top of each other, various degrees of stabilisation methods were utilized to ensure that the timber structures could not move around. On one degree, timbers or beams were secured together at their overlapping ends with treenails or binding to limit the amount of lateral movement that could occur within the structure itself. A further degree of stabilisation was provided by pinning the blockbau structure into place with alignment piles or pegs, reducing the potential for the entire construction to move. To reduce the possibility of the structure sinking into the ground the guiding piles were driven into the ground through pre-cut timber boards that acted as weight spreaders for the above building structure, in some cases the bottom layer of logs were also bound to timber boards. Occasionally, wooden boards were placed under the perimeter of the whole blockbau structure (e.g. house R), or with cross boards running across the long edges of the structure (e.g. house H), which would also have assisted with weight distribution, and is similar to the *Schwellenbau* technique described above (page 49).

Although little material relates to the upper elements of the building structures, building platforms have been inferred from piles and pile plates positioned around the *blockbau* foundations. These piles would have provided support for a platform that extended beyond the edges

of the foundations. The theorized size of the platform suggests that single buildings were built on them, though it is possible that the earliest structures (buildings H and J) were built on a single platform. Whether the settlement was permanently above water is currently unknown, but the measures taken to stabilize the blockbau structure and elevation of the building platform suggest that the buildings were constructed in shallow water (Eberschweiler *et al.* 2007: 259-68).

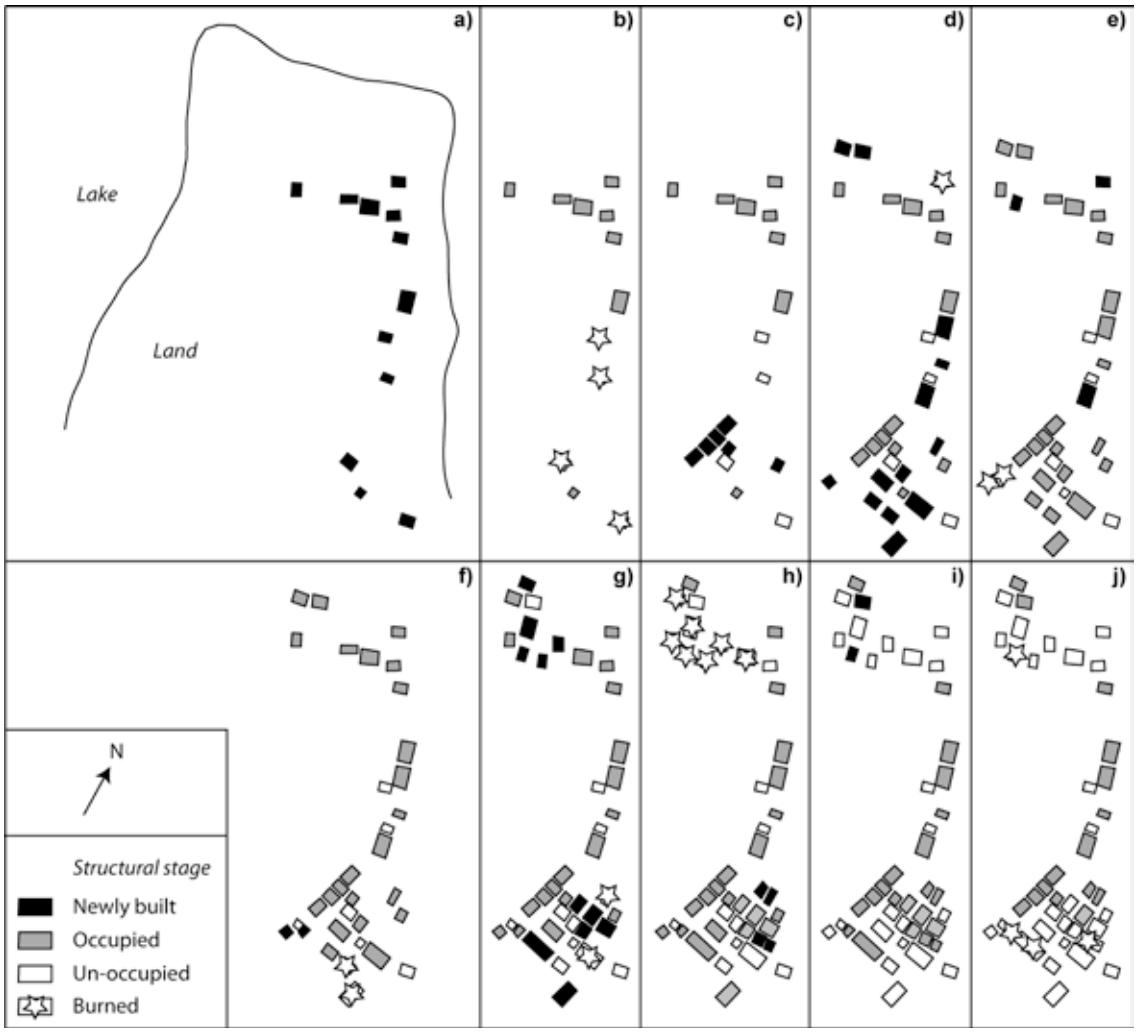

Figure 25: Proposed development of the Late Bronze Age Ürschhausen-Horn settlement, over 10 stages, by Gollnisch-Moos (1999: 133-139). Construction initially began dispersed across the settlement (a), before some buildings were rapidly surplus to requirements (b). The southern half of the settlement was more densely built than the northern half (c-e), with some buildings destroyed or cleared by fire. The northern half of the settlement appears to have remained relatively stable until the latter stages of the settlement, when most of the buildings were abandoned before being burned (f-j), though some minor rebuilding may have occurred (g, i). A similar pattern, though considerably more dynamic, is visible in the southern half of the settlement, with buildings being abandoned, renovated and reoccupied, or destroyed by fire (modified from Gollnisch-Moos, 1999: Fig. 222-224).

4.3.3: Wasserburg-Buchau

The Late Bronze Age settlement of Wasserburg-Buchau (D), constructed and occupied at successive periods between 1058 and 852 BC (Billamboz 2006b, 2009), was most likely built on a low hill/rise in the hinterland of Lake Feder surround by a swampy marshland (Reinerth 1928; Kimmig, W 1992). It is possible that the lake was within close proximity to the settlement, and that on occasion high-water levels reached the edge of the settlement area. Successive palisades were constructed around the settlement, culminating with a final encircling palisade with proposed entrance gateways on opposing sides of the settlement (Figure 27). Such gateways and the presence of trackways in the Federsee area, e.g. the Wuhrstraße (Schlichtherle 2002; Schlichtherle and Strobel 1999: 25-26; Billamboz 1998), and the discovery of wagon-wheels and axles (Kimmig,

W 1992) are further indicators the settlement was not permanently surrounded by water.

Several phases of construction have been proposed for the settlement. An older settlement, consisting of a number of quadrangular buildings, is dated to around 1050-990 BC, with best evidence coming from successive palisade construction events (Billamboz 2006b: 102-03). Suggestions of a younger settlement phase with larger, winged buildings have been disproved and replaced by several phases of construction and repair continuing into the mid-9th century BC (Billamboz 2006b; cf. Reinerth 1928). Structures were built in the blockbau technique, with adjacently laid round wood timbers to create a floor surface. Cross beams were positioned under the floor timbers to provide stability, though a full *packwerkbau* system was not evident (Reinerth 1928).

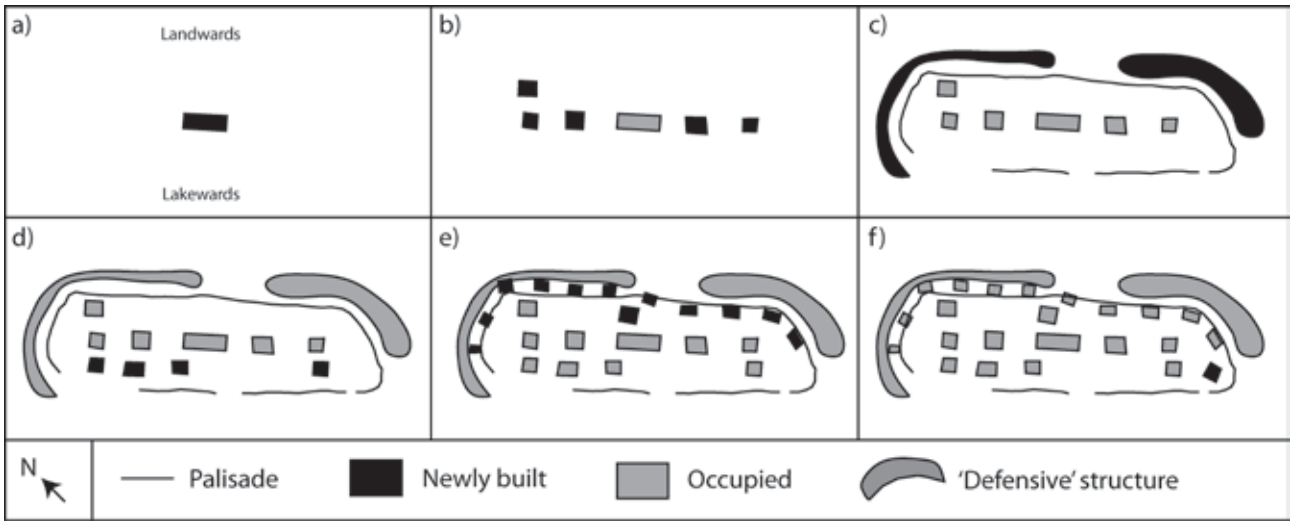

Figure 26: Development of Greifensee-Böschen, beginning in 1051 BC with initial house construction (a). Expansion of the settlement occurred in 1048 BC (b), with a palisade and defensive (?) obstacle constructed in 1047 BC (c). A second phase of expansion spread further into the lake during 1047/46 BC (d) before expansion on the land side of the settlement in 1045 BC (e). The final building of the settlement was constructed in 1042 BC (f) (modified from Eberschweiler et al 2007: 263, Fig. 373).

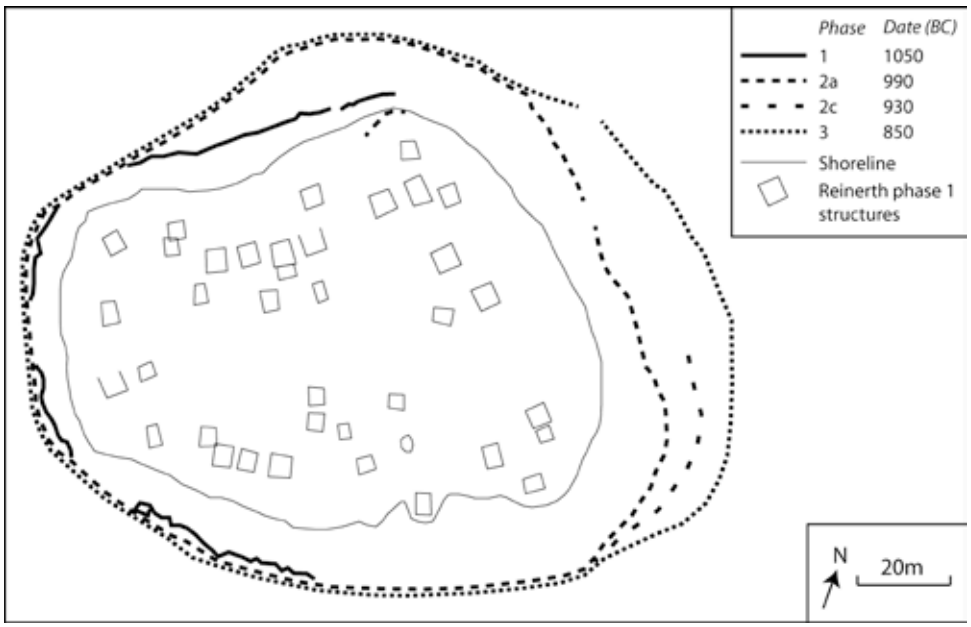

Figure 27: Development of the perimeter palisade at Wasserburg-Buchau (modified from Billamboz, 2006).

4.3.4: Oggelshausen-Bruckgraben

Oggelshausen-Bruckgraben (D) is not strictly a lake-settlement, but a fish trap complex situated in a former section of the Lake Feder, dated to between 730 and 621 BC (Köninger 2001/2002: 51, 2001, 2000, 1999, 1998). This site is important to understand changing attitudes towards lake use between the Late Bronze and early Iron Age. Construction elements at the site relate to the arms of the fish traps, which were used to funnel fish into the catchment area. These arms were formed from piles driven into the lake sediment, with smaller timbers woven between the vertical poles to create a funnel system, standing in between 1.2 and 1.5 metres of water (Köninger 2001/2002: 38). Groupings of piles in four points around the confluence of the arms have been interpreted as foundation piles at the corner of huts built above the end of the fish trap. This proposal is strengthened by the presence of collapsed fireplaces and artefact finds from these areas, but there are no structural remains of these buildings, which would have been elevated above the water surface on piles. Whether these huts were occupied on a long-term basis, or simply for a few weeks a year when the fish traps would have been active during the fish migration season is unknown. Typological ceramic chronologies show that whoever was in charge of the 'fishery' came from at least 30km away (Köninger, pers. Comm. 2013).

4.4: Circum-Alpine influence in eastern Baltic lake-dwellings?

The methods of construction from the Circum-Alpine region briefly described above relate to individual buildings within a settlement, an aspect for which there is little evidence from the Baltic lake-dwellings. The evidence that does survive from Baltic lake-dwellings, particularly those of the West Baltic Barrow Culture, relates to the construction of settlement platforms, upon which multiple, separate, structures and dwellings were constructed. This positions the main occurrence of Baltic lake-dwellings at odds with the constructional concept of Circum-Alpine lake-dwellings, where, despite a range of construction techniques were being employed, a perpetual lake-dwelling tradition can be observed.

With this conceptual difference in mind, it can be suggested that there was not a direct, personnel transfer between the Circum-Alpine and Baltic regions that led to the construction of lake-dwellings in the latter. If a direct transfer of lake-dwelling concept occurred between the two regions, then it would be logical to expect similar construction methods, styles, and concepts in the two regions, as may be seen at Bodman-Schachen I (see Section 3.2). However, the lake-dwellings of the West Baltic Barrow Culture clearly show a different concept of lake-dwellings to those of the Circum-Alpine region in that artificial islands were constructed in the water (or heavily waterlogged terrain), as opposed to on the lakeshore or as individual structures also above the lake water. The construction of an artificial island suggests that the communities were adopting a land-based construction in a wet environment, as opposed to the aquatic adaptations that are evident in the Alpine region.

If a direct initiation of lake-dwelling in the Baltic region is excluded, it is still possible that the general concept of lake-margin occupation was transferred from the Circum-Alpine region via trade routes and social connections formed during the movement of material culture objects between the two regions. However, as previously detailed, the concept of lake-dwelling and lakeshore occupation was not new to the Baltic region during the Late Bronze and early Iron Age; these varieties of settlement are also known from the Neolithic and Early Bronze Age, though they do certainly become more widespread during the later periods (see Section 1.3.2). Furthermore, the proposed spread of the West Baltic Barrow lake-dwellings from east to west Massuria (see Section 1.3.2), argues against influence from the Circum-Alpine lake-dwellings spreading north-eastwards to the Baltic region.

The case for the lack of lake-dwelling 'concept' transfer between the two regions is further strengthened by the low occurrence of objects of Alpine origin or manufacture in the Baltic lake-dwelling region (see Section 9.1). Instead of looking for an external influence for the popularisation of lake-dwellings in the Baltic region it would be more profitable to search for driving factors in the cultural organisation of the West Baltic Barrow Culture (Pydyn and Gackowski 2011: 128). It is not enough to assume that because communities of the two regions shared a tendency to settle on lakeshores or in wetland environments there is a link between the communities of the two regions.

4.5: Settlement biographies

It is widely accepted that settlements and buildings (of all time periods) are not simply functional, but actively manipulated to promote and display social and community identity, prestige and power (e.g. Sharples 2007; Liddiard 2005; Johnson 1989)). Recent publications (e.g. Arnoldussen 2013; Jennings 2012a; Gerritsen 2008, 2003; Brück 1999; also Kopytoff 1986: 73) have attempted to study the individual or typical social biography of houses and buildings (Figure 28), as an 'immovable' form of material culture. Late Bronze Age lake-settlements from the Circum-Alpine region present some difficulties in considering the biography of individual buildings, in that many settlements do not have preserved habitation layers or building remains (e.g. Zurich-Alpenquai), or the settlement was of limited

duration (e.g. Greifensee-Böschen), when compared to settlements from earlier periods (e.g. Arbon-Bleiche 3) where interesting research has been completed on the re-use of buildings and household identities (Ismail-Meyer and Rentzel 2004: 76-78; Doppler *et al.* 2010). Two settlements with greater potential for interpreting building histories and sequences of occupation are Ürschhausen-Horn (see Gollnisch-Moos 1999; Nagy 1999), and Wasserburg-Buchau (Billamboz 2006b).

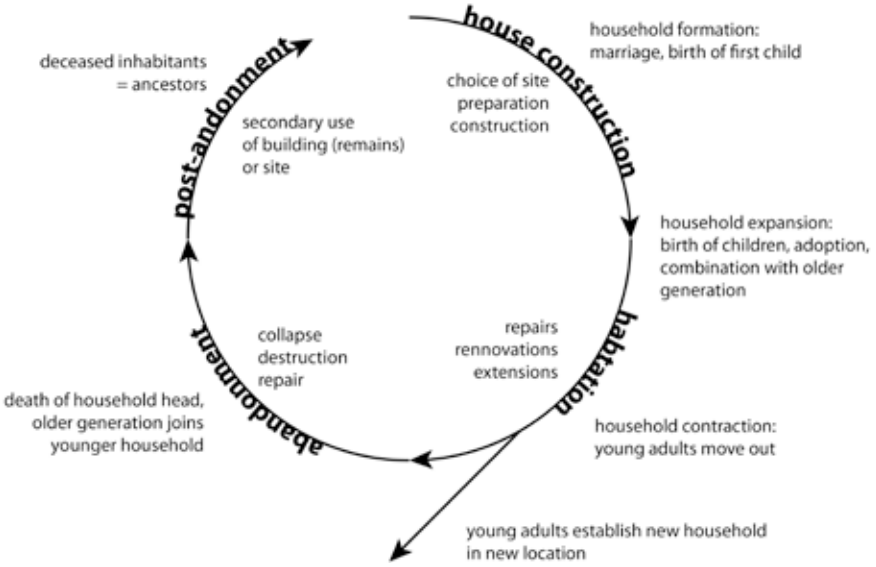

Figure 28: The potential biography of a single-phase farmstead (in northern Europe) in relation to the biography of an inhabiting household (modified from Gerritsen 2003; Fig. 3.1).

While the LBA Circum-Alpine lake-dwellings may have limited potential for considering the biographies of individual buildings, there may be greater possibility for considering the biography of villages and settlements as a collection of buildings, through examination of the construction, development, layout, and abandonment of settlements over time and the movement of settlements in a region or "*Siedlungskammer*" (Ebersbach 2013: 295-96). The concept of "*Hausplatz*" (Billamboz 2006a; Ebersbach 2010, 2013: 291) was developed to explain the fact that buildings were often constructed in the same location as former buildings (i.e. on top of), sometimes after significant interludes, and with spaces left deliberately empty and open for future constructions. Such a concept implies that not only were settlements actively planned, but also that locations had socially acceptable biographies and uses, and settlement location was guided by previous structures and settlements (cf. Jennings 2012a).

4.5.1: Lake-settlement areas of the northern Circum-Alpine region

In order to develop an assessment of the biography of lake-settlements of the Circum-Alpine region it is logical to start with a comparison of various lake-dwelling areas. A number of areas have been selected for further investigation depending upon the presence of Late Bronze Age/early Iron Age settlements, the presence of earlier settlements, and the level of excavation that has been conducted on those settlements.

4.5.1.1: Lake Feder

Evidence of lake-dwellings ranging from the 5th (Aichbühl) to the early 1st millennium BC (Wasserburg-Buchau), and a fishing complex from the mid-1st millennium BC (Oggelshausen-Bruckgraben) are known from Lake Feder (Schlichtherle 2002, 2004). The available dating evidence suggests that many of the Neolithic settlements underwent multiple phases of occupation and construction (e.g. Alleshausen-Grundwiesen (Table 1), with gradual movement of settlements around the lake and subsequent re-occupation (Schlichtherle 2009). The only recorded settlement of the LBA is Wasserburg-Buchau, with evidence of several phases of rebuilding and development, covering both the buildings themselves and also the surrounding palisade (cf. Section 4.3.3). Unfortunately, the limited dating evidence for structures of the settlement interior makes further interpretation of building construction phases difficult. However, inferences may be made from the palisade modifications, suggesting three main phases of construction and occupation (Billamboz 2006b). Perpetuation of the palisade location along the south-

east to western sides of the settlement over all phases suggests a constraint in this region of the settlement, while expansion of the perimeter along the western to north-eastern edge of the settlement between both phases 1 to 2 and 2 to 3, illustrates an expansion of the settlement area, though without an increase in the settlement which was constrained by the 'island' area (Figure 27). Phases of building construction were, in some instances, in roughly the same location, with buildings overlapping and leading to suggestions of 'winged buildings' during early excavations of the site; but these are now recognized as multiple sequential building phases at rotated and displaced locations (Billamboz 2006b).

While the evidence concerning the constructional biography of Wasserburg-Buchau is currently insufficient to progress any further than brief statements, a biography of settlement form may be more possible for the Federsee area. It is evident from the published settlement plans that Neolithic settlements around Lake Feder generally follow a regularized plan or semi-regular arrangement (Figure 29 and Table 1). The Bronze Age sites of Siedlung Forschner and Wasserburg-Buchau display a break with these regularized settlement plans, and become conglomerates of buildings with small clusters separated from each other, and all constrained by a surrounding palisade. Such a development may indicate increasing levels of social differentiation within the resident community.

The early Iron Age fishing complex of Oggelshausen-Bruckgraben (cf. page 54) represents a final break with the lake-dwelling tradition on Lake Feder. Instead of viewing the lake and lakeshore as a viable location for settlement, it is seen as an area for resource extraction and utilisation. Finds detailed by Oscar Paret (1926-28) relating to the LBA-EIA suggest further human interaction in the Federsee area in association with a former waterway running into the lake.

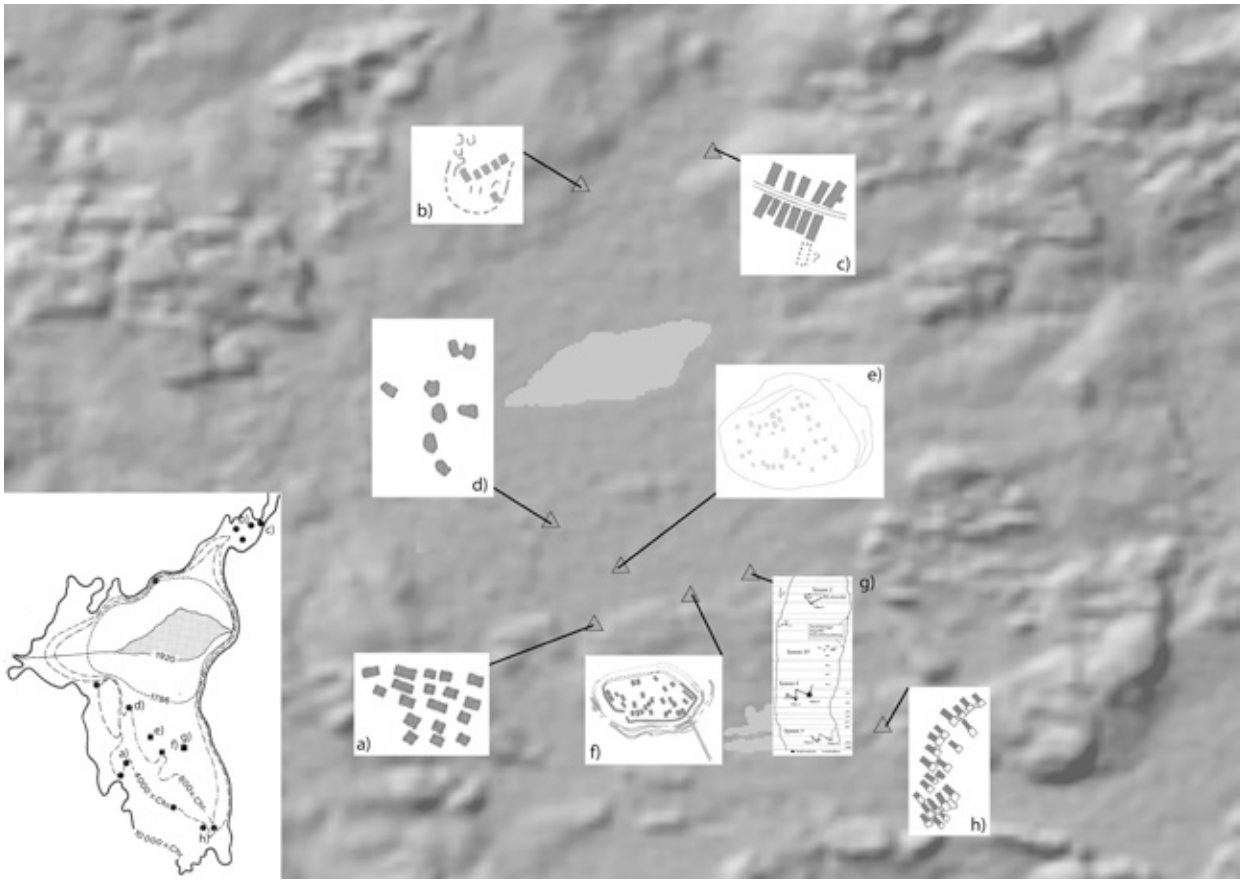

Figure 29: Lake-settlements in the region of Lake Feder (settlement plans after Schlichtherle 2002). Inset image shows extent of lake during prehistory (after Bertsch 1931). See Table 1 for site descriptions.

Table 1. Sites from the Lake Feder region. See Figure 29 for locations and plans of lettered sites. Dating method is dendrochronology unless specified (data from database of Palafittes UNESCO World Heritage Site application 2009).

	Site	Dating	Method
b)	Alleshausen Grundwiesen	3020-2700 cal. BC	C14
	Alleshausen Hartöschle	3920-3916 BC	
	Alleshausen Seekirch	3700-3688 BC	
	Alleshausen Täschenwiesen	3029-2624 cal. BC	C14
		2850-2600 cal. BC	C14
	Bad Buchau Bachwiesen III	3300 BC	
d)	Bad Buchau Dullenried	3332-3035 cal. BC	C14
	Bad Buchau Bachwiesen I	2975 BC	
a)	Bad Buchau Taubried	1680-1520 cal. BC	C14
	Bad Buchau Torwiesen I	3336-3102 cal. BC	C14
	Bad Buchau Torwiesen II	3283-3278 BC	
h)	Bad Schussenried Aichbühl	4260-4100 BC	
		4390-4280 cal. BC	C14
	Bad Schussenried Riedschachen	3871 BC	
g)	Oggelshausen Bruckgraben	730-621 BC	
	Seekirch Achwiesen	2860-2490 BC	
c)	Seekirch Stockwiesen	3932-3930 BC	
		3745-3723 BC	
f)	Siedlung Forschner	1767-1730 BC	
		1600 BC	
		1519-1480 BC	
e)	Wasserburg-Buchau	Wb1: 1058-1054 BC	
		Wb2a: 1006-988 BC	
		Wb2b: 964-945 BC	
		Wb2c: 932-925 BC	
		Wb3: 867-852 BC	

4.5.1.2: Zurich Bay

Zurich bay shows considerable continuation and concentration of settlement, with numerous sites currently known in the area (Figure 30 and Table 2), and dating evidence suggesting repeated re-occupation of sites over many centuries. While published settlement plans for Neolithic and Early Bronze Age settlements follow a regular/semi-regular plan as seen elsewhere, the archaeological remains make a comparison study of the Late Bronze Age settlement forms difficult, as much of the relevant material has been destroyed through erosion of excavation technique (e.g. Alpenquai (Mäder 2001a; Wiemann *et al.* 2012)), though loam deposits and find concentrations have been used to propose house locations (see Mäder 2001a).

Dating evidence and material remains suggests that several of the Late Bronze Age settlements may have been occupied concurrently, such as Wollishofen-Haumesser, Grosser Hafner, and Alpenquai (Gross *et al.* 1987: 154-55; Mäder 2001a: 76-78). Contemporary occupation of these settlements in close proximity raises questions as to how the inhabitants related to, and with, each other in terms of both physical/genealogical and social connections. What may be stated, concerning settlement development, from the number and typology of metal objects found at Alpenquai and Wollishofen is that Wollishofen was the larger or more significant site during the 12^{th} to 9^{th} centuries (HaA-HaB2), with Alpenquai represented by significantly fewer metalwork finds, suggesting a smaller settlement. During the later 9^{th} and 8^{th} centuries (HaB3) the situation is reversed, with Alpenquai yielding significantly more metal objects than Wollishofen-Haumesser. Both sites are, however, represented, suggesting contemporaneous occupation (Mäder 2001a: 76, Fig. 68).

4.5.1.3: Lake Greifen and Lake Pfäffikon

The ten lake-dwellings are currently recorded for Lake Greifen cover the Neolithic to Bronze Age (Table 3), though the most thoroughly investigated, and relevant for this study, is Greifensee-Böschen (cf. Section 4.3.2). The site of Fällanden Rietspitz (Bauer, I 1985) suggests two construction/settlement phases during the Late Bronze Age, though no settlement plans have been published for this site, and only limited excavation took place. From Lake Pfäffikon the most relevant site is that of Wetzikon-Robenhausen (Altorfer 2010: 125), with a Late Bronze Age settlement phase, and Pfäffikon-Baselrüti also suggests a Late Bronze Age occupation (Table 3). While there are not as many dendrochronology dates available for settlements from

Lake Greifen and Lake Pfäffikon as for other regions, typological dating of material suggests that settlement locations were re-occupied over several periods and that settlements may have relocated around the lake (Figure 31, Table 3).

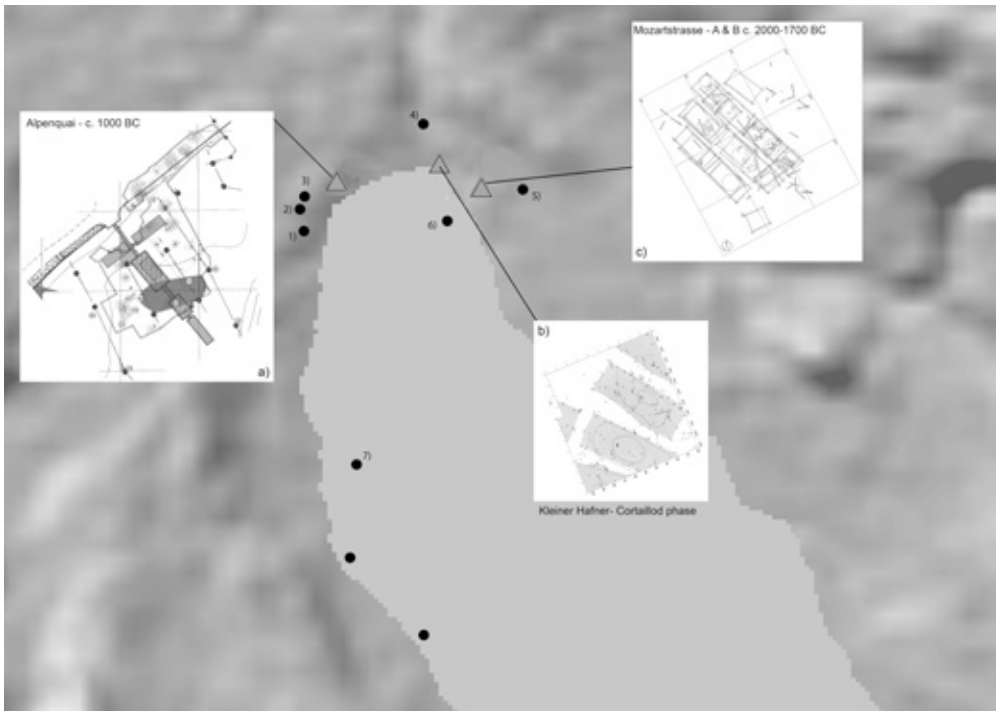

Figure 30: Lake-settlements from the region of Lake Zurich. (Alpenquai after Mäder 2001; Kleiner-Hafner after Suter et al 1987; Mozartstrasse after Gross et al 1987). See Table 2 for site descriptions.

Table 2. Chronological classification and dating of lake-dwellings from the Zurich Bay area. See Figure 30 for locations and plans of lettered and numbered sites. (Data from database of Palafittes UNESCO World Heritage Site application 2009 and Bleicher et al 2011).

	Site (all Zurich-)	Egolzwil	Cortaillod	Pfyn	Horgen	Corded Ware	EBA	LBA	Dating	Method
1)	Enge-Mythenschloss								2680-2548 BC	Dendro
					X	X				Typology
2)	Enge-Breitingerstrasse			X	X	X				Typology
3)	Enge-Breitingerstrasse									Typology
	Rentenanstalt			X	X		X			
a)	Enge-Alpenquai								1041-976 BC	Dendro
								X	-844 BC	Dendro
4)	Bauschanze		X	X	X	X	X	X		Typology
b)	Kleiner Hafner	X	X	X	X	X	X	X		Typology
c)	Mozartstrasse									Dendro
			X	X	X	X	X	X		Typology
5)	Seefeld	X		X	X	X	X			Typology
6)	Grosser Hafner		X	X			X	X		Typology
7)	Wollishofen		X	X			X	X		Typology
	Opera				X					Dendro

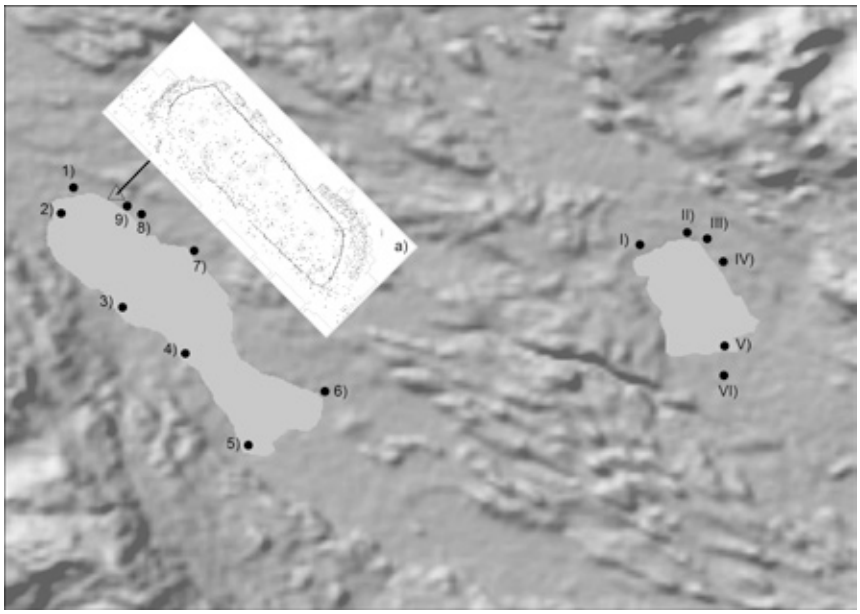

Figure 31: Lake-settlements from the Lake Greifen (left) and Lake Pfäffikon (Greifensee-Böschen plan after Eberschweiler et al, 2007). For site descriptions see Table 3.

Although the low number of published settlement plans from Lakes Greifen and Pfäffikon make an overview similar to that completed for Lake Feder difficult, the settlement Greifensee-Böschen presents an excellent example to study the biography and development of a single site. As has been previously detailed (page 51), the settlement began with the construction of two buildings on a single platform in 1051 BC. These may be interpreted as 'pioneer houses' (cf. Ebersbach 2013: 291; Eberschweiler *et al.* 2004) constructed as foundations for a new settlement, as also seen at the Neolithic sites of Arbon-Bleiche 3 (De Capitani *et al.* 2002; Leuzinger 2000) and Sutz-Lattrigen (Hafner and Suter 2004). It is unknown who these pioneering individuals were, where they came from, and how new sites were selected for settlement. The multi-phase nature of many lake-settlements (but not Greifensee-Böschen or Arbon-Bleiche 3) may suggest that sites were chosen because they were known to have been previously settled, either through cultural memory or direct evidence in the form of visible timbers, indicating that settlement in that location had been successful in the past (cf. Arnoldussen 2013: 739-40).

Expansion occurred three years after the foundation of Greifensee-Böschen, with the construction of five additional, stand-alone, houses, in a regularized orientation running parallel to the lake-shore. The rapid expansion of settlements after pioneer site selection has been taken as an indicator that settlements grew through colonisation rather than demographic expansion (Ebersbach 2013: 291). The time lag between pioneer settlement and expansion may suggest that the pioneer founders were responsible for some preparation work in the area before further colonisation (e.g. clearing, timber selection, construction).

In the year following primary expansion of the settlement a surrounding palisade and elaborate 'hedgehog' structure was constructed, which may have fulfilled the defensive or windbreak function previously mentioned (see page 46). In addition to purely mechanical aspects of palisade construction, social aspects should also be considered; the creation of boundaries can be used to signify community identity, cohesion and exclusion, and to define areas of the environment (cf. Ralston 1995; Wells 2007; Aslan 2002). Certainly, the impressive 'hedgehog' structure would appear as a defensive feature (against either humans or animals), particularly as it occurs only on the landward side of the settlement. To members outside of the Böschen community the 'hedgehog' structure would symbolize their exclusion from the settlement, with a single entry/crossing point representing controlled access to the interior. Furthermore, the palisade and 'hedgehog' structure effectively demarcate the potential size of the settlement; they could have been erected as a planning feature to limit both the size and spread of the village as a way of preventing uncontrolled growth through immigration or population growth (cf. Seifert 1996: 164-65). Indeed, in the three years following the erection of the barrier features more buildings were constructed in the village, including smaller buildings which expanded to the very edge of the 'hedgehog' structure and occasionally overlay parts of the palisade – effectively rendering the internal palisade redundant. Why the palisade was not required after so short a time is unknown, but it adds weight to a non-functional (e.g.

not defensive) argument. Instead of a defensive function it could be suggested that the palisade was constructed after the initial expansion of the settlement to define the settlement perimeter and used to guide immigrant individuals to construct buildings within a specific area, or alternatively to prevent further immigration, with the subsequent buildings, being constructed by 'indigenous' groups instead of outsiders.

After only 10 to 12 years the settlement was apparently destroyed by a conflagration (Eberschweiler *et al.* 2007). Destruction by fire appears to be a common feature in many lake-dwelling settlements, for instance also at Ürschhausen-Horn (see page 50) and Arbon-Bleiche 3, which was destroyed (and not rebuilt) after 15 years of occupation in 3370 BC (De Capitani *et al.* 2002; Jacomet *et al.* 2004; Leuzinger 2000, 2001). An explanation for destruction by fire would be to interpret these incidences as accidental events in which fire began in one building/area and subsequently spread to other structures/areas, or was successfully contained to specific buildings allowing the settlement to continue (e.g. Ürschhausen-Horn). However, such an interpretation is rather simplistic and also suggests that lake-dwellers were rather clumsy with their use of fire. Instead, these burning events could be the symbolic destruction of buildings at the end of their use life, or the demise of households (cf. Gerritsen 2008, 2003, 1999; Bradley 2005: 57, 207-09; Tringham 2000; Rivière 1995: 197-98). Such symbolic destruction by fire has been proposed for the Late Bronze Age remains identified as "Brandschuttgruben" (Bönisch 2005).

Destruction of single buildings may be indicative of the demise of a single household, through death, emigration to another settlement, or by attaining a certain life stage. The destruction of an entire settlement, such as Greifensee-Böschen, may represent the symbolic death of the settlement, and the potential "re-birth" of the settlement through re-construction (e.g. Sutz-Lattrigen - Rütte (Hafner and Suter 2004)). In this situation it is unlikely that the destruction represents the death of the village through the death of inhabitants, but instead the emigration of occupants to another location, through choice or requirement due to environmental change, over exploitation, or by force. The occupation Greifensee-Böschen for a single decade falls at the lower end of the predicted survival period of a pile-dwelling (between 10 and 15 years (Billamboz 2006a; Billamboz and Köninger 2005), but in some circumstances less (Bleicher 2009)), indicating that houses were not subjected to extensive renovation or repair, as is also indicated by the dendrochronological evidence.

4.5.1.4: Lake Chalain

The small lake of Chalain (French Jura) includes an exceptionally high, and concentrated, number of pile-dwelling sites (Figure 32 and Table 4), many of which relate to the Neolithic. Significantly, the Iron Age site Chalain ML V I, located some 100 metres from the lakeshore, illustrates the possible displacement of settlements which would have occurred during periods of high lake levels during the early Iron Age (Pétrequin 2013: 256; Pétrequin *et al.* 2004), as has been demonstrated for the MBA (Menotti 2001a). Indeed, the relocation and displacement of sites away from the lake-shore raises an important point: lakes are enclosed waterscapes, they always have a shoreline; during times of higher – or lower – water levels this shoreline simply shifts position! From an archaeological perspective both raising and lowering of the shoreline may restrict access to the prehistoric resource. Permanently raising the shoreline significantly may increase the depth at which the archaeological material is submerged or buried, and reduce the likelihood of its discovery simply through logistical considerations and the requirements of excavation.

Raising and lowering of the lakeshore, to varying heights, will possibly have an impact upon the preservation and perception of lake pile dwellings during excavation. If the timber is buried in standard terrestrial conditions it is more than likely to decay, leaving only staining on the ground for archaeologists to investigate in the form of postholes. Furthermore, if a lake-dwelling site was found – in a decayed state – at a displaced position in relation to the modern lake (for instance possibly c. 400 metres in areas of Zurich Bay by Menotti's (2001a: 126, 1999; see also Menotti 2003, 2004a) reconstructions), it would require a leap of faith and environmental reconstruction, as conducted at ML V I, to indicate its status as a lake-dwelling.

Returning to the question of the final abandonment of lake-dwellings during the early Iron Age, the possibility of not discovering (through location or preservation) or not recognising (location) of Late Bronze Age/early Iron Age settlements must be considered. The relatively recent discovery and dating of lake-dwellings, such as Conjux Le Port[16], Chindrieux[17], and Le Saut de la Pucelle[18] (Billaud 2006a,b; Billaud and Marguet 2004) should serve as reminders that there is still archaeological material to be discovered, excavated and dated, which may challenge our current models of abandonment and cessation of the lake-dwelling tradition.

[16] Dendrochronologically dated to 816-812 BC; Lake Bourget, FR.

[17] Dendrochronologically dated to 814 BC; Lake Bourget, FR.

[18] Dendrochronologically dated to 805 BC; Lake Bourget FR.

Table 3. Typological classification and dating for lake-dwellings from Lake Greifen and Lake Pfäffikon. For location and plans of sites with letters, numbers, and Roman numerals see Figure 31 (data from database of Palafittes UNESCO World Heritage Site application 2009 and appropriate site publications).

	Site	Cortaillod	Pfyn	Horgen	Corded Ware	EBA	LBA	Dating	Method
1)	Schwerzenbach Suelen						×		Archaeobotanical
2)	Fällanden Rietspitz	×	×	×	×	×	×		Typological
3)	Maur Weierwiesen		×	×	×		×		Typological
4)	Maur Schifflände		×	×	×	×		2680 BC	Dendro
5)	Maur Uessikon		×	×					Typological
6)	Uster Riedikon		×	×			×		Typological
7)	Greifensee Storen/Wildsberg		×	×	×				Typological
8)	Greifensee Furen			×	×				Typological
9)	Greifensee Starkstromkabel			×		×	×		Typological
a)	Greifensee Böschen					×	×	1051-1042 BC	Dendro
I)	Pfäffikon Baselrüti						×		Typological
II)	Pfäffikon Burg		×			×			Typological
III)	Pfäffikon Riet		×						Typological
IV)	Pfäffikon Irgenhausen				×	×			Typological
V)	Wetzikon Himmerich	×	×		×				Typological
VI)	Wetzikon Robenhausen		×		×	×	×		Typological

4.5.1.5: Lake Constance

Being significantly larger than Lake Feder and Lake Greifen, Lake Constance also has significantly more lake-dwellings along its shorelines (not all sites listes here, for examples see Suter and Schlichtherle 2009), and a number of published settlement plans permit a brief discussion of settlement form (Figure 33 and Table 5). From the available dating evidence it is again clear that settlements were occupied over several phases, often after significant intervals of time and in the same locations (Table 5), in accordance with the *Siedlungskammer* and *Siedlungsplatz* proposals (see Section 4.5). The published settlement plans for selected settlements from Lake Constance indicate a somewhat similar development to those seen on Lake Feder (see Schlichtherle 1992), though the buildings were constructed on stilts to accommodate variations in the lake-water level (Schlichtherle 2004: 28); Neolithic settlements constructed in regular, or semi-regular, arrangement. Bronze Age settlements on Lake Constance differ from those on Lake Feder in that they retain the highly regularized arrangement, surrounded by palisades, as illustrated by Unteruhldingen-Stollenwiesen (Schöbel 1996: 29-58), instead of degenerating into a looser arrangement of building clusters (see Section 4.5.1.1). The continuation of regularized settlement plans into the Late Bronze Age is evidenced by numerous other lake-dwellings from particularly the western nCA, such as Hauterive-Champréveyres (Pillonel 2007), Cortaillod-Est, Cortaillod-Les Esserts, Grandson-Corcelettes, and Bevaix-Sud, (see Arnold 1990a).

Continuing regularisation of settlement layout and increasing settlement size has been taken as an indication of increasing levels of urbanisation in the Late Bronze Age lake-dwelling communities (Arnold 1990a; Pétrequin 2013: 263-64; Primas 2008: 15-46, 1990a).

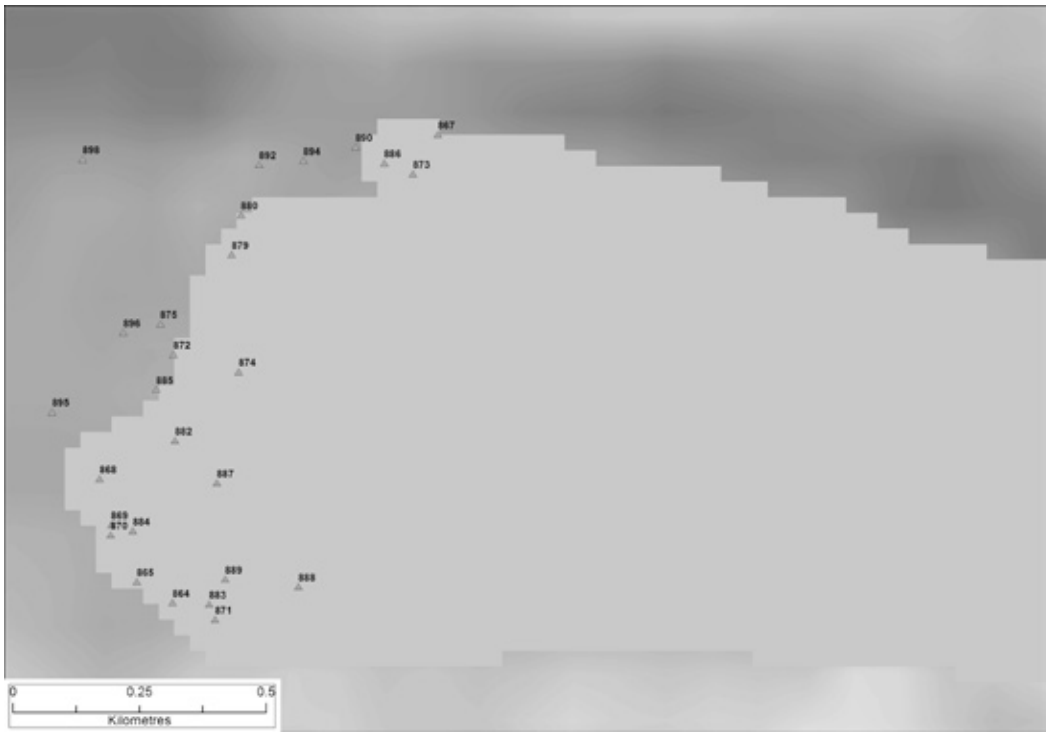

Figure 32: Lake-settlement locations in Lake Chalain, France (data from database of Palafittes UNESCO World Heritage Site application 2009). For site descriptions see Table 4. At present day all sites are on dry land, not underwater.

Table 4. Lake-settlements of Lake Chalain, France. For location of sites see Figure 32. Dating categories in years BC (data from Palafitte UNESCO database).

	Site	Dating Uncertain	4500-4000	4000-3500	3500-3000	3000-2500	2500-2000	2000-1500	1500-1000	1000-500
864	Chalain 19				X					
865	Chalain 18					X				
867	Chalain 10	X								
868	Chalain 14				X				X	
869	Chalain 15					X				
870	Chalain 16					X	X			
871	Chalain 24					X				
872	Chalain 26					X			X	
873	Chalain 1					X		X		
874	Chalain 30								X	
875	Chalain 12					X				
879	Chalain 6				X	X				
880	Chalain 5					X				
882	Chalain 29					X			X	
883	Chalain 27					X				
884	Chalain 17					X				
885	Chalain 25				X	X				
886	Chalain 2/3-5					X				
887	Chalain 22					X			X	
888	Chalain 21					X				
888	Chalain 21					X				
889	Chalain 20					X			X	
890	Chalain 2 A-C				X	X				
892	Chalain 4				X					
894	Chalain 3				X	X				
895	Chalain 28			X	X					
896	Chalain 13				X					
898	Chalain ML V I		X	X	X	X				X

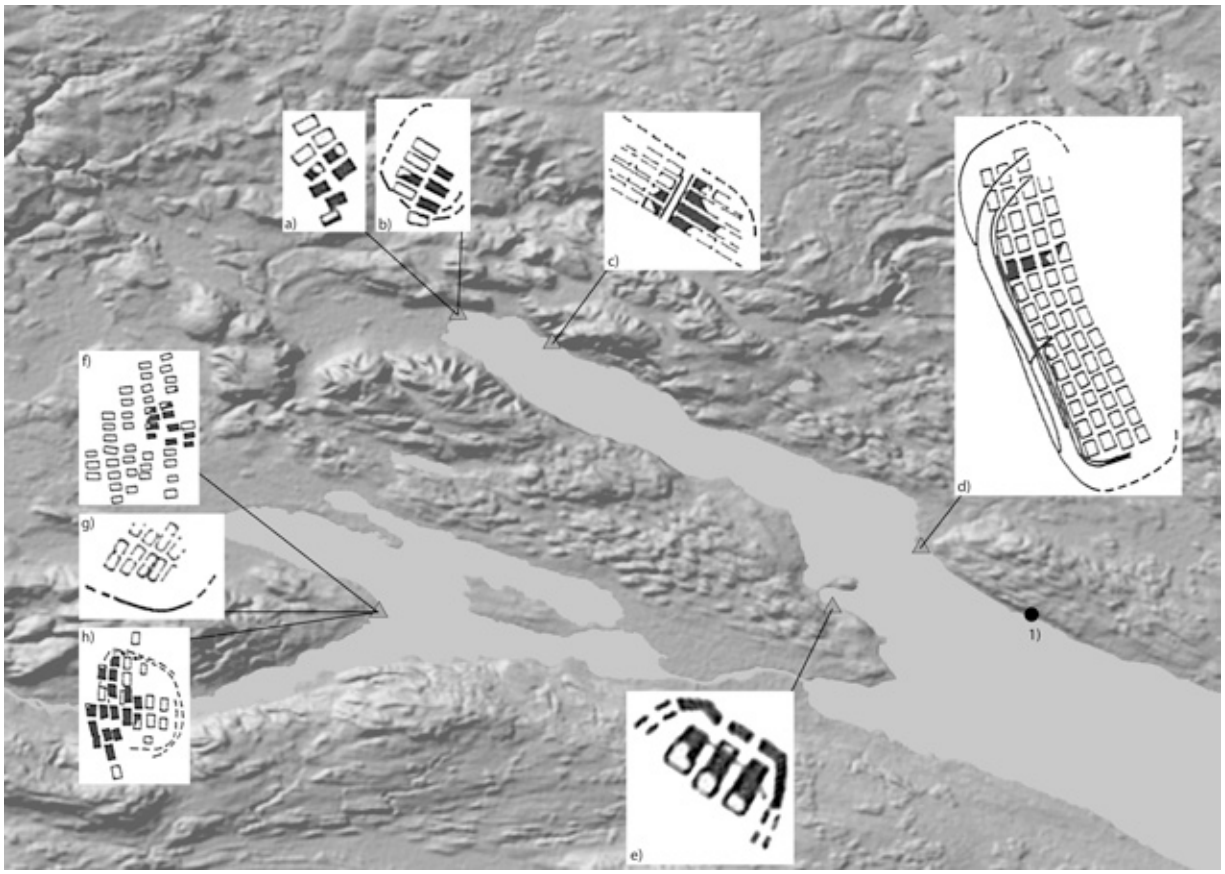

Figure 33: Selected lake-settlements around Lake Constance (settlement plans after Schlichtherle 1995). For site descriptions see Table 5.

Table 5. Typological classification and dating for sites from Lake-Constance. For site locations and plans see Figure 33 (data from database of Palafittes UNESCO World Heritage Site application 2009 and appropriate site publications).

	Site	Michelsberg	Hornstaad	Pfyn	Horgen	Corded Ware	EBA	LBA	Dating	Method
d)	Unteruhldingen					×		×	Phase I: 975-954 BC Phase II: 930-917 BC Phase III: 863-850 BC	Dendro
a) & b)	Bodman Schachen I						×			
e)	Egg Obere Güll I				×		×		3306-3023 BC 1621-1620 BC	C14, Dendro
c)	Sipplingen					×				
f) & h)	Hornstaad Hörnle I		×	×						
g)	Hornstaad Hörnle II			×					3870-3862 BC	Dendro
1)	Hagnau-Burg	×		×	×		×	×	1050-874 BC	Dendro

4.5.2: Inland settlements of the Late Bronze Age and Iron Age in the nCA

Evidence for inland settlements of the northern Circum-Alpine region relating to the Late Bronze Age and Iron Age is scarcer than that relating to the lake-settlements, due to both preservation levels and research agendas. Excavation in advance of motorway construction revealed several LBA sites in the hinterland of Lake Murten and Lake Neuchâtel (e.g. Morat-Löwenberg (Boisaubert and Bugnon 2008), Frasses-Praz au Doux (Mauvilly *et al.* 1997; Mauvilly and Ruffieux 2008a)) and other settlements are known from further inland (e.g. Bavois-En Raillon (Vital and Voruz 1984)) (Map 1). These settlements are somewhat smaller and less regularized in layout than their lake-shore contemporaries, and it has been suggested that the settlement Conjux-Le Port 3 (Lake Bourget, FR) may represent an intermediary between a lake-settlement and an inland settlement (Billaud 2008). Lake-resource extraction areas may also be identified in the archaeological record, for example at Zug-Chollerpark (Lake Zug) there are possible indications of fishing stations relating to both the Late Bronze Age and early Iron Age (Eberschweiler 2004: 161-70).

However, it is not only settlements on the lake-shore which followed a regular layout; the MBA-LBA Alpine settlement Savognin-Padnal also shows indications of standardized structure size and close spatial alignment (Rageth 1976, 1986). Some of these sites show continuation of use between the LBA and IA, for example in the vicinity of Morat-Löwenberg several Iron Age burials are recorded (Boisaubert and Bugnon 2008), and artefacts from sporadic excavation in Zug (CH) suggest that there was Iron Age human occupation in the area – continuing in the vicinity of LBA lake-settlements (Bauer, I 1993).

Greater levels of information are known regarding hilltop and fortified 'highland' sites of the LBA and EIA (Map 2), for example Montlingerberg (CH) (Steinhauser and Primas 1987), Rhinsberg (CH) (Bigler 2005), Ebersberg-Berg am Irchel (CH) (cf. Brem *et al.* 1987: 124), Wittnauer Horn (CH) (Berger, L and Brogli 1980; Bersu 1945), Scuol-Munt Baselgia (CH) (Stauffer-Isenring and Kaufmann 1983), Flueli-Amsteg (CH) (Primas *et al.* 1992), and Brig-Gils Waldmatte (CH) (Curdy *et al.* 1993). Again, some of these settlements show continuation between the Bronze and Iron Age (e.g. Montlingerberg, Wittnauer Horn, and Flueli-Amsteg). It has been suggested that many of the 'highland' fortified sites occur on important trade routes and crossing places and became 'unavoidable' places (*zwangspunkt*) (Jockenhövel 1985; Rind 1999: 3; Brem *et al.* 1987: 124), which would have enabled a degree of control over, and participation in, exchange and communication networks (see Chapter 3); Montlingerberg and Scuol-Munt Baselgia in particular show indications of their involvement in long-distance exchange networks. Occupation of hilltop settlements does not mark a new tradition during the Iron Age (cf. Harding 2006; Jockenhövel 1974b), and many settlements of such form are recorded from the nCA and southern Germany relating to the Early and Middle Bronze Age, which may have been utilized as central places and formed a node in copper circulation networks (Krause 2005). However, the increased population density and elaborate fortifications of some Iron Age hilltop settlements marks a break from previous traditions and new emphasis on enclosure, separation, and display (cf. Harding 2006) and social hierarchy structures enabled larger populations (Seifert 1996: 164-65).

Some of the LBA 'highland' settlements, for example Zurich-Üetliberg (Bauer, I *et al.* 1991) and Heidenburg (Lake Pfäffikon) (Altorfer 2010: 254), occur within the vicinity of, and show indications of contemporary occupation/use to, lake-settlements. How these sites were utilized in combination with the lake-dwellings is unclear, but material culture evidence (e.g. *Pfahlbauperlen* from Üetliberg; see Section 5.2.1.1) suggests circulation of goods between the two settlement types. From the quantity of artefacts recovered from the 'highland' settlements in the vicinity of lake-dwellings it is, however, clear that the latter settlement type formed the large population centres during the Late Bronze Age, with possible sporadic use of the hilltop settlements, especially when compared to more distant 'highland' settlements, such as Montlingerberg (Steinhauser and Primas 1987).

4.5.3: Biographies of Lake-Settlements

In discussing the biographies of settlements an important factor to consider is the possible re-use of timber over successive phases of occupation or between settlements. The construction of pile-dwellings would have required a significant quantity of timber, large amounts of which would have been used for construction of the superstructure, and so protected from possible decaying influence of ground contact. Such superstructure timber may have constituted a significant and readily available timber resource, which, in light of the current dendrochronological evidence, does not appear to have been extensively utilized. One example where timber re-use has been identified is at the settlement Conjux-Le Port 3 (Billaud 2008), and re-use has also been suggested for Hauterive-Champréveyres, where evidence indicates that piles were occasionally removed and possibly reworked (Pillonel 2007: 70). At Conjux-Le Port 3 the initial pioneer construction of two buildings was, possibly, undertaken using timber from a nearby settlement (Billaud 2008). The re-use of timbers, coupled with the splitting of timbers to produce multiple piles from single logs (Billaud 2008; also Hauterive Champréveyres: Pillonel 2007; and Cortaillod-Est: Arnold

1986), may indicate an over exploitation of the surrounding forest resources, leading to a reduced availability of suitable size trees. Such re-use of timbers may have created a social conflict arising from the use of timbers from former settlements, which as has already been discussed (see Section 4.5.1.3), were frequently destroyed by fire as a possible symbolic destruction of dwellings.

As a summary biography of lake-dwelling settlements, a development cycle can be proposed (Figure 34). Settlement, and building, life was likely dependant on social preconceptions of the expected, and acceptable, duration in addition to physical factors such as the survival of building materials (Jennings 2012a; cf. Gerritsen 2008: 159).

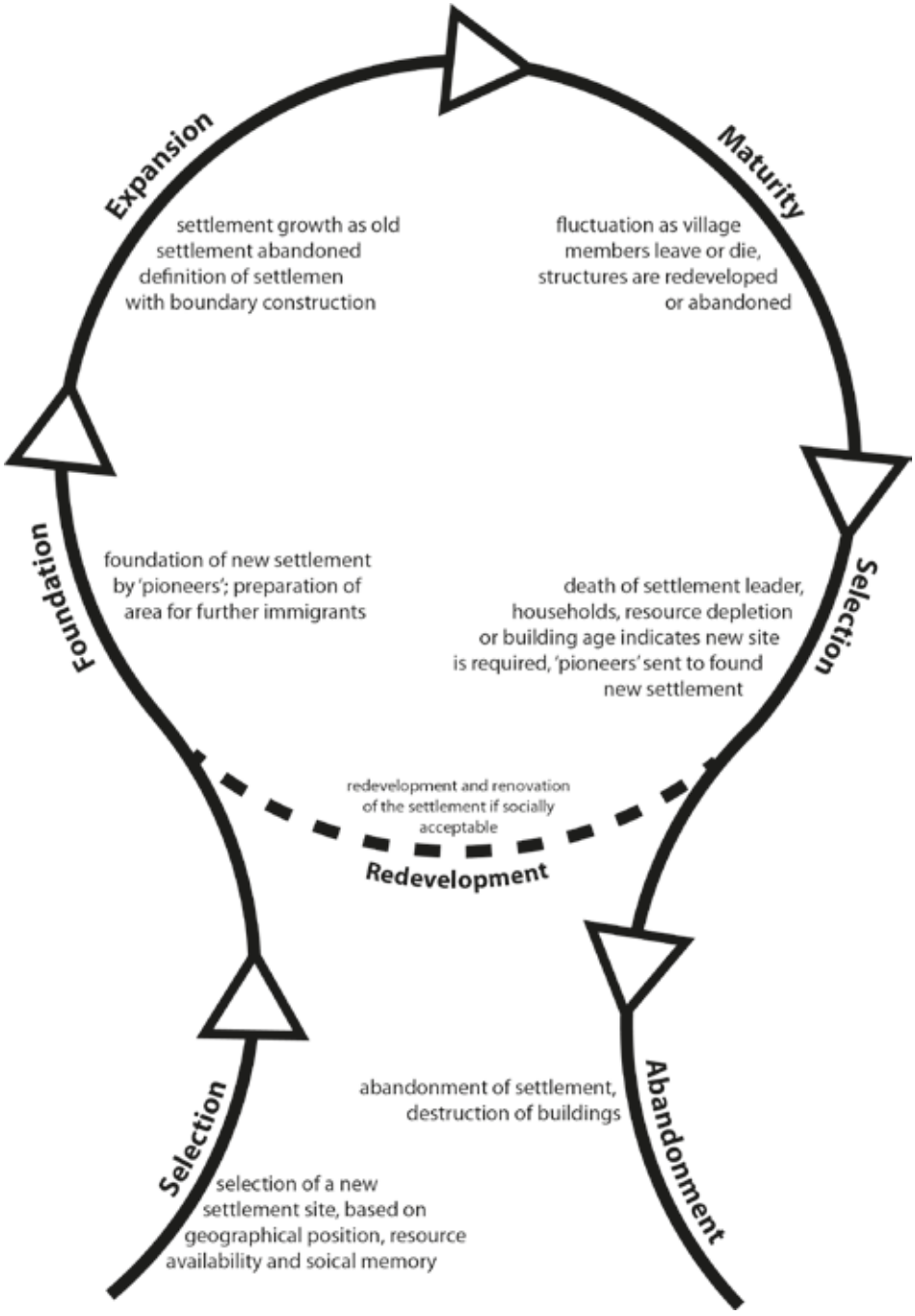

Figure 34: Hypothesized development sequence including a social biography for Circum-Alpine region lake-dwellings (after Jennings 2012a).

Settlement occupation began with the choice to relocate and found a new (or old) site. This would have required the selection of a number of pioneer settlers to begin construction. The choice to found a new settlement may have been influenced by a number of factors, such as the death of elite individuals, reduced environmental resources and agricultural productivity, or the state of repair of buildings. The settlement would then expand as members gradually relocated from the previous site, were joined by immigrants, or through natural demographic expansion and achievement of life stages for individual members of the community. At this stage the decision may have been taken to actively impose a limit on the potential settlement size through the erection of perimeter palisades and fences. The layout and organisation of settlements may provide some indication as to the hierarchical nature of the community; regular alignment with equal sized buildings suggests a more egalitarian society (cf. Aslan 2002), while the clustering of structures may represent the symbolism of social ties and membership of households in certain (sub)communities (Marcus 2000: 236; Marshall 2000: 96-97). However, it is important to remember that building size and position is not the only way to signify status or membership (Chesson 2003), and other methods must have been employed in the otherwise apparently un-hierarchical lake-settlements (Dunning and Rychner 1992: 69). Within the lake-dwelling tradition of the northern Circum-Alpine region, both settlements with a regularized layout and those with an open or loose organisation occur somewhat contemporaneously, but the latter are more frequent in the eastern region (cf. Primas 2004: 39). It is also possible that a development occurred from the regularized to loosely arranged settlements within a specific area even in the western nCA, for example around Lake Bourget at Conjux-Le Port (Billaud 2006b, 2008).

Upon reaching maturity, or a relatively stable size, a settlement may have undergone population fluctuation, as members died or left the community, buildings fell into disrepair and were abandoned/demolished, or renovated, but without undergoing significant expansion. After a period of time (either short – e.g. Greifensee-Böschen – or longer – e.g. Hauterive-Champréveyres) the decision to relocate (or renovate) the settlement was made, based upon the same principles as those suggested above, which would have resulted in the loss of a few members of the community as pioneers to found the new site, followed by complete abandonment of the settlement in the following years. It has been suggested that communities of the Iberian peninsula during the Late Bronze Age and early Iron Age were based around the individual, and therefore when one person died their rights did not pass onto the next generation through principles of inheritance, meaning that the rights to building plots and involvement in exchange networks needed to be attained for each generation, resulting in shifting settlements and building locations (Blanco-González 2011; González-Ruibal 2006). Furthermore, it has been argued that a direct link can be seen between increasing permanence of settlement and increasingly hereditary societies (Blanco-González 2011: 404). A non-hereditary explanation may also account for the transient nature of lake-dwelling settlements in the nCA, with inhabitants required to found now building plots once household elders died, but such practices are difficult to identify – not least because of the limited evidence for funerary practices of the lake-dwelling communities.

From the above descriptions of lake-dwelling evolution around the northern Circum-Alpine region, it is evident that a distinction can be drawn between the 'open'[19] settlements such as Ürschhausen-Horn, Greifensee-Böschen, and Wasserburg-Buchau and those of the compacted regularized type such as Hauterive-Champréveyres and Cortaillod-Est (Primas 2008: 39). Vital (1993) has tried to explain LBA-EIA changes in settlement form (rectilinear pattern of lake-settlement to compact clustered inland settlement) of the French Jura region with relation to socio-cultural changes, from individual to familial/lineage based systems of hierarchy. Late Bronze and early Iron Age terrestrial settlements from Switzerland and southern Germany with settlement plans are relatively rare. The few which have published plans, e.g. Montlingerberg (CH) (Steinhauser-Zimmermann 1989), Goldberg (D) (Schauer 1990), Wittnauer Horn (CH) (Berger, L and Brogli 1980; Bersu 1945), the MBA site Savognin Padnal (CH) (Rageth 1976, 1986), and the Iron Age fortified settlement Heuneburg (D) (Kimmig, P 1975; Kimmig, W and Böhr 2000; Gersbach 1995) indicate that condensed, regularly arranged settlements[20] were common throughout the region, but that (some of) the Late Bronze Age lake-dwellings were somewhat larger than their terrestrial contemporaries (Primas 2008: 39; also compare sites in Boisaubert *et al.* 2008). However, it has also been argued that regularized settlement plans are so widespread across Europe and throughout prehistory that they are of little interpretative value for consideration of cultural influences; instead they may be symbolic of general periods of demographic expansion and colonisation/settlement founding (Barfield 1994; also

[19] 'Open' is not used here to define settlements as enclosed/fortified or not – in which case Wasserburg-Buchau would certainly not be termed an open settlement – but to reflect the arrangement of structures/houses within the settlement. In this case 'open' means that the buildings are not in a regular, dense system, but more loosely organised with space between structures, in contrast to a regular, grid-like, arrangement.

[20] In terms of the internal arrangement of structures.

Herbich and Dietler 2007), which must make one question the possible 'proto-urbanism' connection proposed between the *terramare* settlements and the northern Alpine Late Bronze Age lake-dwellings (e.g. Pétrequin 2013: 263-64).

Instead of considering the internal settlement arrangement, a brief consideration of the settlement enclosure in the form of palisades and the surrounding ditches/walls of Iron Age settlements may suggest a partial social influence in the decision to move away from lake-shores. As discussed earlier, the erection of barriers takes as much a symbolic role as functional defensive role (see page 59). The erection of barrier structures in the Iron Age were likely to have been used as a symbolism to display the prestige and power of ruling elites in an increasingly overt (when compared to the Bronze Age (but cf. Brück 1999; Harding 2006 for BA examples)) hierarchical society, through indications of economic and political strength displayed by the ability to undertake such constructions in competitive consumption of labour and resources (Sharples 2007; Payne *et al.* 2006; Primas 2004: 44). One of the greatest examples for the presence of symbolism in the construction of surrounding works is the Mediterranean style mudbrick wall of the Heuneburg (Kimmig, W and Böhr 2000; Ralston 1995: 71; Gersbach 1995), symbolising identity, power, and status to residents non-residents and 'foreigners'. The settlement of Geiselhöring (D) (Nagler-Zanier 1999) provides further evidence of the role of fortifications as not only physical defensive structures, but also as a method to exclude and deprive the senses of incomers by hiding the settlement interior from the route along which incomers must progress until they are intended, and permitted, to view the settlement (Wells 2007: 391-92).

Returning to the lake-dwellings previously discussed, the settlements of Greifensee-Böschen, Siedlung-Forschner, and Wasserburg-Buchau have the most prominent boundary features, all of which may (partly) have been used as a symbolic display of community and status. However, in a period of increasing individualisation and stratification, settlements in wet environments may have lacked the required stability to create and maintain stratified social systems before structures decayed (see Bleicher 2009) or local resources were exploited, forcing relocation of the settlement. Furthermore, wetland environments are not conducive to the construction of earthworks, which form the basis of many of the perimeters of the Iron Age fortified sites, reducing the ability to demonstrate power through the consumption of labour, although the *terramare* settlements of the Po Plain may be considered in this respect with their perimeter ditches and moats (Menotti 2012: 155-57). The lowland nature of the lakes would also limit the visibility of settlements, reducing the potential external audience of the conspicuous consumption. The relative proximity of the Heuneburg to Lake Feder (circa. 15km to the east), the Üetliberg to Lake Zurich, and the Baarburg to Lake Zug, may suggest that the lake was abandoned in favour of 'highland' fortified sites. Thus, it must be considered a possibility that the lake-dwelling tradition declined, partly, because these settlements, and their environmental position, were unable to support the systems of social differentiation and stratification required by a newly emerging elite class.

4.6: GIS Visibility and Network Analysis

During recent years it has become trendy within archaeology to utilize the power of Geographical Information Systems (GIS) to perform spatial analysis incorporating archaeological sites and their surrounding environment, particularly through visibility analysis (e.g. Wheatley 1995; Woodman 1999; Fisher *et al.* 1997; Llobera 2001; Mainberger and Mainberger 2010) and network analysis (e.g. Bell *et al.* 2002; Johansen *et al.* 2004). For the purposes of interpreting the possible prominence and visibility of lake-settlements a trial GIS analysis was conducted on a region incorporating the Lake Zurich, Lake Greifen and Lake Zug, with locational information for late Bronze Age lake-dwelling sites (Viewshed 1), and compared to two early Iron Age hilltop settlements: Üetliberg overlooking Lake Zurich, and Baarburg, overlooking Lake Zug (Viewshed 2).

Although apparently with little explanatory or interpretative value, visibility modelling does make clear what may be considered as relatively self-evident aspects, such the increased prominence of the 'highland' settlements compared to the lakeshore settlements, and that the visibility of the lakeshore settlements is extensive across the lake but limited inland. However, problems with visibility analysis in archaeological applications concerning the lack of vegetation cover in GIS models, changing landscape features and the over emphasis of visual at the expense of sound or smell orientation indicators have been well discussed in the literature (e.g. Conolly and Lane 2006: 225-33). The impact of vegetation cover should be considered not only as an impairment to the visibility of sites, but should also be recognized as a landscape masking feature, disguising elements of the landscape which may appear significantly different were they deforested, such as ridges, slopes and even the lakeshore (cf. Tilley 2010).
Furthermore, the structures and their appearance will significantly influence their visibility in the landscape, as has been discussed in the case of the whitewashed mud brick wall of the Heuneburg (Germany) making the site significantly more prominent within the local environment (Arnold 2010). Preservation of the lake-dwellings has provided good indications of the sub-structural features, though little information concerning super-structures, making reconstruction of the upper

levels of buildings difficult, and reducing possible interpretations of their prominence within the landscape. With reference to the lake-dwellings and lake environments, weather conditions and influences should also be noted: thick fog banks and snow cover, both of which occur regularly around the lakes of the Circum-Alpine region, would all influence the visibility and prominence of sites in the environment (Figure 35).

For a trade and exchange based study a network analysis may prove more beneficial (Johansen *et al.* 2004; also Primas 2009), though again there are a number of inhibitors presented by the archaeological remains which hinder such a study in this case. Many of the network studies undertaken so far imply an inherent contemporaneity on settlements and sites based on broad period dating. However, from the dendrochronological analysis performed on many of the Circum-Alpine lake-settlements it is evident that settlements were frequently short lived and movable, while there is also a relative lack of information concerning contemporary terrestrial settlements from the region. These factors combine to reduce the potential number of nodes which may be utilized for network analysis, which are reduced further by the general absence of burial structures associated with lake-settlements. With future excavations filling in data gaps, there may be the opportunity and possibility to undertake more significant network analysis on the lake-settlements of the Circum-Alpine region.

Figure 35: Influences of climatic conditions on the visibility of the environment, looking west across Lake Zurich in clear weather (a) and foggy conditions (b), and east across Lake Greifen during clear (c) and foggy (d) conditions. Map shows viewing directions for photographs. (Photographs courtesy of N Bleicher (Zurich)).

5: Portable Material Culture

Traditional forms of material cutlure – that is portable objects – can be used to suggest exchange and communication routes flowing through Europe. However, not all of the material exchanged will be preserved in the archaeological record, and, as previosuly discussed (see Section 3), the exchange of organic objects remains largely invisible in the archaeological record. Even the exchange of raw metal, i.e. copper and tin, remains difficult to observe because they were cast into material objects (see Sub-section 5.4.3). However, a range of objects, both of fossilized organic material, i.e. amber, and material of anthopogenic origin, e.g. glass, bronze, are frequently preserved in the archaeological record. The disparity between natural occurrence of these materials, e.g. amber in the Baltic region, copper and tin in certain mountainous locations, and human occupation across Europe and their desire for functional and prestige materials, influenced the movement of objects between regions. However, it is clear that some objects and materials travelled further than others, with amber being one of those to travel great distances.

5.1: Amber

Amber is an excellent material to begin an assessment of the role of lake-dwellings in long-distance trade during the Late Bronze Age, because it is one of the most visible objects to have been exchanged between the north and south of Europe. A considerable amount of ink has already been spent discussing the significance of amber during prehistory and the routes, by which it was moved across Europe. A thorough review of the literature concerning amber routes here would add little to the existing levels of knowledge, and the reader is directed to other works for broader references (e.g. Bellintani, P 2013; Stahl 2006; Bellintani, P 2002; Palavestra 2005; Bouzek 1993; Beck and Shennan 1991; De Navarro 1925; du Gardin 2002, 1993, 1992). However, less research has been conducted on *why* amber travelled so far during the Bronze Age. A biographical approach will elucidate the changing social value of amber over both time and space and the mechanisms by which amber was exchanged, with particular relevance to the lake-dwelling communities of the northern Circum-Alpine region.

Amber is distributed in varying quantities across Europe, and although it is most abundant along the Baltic coast region spreading in gradually-reducing quantities to the east coast of England, some isolated deposits are known from other areas of Europe, e.g. Sicily. Archaeometric analysis enables the distinction of regional varieties of amber, such as Sicilian (simetite) or Romanian (rumanite), from Baltic amber (succinite) (e.g. Beck and Hartnett 1993; Angelini and Bellintani 2005; Teodor *et al.* 2010). It is not possible to differentiate between different deposits of the same amber – e.g. British from Danish finds.

During the Neolithic, amber was extensively used in burials as a prestige good where natural deposits occurred, for example in Denmark (Shennan 1982; Beck and Shennan 1991) and the Baltic states (Griciuvienė 2000: 48; Butrimas 2001). The Early Bronze Age saw a decline in the use of amber in Denmark as a burial good or prestige object, with a corresponding increase in cultural deposition in central Europe and Britain, though the handful of finds from the Circum-Alpine region suggests limited exchange to northern Italy (see Stahl 2006; Artursson and Nicolis 2005: 333). The decline of amber as a prestige object in Denmark is seen as the result of the commoditisation of amber as a trade substance used to acquire metal objects from central Europe (Beck and Shennan 1991: 141; Kristiansen and Larsson 2005b: 122). Commoditisation of amber may have occurred because it was readily available in Denmark with limited opportunities for control (unlike the access to imported metalwork) and resulted in the collection and accumulation of quantities of amber for probable preparation for exchange (Bech 1997, 2003). The southern and western Baltic region (Pommerania) suggests the reverse of this trend during the early Iron Age (HaC period), where amber changed from having a commodity value in exchange networks to a symbolic, prestige, and religious value to be utilized in burial contexts (see Pydyn 1999). Similarly, during the late Hallstatt period (HaD), amber processed in southern Europe was imported to Denmark for use in elite burials (Kristiansen 1998: 233-34).

Sicilian amber was also utilized during the Early Bronze Age in central Italy, Sicily, and the Iberian peninsula; again confined to burials of the richest members of society who had access to the funerary arena (Cultraro 2005; Angelini and Bellintani 2004; Bellintani, P 2004; Murillo-Barroso and Martinón-Torres 2012). It is possible that contact between communities on Sicily and those of mainland Italy and the Mediterranean region spread knowledge of this substance among elite groups of various regions, leading to an increasing demand for amber. Late Bronze Age utilisation of local amber sources in Romania has also been suggested by analysis of finds from the Cioclovina hoard (Teodor *et al.* 2010), where undulations in the popularity and use of the material has been linked to interruptions in the trade networks and exclusion of the region from the North-South exchange route linking the Baltic to the Mediterranean (Teodor *et al.* 2010: 2394-95).

From the late EBA to MBA an intensification of amber exchange across Europe is visible through the increasing presence of the material in northern Italy (Artursson and

Nicolis 2005; Harding 1984), and particularly the distribution of amber spacer beads/plates, found in Britain, central Europe (between c. 1800-1400 (Woodward 2002: 1045)), and Mycenaean Greece (Gerloff 1975; Sandars 1959; Harding 2005). These spacer plates have been interpreted as travelling through exchange contacts on the continent, flowing across both the mainland/Alps to the Adriatic Sea, and a maritime/transithsmian link along the coast of France, which used the rivers Garonne and Aude to cut across to the Mediterranean (Bouzek 1993; du Gardin 1986; Cunliffe 2001). Further evidence of the land route linking northern Europe to the Mediterranean via central Europe and the Alpine region is provided by an amber bead wrapped in gold leaf from Zurich-Mozartstrasse, most likely dating to the end of the Early Bronze Age (Barfield 1991; Gross *et al.* 1987: 149). That such an amber bead is found in this lake- settlement (though it must be considered that it is only a single bead) demonstrates that some of the lake-dwellings were involved in chains of long-distance exchange. The absence of spacer plates from the Circum-Alpine region (though possible instances occur at Savognin-Padnal (Rageth 1976) and Koblach A-Kadel (Vonbank 1966)), which are, however, known from nearby southern Germany and Austria, poses an interesting question as to why the lake-dwelling communities were not interested in greater exchange and utilisation of these amber objects.

Differential distribution of the spacer plates can be explained through a translation failure: communities from the Circum-Alpine region were unwilling, or unable, to incorporate the symbolism or function of the spacer plates into their local material culture assemblage, despite the fact that amber was known in those communities. Successful translation may be seen in Greece, where spacer plates have been found in elite burials (Harding and Hughes-Brock 1974). An interesting example of such translation is provided by a gold mounted spacer plate found in one of the Khaniale Tekke tombs (Hutchinson and Boardman 1954), which may have been re-used and curated over extended periods of times (cf. Woodward 2002: 1046). Previous interpretations of this object have suggested that the spacer bead was such an uncommon aspect that it was misunderstood and used in manners different from the original function (Sandars 1959: 294). Instead of assuming an element of naivety in the display of these 'foreign' objects, their use should be seen as a re-conceptualisation of the amber objects into a local medium of display, where smaller amounts of amber may have symbolized similar levels of prestige and power (see Hughes-Brock 1999) as could be illustrated by complete necklaces in other areas of Europe where amber was a more common object. The display of ‘foreign’ materials would also signify the wearers’ ability to access and activate exchange networks (see Section 2.6.1 (Helms 1988)). The gold covered bead from Zurich-Mozartstrasse may represent a pre-manufactured import from an external location (possibly Wessex (UK)) where comparable, though not similar, objects are known (Barfield 1991). Clearly, with only a single bead as evidence it is difficult to make any suggestions concerning the mode of exchange. However, accepting that gift exchange was the primary form of exchange during the Bronze Age, particularly for prestige goods (Sharples 2010: 98), this bead may indicate a gift exchange participation with an elite of the region, possibly as an attempt to encourage further trade systems or enable access through the area. From the Middle Bronze Age onwards amber became a more desirable object in the Mediterranean region. This developing popularity is represented by an increasing frequency and density of finds during the later periods of prehistory along the routes by which the material was transported to the south (see Stahl 2006; Palavestra 2005; Bergonzi 1997) for use as ornaments and in burials.

Amber beads with inscribed linear B style text have recently been discovered at a Middle Bronze Age site at Bernstorf (D) (Moosauer and Bachmaier 2005). Although it has been suggested that these beads must be treated with caution (Harding 2005: 52), they may represent the re-export of manufactured amber objects from the Mediterranean area, an aspect of the amber trade which became more prominent during the Late Bronze Age and early Iron Age (see Section 5.1.1).

In the Baltic region (especially Poland), Biskupin has often been suggested as an important node on the amber trade network (e.g. Sherratt, A 1996: 221, 230). However, the actual role of this settlement in the trade of amber must be questioned given the very low amount of the material found at this site (10 beads and 2 pieces of unworked amber (Maciejewski 1950: 111-13)). Other fortified Iron Age sites such as Słupca (4 beads, 10 pieces) and Smuszewo (1 pendant) also have very little amber present, suggesting that they may have been of limited significance to the amber trade routes (Malinowski, T 1971: 106, 2005: 224-26). Contrastingly, the Iron Age (500-400 BC) fortified settlement of Komorow and nearby cemetery of Gorszewice have produced only four amber beads, but over 900 (possibly) pieces of raw amber (Malinowski, T 2005: 223). Whether Komorow can be interpreted as an "amber factory" (Malinowski, T 2005, 1974) for the mass processing of amber instead of simply being an amber collection point, similar to the stash of up to 1800 pieces found at Bjerre (Bech 1997, 2003; Earle *et al.* 1998), remains unclear given the limited amount of amber found in a worked state. What can be stated is that the settlement was most likely a key point and intermediary location on the circulation of amber from the Baltic to southern Europe, particularly in light of the fact that pieces of worked

amber found in the Gorszewice cemetery were imports from southern Europe (Malinowski, T 2005: 231; Bukowski 2002: 100-01).

Currently there is no evidence to link the lake-dwellings from the Baltic region (e.g. of the West Baltic Barrow Culture) to the exchange and circulation of amber either as collection, manufacturing, or distribution centres. During the Late Bronze and Iron Age the use of amber declines to such an extent in some areas of the Baltic region, for instance Lithuania, that no finds have so far been recorded (Tautavičius 2001: 282).

5.1.1: Double exchange

The export of manufactured beads from the Mediterranean region to more northerly areas of Europe is evidenced in greater quantities during the 1st millennium BC through finds such as the Sphynx with a carved amber face from Grafenbühl (Aspberg, D) (Marzoli 2004; Zürn 1975) and numerous artefacts in 'princely graves' (e.g. Navi Pazor) of the Balkan region (see Palavestra 2005; Palavestra 1993; also Wells 1981: 112; Negroni Catacchio 2011: 72). These exported/imported artefacts offer the interesting scenario of communities being involved in effective 'double exchange' of the same basic object. Palavestra (2005) has eloquently detailed that the Balkan region should be considered as having played an important, and previously underrepresented, role in the exchange of amber during prehistory. Effectively, those communities involved in the circulation of amber towards manufacturing centres in Italy (where it was becoming increasing utilized as a burial object during the 1st millennium (Negroni Catacchio 1993, 2011)) were then importing manufactured goods from those same centres. Such double exchanges may reflect the increasing commoditisation of amber during the Late Bronze and early Iron Age (Beck and Shennan 1991: 141), with 'added value' (through processing and decoration), becoming a significant feature of the desirability of amber artefacts, to the detriment of locally manufactured objects. Distribution of some exported processed amber, such as the Sphynx, and associated objects including furniture, from Grafenbühl (Zürn 1975), has been interpreted as gift exchange between elites to encourage systems of interaction (Wells 1995: 237). Such gift exchanges do not detract from the re-valuation of amber in its processed compared to unprocessed state, which elites (such as those at Grafenbühl) may have assisted in circulating to the manufacturing centres in the south.

5.1.2: Amber in lake-dwellings

Amber beads from lake-dwellings in the northern Circum-Alpine region, for example those from Ürschhausen-Horn (Nagy 1999: 70) and Auvernier (Rychner 1987: 35-43), are predominantly of general form, as cylindrical, round, or globular beads (cf. Stahl 2006). These forms are of little use in considerations of manufacture location or origin. Two bead types of specific interest for the Late Bronze Age are the widely discussed *Tiryns* (roughly squared barrel bead rising to a ridge in the middle[21]) and *Allumiere* (roughly cylindrical beads with closely spaced spiral groove carved around the bead perpendicular to its length), circulated during the 12th and 11th centuries BC (Negroni Catacchio *et al.* 2004; Harding 2005). Distribution of these beads ranges from northern Italy across the central and eastern Mediterranean to include Sardinia, the Adriatic coast, Greece, and even Ukraine (Map 3). Distribution of the *Tiryns* beads is more extensive and wide ranging than that of the *Allumiere* beads. Generally *Tiryns* amber beads are found in burial contexts, and represent a broader social context than the previous use of amber in purely elite burials (Czebreszuk 2005: 360). Some *Tiryns* beads, such as those from the Hordeevka cemetery (UA), have been found in association with a rich variety of grave goods (Ślusarska 2005). A large number of other amber bead types found in rich burials in the cemetery have been interpreted as possible indications that they represent elites who controlled the flow of amber through the region (Metzner-Nebelsick 2005). The social function of *Tiryns* beads is as yet unknown, though it has been suggested that their co-occurrence with gold, in composite wheel style objects, is an indication of their association with the 'sun' (Bouzek 2005: 360), a connection to 'warrior tombs' (Cultraro 2004), and as part of a *koine* extending from the Adriatic to the Aegean (Teržan 2005: 162). *Allumiere* beads, on the other hand, appear to be a decorative bead used in multiples to create necklaces, for instance the find from Montlingerberg (CH) (Steinhauser and Primas 1987). It has been suggested that the spiral grove carved into these beads was originally intended to be inlaid with a metal wire (Primas 2008: 155), though no evidence survives of this practice, and the tightness of the spiral would result in the almost entire concealment of the amber bead.

At a number of sites *Allumiere* and *Tiryns* beads occur together, suggesting that they are not mutually exclusive or visually incompatible. Manufacture of both types of beads has been suggested as occurring at the important settlement of Frattesina (IT) (see Negroni Catacchio *et al.* 2004; Negroni Catacchio 1996, 1985), and the recently discovered site Campestrin di Grignano Polesine (IT) would appear to be an important amber processing centre, producing *Tiryns* beads (Salzani 2009). Frattesina came to be a prominent manufacture and exchange centre in the Po Plain during the Late Bronze Age, linking

[21] Described by Harding (1984: 82) as "a stubby, roughly cylindrical or concave bi-conical bead with a central swelling and sometimes a 'collar' at each end".

the Adriatic and eastern Mediterranean exchange spheres with those north of the Alps, particularly with respect to amber. Following the abandonment of Frattesina during the early Iron Age, the settlement Verucchio, further south along the Adriatic coast of northern Italy than Frattesina, has been suggested as the successor in the role of amber distribution centre, retaining good potential to access the eastern Mediterranean, the Balkan Peninsula and Croatia, and central Europe north of the Alps (Negroni Catacchio 2011: 65; Gentili 2003; Bietti Sestieri 1997: 397). The recently excavated settlement of Poggiomarino on the Tyrrhenian coast of Italy shows indications of being an important amber distribution centre from the Late Bronze Age to early Iron Age, with a number of pieces of Baltic origin recovered in addition to several pieces of non-Baltic, probably local, source (Angelini and Bellintani 2004). The settlement has apparent links to the Island of Ischia and Sardinia, through stone ballast found in a dugout canoe (Cicirelli and Albore Livadie 2007: 480), and may have been involved in the low volume circulation of Sicilian amber to other parts of Italy during the Late Bronze Age (see maps in Bellintani, P 2004; and Angelini and Bellintani 2004).

Europe north of the Alps is conspicuous in the distribution of the *Allumiere* and *Tiryns* amber beads by its general absence; only two deposits of *Allumiere* beads are known – at Montlingerberg and Hauterive-Champréveyres (dated to 1050-980 BC (Rychner-Faraggi 1993)). Other artefact finds show definite indications that the region north of the Alps was involved with exchange networks from Frattesina (e.g. glass beads, see Section 5.2.1.1) and pick-ingots (Bietti Sestieri 1997: Fig. 5)). Thus, the general lack of these beads becomes a little perplexing, particularly as amber is found at other sites in the Circum-Alpine region, for instance burials at Reinach (Fischer, C and Kaufmann 1994), and lake-dwellings during the period. Two explanations are possible for this distribution pattern:

1) the active exclusion of the northern region from the circulation of these amber bead types by the manufacturing centre.
2) the self-exclusion from the use of these types of amber beads by the communities north of the Alpine region.

Given that other objects manufactured at Frattesina and in the Po Plain are found north of the Alps, it is probably the self-exclusion of communities north of the Alps from the circulation, and rejection of these amber beads as a socially significant item. Rejection could have been in favour of more traditional amber bead types, which could be manufactured locally. However, there is only limited evidence for the manufacture of amber beads in the Circum-Alpine region during the Late Bronze Age and early Iron Age, for instance a half manufactured bead from Wasserburg-Buchau (D) (Stahl 2006: 43; Kimmig, W 1992: table 28). Alternatively, amber could have been imported as manufactured beads from the north of Europe – though it is also possible that simple forms of beads were imported from Italy. By the late Hallstatt and early La Tène period there is more persuasive evidence for the processing of amber north of the Alps, with raw and waste amber found at the Heuneburg (D), Glauberg (D) (Kreuz and Schäfer 2006), and a burial in Hochdorf (D) (Lüscher and Rast-Eicher 1999: 202).

Absence of raw amber pieces, or manufacturing debris should not be interpreted as evidence for the absence of amber processing in the northern Circum-Alpine region, and it should be remembered that the important amber processing centre of Campestrin di Grignano Polesine (IT) with extensive deposits of amber debitage was only found in 2007. The recent discovery of around 150 shards of amber from the Glauberg *Fürstensitz* (D) illustrates some of the difficulties in finding archaeological evidence of amber working; these deposits were only recovered because of extensive sieving strategies to recover botanical remains during the excavation, and the location of the amber remains (at the base of an annex wall ditch) highlights how debris may have been disposed in various areas and for multiple purposes (Kreuz and Schäfer 2006). Furthermore, the widely assigned high value of amber during prehistory increases the likelihood that remnants of the manufacturing process could have been collected and used for other purposes, for example in 'medicinal' preparations or burned, for instance during burial and 'ritual' practices. The small size of manufacturing debitage, and our modern interpretation of this as waste, does not mean that communities producing amber beads on a small scale shared this perception. Unfortunately, these suggested uses for bead by-products would leave no archaeological trace, and so acquiring supporting evidence for such practices is unlikely, but they should be considered a possibility (cf. Bouzek 1993).

The *Allumiere* beads from Montlingerberg were found in association with v-bored amber buttons of suggested northerly origin (Hughes-Brock 2005: 304; Steinhauser-Zimmermann 1989, 2002; Steinhauser and Primas 1987). The association of these amber objects of differing origins may suggest an attempt at re-contextualising the *Allumiere* beads into a more recognisable local meaning. How the *Allumiere* beads reached both Montlingerberg and Hauterive-Champréveyres is unknown, but they may have been made as high-value gifts to elites in the area/settlements. If the beads travelled through regular trade systems then it would be reasonable to expect a broader distribution of these objects.

The intensity of amber (as raw material) exchange and circulation is an interesting topic. It has been assumed to

be one of the primary substances flowing from northern Europe in exchange for metalwork, but, at the same time, it should be regarded as an almost sporadic and irregular network based on a low volume of traffic transporting bulk quantities of amber (Sherratt, A 1993: 31; Forenbaher 1992: 276). Whether the volume of amber found in the northern Circum-Alpine region supports the concept of intensive trade linking the Baltic and Mediterranean worlds is questionable; the quantity of amber discovered in the region, particularly at lake-dwellings, may be a quirk of the archaeological record. An increased representation of amber in these settlements has been suggested as a result of increased levels of preservation (Beck and Shennan 1991: 14, 103). This reasoning appears somewhat flawed given the number of amber beads that have been found in terrestrial and burial contexts across Europe (see Stahl 2006), and preservation issues should be seen as skewing amber representation towards burials contexts instead of waterlogged contexts. An elevated representation of amber in burial contexts is of more concern to studies involving northern Alpine lake-dwellings, as there is currently a lack of burial and cremation evidence indicating the funerary practices used in those communities. In the case of cremations, it is possible that amber artefacts may have been destroyed during the cremation process itself, or they were added to the remains at the time of burial (Beck and Shennan 1991: 124-25). The possible destruction of amber during cremation practices, and the lack of evidence for funerary rights in the northern Alpine lake-dwelling communities emphasize the occurrence of amber in (lake-)settlement contexts from this region, not simply because of preservation issues, but also because of the cultural practices employed by the lake-dwellers.

What is clear from the known distribution of amber in the Circum-Alpine region at present is an apparent lack of Mediterranean forms during the Late Bronze Age. During the Iron Age amber was used, in a manner similar to practices in the Italian peninsular and the Mediterranean (Nava 2011: 169), to decorate other objects, such as fibula (for instance finds from Aarwangen, Cama, and Langenthal (Stahl 2006: 294, 99; see also Negroni Catacchio 2011)), or to create necklaces (e.g. Waltershausen and Niedererlbach (see Stahl 2006)). The region does not appear to have entered into the dual-exchange relationships that other regions, such as the Adriatic coast, entered with the Mediterranean world for amber products. This is not because of an exclusion of exchange with the region, or the Italian peninsular, as, for instance, distribution of artefacts from the north Italian Golasecca culture attest interaction between the regions during the Iron Age (Curdy 2008: Fig. 339), while glass beads suggest interaction during the Late Bronze Age (see Section 5.2).

5.1.3: Concluding remarks

Archaeometric analysis makes it possible to identify Baltic amber from other, small, regional sources dispersed across Europe. Such analysis has demonstrated that the majority of prehistoric amber artefacts are in fact made from Baltic amber, even though they occur across central Europe and the Mediterranean region. This highlights how far Baltic amber travelled from its source of origin in northern Europe. During the Late Bronze Age the primary direction of movement appears to be from northern to southern Europe, where amber processing is well recorded (e.g. Frattesina and Campestrin di Grignano). Small scale export of processed amber objects occurred to the northern Circum-Alpine region (i.e. Montlingerberg and Hauterive-Champréveyres), but northern style beads remained preferable in this region. However, there is currently little evidence to show regional processing of amber in the nCA, and it is unclear whether amber beads were imported in finished form from northern Europe (Germany, Denmark) or simple style beads from northern Italy.

Amber was increasingly used as an elaborative object in the northern Alpine region during the Iron Age, to adorn and decorate other objects of social value, for example swords, fibulae and needles, in a manner similar to use patterns in northern Italy and the southern Circum-Alpine region. Such uses may suggest either a degree of devaluation of amber as a material in itself, with increased need to associate it with other elements of material culture, or a heightened valuation in which the use of small quantities of amber (instead of multi-bead necklaces) with other objects symbolized the status of individuals and their ability to activate production and exchange networks.

5.2: Glasswork

Vitreous materials, i.e. glass and faience, have been the subject of a significant level of research and analysis, and generally with increased levels of scientific analysis when compared to the research conducted on European archaeological amber finds, as the manufacture of glass offers greater opportunity for chemical composition variability and analysis. Early glass production is thought to have begun in northern Syria during the latter half of the 3rd millennium BC, but glass was an uncommon material in central Europe throughout the early 2nd millennium BC (Towle *et al.* 2001: 7-9; Angelini *et al.* 2003; Henderson, J 1988b: 436). Faience, essentially a partially vitrified glass, has been found in Early Bronze Age contexts across a wide area of Europe, with both regional manufacture and exchange mechanisms identifiable (Tite *et al.* 2008; Angelini *et al.* 2003). The occurrence of Mycenaean faience at Poynsdorf (D) has been used as an indication of exchange relationships between the north and south of Europe (Nightingale 2005: 425). Faience has also been found at Circum-Alpine lake-dwellings, such as Arbon-Bleiche 2 (Harding 1971: 200; Hochuli 1994: 110) and a Late Bronze Age context at Hauterive-Champréveyres (Henderson, J 1993), though this may be a contamination from an earlier context (Tite *et al.* 2008: 143).

5.2.1: Late Bronze Age glass manufacture

The Late Bronze Age shows extensive evidence for the production, working, and exchange of glass across mainland Europe, especially from sites in the Po Plain (IT) (cf. Towle 2002; Towle *et al.* 2001). Of particular interest is the emergence of a regional tradition of glass manufacture with a chemical composition different from other Mediterranean glasses – so called 'Low Magnesium High Potassium' (LMHK) mixed alkali glass (e.g. Henderson, J 1988b; Angelini 2008). This variety of glass, dating to between the mid-12th and 7th centuries BC (Henderson, J 2000: 50-51), has been found at a number of sites and locations across Europe, including Switzerland (Henderson, J 1993), Germany (Hartmann *et al.* 1997), Ireland, and Britain (Henderson, J 1988a). Continuing archaeometric analysis of archaeological glasses will confirm the occurrence of this glass at other sites in central Europe (Mildner *et al.* 2010). While these sites are indicative of the general distribution of LMHK glass in Late Bronze Age Europe, the most intense concentration of this glass is found in the Po Plain, and particularly at Frattesina. It has been suggested that during the (Italian) Final Bronze Age (see Figure 7), Italy was exclusively producing LMHK glass (Angelini *et al.* 2003: 35), with evidence for a production area existing in the Po Plain, at sites such as Frattesina, Mariconda and Montagnana (Towle 2002: 332; Angelini *et al.* 2006; Towle *et al.* 2001). Glass manufacturing and working evidence from Frattesina includes crucibles with fused glass and glass ingots (Brill 1992; Towle 2002: 332-35; Bellintani, P 1997). Although glass preservation and recovery rates, and the chances of glass manufacture sites being discovered, must be considered (Freestone 2001; Towle 2002: 330-32), the archaeological evidence so far indicates that the Po Plain was the main production and working area of LMHK glass. A secondary production, or working area, has been identified at Elateia (Nikita and Henderson 2006; Nikita *et al.* 2006), where a slightly different chemical composition is evident, and also at the site of Rathgal (Ireland) during the 1st millennium BC – after the demise of LMHK in the Po Plain (Henderson, J 1988b).

A wide variety of glass beads were manufactured in the Po Plain, with most evidence discovered at Frattesina (Bellintani, P and Stefan 2008), where they were used as jewellery and often incorporated in cremation burials (see Salzani and Colonna 2010; Bellintani, P 2011). Two specific types of beads are of interest from the assemblage found at Frattesina: *'perle a botticella'* and *'perle ad occhi'* (Bellintani, P and Stefan 2008) or as they are more widely known in German *'Pfahlbautönnchenperlen'* and *'Pfahlbaunoppenperlen'* (Haevernick 1978) – collectively *'Pfahlbauperlen'*, translated into English as *'lake-dwelling beads'*.

5.2.1.1: Pfahlbauperlen

Pfahlbautönnchenperlen[22] and *Pfahlbaunoppenperlen*[23] (Figure 36) are two specific types of glass bead produced during the Late Bronze Age (HaA-HaB (Towle *et al.* 2001: 11)) that have been found at a number of lake-dwellings of the northern Circum-Alpine region, further north to the edge of southern Scandinavia, and a few examples in the eastern Mediterranean (Map 4 and Map 5). In the northern Circum-Alpine region, it is evident that the majority of the beads are found within lake-dwelling contexts, in contrast to the situation from outside of the lake-dwelling area, in which the majority of finds occurred in burial contexts. This can be interpreted as the result of both taphonomic factors, i.e. better preservation and survival rates in the waterlogged lake-dwelling deposits when compared to the potential of erosion and dispersal from terrestrial settlements; and also the lake-dwelling communities' burial practices which remain largely unknown (see Section 6.1). The present general lack of knowledge concerning burial complexes associated to lake-dwellings also distorts this distribution. Other finds from the Circum-Alpine region

[22] A cylindrical barrel shaped bead with a blue glass body and inlaid white spiral thread with a cylindrical hole running through the length of the bead.

[23] A roughly circular, or circular with 'horns', bead of blue glass body with a hole through the centre. The bead is decorated with, normally 4, white glass circles inlaid to create 'eyes'.

indicate that these beads were used as burial items in this area (e.g. Innsbruck-Mühlau ((AT) Wagner, K H 1943), Volders ((AT) Kasseroler 1959). However, there are also terrestrial settlement finds from the Circum-Alpine region (e.g. Tec Nev ((CH) Della Casa 2000), Salorno ((IT) Bellintani 2002; Bellintani and Stefan 2009), which suggest that it is not an exceptional situation to find these beads in such a context. So far no examples of the *Pfahlbauperlen* have been found in Poland or the Baltic region.

Figure 36: Examples of pfahlbauperlen, with blue background and white inlay. The two beads on the left are pfahlbautönnchenperlen. The centre example is also a pfahlbautönnchenperlen, though the white inlay has been degraded. The two examples on the right are pfahlbaunoppenperlen (after Rychner-Faraggi, A. -M. 1993: 74, Fig. 12).

Roughly one hundred *Pfahlbauperlen* have been recovered from the manufacturing centre of Frattesina (IT), compared to over 200 that were recovered from Hauterive-Champréveyres (CH) (Bellintani, P and Stefan 2008: 82; Bellintani, P 2013: 12; Rychner-Faraggi 1993). Such a situation may suggest that Hauterive-Champréveyres should also be considered as a manufacturing/working centre involved in the production of these glass beads. However, in contrast to Frattesina with crucibles, ingots, and extensive evidence for glass beads of other varieties (Bellintani, P and Stefan 2008: 82; Bellintani, P 2013), there is a lack of supporting evidence for this proposition. Given the number of beads excavated at Hauterive-Champréveyres it has been suggested that a manufacturing centre north of the Alps should not be ruled out, though this is not necessarily at Hauterive-Champréveyres (Towle *et al.* 2001: 12). A piece of melted glass from Hagnau-Burg has been interpreted as the remains of glass bead production at the site (Schöbel 1996: 106), but this single, small, fragment is scant evidence for production, and could have occurred through accidental (or deliberate) burning.

A number of small black glass beads represent a rare occurrence in Switzerland, though have been found at several locations (Map 6), including Eschenz-Insel Werd (CH) and Guevaux (CH) (Brem *et al.* 1987; Colomb and Muyden 1896). Beads from Zurich-Grosser Hafner have been variously described as jet (German = *Gagat*) or glass beads (e.g. Brem *et al.* 1987; Wyss 1981b; Primas and Ruoff 1981), and it may be that chemical analysis is the only way to conclusively differentiate between the materials of these beads, as has been suggested for early Iron Age black glass beads (Haevernick 1975). The necklace from Zurich-Grosser Hafner is an interesting object of likely foreign provenance, containing Cardium shell in addition to jet and glass beads. The Mediterranean origin of Cardium shell indicates that the necklace may have been imported to the Zurich region from south of the Alps (Wyss 1981b: 250). The 'foreign' nature of this necklace may also be indicated by the somewhat individual nature of the piece, with no comparable material composition to other Late Bronze Age necklaces from the nCA.

5.2.2: Early Iron Age glass

Following the collapse of the Proto-Villanovan centres of the Po Plain during the early 1st millennium BC, the production of LMHK glass in the Italian peninsula declined, with a return to Low Magnesium Glass (LMG) and High Magnesium Glass (HMG) compositions by the 8th century BC, but there is currently little data relating to the Bronze Age/Iron Age transition (Angelini 2008). As mentioned above, the use of LMHK glass continued at other sites in Europe until later in the 1st millennium BC, for instance at Rathgal (IR) in the 7th century. Concurrent with the decline of LMHK glass manufacture in the Po Plain is a decline and discontinuation of the circulation and deposition of the lake-dwelling beads. Furthermore, the typology (and chemical composition) of the few glass beads found in the Veneto region and Bologna relating to the early Iron Age attests to a decline of glass manufacturing in the area. A corresponding increase in the working of glass imported from southern Italy and the Aegean to northern Italy for manufacturing objects during the 8th century to use in funerary contexts and social practices is evidenced (Polla *et al.* 2008: 347-48; Angelini *et al.* 2008; Towle 2002; Turfa 1986; Towle and Henderson 2007). Few remains of raw glass are recorded from north of the Alps during the Iron Age, with some known from Manching (D), dating to the 1st century BC (Lüscher and Rast-Eicher 1999: 197).

One general type of glass bead that became common across wide areas of Europe during the Iron Age (6th century BC – 1st century AD) was the *'stratified eye-*

bead' [24], particularly with a combination of yellow background and blue eyes (or blue and white/yellow) evident in the Balkan region (Venclová 1983). Similarly, globular beads with blue background and yellow wavy ribbon thread (or vice-versa) are commonly found across Europe, and occasionally in the Circum-Alpine region. Production of glass beads in the northern Circum-Alpine region is currently un-proven, and these beads are thought to have been imports from Slovenia (Lüscher and Rast-Eicher 1999: 196-98; Angelini *et al.* 2008).

Stratified eye beads found in association with amber beads in burials at the Hallstatt C period cemeteries of Miłosławice and Świbie (Silesia, Poland), presumably in the form of necklaces and jewellery, have been interpreted as an indication of trade links to central Europe and the Alpine region (Lasak 2007; Michnik 2007; see also Gedl 1991: 96-97). While many glass beads are known from burial contexts in the Baltic region (e.g. the Gorszewice cemetery and the mouth of the Vistula (Pydyn 1999: 62, 64)), few have been found in sites supposedly related to systems of long-distance exchange, e.g. Biskupin (55 beads (Maciejewski 1950: 111)).

Switzerland presents an interesting distribution of glass beads for the early La Tène period. *Stratified eye* beads with a yellow or blue/green body with yellow/white eyes are rare in Switzerland; instead a variant of the bead – blue based *'all over eye beads'*[25] – was frequently used in combination with blue glass beads and amber. The apparent absence of brightly coloured yellow beads in favour of blue based beads suggests that colour was a significant influencing factor in the use, display, and combination of glass beads in the above-mentioned region (see Kunter 1994; Kunter and Haevernick 1995; Frey and Roth 1983; Frey *et al.* 1987). Burials with inclusions of blue glass and amber beads combined in necklaces (e.g. Arbedo-Cerinasca, Montagny and Münsingen-Rain (see Stahl 2006: 274-76 for sites) may indicate that yellow coloured glass beads were culturally aesthetically incompatible with amber beads.

Another type of glass bead found north of the Alps during the Iron Age are small black beads of the "*Hagenauer*" type (Haevernick 1975), which frequently occur in female burials of the early Iron Age, for instance at Bonstetten (CH) and Subingen (CH) (Map 6). Local manufacture, or glass processing, north of the Alps has been proposed for these beads, but as yet, definitive evidence is lacking (Haevernick 1975; Lüscher and Rast-Eicher 1999; Bellintani, P 2011: 171).

5.2.3: Lake-Dwelling beads?

Clearly, the most interesting glass object for consideration of Circum-Alpine trade routes in the Late Bronze and early Iron Ages is the distribution of the so-called *Pfahlbauperlen*, though their title as lake-dwelling beads should be re-considered. The term *Pfahlbauperlen* was first used in the 1930s by Vogt to describe the glass beads found at lake-dwelling sites (Towle *et al.* 2001: 12). This term should be seen as originating from an era, and following a sustained period, of intense interest and focus on lake-dwellings from the Circum-Alpine region, when many 'excavations' were conducted revealing a large amount of artefacts. In light of subsequent excavations during the 20th century, particularly the discovery of Frattesina, and their extensive distribution across the central Europe (Map 4), these beads should not be viewed as a material culture object specific to lake-dwelling communities. However, even with the vagaries of preservation and discovery, it is undeniable that many more of these decorated beads have been excavated at the Circum-Alpine lake-dwellings (particularly Hauterive-Champréveyres) than other locations.

Considering the finds from Hauterive-Champréveyres first, an exchange relationship with Frattesina has been proposed, which has support from other finds at Hauterive-Champréveyres such as *Allumiere* amber beads (see Section 5.1.2), decorated antler discs (see Rychner-Faraggi 1993), and *Fontanella* knives (see Sub-section FONTANELLA in Section 5.4.2.2). Simply assuming this exchange relationship does not explain their method of movement between the communities, and glass production and circulation cannot be considered as a key part of the Bronze Age economy in the same league as metal (Towle 2002: 351). However, it is evident from the use of the decorated glass beads in burials that they held an important social value for identity construction.

The social function of the glass beads could have changed over both time and location. At the manufacturing locations in the Po Plain (and possibly elsewhere), the beads could have taken both a commodity form, to be used in exchange relationships and given to members of the community. They were also used as social and personal identifiers as signified by their inclusion in (generally female) burials, frequently in multiple numbers as the close proximity to glass manufacturing would have decreased the social value of

[24] These are circular beads with a central hole for threading. 'Eyes' are applied to the bead using an alternative colour glass. Repeated application of the alternative glass is used to create a series of alternating rings. Multiple eyes are incorporated on the same bead. Stratified eye beads are fundamentally similar to the noppenperlen detailed above, with further elaboration, development, and rounding. Venclová (1983) provides a good description of the varieties of stratified eye beads.

[25] Similar to stratified eye beads, though with more eyes covering the available surface of the bead (see Kunter 1994; Kunter and Haevernick 1995 for references).

single glass beads. As the glass beads travelled northwards, the value of these beads would have shifted from a commodity to a social good. Hauterive-Champréveyres could have been an important nodal point on the circulation of these beads north of the Alps, as represented by the number of beads found there (Jennings 2012b: 92; cf. Rychner-Faraggi 1993). Multiple beads found together have been taken as an indication that the beads were intended to be worn as necklaces (e.g. Uenze, O 1949/50; Wyss 1981b), and individual beads may have been used in earrings (Bernatzky-Goetze 1987: Fig. 115). The finding of glass beads (though not *Pfahlbauperlen*) in a decorated birch bark container (Figure 37) at the lake-dwelling Zurich-Grosser-Hafner suggests that beads/necklaces were cared for and kept secure, and raises the possibility that such jewellery was used only at certain social times and occasions.

The *Pfahlbauperlen* could have arrived at Hauterive-Champréveyres (assuming that they were produced in northern Italy and not locally) as either gift objects or trade items. It is difficult to ascertain the most likely method of circulation, and a combination of both initial gift exchange and subsequent commodity exchange following the successful translation of the glass beads into local material culture should be envisioned. From the site of Salorno (Adige Valley, IT) over 200 LMHK glass beads have been recovered (including 12 *Pfahlbauperlen*), adding further support to glass bead exchange systems linking the north and south of the Alps (Bellintani, P 2013: 8), with the high number of beads possibly suggesting their movement as commodity goods.

Considering other sites of the Circum-Alpine region where Pfahlbauperlen have been found, it is firstly evident that the numbers discovered are significantly less than those that have been found at Hauterive-Champréveyres, and secondly that there is a particular fluorescence around Lake Neuchâtel. It can be hypothesized that Hauterive-Champréveyres was effectively a regional distribution centre, from where *Pfahlbauperlen* were dispersed to communities in the region (Jennings 2012b: 92).

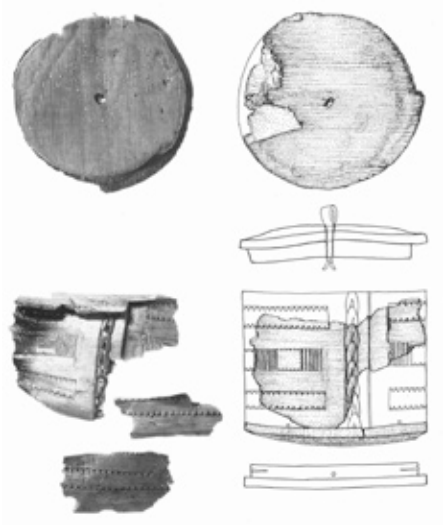

Figure 37: Birch bark container discovered at Zurich-Grosser Hafner. Left: excavated remains. Right: illustration of the reconstructed artefact (after Wyss, 1981: 244, Fig. 4, 5).

Moving further away from Lake Neuchâtel, *Pfahlbauperlen* become increasingly less common and their find context changes from settlements to cremation burials. While this may be a result of changing preservation conditions (as mentioned above), there is a correlation between both find type and find context. From burial/cremation contexts north of the Alps, generally singular and occasionally multiple (but less than 10) beads have been recovered (though they may be in association with other glass beads (see Mildner 2008)); distinctly less than excavated from a number of lake-dwellings and contexts in the Circum-Alpine region. This can be seen as a general reduction in the volume of *Pfahlbauperlen* in circulation with increasing distance from the Alpine region – even reaching as far as Uelsby (D; one bead) near the Germany/Denmark border on the Jutland peninsula (Pahlow 2006).

Associated objects from these burials and cremations, suggest that the *Pfahlbauperlen* were used in burials for both male and female members of society, and also children. Most frequently glass beads were used in female burials, but in a few burials, e.g. at Haunstetten (D) and Ingolstadt-Zuchering (D) burials 108 and 284, the associated grave goods or remains indicate male individuals. Where glass beads were used in male burials it appears that the individuals were older members of society, while they occur in female burials of all ages

(Mildner 2008: 70-73). The association of glass beads with other valuable and high status objects, such as gold and amber, reflects the value and prestige linked to ownership of glass beads (Mildner 2008: 89-90). Circulation of the *Pfahlbauperlen* in decreasing quantities northwards can be seen as a reflection of their reducing commodity value and increasing of symbolic and prestige value, and that they were possibly exchanged as gifts or subject to controlled access by social elites.

A *Pfahlbau* bead fused to two other small glass beads from a group of 17 cremation burials at Marzoll (D) (Figure 38), and a number of other pieces of molten glass from cremation or settlement contexts in north of the Alps (Map 7), present a number of possible interpretations:

- The beads were deliberately included in the cremation process in order to partially or totally destroy them
- The beads could have been accidentally included during the cremation process
- The glass beads were deliberately included in the cremation, but were an uncommon occurrence in the society and the effects of heat on the object were unknown

From the three options, accidental inclusion in the cremation seems unlikely as elements of the cremation required active selection for inclusion in the burial; only socially relevant objects would have been extracted from the cremation remains for burial. This leaves a deliberate inclusion in the cremation and a lack of awareness of the effects of burning/heat on glass. It is well known that burial goods were often added to cremation burials post cremation in order to prevent their destruction by fire, particularly with objects such as amber (e.g. Beck and Shennan 1991: 124-25). So, the glass was either deliberately included for destruction by fire, or it was a novel material with low levels of knowledge concerning its production and manufacture processes. Which of these situations existed is unclear, though it could be assumed that Bronze Age societies were sufficiently aware of heat application manufacturing processes of other materials – i.e. metalworking – to understand the possible effects of cremation on glass.

Figure 38: Molten Pfahlbauperlen, fused to two smaller glass beads from a cremation burial 6 at Marzoll (Germany) (photograph courtesy of Erich Claßen, Archäologische Staatssammlung München).

Inclusion of only a few beads in cremation/burials also raises the issue of object curation and heirlooms. It has been argued elsewhere that inclusion of amber beads and spacer plates in burials represents an heirloom culture in which larger necklaces and collections of amber were deliberately fragmented over time for partial inclusion in select burials (Woodward 2002; see also Lillios 1999; Frieman 2012). Low numbers of glass beads, and *Pfahlbauperlen* found in cremation burials north of the Alps could represent such a fragmentation and heirloom procedure, in which necklaces with multiple beads were divided and distributed between individuals over generations.

Returning to the lake-dwellings of the Circum-Alpine region there is also an apparent decline in the numbers of *Pfahlbauperlen* in circulation over time. Most of the *Pfahlbauperlen* from Hauterive-Champréveyres come from contexts dendrochronologically dated to 1050-1030 BC (HaA2-HaB1) (Rychner-Faraggi 1993: 12-14, 64), placing these beads in the late-middle period of their production. Finds at Hagnau Burg (1050-875/850 BC; D (Schöbel 1996: 83-85)) and Ürschhausen-Horn (870-800 BC; CH (Gollnisch-Moos 1999; Hasenfratz and Schnyder 1998)) suggest that the *Pfahlbauperlen* continued in use and circulation after the decline of the manufacturing centres in the Po Plain (i.e. Frattesina and Montagnana 10^{th}/9^{th} century BC). This may indicate that the beads were curated as heirlooms,

and the reduced numbers of beads found together (2 *noppenperlen* at Ürschhausen-Horn; 8 *tönnchen*- and 4 *noppenperlen* at Hagnau-Burg (D)) may suggest the fragmentation of larger necklaces from earlier periods.

Of interest are three jet (gagat) beads from Hagnau-Burg which were manufactured in the style of *Pfahlbautönnchenperlen*, with white paste (now eroded) used to create the spiral (Schöbel 1996: 106, Plate 79.27-29). Local manufacture has been proposed for these jet beads (Schöbel 1996: 106). During the Bronze Age jet is an uncommon material in the Circum-Alpine region and central Europe (Lorenz 2006: 83; Hochuli and Rychner 1998: 294-95). However, jet beads are known from nCA lake-dwellings, e.g. Ürschhausen-Horn (Nagy 1999) and Zurich-Grosser-Hafner (Wyss 1981b), and also a hoard from Stadtallendorf ((D; (Lorenz 2006) (Map 8)). Jet became a popular material for a variety of objects in the Iron Age, with increasing occurrence from the Hallstatt C period (Map 8), particularly around the Schwäbische Alb (Swabian Alps) region, where jet naturally occurs (see Lorenz 2006: 83; Lüscher and Rast-Eicher 1999: 199-200; Wells 1980: 39-40; Rochna 1962; Wyss 1981b: 250).

From the interpretations presented above concerning the circulation of *Pfahlbauperlen*, and the changing value associated to them over both space and time, a few theories are possible concerning the manufacture of *Pfahlbauperlen* in jet:

- Manufacture of these jet might suggest that the community did not have access to glass manufacture and working technology or knowledge.
- The manufacture of beads in a novel material can be seen as an attempted skeuomorphic translation, to incorporate jet into the local material culture as an acceptable and understandable material. The vitreous nature of jet may have evoked the qualities of glass. During the Iron Age, glass and jet beads of very similar design were manufactured and it is difficult to identify the material without archaeometric analysis (Lüscher and Rast-Eicher 1999: 197-98).
- The production of *Pfahlbauperlen* in jet may have been an attempt to break reliance upon distant manufacturing centres or extended trade networks for the traditional glass beads. This could have been a result of declining production in the Po Plain, restricted access to the exchange routes of the beads, or a desire to manufacture an object of prestige locally.

A combination of the above interpretations is likely to explain the occurrence of jet *Pfahlbauperlen* at Hagnau-Burg, though how successful they were translated into local material culture is open to question given the uniqueness of these beads. Attempted translation between jet and glass beads may also be seen in the distribution of small black glass beads from Late Bronze Age contexts (Map 6), which are of a relatively similar form to the jet beads from Zurich-Grosser Hafner, though these beads are rather simple in form.

5.2.4: Translation, incorporation, rejection

Translation of jet at Hagnau-Burg may be seen as occurring successfully, given the increasing popularity of jet during the Iron Age and the occurrence of jet beads at other lake-dwellings in the Circum-Alpine region. Alternatively, translation may be seen as having been unsuccessful – if jet was used for other plain beads and the translation attempt was to introduce production of the spirally decorated jet beads. Future investigations may offer greater clarity on this subject, if further jet *Pfahlbauperlen* are discovered or improved time resolution can be provided for jet beads of varying types. The occurrence of plain jet objects at Hauterive-Champréveyres (Rychner-Faraggi 1993) may suggest that the translation effort was aimed at the acceptance of jet Pfahlbauperlen instead of the glass variety.

Assuming a north Italian manufacture of *Pfahlbauperlen*, their incorporation into burial practices and lake-dwellings north of the Alps indicates as successful translation of these objects into different communities' material culture practices. Hauterive-Champréveyres provides an interesting contrast between the successful translation and incorporation of the *Pfahlbauperlen* and the failure of translation and rejection of the *Allumiere* beads[26] (see Section 5.1). Here it is possible to see the active acceptance and utilisation of the glass beads, compared to the rejection of the *Allumiere* beads; the incorporation of some elements of central Mediterranean culture while other aspects were rejected. Whether by gift or commodity exchange the circulation of *Pfahlbauperlen* was significantly more extensive than that of the *Allumiere* beads. It could be argued that the limited distribution of *Allumiere* beads north of the Alps is indicative of limited trade in the beads. However, the technical skill required to work amber is quite low[27], and it would have been possible

[26] Haevernick (1978: 153) suggests a *Pfahlbautönnchenperlen* was found at Montlingerberg (CH), though this is not mentioned in the Montlingerberg catalogue by Steinhauser-Zimmermann (1989) and the references provided by Haevernick are insufficient to verify the find.

[27] When compared to glass manufacture for example.

for communities to manufacture the beads locally. Even the conversion of some larger cylinder beads to *Allumiere* beads would have been possible – if there was a social desire for such objects.

The apparent preference for beads with a blue/white colouring in Iron Age Switzerland (see Section 5.2.2) continues the tradition of glass colouring that was set in place with the *Pfahlbauperlen*. Despite a range of glass colours being manufactured in northern Italy/the Po Plain (including red and yellow colours, see Bellintani, P and Stefan 2008) the beads circulated northwards were blue and white in colour. Some other colour beads did, however, travel north from Frattesina, for example at Haunstetten (D) several glass beads with a red spiral on a blue background have been recovered (Mildner 2008; cf. Bellintani, P and Stefan 2008). Within Switzerland, the apparent preference for blue and white beads suggests a continuity of tradition and material colour association and significance between the Late Bronze Age and Iron Age, a continuation which is also evident in the occurrence of black glass beads between the Late Bronze Age and Iron Age.

5.2.5: Concluding remarks

The European wide distribution of a specific form of Late Bronze Age glass bead – the *Pfahlbau* type – demonstrates the involvement of northern Circum-Alpine region lake-dwellings in exchange networks linking northern Europe with a manufacturing centre in the Po Plain (e.g. Frattesina). The use of these beads as indicators of social status and identity is highlighted by their inclusion in burials across their entire area of distribution. Apparently circulating between the 12th and late 9th centuries BC, it is possible that some beads continued to travel after the decline of the northern Italian manufacturing centres. This may have occurred on an 'heirloom' basis, under which necklaces of many beads were gradually broken down and circulated and deposited in ever decreasing numbers. Contemporary with the decline in numbers of *Pfahlbauperlen*, attempts were made to either introduce jet as a cultural material through emulation of glass *Pfahlbau* beads, or to locally manufacture Pfahlbauperlen in jet – a regionally available material and technology already used for simple shape beads.

During the Iron Age several varieties of glass bead are evident in the northern Circum-Alpine region, for instance *Hagenauer* and *stratified eye* beads, which demonstrate the regions continued incorporation into central European exchange networks and aesthetic regimes. However, not all of the beads forms were readily accepted in to the nCA, where communities evidently retained a preference for a specific white/yellow on blue colour combination.

Despite the extensive distribution of glass beads in the nCA during both the Late Bronze Age and Iron Age, there is currently no evidence for the manufacture of glass in this region. Current evidence indicates that the Po Plain was the main source of glass beads found in northern Europe during the Late Bronze Age, while sources for Iron Age glass may have been in central Italy and the Balkan peninsula.

5.3: Pottery

Ceramic remains are, along with flint and stone, one the most visible and frequently encountered corpus of material culture from the Bronze Age. Once fired, clay becomes a highly durable and stable material, permitting its survival in a wide range of environmental conditions (Menotti 2012: 15). However, the preservation of the ceramic material does not necessarily provide a complete picture of the pottery vessel, and applied decoration (e.g. organic inlay (Mäder 1996)), may be missing from the excavated remains. Comparatively inexpensive to produce and easily replaceable, pottery was much more prevalent within Bronze Age communities than many objects made from bronze; in fact, while metalwork remains can be counted in the 10s and 100s of objects and weighed in kilogrammes, ceramic remains are frequently counted in 100s and 1000s of items and weighed in tonnes (e.g. Hauterive-Champréveyres (Borrello 1992, 1993), Zurich-Alpenquai (Mäder 2001b), Auvernier Nord (Rychner 1979), Ürschhausen-Horn (Nagy 1999)).

Pottery has been considered a 'special' form of material culture, which can show similarities over large geographical regions (Pydyn 1999: 24). While this may be true, particularly for Iron Age pottery, for example Attic ware extending across broad swaths of Europe, it should also be noted that ceramics can change form and style over very short distances and time spans (e.g. Stark 1991).

5.3.1: Late Bronze Age – HaB

Many studies have been conducted on ceramics of the Late Bronze Age lake-dwelling communities of the northern Circum-Alpine region (e.g. Ruoff 1974; Bauer, I 1994), and typological chronologies have been created for numerous individual sites (e.g. Zug-Sumpf (Bauer, I *et al.* 2004; Seifert 1997), Zurich-Alpenquai (Mäder 2001a), Zurich-Wollishofen-Haumesser (Bolliger Schreyer 2001) and Hauterive-Champréveyres (Borrello 1992, 1993)). A review or re-assessment to the material would provide little new information, though a focus on specific types of ceramic ware may illuminate exchange and communication routes within the nCA, and also utilisation trends within the region.

Ceramic styles and forms have been used, in conjunction with other material culture objects and burial practices, as the basis for the definition of cultural areas, for example the Rhine-Swiss-East-France (RSFO) and Main-Swabian (MS) regional Urnfield cultures north of the Alps and the Laugen-Melauen (LM) culture of the central Alpine area (Figure 7; (Rychner 1998)). Thus, changing pottery styles at individual sites have been interpreted as increasing influence of certain regional cultures at the expense of others. For example, at Singen-Hohentwiel (D) both the RSFO and MS cultures are represented in the ceramic record (Kimmig, W 1979), while the Alpine valley settlements Flums-Gräpplang, Mels-Castels (Neubauer 1994), and Montlingerberg (Steinhauser-Zimmermann 1989) show alternating assemblages with Urnfield and Laugen-Melauen influences. Fluctuations in percentages need not represent a complete swing from one form to another, but simply an increasing presence, for example at Flums-Gräpplang LM type ceramics constituted up to 16% of the ceramic assemblage between the 12th and 10th centuries BC (Neubauer 1994: 87). Occurrence of ceramics from several different cultural traditions in a single site may represent the influence of trade, exchange, and communication routes in communities, while the sudden decline of ceramic types may signify a re-organisation of trade routes and the communities and individuals in control of those trade routes. Such a situation has been proposed for the sudden decline of LM type ceramics at Flums-Gräpplang during the 10th century BC, when RSFO type ceramics became more frequent at the settlement (Neubauer 1994: 87).

Within Switzerland a broad division between the eastern and western regions is seen in the traditions of ceramic form and decoration (e.g. Bauer, I 1994; Bauer, I and Gross-Klee 1994). The ceramic assemblage from Zug-Sumpf has, for example, been used to highlight the regional variation of decoration, vessel form and body profile, and demonstrates that sites in central and eastern Switzerland shared greater similarities in pottery styles to communities in southern Germany than to those of western Switzerland (Seifert 1997). This pattern is also seen in the assemblages from Zurich-Wollishofen-Haumesser and -Alpenquai (Bolliger Schreyer 2001; Mäder 2001b). However, links between the east and west of Switzerland are still evident, as seen in numerous vessels from Zurich-Alpenquai, which have similarities at Mörigen, Auvernier-Nord, and also sites in eastern France (cf. Mäder 2001b). Inter-regional variations and comparisons can overlie intra-regional variation, as has been well documented around Lake Neuchâtel, and particularly the settlements Hauterive-Champréveyres, Cortaillod-Est, Auvernier-Nord, and Vinelz-Ländti suggest that individual communities may have expressed identity through their ceramic assemblage within wider patterns of similarity (Borrello 1992, 1993; Bernatzky-Goetze 1987).

The comparison of ceramic assemblages from settlement sites to contemporaneous sites in the surrounding area indicates not only similarities and connections between sites, but also differences. For example, the assemblage from the Üetliberg (CH) suggests that the site was occupied during the Late Bronze Age, particularly HaA2-HaB1, indicating a temporal overlap with lake-settlements in the Zurich bay (e.g. Alpenquai, Wollishofen-Haumesser, Kleiner-Hafner,

Grosser-Hafner) (Bauer, I *et al.* 1991: 136-37). However, the ceramics evident at Üetliberg (overlooking Zurich bay at c. 4km distance) deviate from those found in the lake-dwellings in their decoration styles, suggesting the utilisation of local, site based, manufacturing (Bauer, I *et al.* 1991). A similar pattern is observed in the ceramics of the Regensdorf-Adlikon (CH) cremation burials (HaB1-HaB3), which show some similarities to ceramics found in lake-settlements, but demonstrate a greater variety of shape and style (Bauer, I *et al.* 1992). Such a pattern of 'similar to, but different from' lake-dwelling ceramics in burial contexts has also been observed in cremation burials at Vidy-Chavannes (CH), and it has been suggested that such variation may represent specific funerary sets (Kaenel and Klausener 1990: 76). Other objects found in these burials, such as arm ring fragments and glass beads, are predominantly represented in lake-dwelling contexts from the region.

Manufacture

One aspect that remains unresolved regarding ceramic manufacture in the northern Circum-Alpine region during the LBA, is where the manufacture and firing of ceramics actually occurred. Evidence for local production may be seen at the site Le Landeron-Grand Marais (CH), where isolated structures with a high concentration of pottery (over 200 intact vessels) have been discovered, and dendro-dated to 961/957 BC (Schwab 2002; Hofmann Rognon and Doswald 2005). Through the analysis of decorative elements and the repetition of patterns on ceramics from Zug-Sumpf, household production of pottery for consumption within the settlement community, and the absence of a specialized potter, has been suggested (Seifert 1997). Since no furnace or firing location was identified at the site, it was probably located outside of the settlement area (Seifert 1997). The firing of vessels away from the centre of settlement areas appears logical (in the present-day) in terms of fire-safety practices. Utilising locations separated from the core settlement area would also have allowed the potters/kiln workers to control knowledge of firing techniques. It is possible that while clay ceramics were produced on a household basis, the knowledge and ability to convert them to durable, fired, ceramics was held by few members of society, similar to metal workers, who held special positions in the communities.

The assemblage from Zug-Sumpf has also been used to calculate the quantity of vessels production per dwelling per year (4 to 8) (Seifert 1997: 70-71). This rate of production – and thus either vessel replacement or assemblage expansion – compares well with an ethnographically based life expectancy of one year for regularly used vessels (Foster 1960), though numerous factors, including manufacture technique, materials, use, and household conditions, would have influenced pottery breakage rates.

Several vessels are known from lake-settlements which were burnished to create a similar visual appearance to metal vessels, for example from Concise, Zurich-Alpenquai and -Wollishofen, and Grandson-Corcelettes (Wyss 1972). It is possible that these vessels were made in emulation of the metal vessels unavailable in the region, for example the example from Concise which is of similar form to the Nordic style hanging vessel (Wyss 1972: 12). However, the motivations behind such emulative objects are unclear, given the occurrence of many types of metal vessel in the lake-dwelling settlements (see Section 5.4.2.6); it is possible that they were used by members of society who were of insufficient status to use/own actual metal vessels.

Decoration

Despite the divergence between pottery styles in the eastern and western regions of Switzerland, super-regional patterns of decoration development are evident. In a brief account of Late Bronze Age and early Iron Age pottery in north-eastern Switzerland, Bauer (1994; also see Seifert 1997; Mäder 2001b) has detailed the development of ceramic styles, which can be summarized as follows:

- During the 11th and 10th centuries BC pottery was constructed with thick walls and intensively and richly decorated surfaces. Thus, pottery was relatively 'costly', in terms of time and effort, to produce.
- From the latter half of the 10th century BC, pottery was made with simpler edges, care, and generous decoration. A slight reduction in the effort required to make pottery objects occurred with the new edge forms.
- During the 9th century BC, further simplification of profiles, simpler, reduced decoration and less precise application of decoration, rougher finishing and thicker walls, all suggest faster production techniques and less 'expensive' production. These factors may also indicate the widening of the ceramic artisan base, from restricted production by 'specialist' potters, to production by many members of the communities.
- The ceramics of the 8th and 7th centuries continue in the vein of simplistic forms and decorations, and styles may have been influenced through exchange and communication routes with other regions – for example feasting related assemblages.

The occurrence of rich decoration on certain forms of ceramics which may have been used as tableware during the LBA (such as shallow bowls and plates) may indicate their role as a method of signifying social status.

Decoration of vessels of a storage nature is simpler. The richly decorated objects were effectively singularized objects, with unique systems of decoration, which could be differentiated from each other. Assuming that individuals possessed their own set of ceramic ware for personal use, the decoration on individual objects may also have been used as a method of indicating identities (Wells 1998: 250).

The decline of richly decorated objects may have been linked to climatic decline influencing agricultural production and economic contraction in the 11th and 10th centuries (Bauer, I 1994: 27), but also indicates that social symbolism was changing. The occurrence of graphite decorated pottery during the 9th century, often in patterns reminiscent of the richly decorated forms of earlier periods, illustrates the continuation of designs, while the low frequency of occurrence suggests continued prestige functions of certain ceramic styles.

Many of the motifs found on richly decorated ceramics, including hatched triangles, garlands, and half circles have comparable designs on metal work objects of contemporary use (e.g. Sections 5.4.2.2 and 5.4.2.4). With the decline of richly decorated ceramics, a reduction in the decoration on some metalwork objects is seen, with an increase in the occurrence of simply ribbed and grooved decoration – for example on knife hilts. The occurrence of iron inlay on some bronze objects may have performed a similar social function, and also presented (to a certain degree) a similar visual appearance as graphite decorated ceramics (see Section 5.4.3.2).

An interesting feature observed on selected plates and bowls at (for example) Auvernier-Nord (Rychner 1979: Plate 64.9), Eschenz-Insel Werd (Primas *et al.* 1989: Plates 41-43), Hauterive-Champréveyres (Borrello 1992: Fig. 14), Unteruhldingen-Stollenwiesen (D) (Schöbel 1996: Plate 53.7, 54.8), Ürschhausen-Horn (Nagy 1999: Plate 144-45), Wasserburg-Buchau (D) (Kimmig, W 2000: Plate 51), Zurich-Üetliberg (Bauer, I *et al.* 1991: Plate 35), -Alpenquai (Mäder 2001b: Plate 3.10), and -Wollishofen-Haumesser (Bolliger Schreyer 2001: Plates 19-22), is the apparent decoration on the underside of the vessel base (Figure 39). Such decoration is also observed further afield at sites in Germany, for example Acholshausen, Grosslangheim (e.g. Wilbertz 1982), and Kelheim (e.g. Pfauth 1998), and also during the Iron Age (e.g. Möriken-Kestenberg (Holstein 2003: Plate 61.473-75), and Heuneburg (Sievers *et al.* 1984)). Clearly this decoration would not have been in a visible position when the vessel was in use (e.g. on cups) to the user, but would have been visible to observers when the cup was lifted for drinking. Decoration in the form of crosses, wheels, and circles is observed in a similar location on bronze vessels from the Fliegenhöhle (SI) (Borgna 1996). However, the symbols on the underside of ceramics from the nCA are quite irregular, consisting of centred or de-centred crosses, multiple chevrons, single or multiple grooves in parallel or irregular arrangement, checkerboard patterns, and also impressed decoration and hatching similar to 'visible' decoration schemes on the upper surfaces (Bolliger Schreyer 2001: 31-32). The intention of, and motivation behind these 'hidden' decorations is unknown, though possibilities include:

- Testing the clay for firmness during the manufacturing process, to ensure that it was at the correct stage of dryness to apply decoration. However, the skill of the potters would most likely have been sufficient that they could judge the firmness/dryness of clay through colour changes and the passage of time. There would be no need to create patterns to do this, simple and small marks would be sufficient.
- 'Makers' marks, intended to identify the manufacturer of the pottery (Borrello 1992: 18; Wyss 1972: 9). This would make sense if local – household – production of pottery occurred, with communal firing of multiple pots in a location away from the settlement centre. However, if such a situation and practice was common, then a greater occurrence of base decoration would be expected, with a wider variety of forms.

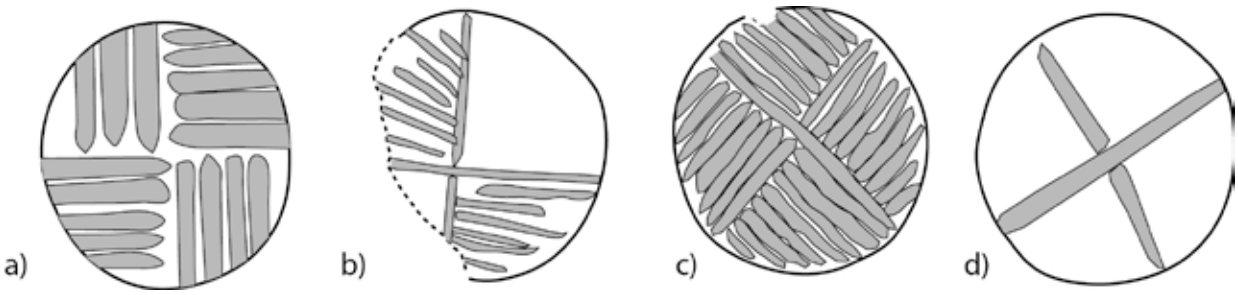

Figure 39: Samples of decoration on the underside of Late Bronze Age ceramic vessels. a) Kelheim burial 173 (re-drawn from Pfauth, 1998: Plate 148); b) Zug-Sumpf (re-drawn from Bauer et al, 2004: Plate 5.1- 595); Zug-Sumpf (re-drawn from Seifert, 1997: Plate 131- 2175); d) Zug-Sumpf (re-drawn from Bauer et al, 2004: Plate 5.1- 1019).

Applied decoration

In addition to the decoration of pottery with impressed and incized motifs, the application of other substances, such as tin, is known from numerous sites in the northern Circum-Alpine region (Map 9), and from central France (Fischer, C 1993; Peake *et al.* 2009)). Such ceramics are found in burial contexts, e.g. Neftenbach 'Steinmöri' (CH), Oberrimsingen (D), Canegrate (IT), as well as in-land settlements (Villiers-sur-Seine (FR)), and lake-dwellings (e.g. Hauterive-Champréveyres, and Zurich-Wollishofen-Haumesser) (Fischer, C 1993; Borrello 1992, 1993; Bolliger Schreyer 2001). The vessel forms suggest that these objects were manufactured locally, not imported from outside of their region of use and deposition (Fischer, C 1993: 22). The scarcity of pottery with tin (a material which must have been imported from some distance as no deposits are known from the Circum-Alpine region) application, and the inclusion of other materials (e.g. amber) in burials (e.g. Vuadens (CH)), suggests that these artefacts were high status pieces, and were utilized in both male and female graves (Fischer, C 1993).

The use of plant material for inlay decoration is recorded across Switzerland, extending into southern Germany around Lake Constance and along the Rhine valley (Map 10). Utilisation of this decoration technique occurred during the LBA across a range of vessel types (Mäder 1996), including shouldered beakers (e.g. from Zurich-Alpenquai (Mäder 2001b) and Üetliberg (Bauer, I *et al.* 1991)), plate-bowls (e.g. Muntelier (Keller, Ferdinand 1866)) and round bottomed jars (e.g. Auvernier (Rychner 1979)). Ornaments and utensils were also decorated in such manner, as illustrated by a '*Mondhorn*' from Zurich-Wollishofen-Haumesser (Heierli, J 1886), and a spinning whorl from Zurich-Üetliberg (Bauer, I *et al.* 1991). The utilisation of these plant decorated vessels occurred across a range of settlement types and locations – including lake-, highland-, and valley-settlements, and in burials (Mäder 1996, 2001b; Della Casa *et al.* 1997: 167).

The application of a white paste, consisting of white bone ash (or in some instances chalk (Primas *et al.* 1989: 103-04)), to ceramics with incized grooves is another additive type of decoration known from sites in the northern Circum-Alpine region (e.g. Eschenz-Insel Werd (Primas *et al.* 1989), Zurich-Wollishofen-Haumesser (Bolliger Schreyer 2001), Zurich-Alpenquai (Mäder 2001b)). This would have created a colour contrast on vessels to highlight the decorative scheme, and may also have performed social functions. It is unclear if the bone used was animal or human; in the latter case interesting considerations of identity fragmentation and personhood may be raised. However, the available evidence is too scant to draw any firm conclusions or hypotheses in this direction.

The function of plant and tin inlay in the ceramics is evidently decorative and, particularly in the case of plant material, may actually have restricted these vessels for/from certain uses. Vessels with plant inlay would be unsuitable for use directly in fires (e.g. boiling purposes) or suspension above fires (e.g. simmering, frying) as the organic material would rapidly combust. The low melting point of tin (c. 230°C) may similarly have restricted the use of these ceramic vessels.

Graphite painted ceramics

During the 9th century BC new decoration techniques, utilising red and black colours through the application of graphite and control of firing process, appears in the northern Circum-Alpine lake-dwelling region (Bauer, I 1994: 23). These richly decorated vessels are relatively rare in lake-dwellings, such as Ürschhausen-Horn (Nagy 1999), Mörigen (Bernatzky-Goetze 1987), Zurich-Alpenquai (Bauer, I 1994: 23), Zurich-Wollishofen-Haumesser (Bolliger Schreyer 2001: 34), Eschenz Insel-Werd (Primas *et al.* 1989) and Chindrieux-Chatillon (FR) (Billaud *et al.* 1991), though such ceramics are more common in burials, e.g. Ossingen (CH) (Ruoff 1974; Viollier 1926). Graphite decorated ceramics are, therefore, known from both the eastern and western halves of the nCA lake-dwelling region during the HaB2/HaB3 period, from both burial and lake-settlement contexts.

Imported ceramics

Some ceramics show clear indication that they were imported from outside of the region. For example, a piece with anthropomorphic decoration from Mörigen is very unusual for the Late Bronze Age, and may represent a piece imported from southern France or northern Italy (Tomedi 2002: 1229-30; Bernatzky-Goetze 1987). From the Montlingerberg hilltop settlement and Auvernier lake-settlement, sherds of "*turbanrandschalen*" pottery are known, which is a style of pottery common to the Carpathian Basin and south-east and eastern central Europe, with occasional finds in southern Germany (e.g. Frauenberg) and northern Italy (Rind 1999: 141). In addition to other forms of material culture of 'foreign' nature, a beaker relating to the HaB1 settlement phase of Zurich-Alpenquai shows decoration similar to vessels from the Tessin region, at Ascona and Castello di Tegna (CH) (Mäder 2001b: 31).

Mycenaean pottery in Italy

Although Mycenaean type pottery was never circulated to Europe north of the Alps, it reached northern Italy and the Po Plain during the Middle and Late Bronze Age. Initially introduced into the south of the Peninsula, the pottery was rapidly incorporated into the material culture assemblage of indigenous populations, and

circulated northwards (Vagnetti and Jones 1986; Vagnetti *et al.* 2004; Jones, R E *et al.* 1999; Jones, R E *et al.* 2004; Teržan 2005). While much of the early pottery was imported from the eastern Mediterranean, during the later phases of occurrence localized manufacture has been proposed – either by immigrant populations from the east, or by local potters emulating the style (Vagnetti and Jones 1986; Jones, R E *et al.* 2004). Ceramics found in the Po Plain may have been manufactured in the secondary production centres in southern Italy, and transported to the north along exchange and communication networks (Jones, R E *et al.* 2004).

Contemporary with the transfer of pottery, and pottery manufacturing techniques, to the Italian peninsula, a change in the 'acceptable' quality of production may have occurred. Vagnetti and Jones (1986) identified objects at Broglio di Trebisacce (IT) which were apparently miss- or poorly fired, but still utilized. They assert that these objects would not have been imported from the eastern Mediterranean region – as they would have been discarded upon manufacture as inferior objects – but were locally manufactured. Thus, in the absence of high quantities of imported pieces, 'low quality' locally manufactured objects may have been utilized to symbolize the foreign connections and status symbolized by the use of imported pieces. The apparent cessation of Mycenaean type pottery at settlements in the Po Plain (e.g. Frattesina, Montagnana (Pearce 2007: 103; Vagnetti *et al.* 2004)) may be a result of the limited number of pieces circulating this far north, with objects retained and extracted from circulation by social elites. However, this may also represent an instance of failed – or limited translation – where indigenous pottery was preferred to that available for import. If there was sufficient desire at Frattesina, for example, for significant quantities of Mycenaean style pottery, it is difficult to consider that the important manufacturing and trading centre with far reaching contacts (see Section 1.2.2) would not be able to acquire more, or produce local emulations. The failure of such pottery to be incorporated into the local material culture of communities in the Po Plain effectively restricted the expansion of use area of this pottery, and ensured that it was not circulated further towards the Alps.

5.3.2: Early Iron Age – HaC and HaD

There is a well-recognized continuation of ceramic style, both in terms of decoration and form, in the northern Circum-Alpine region between the Late Bronze Age (HaB2-B3) and the early Iron Age (HaC) (Bauer, I 1994; Dunning and Rychner 1992; Ruoff 1974; and southern Germany e.g. Brosseder 2000; southern France e.g. Dietler 1997). Evidently there was no significant cultural or social change, in terms of ceramics, during this period. Early Iron Age pottery is known from sites in the nCA which also contain Late Bronze Age ceramics, for example Baar-Martins Park (CH) (Gnepf Horisberger 2003), Üetliberg (Bauer, I *et al.* 1991), Wittnau Horn (CH) (Berger, L and Brogli 1980; Bersu 1945), Zug (CH) (Bauer, I 1993), and at many of the sites excavated during the A1 road construction in the canton of Fribourg (CH) (Boisaubert *et al.* 2008).

Similarities in the Hallstatt D and early La Tène period ceramic assemblages from the Üetliberg and Baarburg hilltop settlements in central/eastern Switzerland, and differences when compared to sites from further afield, such as the Heuneburg (D) and Châtillon-sur-Glâne (western CH), have been interpreted as indications of local/regional production of ceramics in addition to the importation of some foreign pottery (e.g. Attic ware) (Béarat and Bauer 1994). The representation of 'exotic' elements in materials can be interpreted as communication links between different regions (Brosseder 2000), though the actual incorporation, translation, and re-contextualisation of those elements and styles may have been undertaken by local potters and manufacturers, as has been proposed for some elements in grave assemblages from Tübingen and Rottenburg (both D) (Stegmaier 2010).

Imported ceramics: Attic ware

During the latter Iron Age (HaD and La Tène period), central Europe north of the Alps and southern France began importing and utilising Attic pottery from the Italian peninsula and the Greek archipelago. The export of pottery from Greece to the western Mediterranean/Italy intensified after the 8th century BC (Crielaard 1996), with Attic ware forming a significant presence in central Italy from the mid-6th century BC (Hannestad 1996). The desire for Attic ware in central Italy – and particularly the Etruscan cultural region – probably led to the creation of a trading centre at Spina (near modern Comacchio) on the Adriatic coast (Turfa 1986: 79; Hannestad 1996: 312). However, the desire for foreign pottery may not have been overwhelming, with apparent resistance to the incorporation of Attic pottery in funerary practices at Este (IT) until around 500 BC (Hannestad 1996: 312.)

Attic pottery is a rare occurrence in Switzerland, with exceptions at the *Fürstensitze* of Châtillon-sur-Glâne (Maggetti and Galetti 1987; Lüscher 1991) and Üetliberg (Bauer, I *et al.* 1991), the 5th century BC settlement at Sévaz-Tudinges (Mauvilly and Ruffieux 2008b; Mauvilly 2008), and Yverdon-les-Bains (Guggisberg 1991). The remains of Attic pottery from the Üetliberg attest to the regional importance of this site through the Iron Age, continuing the occupation of the site from the Late Bronze Age (Bauer, I *et al.* 1991). In southern Germany, Attic ware ceramics are known predominantly, though not exclusively, from *Fürstensitze*, such as the Heuneburg (Pape 2000), Ipf (Krause *et al.* 2006), and

Glauberg (Herrmann 2008). Other sites (e.g. Kircheim am Reis) show that dissemination of Attic ware occurred between the central places and surrounding settlements (Krause *et al.* 2006).

It is important to stress that Attic ware ceramics were not the first, or the only, form of material culture to be transferred from the Italian peninsula to regions north of the Alps (see Chapter 3). A wide variety of metalwork items, such as fibula, sickles, razors, and swords (see Section 5.4), were circulated between the two regions during the Bronze Age – and this continued through the Iron Age with *Schnabelkannen* and various fibula forms. However, the circulation of Attic pottery in the Iron Age marks a departure from previous eras in the material transported and the routes of exchange utilized. With the foundation of Massalia (modern Marseille) on the southern coast of France around 600 BC, a new, more direct trade route was opened between the eastern Mediterranean and western Europe, less reliant upon exchange chains incorporating the Etruscan region (Dietler 1997). The distribution of imported ceramics and transport amphorae indicates exchange routes flowing along the Rhône, Saône, and Doubs rivers, and cutting across land into Switzerland and southern Germany and beyond along the Danube (e.g. Kimmig, W 1983: Fig. 27-32). It has been suggested that those objects exported from Greece were low quality pieces due to the inherent risks of breakage during marine based transit and the desire of merchants to maximize profit margins (Bradley and Smith 2007: 38). The export of low quality, low value, items from their area of manufacture (Greece) would have significantly altered the biography and value of those objects, from low value commodities to high value prestige objects with foreign associations in their area of consumption (southern France or central Europe).

In addition to ceramics, wine was also consumed, resulting in the distribution of Etruscan and Massaliot amphorae throughout southern France, Switzerland, and southern Germany during the late Hallstatt and early La Tène periods (Dietler 1997: 278-85). By the late 5th century BC the desire for Attic ware in southern France, for use locally or as exchange objects, had grown to such an extent that imitative/emulative objects were being made locally in Massalia (Dietler 1997: 285).

The acceptance and incorporation of Attic pottery into central European customs was accompanied by the adoption of specific social practices, and, in some locations, building techniques and symbolism. Attic ware ceramics and wine were used in conjunction with feasting and drinking practices, which were, particularly in southern France, increasingly used as spheres for displays of wealth, prestige, and power (Dietler 2005, 1997: 297, 332; Guggisberg 2011). However, the forms of Attic ware incorporated into central European societies were not only a result of the incorporative desire of communities, but also the export practices of the manufacturing region and merchants: it has been suggested that *kylix* drinking vessels were a dominant export object because of their robusticity and stacking capabilities (Bradley and Smith 2007). Thus, part of influence for the rise of drinking and feasting practices in central Europe during the Iron Age may have been the attempts of Greek merchants to maximize their profits on trading expeditions.

The incorporation of eastern Mediterranean architectural and building practices in the lower Rhône basin, for example the mud-brick walls at Saint Blaise and Le Cros during the 6th century BC (Dietler 1997: 311-13), is not surprising given colonial foundation at Massalia. The occurrence of such building techniques at the Heuneburg (D) is, however, surprising given the distance between this settlement and southern Europe, where such techniques were dominant (Arnold 2004, 2010). Current dating evidence indicates that the mudbrick wall at the Heuneburg was most likely constructed around 600 BC, roughly contemporary with the founding of Massalia and before Attic ware occurs at the settlement. Hence, it is unlikely that influences for the construction of these fortifications were circulated with foreign ceramics via southern France (Arnold 2010). Instead, it has been proposed that the construction of the mudbrick wall represents a transformation of the built environment, prior to a transformation of the cultural and social environment by the introduction of new material culture styles (Arnold 2010). The construction of the mudbrick fortifications at the Heuneburg may be the material remains of an immigrant from southern Europe, or the acquisition of knowledge of that region by an indigenous local, for example by personal travel, which may then have driven a local desire for material objects from the Mediterranean region. This may counter the assertion that "… the presence of the Greek trading port [Massalia] created a demand for commodities from the north and that this led to the emergence of powerful chiefdoms in the core of the barbarian area, able to command the flow of luxury objects to the south" (Cunliffe 1988: 24-25), in favour of a reciprocal situation where development of central places created a demand for Mediterranean products, which were then filled by the creation of a trading port.

Clay Schnabelkannen

In addition to the circulation of Attic ware pottery to regions north of the Alps, bronze *Schnabelkannen*, manufactured in the Etruscan cultural region, were transported over the Alps to Switzerland and southern and western Germany (see Sub-section SCHNABELKANNEN in Section 5.4.2.6). At several sites, such as the Dürrnberg (AT), Hallstatt (AT), and Heuneburg (D)

ceramic emulations of *Schnabelkannen* have been identified (Map 131). These emulative vessels are found in locations with other wheel manufactured pottery (e.g. Salzburg) and Attic pottery (e.g. Heuneburg). Ceramics provided an easy way to emulate the prestige and social function of the prototype objects (be it Schnabelkannen or wheel thrown pottery) when access to the originals was restricted or unavailable.

Wheel thrown pottery

During the Iron Age a new ceramic manufacturing technique began to be utilized in the area north of the Alps – the potter's wheel. Although some Late Bronze Age pottery – for example pieces from Zurich-Alpenquai (CH) and Wasserburg-Buchau (D) – are decorated with regular, parallel lines and grooves running around the circumference of the vessels, which may have been made with the use of a slowly rotating wheel or turn-table (Rieth 1960: 16-17), it is not until the Iron Age that manufacture of pottery on fast wheels is evidenced. Initially introduced into Greece during the early 2nd millennium BC, the technique of manufacturing pottery on a wheel spread to southern Italy by the Middle - Late Bronze Age (c. 1500-1200 BC), and did not reach the regions north of the Alps until the final Hallstatt phases (HaD) around the 7th and 6th centuries BC (Rieth 1960; Collis 1997: 95). Evidence from the Heuneburg (D), Mont Lassois (FR) and Breisach-Münsterberg (D) fortified hilltop settlements suggest that wheel pottery may have begun at this settlement during the HaD period, while evidence from other settlements varies between the late Hallstatt and early La Tène period (Hopert 1996).
In a study of the pottery from Breisach-Münsterberg (D), Balzer (2009: 145; see also Bauer, I 1991; Primas and Schmid-Sikimić 1994) has suggested that wheel thrown pottery may have been circulated to Europe north of the Alps via three different routes, each of which show evidence in form, decoration, materials or technique:

1) Through the south of France via the Rhône, Saône, and Doubs rivers
2) Through northern Italy and the Tessin region over the San Bernardino Alpine pass
3) Through north-eastern Italy and Slovenia over the Etsch-Eisack, Brenner, Reschen, and Hohen Tauern passes

Through the analysis of pottery Balzer (2009: 149) identified three groups of pottery, which occur in different areas (Map 11). The sites where wheel thrown pottery is known ranges from the *Fürstensitze* (e.g. Heuneburg (D)) to non-central hill top settlements (e.g. Baarburg (CH)) and lowland and valley settlements (e.g. Bragny-sur-Saône (FR)). Thus, wheel thrown pottery was utilized at sites involved with the long-distance circulation of Attic pottery – most likely transported through the south of France – but also settlements where Attic pottery is not known. Settlements such as the Baarburg, Brangy-sur-Saône, and Singen-Hohentwiel (D) may have been linked in exchange relationships to central *Fürstensitze*, and held prominent positions in regional exchange networks, or had access to raw material (such as iron ore) sources (Bauer, I 1992; Hopert 1996).

Comparatively few burials incorporating wheel thrown pottery are recorded, for example at Dannstadt-Schauerheim (D), and from the cemetery at Münsingen-Rain (CH). It is possible that wheel manufactured ceramics were (similar to many of the Attic ceramics recorded from central Europe) separated from the funerary ritual. Instead, these vessels were utilized and consumed in social events as expressions of individual status and power, resulting in the primary occurrence in settlement contexts.

The manufacture of wheel thrown pottery on a local and regional basis in temporary workshops is evidenced, for instance, at Heuneburg (D) and Châtillon-sur-Glâne (CH) (Bauer, I 1992; Balzer 2009: 151-52). In addition to wheel manufactured pottery, there are also some 'imitation' pieces, formed by hand but decorated to mimic the features of thrown pottery (Balzer 2009: 67, 149). Some of this emulative pottery is known from sites where actual wheel thrown, and Attic pottery, is recorded – e.g. Heuneburg and Breisach-Münsterberg (D), though more frequently it is occurs where wheel manufactured pottery does not (Map 11).

5.3.3: Adopting and changing ceramic styles

In discussing the adoption of ceramic technology into early Neolithic communities Knappett *et al.* (2010: 598) asserted that:

> *… the decision to innovate is a straightforward question of adopting or resisting externally sourced bodies of knowledge and practice. In the case of the earliest ceramic containers, the decision to adopt or resist will not simply depend on the advantages perceived as accruing to this particular form of containment technology, but on wider sets of contextual criteria.*

Thus, the choice of whether to adopt and incorporate new practices and technology did not depend only upon (possible) technological advantages/benefits, but also social influences and cultural factors. When considering the Late Bronze Age and early Iron Age communities of the northern Circum-Alpine region, these societies had already been employing ceramic technology for several millennia, and so the possible technological benefits of adopting new styles are somewhat limited compared to earlier epochs, thus pushing cultural factors to the fore as primary influences in the decision to adopt or reject

influences. It has been argued elsewhere (Papadopoulos 2011: 167) that the form of ceramic vessels is primarily related to functional purposes, while the decoration is dictated by social factors. However, this point does not address the fact that the functional requirements of pottery are dictated by the social desires behind their creation. The basic function of any form of pottery is as a container; the shapes and forms adopted to perform these functions are dictated by the social needs and requirements of individuals and communities, symbolising not only individual status and identity but also that of social groups (e.g. Vatya culture (HU) Earle and Kristiansen 2010: 242; Greek or 'indigenous' groups Handberg and Jacobsen 2011).

5.3.4: Concluding remarks

The occurrence of varying forms of applied decoration on Late Bronze Age ceramic vessels has privileged an insight into the communication and exchange networks in which lake-dwelling communities were involved, and also demonstrated that ceramics may have travelled over both long-distance and local exchange routes. It is also clear that decoration was applied to signify special ceramics and highlight the status of their users. Some decoration was applied to the base of ceramics, which would have made it invisible to the individuals using the vessel, but may have been visible to other persons during its use. Perhaps these ceramics were used in ceremonies and the revelation of the symbols was a significant event; or perhaps they were simply makers' marks.

There is a well-documented continuation of ceramic form and decoration between the Late Bronze Age and early Iron Age, indicating a continuation of social systems, structures and practices in the lake-dwelling region, despite the abandonment of the lake-dwelling tradition. The choice to move inland was not associated with a complete rejection of the Late Bronze Age practices in favour of entirely new decorative schemes and object styles.

Although imported Attic ware and wheel thrown (also locally manufactured) ceramics are easily identifiable in the archaeological record, and stand out against the background of the indigenous ceramic assemblages in communities north of the Alps, they represent a very small percentage of the ceramic assemblage of sites. For example, Balzer (2009: 174) has recorded that imported ceramics represent only 0.001% of the ceramics from Breisach-Münsterberg (D). Thus, the exchange and circulation of pottery from southern Europe to communities north of the Alps should not been seen as high volume, intensive, and continuous, but rather as sporadic, low volume traffic. The relative scarcity of material may also provide indications as to the exchange mechanism used in the circulation of these ceramics: gift exchange between (or to) social elites, rather than market style commodity exchange.

5.4: Metalwork

A wide range of bronze work was manufactured during the Late Bronze Age, and can be broadly classified as 'Weapons' or 'Accessories'. Under the heading 'Weapons' are listed swords and spearheads, while 'Accessories' covers a range of objects from possible tools, e.g. knives and razors, to jewellery, e.g. arm-/leg-rings, and equipment, e.g. horse-gear. Although these categories are used to separate the groups of objects, they are not being used to assign a descriptive function – it is in fact possible, for instance, that swords and spears were used as accessories or symbolic objects in addition to/instead of weapons. Two artefact types which have not been explicitly considered in this thesis are jewellery needles/pins (*Schmucknadeln*) and various types of axes (*Beile*), but they have been mentioned in the general discussion of other object types. These two groups were omitted from in-depth consideration because they do not have widespread catalogue publication, which hinders comparison between different areas of Europe. However, the literature available from some specific sites in Switzerland (e.g. Zurich-Alpenquai (Mäder 2001a) and Hauterive-Champréveyres (Rychner-Faraggi 1993)) indicate that the distribution of such objects would complement the distribution of the other material groups considered, particularly with regard to the jewellery needles linking the northern Circum-Alpine region lake-dwellings to the region around Mainz and Frankfurt (see Chapter 8).

5.4.1: Weapons

5.4.1.1: Swords

Bronze swords are one of the most extensively studied groups of Bronze Age objects. Their easy identification, relatively self-apparent function, enigmatic nature, and evocation of warrior identities and associated ideals ensure that they remain one of the most popular objects for the public. The physical properties of bronze swords mean that they are relatively well preserved in the archaeological record, and can be readily defined into various types. This has led to an extensive record of catalogue publication, particularly in the *Prähistorische Bronzefunde* (PBF) series (e.g. Sprockhoff 1934; Müller-Karpe 1961; Bianco Peroni 1970; Krämer 1985; Quillfeldt 1995; Wüstemann 2004; Laux 2009; and also the recent online database of Hahnekamp 2012). Other publications have focused on construction techniques and functional aspects (e.g. Mödlinger 2011a; Kristiansen 2002). A key aspect of many of the sword typologies developed in the PBF volumes has been to identify the genealogy of different sword types (to see which sword types influenced others) and to propose regional origins for types. The intention is to observe the European wide distribution of various Late Bronze Age and early Iron Age swords found in the Circum-Alpine region in order to try and establish exchange and communication circles in which different communities were engaged, and also to assess the symbolism and function of swords in those communities.

It has been argued that during the latter half of the 20th century there was a 'pacification of the past' and a tendency to view the Bronze Age as a relatively passive time period, while symbols of violence were under represented (Kristiansen 1999: 175; Mödlinger 2011b: 153). Recent works have seen to redress this balance and recognize that Bronze Age swords were not only symbols of power, but also utensils of power. Indeed, when combined with other artefacts such as armour, and fortified sites across Europe, they should be seen as signs of warfare in society. Furthermore, the development of the sword during the Early and Middle Bronze Age in central Europe represents the first development of a tool designed purely to be a weapon; other 'weapons', such as spears, daggers, axes, and arrows, could be used both as weapons and hunting equipment or working tools.

Use

The function of Bronze Age swords can be separated into two broad categories: functional (briefly discussed here) and symbolic (see Sub-section SYMBOLISM in Section 5.4.1.1). Recent studies have argued that swords should be seen as indicative of warfare and conflict, particularly as "there can be no rituals or symbols without the reality of what they signify" (Kristiansen 1999: 188, note 3); the symbolism, which came to be attached to swords was only relevant if they were functional objects of power. This assessment is further supported by the fact that many swords show evidence of re-sharpening and the removal of nicks from the blade, and also post casting treatment to improve the strength of blade edges (Mödlinger 2011a,b; Kristiansen 2002).

Further information can be gleaned from the shape of swords, suggesting different methods of use. For instance the form of Early and Middle Bronze Age swords (up to BzD) suggests that the swords were primarily intended for use as a stabbing weapon, in close contact combat on foot, and with a specific type of fighting style. During the Late Bronze Age (BzD-HaB) the function of swords appears to change from a stabbing function to a slashing and hacking function, possibly indicating the early development of mounted warfare and new fighting techniques (Mödlinger 2011a; Kristiansen 2002). The change to slashing weapons during the Late Bronze Age coincided with a change in manufacturing techniques to produce more durable weapons, which would also have extended their possible use life, and also improved the functionality of the sword as a weapon (Mödlinger 2011a; Kristiansen 2002). Early Iron Age swords of the *Gündlingen* and *Mindelheim*

types continued the development of both multi-purpose swords for close combat fighting and mounted warfare (Cowen 1968).

It has been suggested, particularly by Kristiansen (e.g. 1999), that different types of swords may have performed different functions. For instance, the highly decorated octagonal hilted swords of the Middle Bronze Age may have played a social role and display less signs of functional use when compared to contemporary flange hilted swords, which show extensive evidence of use and would have had an extremely stable and strong hilt (Kristiansen 1999: 177). If different functions and roles were performed by different types of sword, and individual swords had a functional/symbolic dichotomy, it may be possible to interpret the changing social significance of swords over time through a brief examination of manufacturing techniques.

Manufacture

Several studies have focused on specific manufacturing processes and techniques used in the production of Bronze Age swords and recognized that the form of a sword would have been based not only upon local tradition and fighting techniques, but also local manufacturing skills, cultural traditions, religious and social aspects (Mödlinger 2011a). However, direct evidence for sword manufacture, in the form of moulds for sword blades and hilts, has been recovered from only a few locations (Map 12 and site numbering therein) and from these stone moulds for sword blades (or plate hilt swords) are predominant. The reason for such a lack of direct evidence – in comparison to other objects (e.g. spears, sickles, and axes (see Section 5.4.3)) could be simply due to the fact that swords were a less common object in society, and thus, there were fewer moulds in circulation. The manufacturing techniques employed would also have played a significant role in the rate of preservation of sword casting equipment: clay moulds are less commonly found than stone moulds as they are more susceptible to erosion and decay over time, and are often broken to remove the cast object; however, clay moulds for other objects, e.g. spearheads, have been recovered from lake-dwellings in Switzerland.

Mörigen sword hilts evidently manufactured in clay moulds and around clay cores are also known, such as that from Kehmstedt (D) (Wüstemann 2011). This same sword also has a mass of lead filling a cavity in the hilt, as do a number of other swords from the Late Bronze Age, including a *Mörigen* sword from the hoard at Berlin-Buch (D) (Wüstemann 2004, 2011). The function of such lead filling is unknown, but it may would have increased the weight of the hilt, changing the balance of the sword, possibly to make it more usable as a weapon, or may have been intended as a ritual practice (Wüstemann 2011).

During the early Iron Age, sword types become more homogenous, with many examples of the same sword type appearing extremely similar, e.g. the *Gündlingen* type (Fontijn 2002: 223), though differences may be observed in the hilt and pommel pieces of swords. Thus, it is apparent that during the LBA and EIA swords were differentiated by their decoration of their hilt; in flanged hilted swords plates would have been attached to the cast handle, while in full hilted swords separate hilts were specifically cast. The method of attaching sword blades to their hilts with rivets would have allowed the possibility of replacing either the hilt or the blade of full hilted swords, as may be seen through the evidence of multiple rivet holes on blades (Mödlinger 2011a). This possibly extended the life of a sword through replacement of the blade, and/or allowing sword blades to be exchange between owners. In this context the notion of what constitutes a sword should be questioned – is it the hilt, the blade or dependent upon the situation? Regardless of possible exchange of blades or hilts, it is evident from the decoration on numerous Bronze Age sword hilts that decoration was an important feature of these weapons.

Decoration

Decoration of sword hilts can be seen as an attempt to 'individualize' swords, to make them unique for individual wielders. While this may be a projection of present ideals and association of sword ownership derived from the medieval period onto the Bronze Age, it is difficult to argue against the individualisation that would have resulted from the decoration of specific swords. For instance, the sword from Frattesina with gold rivets (Peroni 2004) clearly demarks this sword as unique, and may have been used to signify the status and power of its wielder. Furthermore, of all the Bronze Age swords where the hilt had been decorated, none of them are identical; there may be similarities in style, but the decoration applied to them makes them unique. Decorations may have been taken the form of simple markings in the hilt (or hilt plates), but frequently other materials were applied to the hilt in the form of decorative inlay. As mentioned above, this may have been in the form of gold, or in other materials, such as copper; for instance in swords from Nächstenbach-Weinheim (D), Rovereto (IT) and Cochem (D) (Berger, D 2011). However, for Late Bronze Age swords north of the Alps, one of the most common materials for inlay decoration on swords was iron (Berger, D 2011). This again illustrates how new technology and new materials were initially adopted on a small scale and initially in the form of minor objects to perform a social function (see Section 5.4.3).

Such use of iron during the Late Bronze Age may have been a method to individualize these swords and to associate them with their wielders (Wirth 1996: 574).

Not only through unique markings and symbols, but also through the ability to control access to, production, and working of this relatively new and rare material. It is not certain that all decoration occurred at the point of manufacture. For example, it is possible that the *Auvernier* sword from Dessau-Kuhnau (D) was produced in southern Germany or Switzerland, and then decorated in the vicinity of its deposition; the sword may have been modified throughout its life, to fulfil the varying desires of its wielder(s).

Considering early Iron Age swords, the trend of decoration continues, though with different materials. For example, from grave 573 at Hallstatt a sword or dagger with amber decoration on the pommel was recovered (Gerdsen 1986: no.287), and daggers decorated with ivory are also known (Peroni 2004). Individualisation of swords continued into the Iron Age, even though many examples of single types may have appeared the same (e.g. the *Gündlingen* type). In this case it is worth noting that many of the pommel pieces and hilts for *Gündlingen* swords have not survived; therefore, the individualizing and identifying elements may have been lost.

Sword Types

In this section a brief overview of a variety of types of swords from the Bronze Age and Iron Age is presented, with a particular focus on their European distribution. The distribution mapping of Bronze Age swords has been greatly aided by the various volumes of the PBF series, and where necessary additional entries have been made. For the Iron Age swords and daggers, the works of Cowen (1968), Pare (1991) and Gerdsen (1986) have been particularly useful.

Various types of swords have been chosen for study, depending upon their charted occurrence in the northern Circum-Alpine region, and lake-dwelling contexts in particular, in an attempt to elucidate some of the exchange and communication networks in which those lake-dwelling communities were involved. Kristiansen and Larson's (2005a: 31) supposition that the Bronze Age sword represented a passport for elite members, or their representatives, of society, identifying them to other elites in other communities and regions, suggests that swords themselves were not necessarily traded, but may have been associated with the ability to trade through status (or on behalf of high status individuals) and travelled, effectively, as a by-product of social convention.

It is not the intention to provide a complete catalogue for all swords on central Europe; such a feat has not been achieved throughout the entire PBF series and over 40 years of research. As a result, some sword types have undoubtedly been missed, and single instances of swords are likely to be absent from the catalogue contained herewith. However, this will not detract from the overall distribution patterns of the sword types presented here. Discussion will progress in a broadly chronological order.

Late Bronze Age

A variety of swords relating to the final period of the Late Bronze Age, particularly the 10th and 9th centuries BC (HaB2-HaB3), will be discussed. Many of these sword types have been named after lake-dwellings where they were found during the 19th century, such as *Mörigen* and *Auvernier*. However, with the exception of the mould from Port (Map 12) and a possible sword mould found amongst a cache of moulds for various objects from Mörigen (Krämer 1985: 50; Heierli, Jakob 1888: 38-40), there is little evidence for the manufacture of swords at lake-dwelling settlements.

Erbenheim

The oldest variety of sword examined here is the *Erbenheim* sword (Figure 40.g), dating to the late Middle and early Late Bronze Age (BzC-HaA). This Bronze Age flange hilted sword type is of interest here as an example for which a stone mould is known from Piverone near the lake-dwelling settlement of Viverone in northern Italy, and made of a special variety of stone (Bertone *et al.* 2004: 68-69). Although several swords are known from the lake-dwelling of Viverone, none of them are of the *Erbenheim* type (Bertone *et al.* 2004). In fact, the distribution of this type of sword is predominantly in central Europe north of the Alps, extending from the British Isles and Brittany (FR) in the west to Hungary in the east. A cluster of finds are known from the Middle and Lower Rhine Valley (Map 13). Of the 28 *Erbenheim* swords mapped here, the majority of them come from water based contexts (11), with the remainder as single finds (7, including Piverone mould), or burials (5). In six instances the recovery circumstances were not listed. In this respect, find locations for this type of sword conform to the general pattern described by Schauer (1971: 2-3) for the late Middle to early Late Bronze Age, with water deposition predominant during the BzD phase, being superseded by deposition in burials during the HaA phase.

Three examples from the Alpine Rhine Valley (Stroppel, Letten, and Niederurnen (all CH)) may indicate a possible interaction route traversing the Alps. The mould from Piverone indicates the acceptance and incorporation of this sword from north of the Alps. However, the influence of impact of this incorporation should not be overstated, as these *Erbenheim* swords would have fulfilled a similar role, both social and functional, to multiple types of local (northern Italian) sword types (see Bianco Peroni 1970). The ownership and use of 'foreign' types of swords may have signified the inter-

cultural connections of individuals, but it is important to note that no actual *Erbenheim* swords are recorded from northern Italy, only the casting mould.

Locras or Port

The Middle and Late Urnfield period (HaA2-HaB1) flange hilted *Locras* or *Port* sword (Figure 40.h) is one of the few swords for which a mould is known (from Font-La Pianta, see Map 12), so it is likely that at least one manufacturing area was located in the western Switzerland lake region. Distribution of this sword shows a concentration in the west of Switzerland, with the remainder distributed widely across central Europe, extending to Poland and the Czech Republic (Map 14), though there are considerably fewer of these swords known than of the *Auvernier*, *Tachlovice*, *Mörigen* and *Tarquinia* types.

The find contexts of *Locras* swords type are standard for the LBA pattern north of the Alps, with more from wetland contexts than in burials or hoards (Table 6.)[28]. Caution should be given to those listed as settlement finds (i.e. lake-dwellings) as this may mask un-recognized structured deposition in hoards or as single objects (see Section 1.5 (cf. Fischer, V 2012)).

Auvernier

The full grip *Auvernier* sword (Figure 40.d) relates to the final stages of the LBA (HaB3), or in terms of northern Europe, Period V (Quillfeldt 1995; Wüstemann 2004: 188-89), and shares many visual similarities with the *Mörigen* type sword; the main obvious difference being that the *Auvernier* hilt is designed to have organic (e.g. antler, wood, ivory) or metal plates attached. Several of the *Auvernier* swords detailed here also have iron inlay in their hilt and pommel (see Section 5.4.3.2).

The distribution of *Auvernier* swords extends from northern France in the west to the border of Germany and Poland in the east. In the north items are recorded from Sweden, extending south to the northern Circum-Alpine region, with examples from Lake Neuchâtel and the French Jura, and the Alpine borderlands of Austria (Map 15). The clustering of this type of sword in western Switzerland and southern Germany has led many authors to suggest that these were possible manufacturing locations for *Auvernier* swords, which were then circulated to the various parts of Europe (Müller-Karpe 1961; Wüstemann 2004: 188-89).

Considering the deposition and find circumstances of the *Auvernier* swords, the general situation tallies well with that accepted for the end of the HaB period, with predominant deposition in water, and some deposition in hoards, but rarely in burials (Table 7). From the northern Circum-Alpine region in particular, it is evident that the same situation applies, though finds from lake-dwellings (Auvernier, Hagnau-Burg, Hauterive-Champréveyres) may indicate settlement finds. However, the assignation of these finds to settlement contexts must be treated with caution, as they may have been water depositions or hoards in the vicinity of settlements (see Fischer, V 2011: 1307-09).

Tachlovice

Like the *Auvernier* sword, the *Tachlovice* sword type dates to the LBA period HaB2-HaB3, (Müller-Karpe 1961). The sword is also a full grip variety (Figure 40.e), with intended hilt plates and possible attachments on the pommel (see Sicherl 2008; Boulud-Gazo 2011). Several authors have divided the *Tachlovice* sword group into a number of different variants (e.g. Wüstemann 2004; Sicherl 2008; Boulud-Gazo 2011), though these are not of particular concern here.

The distribution of *Tachlovice* swords is far more extensive than that of *Auvernier* swords, including central France, sections of the Rhône valley, Switzerland, central and eastern Germany, the Czech Republic, and Austria, with outliers in Sweden, Poland, Norway and Slovenia (Map 16). Clusters of finds can be used as a suggestion of manufacturing area, for instance production areas have been proposed in the western Alps and Bohemia (Sicherl 2008: 252). This gains further support through the apparent separation of the distribution into two broad areas, separated by the region of west-central Germany, though the sub-groups detailed by Sicherl somewhat blur the picture, with most groups having at least one or two instances in each region (Map 17).

It has been suggested in several volumes that the distribution of *Auvernier* and *Tachlovice* swords is (to an extent) a distribution of exclusion; they are not found in the same regions (Boulud-Gazo 2011; Sicherl 2008; Müller-Karpe 1961). As a general rule, this is true, though there is some overlap in the northern Circum-Alpine region, around Lake Neuchâtel, in the Rhine valley, and to a lesser degree in eastern Germany (Map 18). If it is accepted that the distribution of these two swords types illustrates, to some degree, different cultural affinities and exchange/communication routes (Boulud-Gazo 2011), it may be possible that the overlap areas indicate the communities in these regions were involved in exchange relationships with both the eastern and western halves of northern central Europe, circulating goods between the two regions.

[28] Including the mould from Font-La Pianta, and two sites included in the databse but not mapped due to the broad definition of their find location: 'Switzerland' and 'Hungary'.

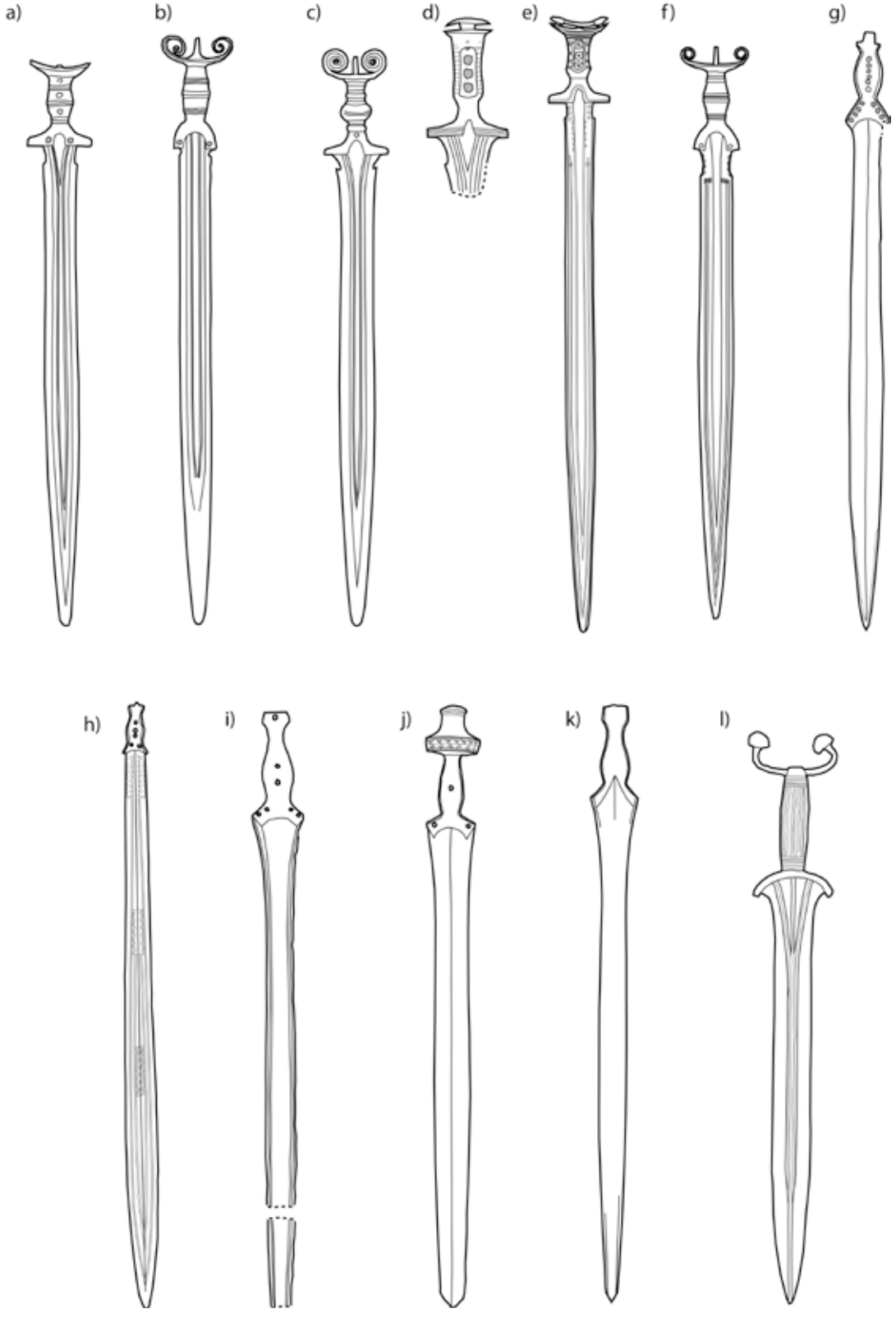

Figure 40: Late Bronze Age sword types. a) Mörigen [Mörigen]; b) Tarquinia [Auvernier]; c) Weltenburg [Grandson-Corcelettes]; d) Auvernier [Auvernier]; e) Tachlovice [Humes]; f) Zurich [Bings]; g) Erbenheim [Wiesbaden-Erbenheim]; h) Locras var. Port [Port]; i) Gündlingen var. Steinkirchen [Steinkirchen]; j) Mindelheim [Wels-Pernau]; k) "Hallstatt" [Bingen]; l) Dagger [Hallstatt] (re-drawn from: a-d, f) Krämer 1985; e) Boulud-Gazo 2011; g-k) Schauer, 1971; l) Sievers 1982).

Table 6. Find contexts of Locras type sword from central Europe, and subset of the Circum-Alpine region. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	4	1	3	3	3	8
Circum-Alpine	0	1	3	3	0	1

Table 7. Find contexts of Auvernier type swords in Europe and from the northern Circum-Alpine region subset. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	12	6	2	1	6	6
Circum-Alpine	4	(1 in moor)	3	1	0	1

Table 8. Find contexts of Tachlovice swords from Europe and the northern Circum-Alpine region subset. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	12	15	0	7	3	6
Circum-Alpine	5	1	0	0	0	4

The find contexts of *Tachlovice* swords differ somewhat from the find contexts of the *Auvernier* swords in that there is a far higher proportion of swords found in hoards, more even than in wetland contexts, which represent the influence on the record of the finds from eastern Germany and the Czech Republic (Table 8). Hoard depositions are less common in the Rhône valley and Circum-Alpine regions, where they were more frequently found in wetland contexts. The four sites where find information is unavailable relate to old finds from the vicinity of lake-dwellings, and should possibly be interpreted as wetland depositions.

Mörigen

The full grip *Mörigen* type sword (Figure 40.a), with a cast hilt and frequent inlay decoration is one of the most extensively found Late Bronze Age (HaB3, Period V and VI (Quillfeldt 1995)) swords from Europe, covering virtually the entire area of central Europe (Map 19). Concentrations can be seen in the northern Circum-Alpine region (Map 20) and the Middle Rhine Valley (Map 21). Due to the numbers of *Mörigen* swords found, they have often been divided into sub-groups, for example by Müller-Karpe (1961 - into 3 types) and later by Quillfeldt (1995 - into 5 types). The sub-groups of Müller-Karpe may provide some greater clarification of the distribution of these swords, though not all of them have been classified or are not classifiable in this system (Map 22).

From the distribution of the Müller-Karpe *Mörigen* sword variants it is evident that the most common variety in the Circum-Alpine region is variant 2, with multiple instances from the sites of Mörigen and Grandson Corcelettes (Bernatzky-Goetze 1987), and extending to the Rhône valley. It should be noted that both variants 1 and 3 are also evident in the region. Several examples of variant 2 appear to fall outside of their normal distribution area – those from Gernsheim (D) and Dommelstadl (D). These swords occur in areas in which variant 1 is more predominant. Variant 3 is uncommon across the entirety of central Europe. From these distributions it has previously been proposed that variant 1 was produced in the Frankonian Jura, variant 3 in the region of south-eastern Germany/Austria, while variant 2 may have been a product of the western Switzerland lake region (Müller-Karpe 1961). Regardless of production locales, for which the only direct evidence is the previously mentioned hilt mould from Erlingshofen (D), the distribution of *Mörigen* swords clearly indicates extensive trade and communication networks across central Europe and the exchange of symbolism which occurred in association with that communication.

Two interesting examples of *Mörigen* swords highlighted in the distribution are possible 'imitation' swords from Angeblich-Bleicherode (D) and Angeblich-Nioederfinow (D) (Wüstemann 2004). Both of these swords occur in areas which also show a distinct presence of 'authentic' *Mörigen* swords, particularly of Müller-Karpe's variant 1. These 'imitation' swords may represent a local attempt to begin producing swords, though such a supposition remains open to question.

Recorded find contexts of *Mörigen* swords[29] creates an unusual situation in that many of finds are from supposed lake-settlement contexts (Table 9). As detailed previously, the designation of settlement finds for these swords should be hesitant, and they may represent either deposition in hoard, burial, or wetland contexts.

[29] Including the two imitation swords and swords listed as *Mörigen* **or** *Auvernier* (Hagnau-Burg (D) and Cochem (D)), but not the hilt mould (Erlingshofen (D)).

Table 9. Find contexts for Mörigen swords from Europe, and the subset from the Circum-Alpine region. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	27	36 (+ 2 in moor)	19	10	26	23
Circum-Alpine	3	0	19	1	3	8

Tarquinia

A variety of sword which introduces an area of Europe as yet not covered by swords discussed – Italy and the southern Circum-Alpine region – is the *Tarquinia* sword (Figure 40.b). This is a full hilt sword relating to the Late Bronze Age (Late Urnfield; HaB1-HaB3 period) and extending into the early Iron Age (Early Hallstatt, HaC) (Quillfeldt 1995; Krämer 1985), and has a typical antenna spiral on the pommel. Distribution of the *Tarquinia* sword is extensive in central Italy, with some instances in the Po Plain and pre-Alpine region, and also in the south of the peninsula. Outside of Italy, there are several instances in the eastern Alps, one in central France, and others in Austria, Poland, Ukraine, and northern Germany (Map 23). Aside from the main distribution in Italy, there is also a cluster of these swords in the lake-region of western Switzerland (Map 24). While the varying levels of documentation across different areas of Europe may be a factor in creating a somewhat illusionary distribution (as it may with all of the material discussed here), the occurrence of a second type of antenna sword, the *Weltenburg* sword (see below), in areas of Europe conspicuously absent in the distribution of the *Tarquinia* sword would suggest that this pattern is not simply an artefact of documentation.

As has been the case of several of the sword types already detailed above, several variants for the *Tarquinia* type of sword have been proposed (Krämer 1985; Quillfeldt 1995). By charting the distribution of these variants (Map 25, Map 26) it is evident that there is a particular prevalence of the *Vetulonia* variant (Quillfeldt 1995) in central Italy and the Po Plain, while only two of these variants are found outside of Italy in the hoard at Bex (CH), and a river find at Amboise (FR). Contrastingly, the variant *Steyr* is not found in Italy, but common in the lake region of western Switzerland, the eastern Alps, northern Germany, and Poland. Such distribution may be taken as an indication of southern and northern Alpine variant of this sword with associated separate manufacturing zones in the respective regions.

The find contexts of *Tarquinia* swords mapped show a different situation to the swords so far discussed: an increased number of burials when compared to find other find contexts, though it must also be noted that the number of swords without find context listed is very high (Table 10). However, it is possible to see that the high proportion of burial contexts is a result of the number of finds from the Italian peninsula, where they have also been attributed to a slightly later period than the other swords which have been detailed here so far; instead of Late Bronze Age contexts these are from early Iron Age burials of the 9th and 7th centuries BC, and continue the traditional practice of sword burial in Italy (see Bianco Peroni 1970). From the finds in the Circum-Alpine region, there are again a number of contexts attributed as lake-dwellings that must be considered with care (see Section 1.5), and the two finds without contexts listed from Auvernier may represent wetland contexts.

Table 10. Find contexts of Tarquinia swords from Europe, including the northern Circum-Alpine region, and Italy. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	3	5	3	13	3	14
Circum-Alpine	0	3	3	0	0	2
Italy	1	0	0	11	1	6

Weltenburg

The *Weltenburg* type sword is a Late Bronze Age (HaB3) antenna sword, which displays some similarities to the *Tarquinia* type sword (Figure 40.c). Like the *Tarquinia* sword, the *Weltenburg* sword extends between the Italian peninsula, the western Switzerland lake region, central and eastern Germany, and northern Poland, with instances in Scandinavia (Map 27). Comparing the distribution of the *Weltenburg* swords to that of the *Tarquinia* swords illustrates a similar pattern of exclusion to that proposed for the *Auvernier* and *Tachlovice* type swords. Exceptions to these areas of exclusion are, again, the western Switzerland lake region, and also parts of northern Italy and northern Germany (Map 28).
The find contexts of *Weltenburg* swords mirrors that discussed above for *Tarquinia* type, with Italian finds representing the majority of burial contexts, mostly relating to the 9th to 7th centuries BC.

Table 11. Find contexts for Weltenburg swords from Europe, and the subsets from the Circum-Alpine and Italian regions. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	6	6 (+ 2 in moors)	6	11	4	5
Circum-Alpine	0	1	6	1	3	0
Italy	0	0	0	6	0	2

Corcelettes

The *Corcelettes* type sword should be considered in conjunction with the *Weltenburg* sword, as they share many characteristics and cover the same time period (HaB-HaC), and a number of *Weltenburg* swords have been classified as *Corcelettes* swords by different researchers (e.g. Quillfeldt 1995; Wüstemann 2004). Even combining these two categories together, there are only a handful of swords classified under this type: 18, of which 12 are considered to be a sub-category of the Weltenburg type. With only 6 swords listed as *Corcelettes* type there is relatively little which can be said about their distribution (Map 29) and find context (Table 12), other than it generally complements that of the *Weltenburg* - *Tarquinia* opposition, and most of them are from hoards; but the evidence is too sparse to say anything further.

Table 12. Find contexts for Corcelettes swords from Europe, and the subset from the Circum-Alpine region. Corcelettes swords listed before slash, Weltenburg-Corcelettes variant after slash. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	1 / 2	3 (+ 1 in moor) / 3	0 / 0	0 / 4	1 / 2 (+ 1 lakeshore)	0 / 1
Circum-Alpine	0 / 0	1 / 0	0 / 6	0 / 1	0 / 3	0 / 0

Zürich

The *Zürich* type sword is an antenna sword (Figure 40.f), relating to the Final Urnfield period (HaB2-HaB3). Unlike the previously described swords, limited numbers (13) of this sword type have been documented. The distribution of these 13 swords spreads across Europe from eastern France and northern Italy in the west, to Romania and Moldova in the east (Map 30). With so few swords spread over such a large distance, it is difficult to discern any clustering of these swords, though eight of the 13 occur in the eastern France-Switzerland-Germany area, with a ninth nearby in the southern Alpine forelands. Noticeable by their absence are any swords of this type in the western Switzerland lake region, from where so many swords of other types are known.

Assessing the find contexts of these 13 swords, there is an apparent correlation between the finds from Europe as a whole and those from the Circum-Alpine region[30], which also respects the previously detailed typical find contexts for the Late Bronze Age of more wetland finds and few burial instances (Table 13). The number from hoard contexts is elevated, due to the presence of the four finds from Romania and Moldova, which are all from probable hoards.

Other LBA forms

In addition to the swords detailed above, there are several types of swords which are recorded in small numbers, but do not fit into categories above or cannot be placed into the typology, such as fragmentary pieces of antenna and full grip sword. These swords are mapped as further indication of the exchange systems in which communities of the Circum-Alpine region were involved (Map 31). For instance the *Parierflügelheft* sword occurs in both western and eastern Switzerland, and outside of the region. The Late Urnfield period *Calliano* type illustrates trade connections to their main centre of distribution in northern Italy (Bianco Peroni 1970). The *Calliano* sword from Villach (AT) found in a burial context in association with an *Este* type socketed knife – also common to northern Italy (see Sub-section SOCKETED KNIVES in Section 5.4.2.2). The *Wien-Leopoldsberg* sword from Horní Lideč (CZ) is of interest, because it demonstrates an instance where iron was utilized for a non-decorative function – as rivets – in a bronze sword.

[30] Here including the southern Circum-Alpine region find at Sirio (IT) and the find from Wolfratshausen (D).

Table 13. Find contexts of Zürich type swords from Europe and the Circum-Alpine region subset. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	5	5	0	0	2	1
Circum-Alpine	2	0	0	0	2	0

Late Bronze Age iron swords

Given the frequency with which iron was used to decorate swords, and particularly *Mörigen* swords, it is interesting that there are several examples for the functional use of iron in Bronze Age contexts (Map 32). This use of iron is not confined to swords, and many other objects such as knives, spears, and horse gear, are decorated with, or partially manufactured from iron (see Section 5.4.3.2). In addition to the above-mentioned example of iron rivets in a bronze sword from Horní Lideč (CZ) a full iron sword was excavated from a burial context at Singen-Hohentwiel (D) (Kimmig, W 1979, 1981), and a sword with an iron blade and bronze handle was found in the river by Schwann (D).

The burial from Singen has been interpreted as showing similarities to the form and context of swords from the Aegean region (Brestrich and Wahl 1998: 305). Furthermore, changing pottery styles have been taken to indicate changing communication and exchange networks at Singen during the Late Bronze Age. During the early Late Bronze Age (BzD-HaA), pottery from the site demonstrates a link to the German, Swiss, south Bavarian region. From the middle to late LBA (HaA-HaB), pottery showing association with the Rhine-Swiss-east France (RSFO; Figure 7) cultural group becomes more common (Brestrich and Wahl 1998: 306). It is possible that the iron sword itself was imported from a southern region, or the desire for, and skills to manufacture, such a sword were imported along with the new pottery styles.

Early Iron Age

Early Iron Age swords continued in much the same manner as Late Bronze Age swords, with many examples still being made of bronze – such as the *Gündlingen* and *Mindelheim* swords of the 8th and 7th centuries BC (HaC1 period). During the latter half of the 7th century BC (HaC2) the short sword/dagger began replacing the (longer) sword in many areas of central Europe, a process which continued into the through the 7th and 6th centuries (HaD) (Pare 1991).

Gündlingen

The *Gündlingen* (Figure 40.i) sword became a popular sword type across a large area of central Europe during the early Iron Age (HaC) (Cunliffe 2001: 291, 2008: 300), with such frequency that it has been used to define a short cultural period in central Europe between the Late Bronze Age and early Iron Age (Harding 2000: 12; Roymans 1991). Concentrations of *Gündlingen* swords are visible in the lower Rhône Valley, lower Rhine Valley, and across southern and central Germany (Map 33). Finds of the swords from the United Kingdom and Ireland have not been mapped here (see 1968). Based upon the hilt type and pommel piece five subdivisions of the *Gündlingen* sword were defined by Cowen (1968), though the organic pommel pieces of these swords do not often survive. Further categories were suggested by Schauer (1971, 1972). The distribution of the varieties of *Gündlingen* sword (Map 34) does not particularly indicate any specific distribution or manufacturing areas, though a possible origin in western Europe has been proposed (Warmenbol 1988). One apparent feature of the distribution of this type of sword is a relative absence from the Circum-Alpine region, particularly from the former lake-dwelling areas. This is partly a result of the fact that there are no lake-dwellings relating to the period of circulation of this sword in the northern Circum-Alpine region. However, the rare finds from the region, such as Sion (CH; single find), Font (CH; burial), Barésia (FR; burials) and Doucier (FR; burials) indicate that these swords did circulate within the former lake-dwelling areas.

From the shape of the *Gündlingen* sword, it has been suggested that it was a multi-purpose weapon, possible to use by both foot and mounted individuals. Combined with the numbers of this sword type recorded (196 listed here), it has been suggested that these swords were utilized by a minor aristocracy, while other swords, e.g. the *Mindelheim* type, were used by social elites (Cowen 1968).

The recorded find contexts of *Gündlingen* swords reveal a contrasting situation to the Late Bronze Age system, in that there are many more swords found in burials compared to other contexts (Table 14). This pattern conforms to that which detailed for the early Iron Age

Table 14. Find contexts for Gündlingen swords from central Europe and the subset from the northern Circum-Alpine region (including burials from Barésia (near Lake Chalain) in eastern France). N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	32	3	1	108	21	31
Circum-Alpine	0	0	0	11	1	0

(Schauer 1971: 2-3; Roymans 1991), with swords predominantly found from burial contexts.

Mindelheim

As mentioned above, significantly fewer *Mindelheim* (Figure 40.j) swords than the *Gündlingen* type have been catalogued from Europe; 40 are recorded here. The sword is quite similar to the *Gündlingen* swords, with a leaf shaped blade and elaborate decoration on the pommel, and was apparently designed for use as a slashing weapon by mounted warriors (Cowen 1968). The distribution of *Mindelheim* swords is focussed on central to south-eastern Germany, the Czech Republic and Austria, with outliers in Scandinavia and Romania (Map 35). A small cluster of swords occurs in the lower Rhine valley, in Belgium and the Netherlands, while none are recorded from the Circum-Alpine region. Again, different variants have been defined for the *Mindelheim* type of sword, illustrating a clustering of Mindelheim and Bubesheim variants in southern Germany, though, because not all of the swords have been categorized into variant types, this distribution is tenuous (Map 36).

Find contexts for *Mindelheim* swords continue the pattern seen for *Gündlingen* swords, with more found in burials rather than in other contexts (Table 15). The few wetland finds suggest that these swords may, occasionally, have been utilized in Bronze Age tradition functions. There is some disparity in the find contexts listed below and those detailed by Pare (1991: 4), in which he states that of 58 Hallstatt C period wagon burials, 28 of them include swords, of which 27 are iron *Mindelheim* type. Unfortunately, a catalogue list is not incorporated with this statement to verify the data. However, the occurrence of richly decorated *Mindelheim* swords, such as that from Marainville-sur-Madon (FR; wagon burial), or in association with richly decorated objects, such as a gold decorated iron knife (Frankfurter Stadtwald; D), would support the theory that these swords were intended for the "princely elite" (Cowen 1968).

Table 15. Find contexts for Mindelheim type swords. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	6	3	0	25	6	0

Sword Burials

An alternative way to interpret sword distribution from the Iron Age is to map the distribution of burials incorporating swords (Map 37). The burials charted here are only a small section of the Iron Age sword burials covering central Europe listed by Gerdsen (1986), but these are the burials relevant to our discussion. These sword burials will also incorporate a number of the *Gündlingen*, *Mindelheim* swords detailed above, and Daggers discussed below. The distribution clearly shows an apparent absence of such burial practices from the northern Circum-Alpine region, but the Rhône-Doubs-Rhine network is represented by many finds.

"Hallstatt" swords

A small group of swords grouped under the term *Hallstatt* (Figure 40.k) are not listed in the sword burials, but should be considered in the same context as the examples are all from burials dating to the Iron Age (HaC-HaD period). Spread between the Circum-Alpine region and northern Germany (Map 38), these weapons are objects which have not been classified into a specific type, and as such are most likely similar to the majority of swords dating to the Hallstatt C period which have not been categorized as either *Gündlingen* or *Mindelheim* swords. Two examples of the *Hallstatt* sword display a reversal of the iron inlay/section decoration on Late Bronze Age swords, in that they incorporate bronze rivets in the iron sword (Ihringen and Kemnitz (both D)). Such instances may represent an attempt to continue the colour combination of bronze and iron from the Late Bronze Age, though switching the materials to represent new prestige styles and functional aspects. Furthermore, the biography and social value of bronze and iron (as a material) has been inverted. The social value of bronze changed from the primary metal used to create swords, which were visually enhanced by the application of other materials (such as iron), to a decorative material used to enhance and individualize weapons made of iron.

Daggers

The replacement of the long-sword by the 'short-sword' or dagger (Figure 40.l) during the Iron Age simply changed the material expression of power amongst the

elite communities in the Hallstatt region of Europe (Pare 1991). The form of the dagger, particularly the *Antenna* hilted daggers, in many ways represents a continuation of some Late Bronze Age sword forms into the Iron Age, at the expense the mushroom pommel *Gündlingen* and *Mindelheim* swords. Many of these daggers would have required organic material on their hilt, such as wood, antler, or ivory, to provide a suitable grip, this has rarely survived in the archaeological record (Sievers 1982).

Mapping of Iron Age daggers and short-swords has focused on the northern Circum-Alpine region (Map 39, Map 40), though selected others have been charted, such as the Iron sword from Osteria dell'Osa (burial 69; IT), and that from Hallstatt (burial 555; AT). What is evident from this distribution is that, in contrast to the situation for *Gündlingen* and *Mindelheim* type swords, the northern Circum-Alpine region (including the western and eastern Switzerland lake areas) is very much involved in the circulation and use of these HaC2-HaD period weapons.

These weapons are found in burials, though the occurrence of rich wagon burials declines at the same time as the occurrence of the dagger increases – particularly from the 7th century BC (HaD) onwards (Pare 1991, 1992). No instances of wetland finds are recorded for these objects, which could partly be due to preservation factors, as iron weapons deposited in watery contexts would significantly degrade.

Table 16. Deposition contexts for Iron Age daggers and short-swords from central Europe and the Circum Alpine region. N/A = Not available.

Region	Wetland	Hoard	Settlement	Burial	Single find	N/A
Europe	0	0	0	36	4	1
Circum Alpine	0	0	0	19	4	1

Deposition trends

As previously mentioned, changing patterns of sword deposition practices are visible during the Bronze and Iron Age. This can be summarized in four stages (cf. Schauer 1971; Roymans 1991; Krämer 1985; Torbrügge 1972):

1. Early Urnfield — BzD1/BzD2
   Mostly in wetland contexts
2. Older Urnfield / Younger Urnfield — HaA1/HaB1
   Mostly from burials or single finds
3. Late Urnfield — HaB2/HaB3
   Mostly in wetlands contexts, seldom in hoards or burials
4. Hallstatt Iron Age — HaC/HaD
   Mostly in burials, seldom in wetlands

Comparing the find contexts of swords of different periods from Switzerland (CH), Austria (AT) (see Krämer 1985), and the Middle Rhine region (MR) (see Roymans 1991) provides a clear indication of this pattern (Table 14). For the HaB2 and HaB3 periods, a high number of possible burial finds are listed (14); these are swords, which show indications (burned and broken) that they may have been used in cremation burials, though this is not certain. A contrast can be seen in the deposition of *Gündlingen* swords between those of central Europe and the Lower Rhine region, and those from Atlantic Europe. In the former region, swords are predominantly found in inhumation burials, while in Atlantic Europe they are deposited in rivers, suggesting a mingling of new equipment and old traditions (Warmenbol 1988: 261-62).

Combining the data from the previously-discussed Late Bronze Age and Iron Age swords of the Circum-Alpine region indicates that the region corresponds to the central European practice of predominant deposition in water contexts with fewer finds in burials during the LBA, and more burial than wetland finds during the Iron Age (Table 18). As mentioned previously, the occurrence of swords in 'settlement' (i.e. lake-dwelling) contexts must be treated with caution. These may represent swords deposited in the lake, or hoards within the settlement area. Such a situation has been suggested for the *Auvernier* sword recovered from the vicinity of Auvernier, which may represent deposition in a wetland environment (Berger, D and Pernicka 2009: 5), during practices of a 'ritual' water offering or consecration (Görmer 2006: 293-94). If a proportion of these lake-dwelling based finds are considered as 'wetland' finds, then the situation would certainly reflect the deposition pattern from the rest of central Europe.

Fontijn (2002: 229-30) has suggested the possibility that swords, and swords in hoards, represent the warrior identity outside of a burial context, which may also apply to deposition in wetland places. Many of the sword finds from the Circum-Alpine region show a level of fragmentation, across all context types, and during both the Late Bronze Age and early Iron Age; a pattern which is repeated elsewhere in Europe (Table 19; Table 20). Deliberate fragmentation of weapons during the Late Bronze Age may suggest the destruction of the symbolic and physical power that the swords represented during their use life (Nebelsick 1997: 166). As such, the occurrence of intentionally fragmented swords in the

location of lake-dwelling sites provides further support to the argument that these swords do not represent settlement finds, but hoards, wetland depositions, or burials within the area and vicinity of a settlement.

Table 17. Comparison of find sword contexts by period, with examples from Switzerland and Austria, and the Middle Rhine region. N/A = Not available.

Period	Region	Wetland	Burial	Single find	Hoard	N/A
BzD1 / BzD2	CH / AT	5	5	-	-	-
	MR	-	-	-	-	-
HaA1 / HaB1	CH / AT	17	20	26	-	-
	MR	-	-	-	-	-
HaB2 / HaB3	CH / AT	19	7 (+14)	-	1	1
	MR	25	1	-	18	1
Gündlingen	CH / AT	-	-	-	-	-
	MR	1	7	-	3	-
HaC	CH / AT	-	-	-	-	-
	MR	-	71	-	1	-

Table 18. Find contexts for swords of the Late Bronze Age and Iron Age in the Circum-Alpine region. N/A = Not available.

Period	Type	Wetland	Hoard	Settlement	(Lake-Dwelling)	Burial	Single find	N/A
LBA	Auvernier	4	(1 in moor)	2	(2)	1	0	1
	Tachlovice	5	1	0	(0)	0	0	4
	Mörigen	3	0	19	(19)	1	3	8
	Tarquinia	0	3	3	(3)	0	0	2
	Weltenburg	0	1	6	(6)	1	3	0
	Corcelettes	0	1	0	(0)	0	0	0
	Zürich	2	0	0	(0)	0	2	1
	Locras	0	3	3	(3)	3	0	1
IA	Gündlingen	0	0	0	(0)	11	1	0
	Daggers	0	0	0	(0)	19	4	1

It has been argued, with particularly reference to the *Tachlovice* type sword (Sicherl 2008: 255), that a sword production and exchange system may create a distribution area of up to 200km, within which swords would be exchanged and manufactured true to the original design of swords. Outside of this 200km area, swords may have been locally manufactured in imitation of those imported from more distant regions. Such a process would account for the development of sword variants in different regions. Furthermore, it has also been suggested that it may be possible to identify imported objects through their deposition context: such imported swords may be found in settlement contexts, while hoard and burial contexts are more likely to indicate locally manufactured objects (Sicherl 2008: 255). This supposition is built upon a premise that imported objects would carry less locally relevant social significance, and thus, they were not deposited in an apparent ritualistic manner, in contrast to those which were locally manufactured and carried local social and symbolic significance. As detailed above, there were a variety of swords utilized in the Circum-Alpine during the Late Bronze Age, some of which may have been locally manufactured (e.g. *Mörigen*, *Auvernier*), and others of which are most likely to have been imported (e.g. *Tarquinia*). The occurrence of each of these sword varieties in the same variety of contexts, and particularly the 'imported' sword types in hoards and fragmentary in 'lake-dwellings', indicates that such a distinction between 'imported = settlement' and 'local = hoard/burial' may not be possible in the Circum-Alpine region (or beyond).

Table 19. Quantity of fragmented swords per context from the Circum-Alpine region. N/A = Not available.

Type	Wetland	Hoard	Settlement	(Lake-Dwelling)	Burial	Single find	N/A
Auvernier	4	0	1	(1)	0	0	0
Tachlovice	0	0	0	(0)	0	0	0
Mörigen	1	0	12	(12)	0	0	0
Tarquinia	0	0	1	(1)	0	0	2
Weltenburg	0	0	2	(2)	0	0	0
Corcelettes	0	0	0	(0)	0	0	0
Zürich	0	1	0	(0)	0	0	0
Locras	0	0	2	(2)	1	0	0
Gündlingen	0	0	0	(0)	8	1	0
Total	**5**	**1**	**18**	**(18)**	**9**	**1**	**2**

Table 20. Quantity of fragmented swords per context from central Europe. N/A = Not available

Type	Wetland	Hoard	Settlement	(Lake-Dwelling)	Burial	Single find	N/A
Auvernier	3	0			0	2 (+ 2 in moor)	
Tachlovice	0	4			2	0	1
Mörigen	4	6			3	5	1
Tarquinia	0	0			4	0	
Weltenburg	1	1			3	0	1
Corcelettes	0	1			0	0	0
Zürich	0				0	1	0
Locras	0	1			1	0	2
Gündlingen	15				64	12	13
Total	**23**	**13**	**0**	**(0)**	**78**	**2(+2)**	**18**

Symbolism

The development and re-emergence of the sword in burials of central Europe during the early 1st millennium BC (LBA) has been taken as an indication of the increasing importance of social hierarchy and the rise of a social aristocracy (Randsborg 1999: 199), and the sword has always been interpreted as an elite symbol, for use as both weapons and symbols by selected (male) members of society (Wells 1998). The presence of swords in burials has been seen as evoking such a 'warrior' identity to a greater degree than depositions in wetlands or hoards (Harding 2011). This assertion appears sound, but may not necessarily represent the entire situation. As Fredengren (2011) has argued, hoards of equipment may represent many members and performers from society. Fontijn (2002: 229-32) has also argued that deposition contexts may represent different life stages of individuals, and so the inclusion of swords in burials may be related to the age or life status of individuals. Instead of assuming that the inclusion of swords in burials represents the 'warrior' identity, they should instead be taken to indicate the social identity of the individual buried. It is the persons surviving the individual to be buried who decide which goods and equipment should be placed with the remains and utilized in the burial ceremony. Furthermore, the use of swords in burials may not indicate that the individuals were 'warriors' in life, but simply that they were warriors, and/or sword wielders by status; social positions may have demanded, or ascribed, 'warrior' status, which may not have been fulfilled in practice (Whitley 2002).

Based upon differential distribution of various types of sword in south Scandinavia/Denmark and central Europe, Kristiansen (e.g. 2011) has proposed a three-tier system of social identity and symbolism associated with swords from the Middle to Late Bronze Age (c. 1500-1100 BC, BzB-HaA, Period II–IV) based around local, ritual identities, and foreign, warrior identities. In this proposal full hilt swords were used by, and a symbol of, 'ritual' chiefs who were responsible for the maintenance of local traditions and cultural processes, while flange hilted swords were used by 'warrior' chiefs responsible for political and foreign relation areas of society. Octagonal hilted swords represent a third identity – that of traders and metal-workers – which straddled both 'local' and 'foreign' aspects of society. Under this proposal, the system of sword ownership represents much more than simply a warrior ideology, but incorporates the

social and political sphere into sword ownership and deposition. From the Circum-Alpine region the distribution of sword types of the Late Bronze Age cannot be defined into categories of 'ritual' or 'warrior' chief. However, the distribution of swords decorated with iron (or other metal) inlay from Late Bronze Age contexts may be of interest, given the individualisation that this may imbue on the object and the biographical properties that may be enabled (see Section 5.4.3.2).

That the biography of individual swords and weapons had significance for potential wielders, and was mutually constructed through the interaction of wielders and objects, is demonstrated for later periods in the Iliad:

> *And he too put over his head a helmet fashioned of leather; on the inside the cap was cross-strung firmly with thongs of leather, and on the outer side the white teeth of a tusk-shining boar were close sewn one after another with craftsmanship and skill; and a felt was set in the centre. Autolykos, breaking into the close-built house, had stolen it from Amyntor, the son of Ormenous, out of Eleon, and gave it to Kytherian Amphidamas, at Skandeia; Amphidamas gave it in turn to Molos, a gift of guest-friendship, and Molos gave it to his son Meriones to carry. But at this time it was worn to cover the head of Odysseus.*
> (Kahane and Mueller No Date: Iliad, Book X, lines 261-71)

In another example, the tale of Prince Uffe the Weak (from Saxo Grammaticus) relates the story of how, and by whom, powerful objects may be utilized in society (Kristiansen 2002). Such biographical significance for the Late Bronze Age is difficult to reconstruct, though the re-use and replacement of sword blades or hilts, as evidenced by the occurrence of secondary rivet holes on swords (Mödlinger 2011a) which are also present on several Gündlingen swords (e.g. from Naabsiegenhofen (D), Stöndar (SE) and Barésia (FR)), indicates that some swords may have had extended use lives and been curated for longer periods, and possibly by different individuals.

How many swords may have been utilized contemporaneously in the same community is a factor which is difficult to address. The deposition of multiple swords in hoards (e.g. Berlin-Buch (D), Kehmstedt (D)), and multiple occurrences of the same type of sword at the same location (e.g. *Mörigen* swords around Lake Neuchâtel and at Grandson-Corcelettes) indicates the presence and participation of multiple sword wielders. However, through analysis of burials with swords from Volders (AT) and Innsbruck-Mühlau (AT), relating to the Late Bronze Age (BzD-HaB2/B3), it has been suggested that only one individual attained the status of "sword bearer" per generation – effectively the 'chief' (Sperber 1992). The general absence of sword burials (and burials in general) from the northern Circum-Alpine region (and lake-dwelling areas in particular) make such a hypothesis difficult to establish in this region; even the identification of social elites from the lake-dwelling region is problematic due to this lack of burial evidence.

The decline of sword utilisation, and corresponding rise of daggers, in society during the Iron Age, particularly from the 6th century BC onwards, has been linked to increasing Mediterranean and Aegean influence, spread via the Rhône valley route from Massalia, and also across the eastern Alps from Italy. Such trends of Mediterranean influence are also evident in the distribution of Attic and Etruscan pottery, Etruscan metal vessels and jewellery, while the Greek style fortifications at the Heuneburg provide an excellent example of a direct Mediterranean influence (Gersbach 1995; Gersbach and Boom 1996; Kimmig, W and Böhr 2000).

Concluding remarks

The distribution of sword burials of the Hallstatt Iron Age shows regional clusters in southern Germany, the upper Saône valley, and the French Jura of the western Circum-Alpine region. Several instances are visible in the former lake-dwelling region, such as around Lake Neuchâtel, Lake Zurich, and Lake Constance. When comparing the distribution of the Hallstatt period sword burials and the *Gündlingen* type swords, with the distribution of the *Mörigen*, *Tachlovice* and *Auvernier* type swords of the Late Bronze Age, there is a slightly comparable distribution. The Hallstatt sword burials and *Gündlingen* swords show extensive presence in the Rhône and Saône valleys and southern Germany, which mirror the route that was utilized from the late 7th and early 6th century cal. BC in the transportation of Attic pottery from Massalia to the Hallstatt *Fürstensitze* of central Europe (see Section 5.3.2). The occurrence of *Mörigen*, *Tachlovice*, and *Auvernier* swords in the Rhône/Saône valley, and in southern Germany may be an indication of the development of the this exchange network and beginnings of extension and re-alignment of trade routes in the Circum-Alpine region from the trans-Alpine Italian route prevalent during the Late Bronze Age and early Iron Age, visible in the distribution of swords such as the *Weltenburg* and *Tarquinia* types, and other Late Bronze Age material culture such as amber, glass beads, razors, and fibulae. In the Iron Age, distribution of sword burials and daggers extends across the western and eastern regions, indicating a more homogenous use of swords across the northern Circum-Alpine region. The distribution of *Antenna* daggers, in particular, suggest that the former lake-

dwelling region was re-integrated to inter-regional exchange systems by the HaD period.

The distribution of the above-discussed LBA swords in the northern Circum-Alpine region shows a clear disparity between the western (Lake Neuchâtel, Lake Geneva, Lake Biel) and eastern regions (Lake Zurich, Lake Constance), with the vast majority being found in the western region. This may indicate differential usage of swords between the two regions during the Late Bronze Age, though a comparison with the PBF catalogues of Schauer (1971) and Quillfeldt (1995) illustrates that during the Early and Middle Bronze age the regions were, to some extent, separated in the types of swords found in either region. The varying distribution of other types of metal work between the two regions, such as spears, razors, knives, sickles and bracelets suggest that the two regions were largely separated in the use of material culture, and that metal work did not travel in large quantities between the two (cf. Rychner 1979).

The deposition practices associated with swords varied through the Late Bronze Age, with deposition in wetland environments, hoards, or burials variously being the preferred method in central Europe (particularly Switzerland, southern Germany, and Austria). Many of the swords were deliberately fragments prior to their deposition, possibly as a symbolic destruction of their power, and also the physical breaking of the object to correspond with the actual death of the sword bearer (assuming a deposition-wielder death link). While some evidence suggests that swords may have been (re-)used over extended periods of time, for example multiple rivet holes, there is little evidence to indicate that swords were curated over multiple generations. The use of inlay decoration (or various materials, including iron) during the Late Bronze Age was used as a method to individualize specific weapons, to either enhance the demonstration of the sword bearers status, or to associate the sword with an individual owner. If the latter is true, then it is clear that swords were tied to a single person and so would have been deposited with the death (or end of life-stage) of that person. Decoration and embellishment of swords continued during the Iron Age, with imported organic matter frequently used (e.g. ivory and amber [31] on the *Mindelheim* sword from Marainville-sur-Madon (FR)), which may have been a method to demonstrate the ability of the owner to manipulate and participate in long-distance exchange networks.

[31] Although not strictly an organic material in its present state, amber is fossilized tree resin, and therefore is an organic compound.

5.4.1.2: Spearheads

Prehistoric spears would have been utilized as both weapons, for combat, and as equipment, for hunting. Spearheads are known in a variety of materials, including flint, horn, bone and wood, in addition to those of bronze. The spread of socketed spearheads across Europe during the Early and Middle Bronze Age (Tarot 2000: 2-3) brought new manufacturing techniques and hafting methods, which remained relatively unchanged until the Iron Age. Increased production and utilisation of bronze spearheads between the EBA and LBA is evident in Switzerland, with the vast majority of finds dating to the Late Bronze Age (HaA2-HaB3).

Late Bronze Age

Different types of spearhead have been defined based upon their size, shape, method of hafting, and decoration (e.g. Tarot 2000; Jacob-Friesen 1967; Baudou 1960). The most relevant types here are spearheads with wave decoration (*Wellendekor* (Tarot 2000: 13)), the *Pfahlbau* type (Baudou 1960: 14) and the *West Baltic* type (Jacob-Friesen 1967: 250).

Wellendekor

Spearheads decorated with linear bands and half circles in a wave pattern (*Wellendekor*; Figure 41.h;k), and a variant motif where the circles do not align into a wave (*Bogendekor;*Figure 41.b) relate to the Late Urnfield period (HaB1) (Tarot 2000: 13). The decoration on these spearheads is typical of the lake-dwelling region during the Late Bronze Age, and can be seen on various other types of metal work, such as arm-/leg-rings (see Section 5.4.2.4), knives (see Section 5.4.2.2), and needle heads (Vogt 1952). Spearheads with this type of decoration are known from other parts of Europe (Map 41), and particularly southern Scandinavia, a distribution which is generally interpreted as the exchange of objects along communication networks from the lake-dwelling region (Jacob-Friesen 1967: 262). The transfer of this line/half-circle/wave decoration to other objects, for example bronze bowls (see Sub-section LATE BRONZE AGE in Section 5.4.2.6), and northern European type spears (Jacob-Friesen 1967: 270-73) show the cultural incorporation of this motif into the local material culture in the north of Europe (Figure 42).

Pfahlbau

The so-called *Pfahlbau* type (Figure 41.a;d) spears are characterized by groups of parallel lines, either ribbed or grooved (Tarot 2000: 14-15), decorating the base of socket, and generally having a rivet hole for hafting, with a length of between 0.25 and 0.4 m, (Baudou 1960: 14). The leaf-shaped blade of these spears have a relatively flat cross section blade, with little thickening as it joins the body of the spearhead. The distribution of these spearheads is predominantly in the Circum-Alpine region, and lake-dwellings therein (Map 43), where this parallel line ribbed/grooved decoration was common during the final phase of the LBA (HaB3) and occurred on a range of metal artefacts including knives and arm-/leg-rings (Vogt 1952). Distribution of this form spreads outside of the Circum-Alpine region, with examples extending through Germany and France to Scandinavia and, less frequently, the Baltic coast of Poland (Baudou 1960). The extent of circulation of these spearheads has been used to suggest trade networks between northern and southern Europe, with the lake-dwellings of the Circum-Alpine region playing an important intermediary role in the chain of communication (Kristiansen 1993: 162, 1998: 161-66). The relatively rapid change of the dominant spear type from *Pfahlbau* to *West Baltic* at the border of the Nordic cultural region has been seen as an indication that communication networks in the Urnfield culture extended over greater distances than in the Nordic culture (Kristiansen 1993: 147). Furthermore, the scarcity of *Pfahlbau* spears from the region of the Lausitz culture and Poland has been seen as an exclusion of those areas from the communication networks (Kristiansen 1998: 165).

From Poland there is a notable under-representation of the LBA and EIA lake-dwelling settlements in the distribution of metal spearheads. While occasional finds of iron spearheads are known from Orzyz and Mołtajny, more frequently found are antler spearheads, such as from Szczecinowo, Ostrów, Plesno and Orzyz (Gedl 2009). This is likely to be a reflection of lower preservation rates for iron objects compared to organic materials in wetland contexts, but may also be a cultural influence with antler pieces being very common at the expense of bronze spearheads in the West Baltic Barrow Culture (Gedl 2009).

West Baltic

The *West Baltic* type (Figure 41.e;f)is relatively similar to the *Pfahlbau* spear, with linear decoration groups around the base of the socket, but generally without a rivet hole, and has a convex shaped blade that thickens significantly as it joins the shaft (Jacob-Friesen 1967: 250-61). These spearheads are found predominantly in southern Scandinavia (Denmark), and extending across to northern Germany and Poland (Jacob-Friesen 1967: Map 16). Examples are known from central and southern Germany, indicating their circulation further into central Europe (Map 43). A single example from the Circum-Alpine region, at Grandson-Corcelettes, further illustrates the involvement of LBA lake-dwellings in communication and exchange networks with the north of Europe.

Iron spearheads

Several Late Bronze Age iron spearheads are known from the Circum-Alpine region (Map 45), one of which comes from the lake-dwelling Nidau-Steinberg (Figure 41.c),

showing a combination of decoration forms, including the wave-like (*Wellendekor*) motif of the Late Urnfield period, and ribbing around the socket base typical of the Final Urnfield period (Tarot 2000: 16). An iron spearhead without context from Lake Biel, shows good comparison in size and form to LBA examples, though has no decoration (Tarot 2000: 16). An iron spearhead in association with infant bones, ring jewellery, needles, and ceramics is also known from the Urnfield period grave 60 at Künzing (D) (Schopper 1995).

Isolated spearheads

A possible spearhead, or small dagger, re-manufactured from a sword blade, recovered at Mörigen (CH), is a unique instance from the Circum-Alpine region (Tarot 2000: 22), and illustrates that it was possible for material culture objects to be modified and re-conceptualized as required by their owners (cf. Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1). A single *Vénat* type spearhead (Figure 41.g) from Auvernier-Bréna (CH) occurs outside of the normal distribution for this form (Tarot 2000: 19; Coffyn *et al.* 1981: 194), and provides further indication of exchange and communication networks between the lake-dwelling region and western France, and particularly to the hoard of Vénat (Saint Yrieix, FR), as seen in other materials (e.g. arm-/leg-rings, swords).

Four spearheads from the Circum-Alpine region (at Auvernier; Bex; Mörigen; Nidau (Tarot 2000: 15)) show signs of inlay decoration, and a comparable example is known from the Heunischenburg hilltop settlement in Germany (Berger, D 2011: 408). In form these spearheads are typical of the Late Bronze Age, and the decoration is similar to the *Pfahlbau* type spears, consisting of parallel bands running around the base of the socket; an exception is the Heunischenburg example, which includes a triangular symbol similar to that included in the *Wellen-* and *Bogendekor* spears (Tarot 2000: 13). Although inlay decoration is unusual for Bronze Age artefacts, such decoration is known on a range of objects, including swords, arm- and leg-rings, horse gear, needles, and balance weights (Berger, D 2011). Given the rarity of inlay decoration one of the intentions in applying inlay may have been to individualize these objects, as a method of displaying both personal ownership and status.

Iron Age

Preservation issues may play a factor in this distribution, though the occurrence of La Tène period iron spears across many areas of Switzerland, and the Alpine region (Pernet and Schmid-Sikimić 2008; Wyss 1981a), suggests that this is not the only cause. Differing levels of publication between the Bronze Age spearheads, extensively covered by the PBF series and Tarot's volume (2000), and Iron Age spearheads without catalogue research, may be a large factor in this apparent distribution. However, Drack (1973: 125) managed to divide examples from northern and central Switzerland into "broad" and "narrow" categories (Figure 41.i;j). From the form of these iron spearheads it is evident that a new style becomes dominant during the Iron Age, most likely partly connected to the different manufacturing techniques required to fashion these objects from iron. Instead of the socket extending to the very end of the blade, as seen in the *Pfahlbau* type, the blade is more of an extension of the socket, with very little, if any, of the shaft running inside the blade. The Iron Age spearheads recorded by Drack (1973) are confined to central Switzerland (Map 46), and only two instances are in former lake-dwelling areas – one from Zurich and one from Seegräben (Lake Pfäffikon).

Deposition

Changing deposition practices are visible for spearheads in the nCA between the Bronze Age and Iron Age (Table 21), and also within different phases of the Bronze Age, and between different areas of Europe. Within the Circum-Alpine region spearheads of the Late Bronze Age, particularly the *Pfahlbau* and *Wellendekor* spears, are mainly known from lake-settlements (Tarot 2000: 5), though undecorated examples and fragments come from a wider variety of contexts (Tarot 2000: 22-30). Wetland and moor finds are relatively rare in the Circum-Alpine region, and mostly relate to the Middle and early Late Bronze Age (BzA-HaA2), (Tarot 2000: 6), but they are more frequent in southern Scandinavia, northern Germany and Poland. Burial contexts are similarly under-represented in the LBA of the Circum-Alpine region, uncommon in northern Europe, but are known from Germany (e.g. Künzing (Schopper 1995)). Spearheads were seldom included in hoards of the Circum-Alpine region, with only 37 (c. 5%) of examples from the 715 listed by Tarot as coming from hoards, though two are known from a hoard at Auvernier and one in a small assemblage from Wasserburg-Buchau (Kimmig, W 1992). In contrast, hoard finds are extremely common in the north of Europe, with this being the most frequent context (where recorded) for spearheads of the types discussed. The majority of these spearheads are deposited as whole objects, with fragmentation rarely occurring.

Deposition practices within the Circum-Alpine region during the Iron Age show a marked contrast to those of the Bronze Age: all of the Iron Age spears detailed by Drack (1973), except two single finds, are from burial contexts. Associated objects in these burials frequently include iron knives, and leg- and arm-rings (Drack 1973), while spears from southern Germany are often found in wagon burials (Kossack 1959: 94).

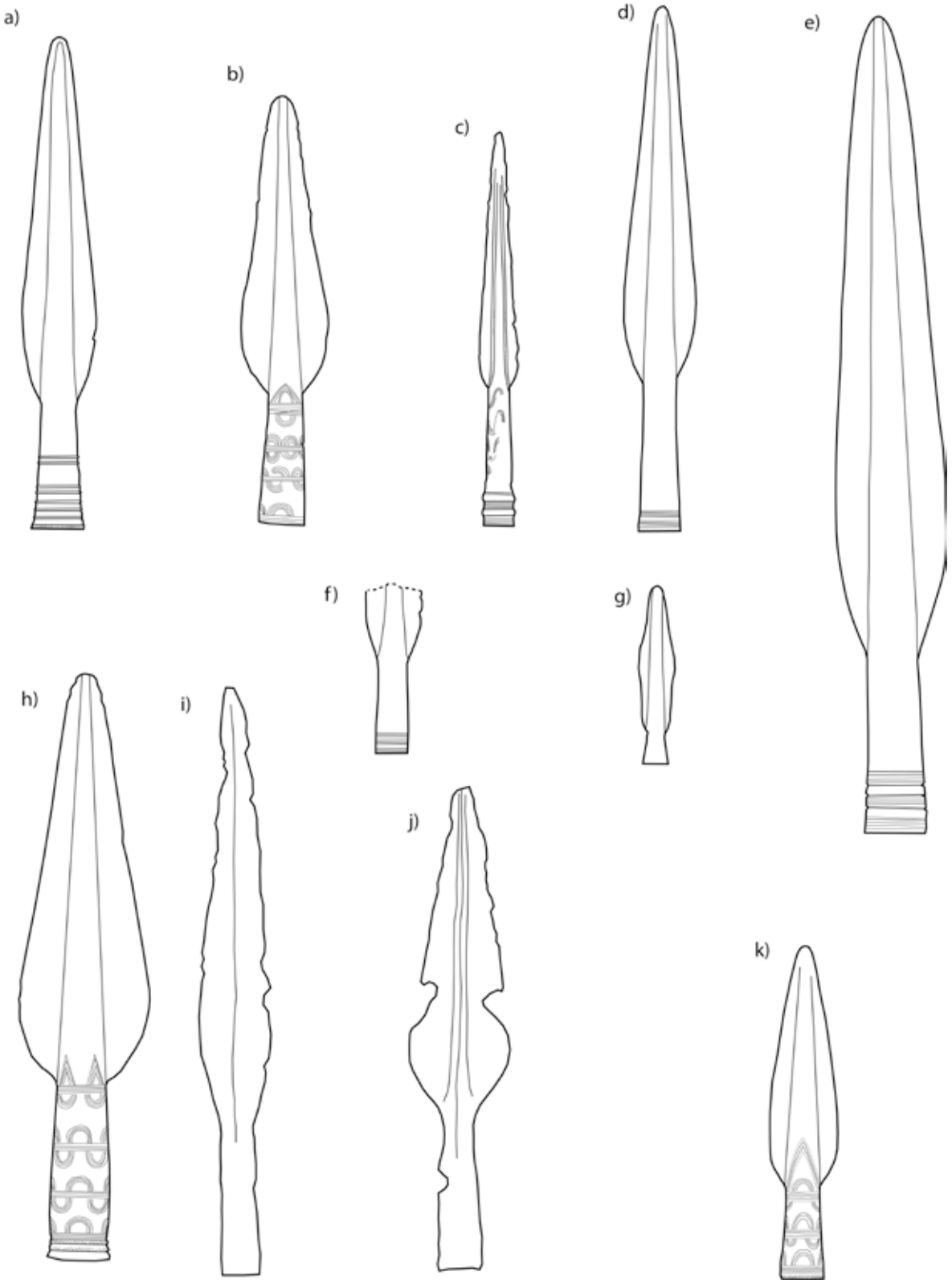

Figure 41: Late Bronze Age and early Iron Age spearheads. *Late Bronze Age*: a) Pfhalbau (Astragalierter) [Mörigen]; b) Bogendekor [Zurich Alpenquai]; c) LBA Iron [Nidau]; d) Pfhalbau Strichverzierter [Grandson Corcelettes]; e) West Baltic [Rövalls]; f) West Baltic [Grandson Corcelettes]; g) Venat [Auvernier-Brena]; h) Wellendekor [Haassel]; k) Wellendekor [Zug Sumpf]; *Iron Age* i) Narrow Iron [Büron]; j) Broad Iron [Büron] (re-drawn from: a, b, c, d, f, g, k) Tarot 2000: 401; 648; 434; 319; 301; 44. 645; e, h) Jacob-Friesen 1967: 272; 1167; I, j) Drack 1973: 25.1; 21.3).

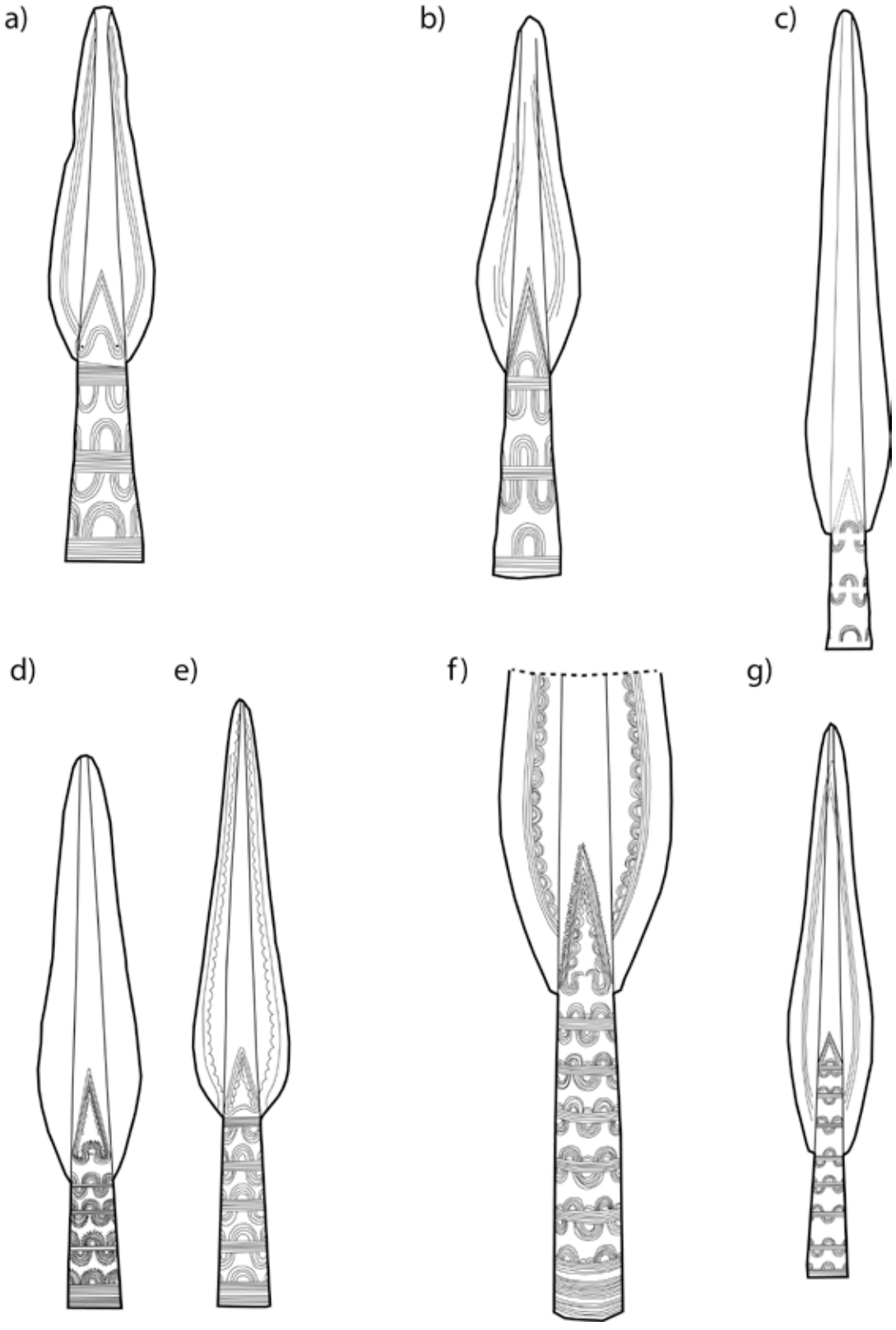

Figure 42: Decoration on Late Bronze Age spearheads from a) Zurich-Wollishofen-Haumesser [CH]; b) Cortaillod [CH]; c) Yverdon-les-Bains [CH]; d) Denmark; e) Dep. Eure [FR]; f) Kirkesøby [DK]; g) Napajedla [CZ] (re-drawn from a, b, c) Tarot 2004, Plate 12.662, 12.112, 15.638; d, e, f) Jacob-Friessen 1957,Fig. 5.1, Fig. 5.3, Fig. 5.2; g) Říhovský 1972, Plate 8.64).

Table 21: Find contexts for spearheads. L-D = Lake-dwelling; N/A = Not available; Sett. = Settlement; Sgl = Single find; + = multiple examples but quantity not recorded (specifically for Vénat type in France); ? = possible type attribution.

Type	Burial	Hoard	L-D	L-D Hoard	Sgl	Area/N/A	Lake/Moor/River	Inland Sett.
Wellendekor	5	16	20	1	27	25	17	1
Pfahlbau	1	28	25	1	6	25	5	
Emulative Pfahlbau		1				1		
Pfahlbau?	1	8	39		14	1		
West Baltic	4	53	1		11	43	7	
West Baltic?		5				3	3	
Pfahlbau/West Baltic	4	15					1	
Vénat		+	1					
LBA Iron	1		1				1	
Converted sword			1					
IA Small	12				1			
IA Broad	14				1			
Total	**42**	**126+**	**88**	**2**	**60**	**98**	**34**	**1**

Symbolism

Differing depositional practices may indicate different symbolism associated with spearheads, and spear users, during the Bronze and Iron Age. The inclusion of spears in burials during the Iron Age, particularly in association with other weapons, is seen as evidence of a warrior and elite identity, as also identified in early texts and iconography (Tarot 2000: 40-48). The deposition of spearheads in the Circum-Alpine region during the LBA in contexts other than burials suggests a different symbolic association, though may still be connected to creating social identity and status. Decoration of selected spearheads with inlay metals may be a method of identifying individual objects, or creating social status, above and beyond that created by elaborately inscribed decoration, such as the *Wellen-* and *Bogendekor* patterns, which have been interpreted as status indicators (Gedl 2009: 3). The inscribed and ribbed decoration on spearheads without inlay is similar to that seen on a variety of LBA objects, indicating their incorporation and utilisation in similar schemes as knives, and arm- and leg-rings. A small number of spears from Europe have been found with their shaft intact, indicating a minimum length of 1.4 m, which, when combined with the spearhead itself, would place the height of the spear at almost the same height as a person, creating a visually impressive weapon (Hooper and O'Connor 1976).

Although the finding of many spearheads in settlement contexts may suggest a semi-casual disposal rather than elite association, a recorded 'lake-dwelling' context does not necessarily exclude structured deposition practices (as the hoard from Auvernier-Nord illustrates); only that such depositions were not recognized at the time of excavation (cf. Fischer, V 2012, 2011). Where associated objects are recorded for spearheads from hoards and burials (in- and outside of the Circum-Alpine region), they frequently include LBA type swords, or fragments thereof, in addition to horse gear, hanging vessels, axes, razors, and knives, typically seen as objects associated with male identities (e.g. Schopper 1995: 91). The inclusion of a spearhead and axe with two sets of arm-/leg-rings at Wasserburg-Buchau has been interpreted as a combination of male and female identities in a single deposition, representing multiple actors in a social event (Nebelsick 1997: 167). Representation of several actors may also be seen in hoards containing multiple spears and swords, particularly if it is accepted that spears were a weapon mainly used by a warrior retinue, while swords were the weapon of leaders (Vandkilde 2007: 158).

Concluding remarks

The distribution of Late Bronze Age *Pfahlbau* and *West Baltic* type spearheads provides an indication of the exchange and communication networks in which lake-dwelling communities of the northern Circum-Alpine region were involved. Sparse representation of these spears in certain areas, for example the Lausitz culture, may indicate the exclusion of those areas from circulation networks, even though other contemporary materials, such as sword types, suggest at least limited involvement of that area in exchange systems with the Circum-Alpine region. A *Vénat* type spear from Auvernier-Bréna indicates exchange links between central France and the lake-dwelling communities, as further indicated by other material objects (e.g. Section 5.4.2.4) found in the Circum-Alpine region and in the Vénat hoard, Saint Yrieix (FR) (Coffyn *et al.* 1981).

Decorative designs on selected spearheads, and other material culture objects (e.g. Section 5.4.2.6) from southern Scandinavia and northern Germany show similarities to designs typical of the Urnfield culture in the Circum-Alpine region, and particularly in the lake-dwelling settlements, providing further indication of the

exchange and interaction networks. Within the lake-dwelling communities, the applied decoration on spearheads is seen on a wide variety of objects, such as arm- and leg-jewellery, and knives. The rare instances of inlay decoration applied to spearheads have comparable application on sword hilts, horse gear, arm- and leg-rings, knives, and needles. Inlay, inscribed, and cast decoration may represent the individualisation of objects, the identification of their owners, and the establishment of social status.

Deposition practices during the Late Bronze Age differ across Europe, with most of the spearheads from the Circum-Alpine region known from settlement and lake-dwelling contexts. In southern Scandinavia and northern Europe many of these spearheads are known from hoard assemblages, but are infrequent in burials. Low fragmentation rates suggest that many of these depositions were not 'founders hoards', and nor were the weapons symbolically 'killed' (Nebelsick 1997). Instead, these depositions may be interpreted as social events representing the involvement of several actors, particularly where multiple spears, swords, and arm-/leg-rings are found in association (Nebelsick 1997: 167; Fredengren 2011). Deposition practices indicated by a small ensemble of Iron Age spearheads from the Circum-Alpine region finally suggests that the spear was used extensively during the burial ritual, as a method of individual and status identification (Kossack 1959).

5.4.2: Accessories

5.4.2.1: Razors

Metal razors of the Late Bronze Age and Iron Age form a large group of objects spread across central Europe, which have received attention through the *Prähistorische Bronzefunde* series. In three volumes relating to central Europe (Jockenhövel 1971), western Europe (Jockenhövel 1980) and Italy (Bianco Peroni 1979), over 2500 items have been catalogued (central-582; west-777; Italy-1346). While razors of different materials, such as flint or shell, and from the Early Bronze Age are known from Europe, the examples discussed below are typically of bronze, occasionally of iron, relating to the Late Bronze Age and early Iron Age.

Late Bronze Age

Prehistoric metal razors can be defined into varying types based upon their form and design, and these razors can be divided into two separate groups: two sided razors relating to the earlier LBA, or Early and Middle Urnfield periods (HaA); and single sided razors of the later LBA, or Later and Final Urnfield periods (HaB). Early Iron Age razors (HaC to HaD) continue the single sided form of the Late and Final Urnfield type razors.

HaA period

Reviewing the catalogue of Jockenhövel (1971) covering razor finds from Switzerland, it is evident that four types of two-sided razor relating to the Early and Middle Urnfield period are of relevance to the northern Circum-Alpine region lake-dwellings: types *Cortaillod*, *Neckarmühlbach*, *Velké Žernoseky*, and *Alzey*, in addition to several broken fragments (Map 47, Map 48). Solid handled razors such as these were manufactured in two-sided moulds, such as those from Teplice and Nechranice (Jockenhövel 1971: no.200;17).

Find contexts of these Hallstatt A period razors are distributed between lake-dwellings, burials, and inland settlements (Table 22). Occasional riverine and single finds may indicate deposition practices.

Table 22: Find contexts for Hallstatt A period razors. N/A = Not available.

Type	Lake-Dwelling	Settlement	Burial	Wetland	Single find	N/A
Cortaillod	4		2			1
Neckarmühlbach	1		2	1	1	
Velké Žernoseky	1	1	4	1		2
Alzey	2		2			1
Un-typed	6	2				
Total	**14**	**3**	**8**	**2**	**1**	**4**

Cortaillod

The *Cortaillod* type razor (Figure 43. a) belongs to the two-sided, X-form handle group of razors (Jockenhövel 1971: 125). The distribution of this razor type is concentrated in the lake-region of western Switzerland and in southern Germany (Map 47 and Map 48). The examples from western of Switzerland are from lake-dwelling contexts; while two of the three from southern Germany were recovered from burial contexts, the find context of the third is unknown (Table 22). Of these razors one has some inscribed decoration (from Concise), a practice more common on two sided razors from western half of central Europe (Jockenhövel 1971: 148, fig. 46B).

Neckarmühlbach

Five examples of the *Neckarmühlbach* type razor (Figure 43b) are recorded in central Europe, one of which comes from the western Switzerland lake-region (Font, Map 48), one from Austria, one from the French Jura, and one from south-western Germany (Map 47). A further example of this razor is known from the River Seine by Paris. Similar to the Cortaillod razor, this razor is of the two sided, X-form handle group, and a mould for a razor of this type is known from Preist (D). Of the razor finds, one is from a lake-dwelling context, two from burials, and one from a river (Table 22). The find from Arbois (FR) is reported as a cave, though further details are unknown, and the mould was a single find.

Velké Žernoseky

A further type of two-sided, X-form handle razor with find instances in the lake-dwellings of the northern Circum-Alpine region is the *Velké Žernoseky* group (Figure 43.c). An example from Grandson-Corcelettes (Map 48) appears to be outside the normal distribution of this type of razor (Map 47), with other instances of this razor occurring in the eastern half of central Europe, in eastern Germany, the Czech Republic, and Austria. Aside from the Grandson-Corcelettes example, four of these razors are from burial contexts, with two from

caves with limited find information, one from a settlement and one from a river (Table 22).

Alzey

The *Alzey* type of two sided, X-form handle razor (Figure 43.d) is represented by five finds from Switzerland and the Rhine valley (Map 47 and Map 48). Two of these razors are known from lake-dwellings – one in western Switzerland (Vallamand) and one in eastern Switzerland (Wollishofen-Haumesser) – and two others are from burial contexts (Table 22). Found in association with the example from Vallamand were two wooden discs, which apparently formed a sheath to protect the blade of the razor (Jockenhövel 1971: 124).

Un-typed and fragments

In addition to the above-defined types of two-sided razors, a number of fragments have been found in the nCA, and significantly the eastern part of this region (Map 48). Most of these fragments are from lake-dwelling contexts, the remaining two from terrestrial (inland) settlements, at Montlingerberg (CH) and Üetliberg (CH) (Table 22). These fragmentary and un-typed examples of two sided razors are significant, in addition to the *Alzey* type, because they indicate that the eastern part of the Circum-Alpine lake-dwelling region was involved in the circulation and distribution of these razors. Involvement in such exchange networks is more pronounced for the western half of the northern Circum-Alpine region, with the occurrence of some razor types spreading over large distances, such as those of *Velké Žernoseky*, *Cortaillod* and *Neckarmühlbach*. However, the above-mentioned types of two sided razors are only a small selection of this form, others which have different distribution zones in central and western Europe, and some razors dating to earlier periods of the Bronze Age also illustrate the involvement of the northern Circum-Alpine region in wider contact networks, for example the types *Morzg* and *Stadecken* (see Jockenhövel 1971, 1980).

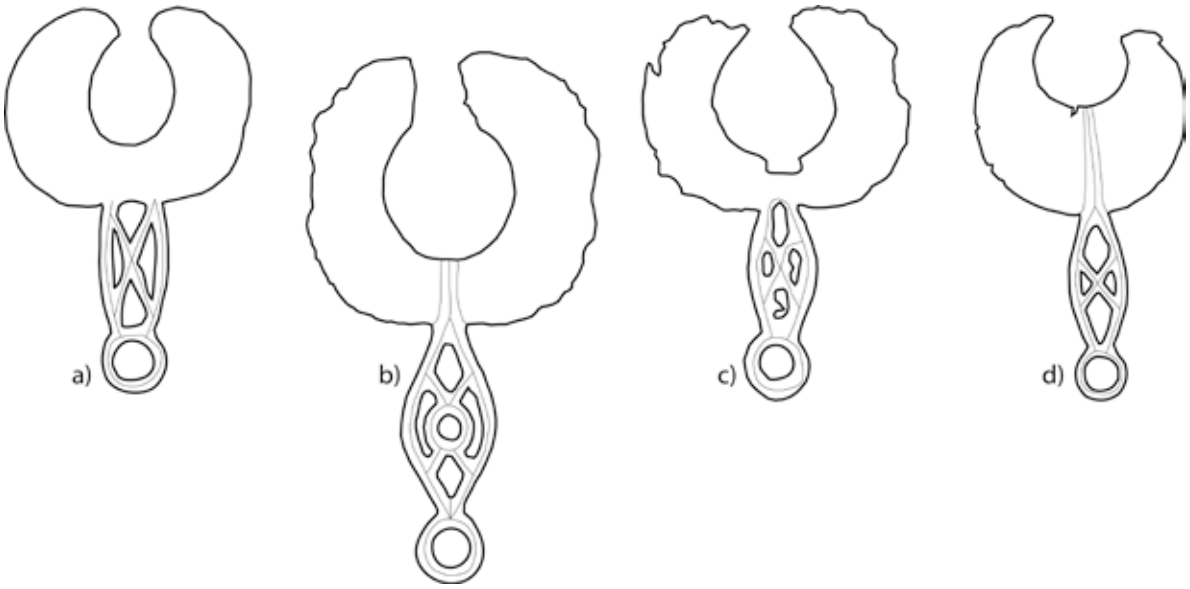

Figure 43: Razor types of the Hallstatt A period. a) Cortaillod [Cortaillod]; b) Neckarmühlbach [Innsbruck-Wilten]; c) Velké Žernoseky [Velké Žernoseky]; d) Alzey [from Bingerbrück] (re-drawn frrom Jockenhövel 1971: no. 212; 220; 222; 204).

HaB period

During the latter stages of the Bronze Age (HaB2/B3 period) a change in razor style occurred, with the two-sided form being largely replaced by single-sided razors (Jockenhövel 1971: 237; Nicolas 2003), the *Nynice* type being one example of exception (Jockenhövel 1971: 152-57). While some of the single-sided razors with ring handles or handle spikes may have been manufactured from bronze plate work, others will still have required manufacture in moulds, such as the half-moon razors with plastic decoration on handles. One-sided razors of various types have been mapped in a similar manner to the double-sided ones in order to interpret their relevance to the lake-dwelling communities of the northern Circum-Alpine region. From the combined find contexts of Hallstatt B period razors, it is evident that the vast majority have been recovered from lake-dwelling contexts (55 %), with fewer being found in burials (22%) or hoards (7%; Table 23)

Nynice

The *Nynice* razor is an example of a two-sided razor from the HaB phase of the Late Bronze Age, but the X-form handle of the earlier razors has been lost in favour of a

smaller handle with simpler ring end (Figure 44.m). Seven examples of this razor, and a mould (Vepřek (CZ)), are mapped (Map 49), with the majority of these in eastern Germany, Austria, Hungary, and the Czech Republic. A single example is present in the northern Circum-Alpine region at Berg-am-Irchel (CH). The majority of these razors are from burial contexts, with further examples from a 'highland' settlement (Kutná Hora (CZ)and Velem (HU)) and a settlement based hoard (Vepřek; Table 23) The mould from Vepřek indicates a local manufacturing centre for these razors in the Czech Republic.

Table 23: Find contexts for Hallstatt B period razors. B = Burial; C = Cave; H = Hoard; L-D = Lake-dwelling; N/A = Not available; Sett = settlement; Sgl = Single find; W = Wetland.

Group Type	L-D	Sett.	B	W	Cave	Hoard	Sgl	N/A
Two-sided								
Nynice		2	4			1		1
Half-moon								
Oblekovice	3	2	18			1		1
Fontanella	(1)		5		1			1
Herrnbaumgarten		1	32			5	4	6
Villanovan	1			2		1		2
Quattro Fontanili			10					5
Half-moon no Grip	23	1		2		6		
Ring Grip								
Mörigen	23	2	1		1			2
Chevroux	5							
Tetín	3	1				1		
Sulpice	8							
Allendorf	7		2			1		1
Genf	2					1		1
Assorted	5	1						
Handle spike								
Auvernier	29	2	5	2	2	6		
Buchau	9							
Bodman	4	1	2			2	1	
Assorted	8							
Trapezoid	35			2		1		
Other	25						1	
Total	**190**	**13**	**79**	**8**	**3**	**26**	**6**	**20**

Half-moon

One-sided half-moon razors from central Europe were common to the Hallstatt B period of the Late Bronze Age, and can be categorized into different types (Jockenhövel 1971: 203-18). Two of these – *Oblekovice* and *Herrnbaumgarten* – are of particular interest for the lake-dwelling region of the northern Circum-Alpine region. Many of the Italian lunate type razors show similarities to the half-moon razors from north of the Alps, particularly the *Fontanella* type (Bianco Peroni 1979: 58). Whether the half-moon type of razor was initially developed in Italy or north of the Alps has been summarized by Jockenhövel (Jockenhövel 1971: 203-04) and have been considered as indications of interaction across the Alps (Bugaj 2007: 304; also Starè 1957).

Oblekovice

Twenty-five examples of the *Oblekovice* type of razor (Figure 44.l) are recorded, dating to the Hallstatt B1-B3 period. Four of these examples come from the Czech Republic and Slovakia (Map 49, Map 50), one is recorded from Austria – without specific find context or location – and 13 are from Hungary and Slovenia (Weber, C 1996: 234-37). The remaining three examples are from lake-dwellings in western Switzerland (Table 23). Four examples of a variant of the *Oblekovice* razor (*-Gliniany*) have been recorded from Poland (Gedl 1981: 35). Weber also lists examples of this razor from northern Italy (1992: 235; Fig 65A), and suggests that they, and *Fontanella* type razors, may have influenced the *Oblekovice* razors in the northern Alpine region and Slovenia, particularly those examples with twisted handles, such as the examples from Estavayer-le-Lac and Velika Gorica (HR) (Weber, C 1996: 240).

Fontanella

The *Fontanella* type of razor appears visually very similar to the *Oblekovice* type, to such a degree that the example of an *Oblekovice* razor from Estavayer-le-Lac, has been listed by Bianco Peroni as an example of the *Fontanella* type (Bianco Peroni 1979: 58). Other instances of the Fontanella razor in Italy are from the region of the Po Plain (Map 49, Map 50), and the area which would become dominated by the Etruscan culture. Five of these *Fontanella* razors are from burial contexts, one from a cave, and one from a lake-dwelling – if the example from Estavayer-le-Lac is considered (Table 23).

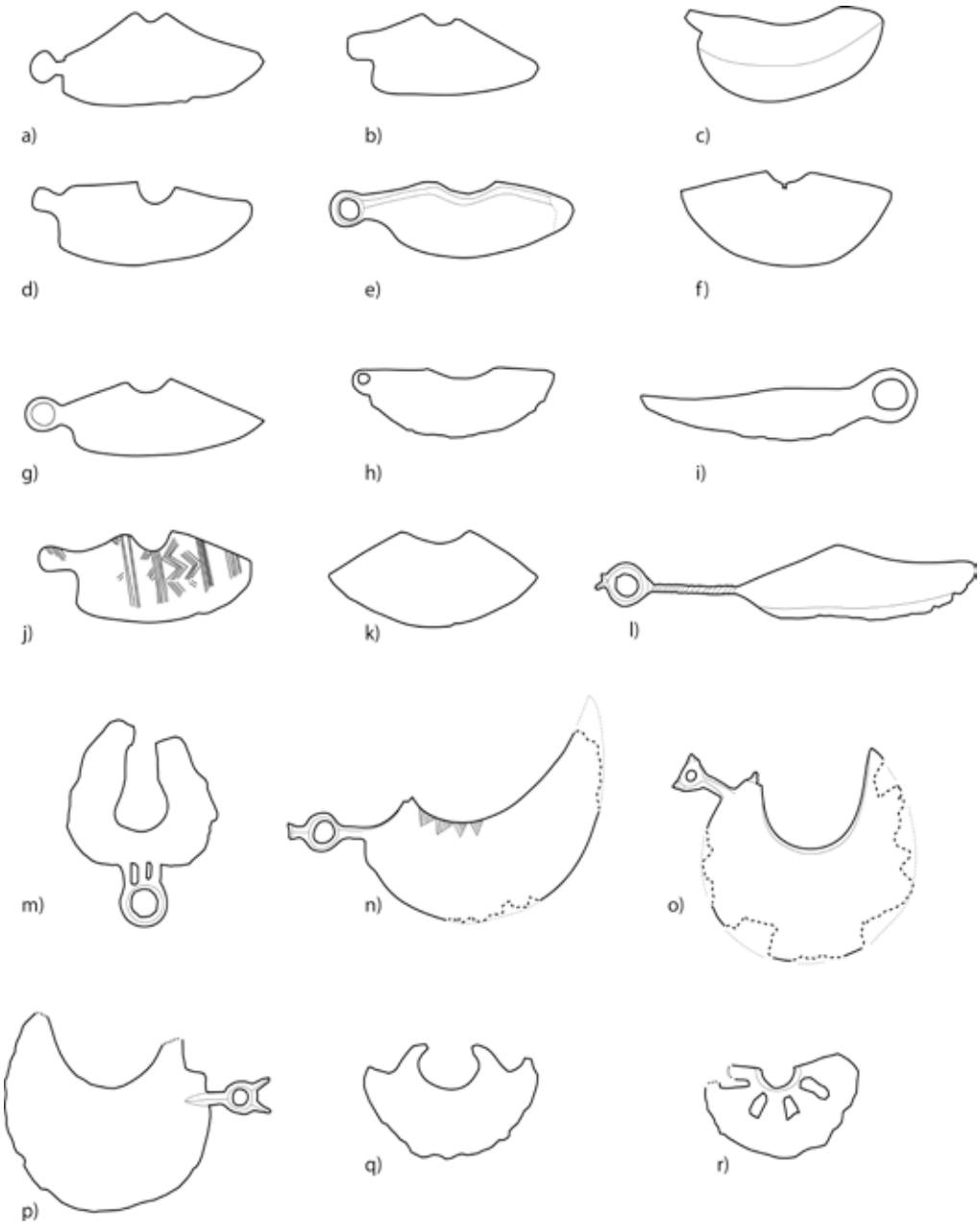

Figure 44: Razor types of the Hallstatt B period and Early Iron Age. *HaB*: a) Allendorf [Auvernier]; b) Auvernier [Mörigen]; c) Bodman [Mörigen]; d) Buchau [Grandson-Corcelettes]; e) Chevroux [Auvernier]; f) Half-moon without grip [Grandson-Corcelettes]; g) Mörigen [Switzerland]; h) Sulpice [Grandson-Corcelettes]; i) Genf [Geneva]; j) Tetín [Grandson-Corcelettes]; k) Trapezoid without grip [Auvernier]; l) Oblekovice [Estavayer-le-Lac]; m) Nynice [Nynice]; n) Herrnbaumgarten [Herrnbaumgarten]; o) Villanovan [Mörigen]; p) Quattro Fontanili [Veio]. *Early Iron Age* q) Cordast [Cordast]; r) Half-wheel [Langenthal] (re-drawn from o) Bernatzky-Goetze 1987: Fig. 22.8; p) Bianco Peroni 1979: no. 464; remainder Jockenhövel 1971: no 461, 492, 513, 504, 440, 541, 433, 447, 465, 445, 537, 394, 321, 400, 577, 579).

Herrnbaumgarten

Thirty-eight examples of the *Herrnbaumgarten* type razor (Figure 44.n) are mapped, the majority of which are from the eastern half of central Europe, the Czech Republic and Austria (Map 51). Further finds of *Herrnbaumgarten* razors are listed from Ukraine (Gedl 1981: 34), Hungary, Slovenia, and Bosnia and Herzegovina (Jockenhövel 1971: 209; Weber, C 1996). Single examples are recorded from the Rhine valley (Niederbieber-Segendorf (D)) and the Swiss Alps (Chelin/Lens). Three variant types are recorded from Poland (Gedl 1981: 33-34), Legnica (4), Parszowice (1) and Słup (1), including a mould for the *Legnica* variant. A razor from a burial in the cemetery of Legnica may have been made in the mould found in the same cemetery, indicating that manufacture of these objects would have taken place in the locally (Gedl 1981: 33).

The majority of the *Herrnbaumgarten* razors are from burial contexts (18) with a single example from a hoard (Herrnbaumgarten; Table 23). The example from Chelin (CH) provides an instance of a razor included in a burial from the Circum-Alpine region, though it is at some distance from the lake-dwelling region. This razor indicates contact and exchange with communities of northern Italy (Jockenhövel 1971: 212), and may represent an individual 'visitor' to the region (Nicolas 2003: 283). It has been suggested that influence from northern Italy can be seen in both the *Oblekovice* and *Herrnbaumgarten* type razors (Weber, C 1996: 246).

Villanovan & Quattro Fontanili

A small group of razors (6) detailed by Jockenhövel as *Villanovan* (1980: 153), show clear affinities to razors commonly found in Italy, such as the *Quattro Fontanili* type (Bianco Peroni 1979: 80-83) (Figure 44.o; p). These *Villanovan* razors are generally accepted as belonging to the Late Bronze and early Iron Age (HaB2-HaC; Bologna 1.I-1.II), and are found in the western Alpine region, central France and the Rhine Valley (Map 52). An example from Lake Bourget (FR) may have come from a lake-dwelling context, and a further example is known from Mörigen (Bernatzky-Goetze 1987).

The *Quattro Fontanili* type of razor from Italy shows a concentration in central Italy, and an example north of the Apennines. In addition to the this type of razor, many other examples of half-moon razors confirm the distribution in central Italy and the Po Plain (Bianco Peroni 1979: Fig. 114-18). In contrast to the variety of find contexts of the *Villanovan* razors, these *Quattro Fontanili* razors are predominantly from burials (13), with one example from a hoard at Bologna San Francesco (IT; Table 23) along with many other razor types (Bianco Peroni 1979: 77.443).

Half-moon Razors without grip

In contrast to the above-detailed types of half-moon razor which have a cast handle, there are many examples which do not have a handle at all (Figure 44.f), and are thus termed "half-moon without grip" (Jockenhövel 1971: 231). Thirty-two examples of this razor type are catalogued here, the majority of which come from lake-dwelling contexts of the northern Circum-Alpine region (Table 23), while examples from France are found in hoards (e.g. St. Yrieix). Notable in this distribution is the apparent absence of the eastern half of Switzerland (Map 53).

Ring grip

Many of the Late Bronze Age single-sided razors take the form of broadly triangular shaped blades (e.g. *Mörigen* type) to broadly half-moon shape blades (e.g. *Bodman* type), with handles, and handle tangs, protruding from one side of the blade. In contrast to the above discussed half-moon razor types, many of these examples are not manufactured in a casting process; instead they were produced from sheet metal (Jockenhövel 1971: 218). The number of ring grip razors recovered has enabled the definition of various types of this razor, of which the relevant examples to the Circum-Alpine region are discussed.

The majority of these ring grip finds are from lake-dwelling contexts, though other instances are from 'highland' settlements, burials and hoards (Table 23). The numbers of ring grip razors found in lake-dwelling contexts has led to the assumption that many of these types, such as *Mörigen*, *Chevroux*, and *Sulpice* were manufactured in the northern Circum-Alpine region (Jockenhövel 1971: 221-37).

Mörigen

Twenty nine examples of the Late Bronze Age (HaB3) *Mörigen* type razor (Figure 44.g) are recorded, of which 25 are from the northern Circum-Alpine region (Map 54), and the Lake Neuchâtel, Lake Biel, and Lake Murten region in particular (Map 55). Outside of the Alpine region an example is known from London, and one from Belgium, and two from the Lower Rhine Valley. The examples outside of the lake region come from settlement, burial, and cave contexts (Table 23). Of the 27 examples listed by Jockenhövel (Jockenhövel 1971, 1980), 17 are detailed as being produced in a mould.

Chevroux

The *Chevroux* razor is very similar to the *Mörigen* type (Figure 44.e), with the addition of ribbing along the upper edge of the blade. Only five examples of the *Chevroux* razor are catalogued, all of which come from lake-dwellings of the northern Circum-Alpine region (Map 56). Interestingly, an example of this razor occurs

in the eastern part of the region at Zurich-Grosser Hafner. Of these five examples, four of them are listed as being manufactured by casting, most likely in the locality of the lake-dwelling communities (Jockenhövel 1971: 220).

Tetín

Only five types of the *Tetín* razor (Figure 44.j) are catalogued (Map 49, Map 50), three from the western Switzerland Three Lakes region, one from a hoard in central France (St. Yrieix) and one from the 'highland' settlement in the Czech Republic, from which this type takes its name (Table 23). Of these five razors, four of them are listed as being manufactured from plate work, with the fifth not detailed.

Sulpice

Eight examples of the *Sulpice* type of razor (Figure 44.h) are mapped (Map 49, Map 50), all of which come from the western Switzerland lake-dwelling region, and lake-dwelling contexts (Table 23). They were most likely a type manufactured in this region. All of these razors are detailed as being made from plate work rather than cast objects (Jockenhövel 1971: 221-22).

Allendorf

A total of 11 examples of the *Allendorf* razor (Figure 44.a) are recorded, distributed predominantly in the western Switzerland lake region, but also with examples in the east of Switzerland, central and southern Germany, and one example in the Netherlands (Map 58). Nine of these razors are made from plate work, with the remaining two being cast pieces (Jockenhövel 1971: 222-23, 1980: 144).

Genf

Of the *Genf* type of ring grip half-moon razor (Figure 44.i), only four examples are listed (Map 56, Map 57). Two of these are from lake-dwellings in western Switzerland, a third from Genève, and the fourth from northern Germany (Table 23). Of these razors two are listed as being cast objects and one as being made from plate work (Jockenhövel 1971: 223), the fourth object is not detailed.

Un-typed and fragments

Six un-typed razors with a ring grip are mapped (Map 59), of which five are from lake-dwellings of the northern Circum-Alpine region, and the last from a settlement in the Alpine valleys of eastern Switzerland (Salouf, Grisons). Four of these objects are listed as being cast objects, with the remainder being plate work (Jockenhövel 1971: 224, 1980: 498).

Handle tang

A second group of razors of half-moon form, but without full grip handle, are those with have handle tangs instead of rings, to aid the attachment of organic handles. Similar to the ring grip types of razors, the handle tang group were manufactured through either casting or from plate work, but in this instance the vast majority of objects are plate work. Again, various types of relevance to the Circum-Alpine region are detailed, with the vast majority of these finds coming from lake-dwelling contexts, and fewer examples from hoards and terrestrial settlements (Table 23).

Auvernier

The most numerous single group of razors discussed here is the *Auvernier* type (Figure 44.b), with a total of 46 razors (Map 61). Twenty-nine of these examples are from lake-dwellings of the northern Circum-Alpine region, and particularly around Lakes Neuchâtel and Lake Biel (Map 62). Other examples are distributed in settlements and hoards across Germany, Belgium, Poland, the Czech Republic, and Austria, while single finds are also known from the Thames and Rhône valleys (Table 23). The majority of *Auvernier* razors (29) are listed as being made from plate work, with only 10 detailed as being cast (Jockenhövel 1971: 225-27). The number of these razors found in the lake-dwellings of western Switzerland suggests that they were locally manufactured. Examples of the razor outside of the Circum-Alpine region may have travelled from the lake-dwelling region, but may also represent localized manufacture.

Buchau

Of the *Buchau* type single-sided razor (Figure 44.d) only nine examples have been recorded, all of which are from lake-dwellings of the northern Circum-Alpine region (Table 23), eight from Lake Neuchâtel and Lake Biel, and a single example from the settlement Wasserburg-Buchau, Federsee in southern Germany (Map 56, Map 57). All nine of these razors are listed as being made of plate work (Jockenhövel 1971: 228), and, again, local production in the lake-dwelling region is proposed for this type of razor.

Bodman

A total of ten examples of the *Bodman* type of razor (Figure 44.c) are catalogued (Map 56, Map 57), of which three originate from lake-dwellings of western Switzerland (Le Landeron-Grand Marais, Chevroux, Mörigen), one from a lake-dwelling in southern Germany (Bodman-Schachen 1), and two from a hoard in western France (St. Yrieix; Table 23).The remaining four examples are from Poland. Four of these razors are detailed as being made of plate work (Jockenhövel 1971: 229, 1980: 147), most likely in the northern Circum-Alpine region.

Un-typed and fragments

In addition to the above-discussed types of single sided razors with handle spike, eight razors of no specific type are mapped (Map 60). These eight razors all come from lake-dwellings of the Circum-Alpine region, 5 from the

eastern half and three from the western portion (Table 23). Only three of these examples have been studied for manufacturing techniques, of which two are cast objects and the third is plate work (see Jockenhövel 1971: 229).

Trapezoid without grip

A further form of razor to be utilized during the Late Bronze Age in the Circum-Alpine region is the *Trapezoid* razor, which in contrast to the half-moon razor form is more angular, with a marked trapeze shape to the blade, without handle protrusion (Figure 44.k). A total of 38 instances of this razor form are mapped (Map 63), of which 35 come from lake-dwellings of the Circum-Alpine region, mostly around Lake Neuchâtel, and one is from the hoard at St. Yrieix, which contained many other razors. Where it has been recorded (36), all of these razors are detailed as being manufactured from plate work, with two examples re-manufactured from arm rings (Jockenhövel 1971: 231, 1980: 147).

Various razor fragments

Aside from the above-detailed types of Hallstatt B period razors, there are numerous examples of razor fragments which cannot be assigned to a specific type, and also razors which are atypical. A total of 26 atypical or broken razors are mapped (Map 64), of which 25 are from lake-dwellings of the northern Circum-Alpine region, the last being a single find from Pfäffikon (CH; Table 23). Of the razors where manufacturing technique has been recorded, 16 are of plate work, while three examples are cast objects (Jockenhövel 1971: 232-33).

Early Iron Age

HaC-HaD period

A number of early Iron Age (HaC-HaD) razors from the northern Circum-Alpine region have been charted to observe the distribution of Iron Age razors in this area, and the area of the former lake-dwelling communities (Map 65; Map 66). While some of these razors can be defined into groups, such as *Cordast* and *Ins* (Jockenhövel 1971, 1980), others are simply grouped into their general form, such as Half-moon. All of the razors recorded relating to the early Iron Age come from burial contexts (Table 24), a trend which is further illustrated by the distribution of EIA razors in western Europe listed by Jockenhövel (1980: Fig. 59.A), in which a clear preference for incorporation of razors in Tumulus burials is evidenced.

Table 24: Find contexts for early Iron Age razors of the northern Circum-Alpine region. L-D = Lake-dwelling; N/A = Not available.

Type	L-D	Settlement	Burial	Wetland	Hoard	Cave	Single find	N/A
Cordast			12					
Ins			2				1	1
Half-moon etc.			9					
Total			**33**				**1**	**1**

Cordast

The distribution of the 12 *Cordast* type of single-sided, half-moon razor (Figure 44.q) extends from southern France to central France and the west of Switzerland (Map 65). These razors were manufactured in a single piece casting, which has been used to suggest a possible origin of southern France for the objects from Cordast and Nendingen (Jockenhövel 1980: 188). All of the examples of this razor are from burial contexts (Table 24).

Ins

Two razors of the type *Ins* are recorded from the Circum-Alpine region (Map 65), while many more examples are known from the south of France (Jockenhövel 1971: 243, 1980: 191). Both of these examples from the Circum-Alpine region are from burials (Table 24). Two razors are recorded from Poland, one of which is only provided a general find area (Gdańsk), and one is a single find from the early Iron Age cemetery of Gorszewice, which also shows other connections to southern Europe (see Section 5.1).

Half-moon, -wheel, & un-typed razors

Eight iron *half-moon* and *half-wheel* razors (Figure 44.r) are recorded dating to the early Iron Age (HaC-HaD), and all of them come from burial contexts (Table 24). A single undefined razor has been found in a burial at Vidy-Chavannes (Moinat and David-Elbiali 2003). The distribution of these razors within the northern Circum-Alpine region illustrates that communities still inhabited the former lake-dwelling region during the early Iron Age, and, as evidenced by other material culture groups (e.g. Section 5.4.1.1) that they were involved with exchange and communication networks (Map 65).

Manufacture of razors

As has been alluded to in the above details of specific razor types, two different methods of manufacturing

razors can be identified: casting, and hammered plate work. Several instances of moulds for two-sided razors are detailed by Jockenhövel (1971) and Gedl (1981), such as those from Preist, Vepřek, and Legnica. Find contexts for these moulds include settlements, hoards, in burials, and as single finds. Given the number of razors found in lake-dwellings of the northern Circum-Alpine region, and the supposed localized manufacture of razors in those settlements, it is remarkable that only a single razor mould (from Grandson-Corcelettes) has been identified among the numerous moulds from lake-dwellings (see Section 5.4.3.3).

One possible explanation for this apparent discrepancy between the number of manufacturing equipment and razors found is a change in production technique at the same time as the double-sided razor was being replaced by the single-sided (HaA-B transition; Table 25). While some of varieties of single-sided razors were cast in moulds, such as the *Herrnbaumgarten* type, others were increasingly made by hammering plate bronze work flat. Such manufacturing techniques would not leave unique traces behind, as the equipment for such processes (e.g. anvil, hammer, chisel, and punch) would be used for general metalworking practices.

Table 25: Manufacturing technique for razors from the Late Bronze Age and early Iron Age.

Period	Cast	Plate	Re-Manufactured
HaA	30		
HaB	111	148	10
Iron Age	32	1	
Total	**173**	**149**	**10**

Re-manufactured razors

The manufacture of razors from plate bronze also permits the re-use and re-manufacture of old objects into razors (Table 25). This is seen on several of the single sided razors from catalogues of Jockenhövel (e.g. 1971: no.445; 473; 486; 516; 517; 529; 562; 1980: no.512; 516). Three of these re-manufactured examples which were cut out from arm-/leg-rings and hammered flat are examined in greater detail.

Re-manufactured Auvernier razor from Mörigen

The most visually striking razor made from a section of an arm-/leg-ring is the example from Mörigen (Figure 45). This *Auvernier* razor has the typical decoration of a *Corcelettes* type leg-ring (Figure 46.a), the best comparable examples of which come lake-dwellings at Nidau and Bevaix (Pászthory 1985: no.1399;1400). The extension of the decoration to the very edge of the razor, both along the upper side and the handle tang, suggests that the razor was cut from the larger section of a leg-ring (Figure 45.b; c). On the cutting edge of the blade it is evident that the decoration has been worn away due to sharpening of the blade (Figure 45.a).The regularity of decoration on this blade is quite remarkable, considering the curvature which would have been inherent to the object when shaped in the form of ring jewellery.

Re-manufactured Auvernier razor from Auvernier

A second example of a re-manufactured *Auvernier* type razor, also from a *Corcelettes* type leg-ring, is known from Auvernier (Figure 47). Decoration on this razor is less extensive than on the above discussed razor, but again, the continuation of decoration across the upper edge of the razor (Figure 47.b), and interruption of the pattern (Figure 47.a) suggests that this object was cut from a larger piece of metal. Approximately one third to one half of the way down the blade the incized decoration ceases, most likely as the result of extending the cutting edge though hammering, and sharpening of the blade. It may be possible to observe the pattern distorting effect of converting a curved object to a flat object by comparing the two areas of vertical striations on the blade (Figure 47.b; c). At the centre of the blade, these striations are practically perpendicular to the blade, while at the extent of the blade they are at a marked angle; when observed on an arm ring, these striations are typically perpendicular to the object edge along its entire length (Figure 46.a).

Re-manufactured Trapezoid razor

Finally, a *Trapezoid* razor without grip has decoration typical of a *Boiron* type leg-ring (Figure 46.b). The decoration on this razor is less pronounced than the two previously discussed objects, but the extension of the decoration to the edge of the razor, and asymmetrical positioning of decoration in the centre of the blade (Figure 48.front), provides an indication that this object was manufactured from a larger 'parent' item.

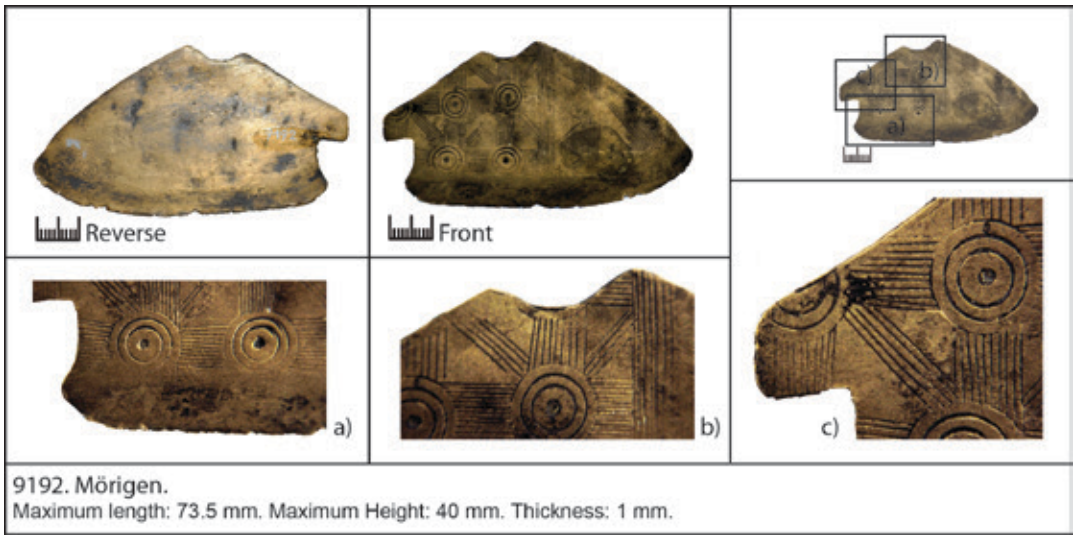

Figure 45: *Auvernier* razor (SNM object no. 9192) manufactured from a *Corcelettes* type arm-ring. (Photographs and graphic by the author).

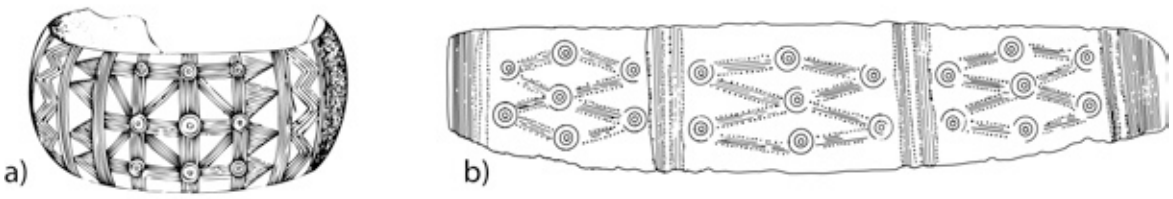

Figure 46: Decoration on *Corcelettes* (a) and *Boiron* (b) type arm-/leg-rings. (re-drawn from Pászthory 1986: no.1399; 1441).

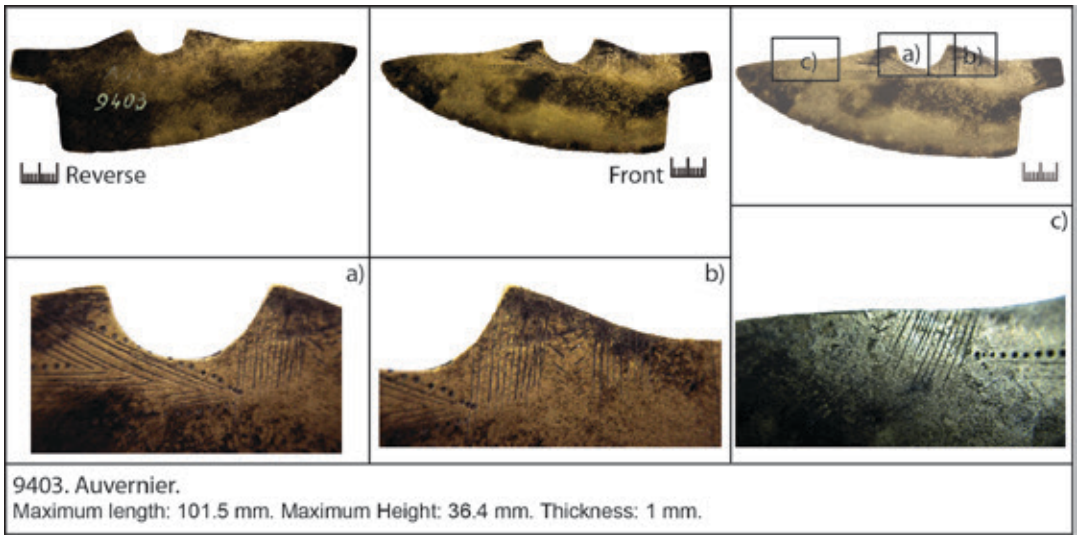

Figure 47: *Auvernier* razor (SNM object no. 9403) manufactured from a *Corcelettes* type arm-ring. (Photographs and graphic by the author).

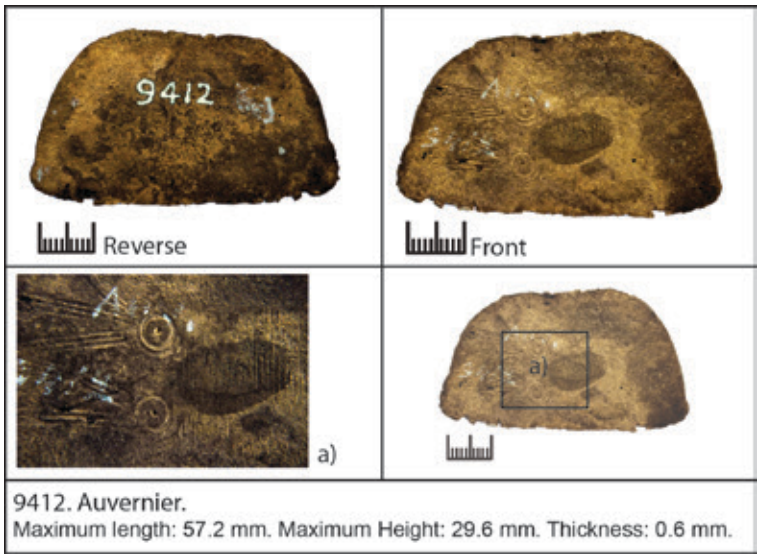

Figure 48: Trapezoid razor (SNM oject no. 9412) manufactured from a *Boiron* type leg-ring. (Photographs and graphic by the author).

Decoration

Razors which were manufactured from old objects clearly retain the decoration of the original object without further modification. Other razors show more specifically applied decoration, such as those examples from Nidau (*Half-moon no Grip*), Grandson-Corcelettes (*Auvernier*, *Trapez no Grip*), and Mörigen (*Half-moon no Grip*). The decoration on these razors uses the typical motifs of the Late Bronze Age, such as concentric circles and incized triangles, as can be seen on other types of material culture (e.g. arm-/leg-rings and knives). The number of razors, from all periods and types discussed here (and also types not detailed; see the PBF catalogues), with incized decoration total only a fraction of the known razor assemblage (Table 26). To some extent the double-sided razors of the Early Urnfield may be seen as possessing an 'inherent' decoration in their X-form handle, making them more ornamental than the HaB period single sided razors.

Table 26: Numbers of razors with incized decoration from the Late Bronze Age and early Iron Age.

Period	Decorated	Undecorated
HaA	4	38
HaB	59	280
Iron Age	1	18
Total	**64**	**336**

When compared to razors of northern Europe (particularly Denmark), the decoration on the razors discussed here is evidently very plain (Figure 49). Decoration on some of these Nordic type razors has been linked to the Late Bronze Age sun-bird-ship symbolism (Kaul 2004), clearly indicating a social function of the razors. While the decoration on the central European razors tallies with that seen on other contemporary material culture, the low quantity of razors with designs, and the level of application suggest that this was not an important aspect of the symbolism or use of these objects.

Symbolism and use

For functional purposes applied decoration on razors is irrelevant, and would not have affected the characteristics of the razor. The obvious function of razors is for the cutting and management of human hair, which would have formed an important part of maintaining personal appearance and social identity (Kristiansen and Larsson 2005b: 227-31; Jockenhövel 1971: 245; Harding 2008: 194). The adherence of human hair to several razors (e.g. Jockenhövel 1971: no.6;29;68;136;251;255) attests to such a function, while several experimental studies have interpreted the effectiveness of personal grooming with Bronze Age

style razors (Vorlauf 1996; Eibner 1996). Alternative functions may have been in butchering or grooming animals (Eibner 1996: 265), a purpose which may be indicated through the attachment of animal hair to some razors (e.g. Jockenhövel 1971: no.23;158). Thus, it may be that razors were a multi-purpose tool, used as their owners needed.

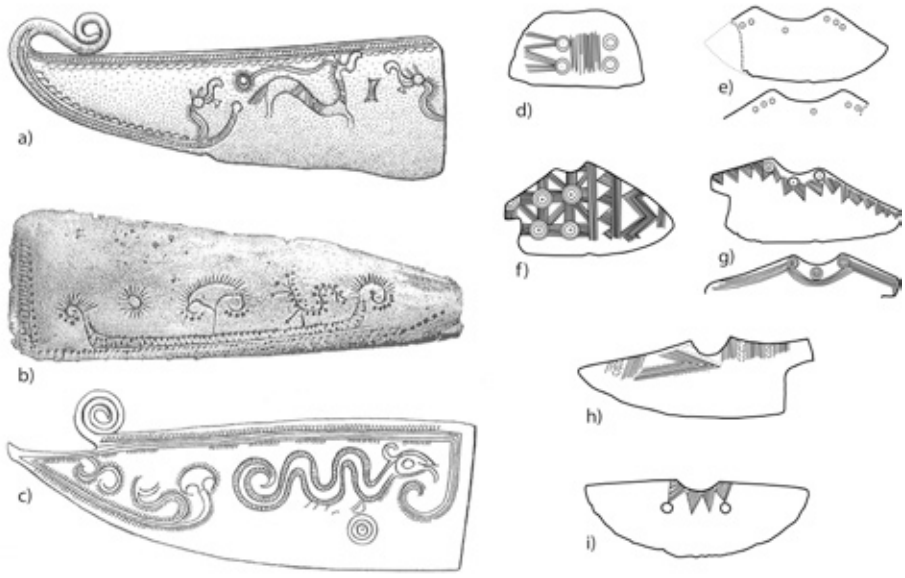

Figure 49: Inscribed decoration on Late Bronze Age razors from Denmark (a - c) and Switzerland (d – i) (after: a, b, c) Kaul 2004; re-drawn from d – i) Jockenhövel 1971: no. 128, 142, 232, 228, 217).

The number of razors found has been taken as an indication that they were the personal equipment of individuals, rather than specific 'barbers' serving numerous individuals (Harding 2008). Individual ownership and use of razors may provide some indication as to the variability of decoration on razors: owners would have been able to decorate them as they wished, using a range of contemporary designs. The manufacture of single-sided razors from plate work may have removed the metal-working artisan as a specialist from the production of such objects, as the skills to cut out and flatten a blade are less than those required to cast objects. Furthermore, the actual razor may have been a peripheral aspect of its function – grooming and maintenance of identity – reducing their symbolism and the need to decorate these objects.

However, that razors had symbolic value is clearly evidenced by their inclusion in burials (cf. Table 22-Table 24). The symbolic function of razors during the Bronze Age is difficult to identify from the archaeological record, though it has been suggested that they may be indicative of the attainment of particular social status, level or age (Nicolas 2003; Harding 2008: 193). Associated goods with razors included in burials indicate that they accompanied male individuals (particularly the Herrnbaumgarten type Jockenhövel 1971: 210), and are found in both 'rich' and 'poor' graves, and those with and without weapons and spears (Harding 2008: 193-94; Jockenhövel 1971: 247; Schopper 1995: 91). When included in inhumation burials there appears to be no consistent distribution of razors, with placement at various location including the waistline, at the head, arm, knees, and feet (Jockenhövel 1971: 246).

Concerning the LBA razors from the northern Circum-Alpine region it is difficult to approach an understanding of the symbolism of these objects, primarily because so many of them are from lake-dwelling contexts. Without further contextual information it is difficult to interpret their social function, though the occasional finds in burials indicates that they did possess a socially-active symbolism. It is unlikely that the finds from lake-dwellings (and lakes) represent lost objects, and may have formed part of the burial practice of the lake-dwelling communities (of which very little is known), or represent single depositions (cf. Fischer, V 2012: 115).

Where razors are re-manufactured from other objects, there is a diversion of the object from its traditional and accepted biography. The majority of the arm-/leg-rings from the Circum-Alpine region are from lake-dwelling (unclear deposition) contexts, with relatively few from burials and hoards (see Section 5.4.2.4), though many of these lake-dwelling finds could be considered as representing hoards, depositions or burials (Fischer, V 2011, 2012). Where arm- and leg-rings occur in burial contexts, they are generally interpreted as representing

female individuals (Pászthory 1985: 256). Thus, their conversion into a razor marks a definite diversion of the life path into new gender, use, and deposition spheres. It is possible that the conversion of these objects represents an element of fragmentation practices and dividual personhood (see Section 2.3) in the lake-dwelling communities, under which ring jewellery was fragmented as owners reached certain life stages; however, the motivations for such diversion remain clouded (Jennings, in print).

Concluding remarks

From the above examination of razors from late Bronze Age contexts of the Circum-Alpine, several points can be summarized. Firstly, the distribution of various razor types suggests that the lake-dwelling region, and lake-dwelling communities, were incorporated in communication and exchange networks with various parts of Europe. Secondly, the distribution of razors in the northern Circum-Alpine region is skewed towards a higher deposition rate around the lakes Neuchâtel, Biel, and Murten, with relatively few are lakes Zurich and Constance. This pattern is interesting given the high number of other metal work objects found in eastern Switzerland, e.g. needles and knives, for example at Zurich-Alpenquai and -Wollishofen (Bauer, S 2002; Mäder 2001a), though corresponds with the general distribution of arm-/leg-rings (Pászthory 1985: 253). Finally, despite the frequent deposition of razors in burials, due to the lack of recurrent decoration and apparent ease and readiness with which other objects were transformed into razors, their symbolic significance may be questioned, but they may indicate the attainment of certain life stages by male individuals. It has been argued that razors included in burials in northern and central Italy are present in both male and female inhumations (Bianco Peroni 1979), but north of the Alps they appear to have more exclusively male associations (Schopper 1995: 91).

With regard to the incorporation of the lake-dwellings into wider communication and exchange networks it is unlikely that razors were an extensively traded commodity. Instead, they probably represent individual mobility, and were transported as personal, functional, equipment (Harding 2000: 191-92). The regional distribution of razors illustrates local exchange and communication networks, indicating style and cultural preferences. Where razors occur in burials, frequently with other personal grooming equipment such as tweezers, they would not only have signified the social identity of the individual, but also, as individualized and personal objects, the personal identity, and may thus aid in the identification of 'foreign' individuals in communities – such as the *Herrnbaumgarten* razor in a burial at Chelin, and the *Villanovan* razor from Mörigen.

5.4.2.2: Knives

While not as functional as a "Swiss Army Knife", metal knives of the Late Bronze Age form a group of objects that may have fulfilled a number of purposes: they could have been used as personal equipment in cooking and eating practices – as cutlery – or as utility tools, used for various functions such as butchery and light craft practices (Hohlbein 2008a: 368). However, as single-sided objects they may have performed poorly as weapons. Catalogues of bronze knifes are available in the PBF series for some areas of Europe (Italy (Bianco Peroni 1976), Poland (Gedl 1984), Austria and the eastern Alpine region (Říhovský 1972), northern Germany (Prüssing, P 1982), southern Germany (Hohlbein 2008a) and the Czech Republic (Jiráň 2002)), while the knives known from Switzerland have largely been interpreted in their own scheme (Rychner 1979; Bauer, I *et al.* 2004: 67).

Late Bronze Age

With a large material assemblage across Europe (over 1000 examples from the PBF volumes), a range of knife types have been proposed, which can be grouped into broad categories dependent upon their method of hafting. Knives with 'frame' handles (*Rahmengriff*) are a form of the MBA to early LBA (BzD-HaA) and are not discussed here due to their occurrence outside of the main time period under consideration. Handles intended to accommodate plates along their length attached by rivets (*Griffzunge*), similar to sword varieties (cf. Schauer 1971), are known throughout the LBA, and several examples are recorded from the northern Circum-Alpine region. The largest group of knives relevant to the nCA are those with a handle spike or tang (*Griffdorn*), pushed into an organic material, e.g. wood, bone or antler, to form the handle. Knives of the final phases of the LBA (HaB) with full cast handles, and the possible organic handle attachments (*Vollgriff* and *Phantasiegriff*) are known from the region of study, as are socketed (*Tüllen*) knives.

Griffzunge

Matrei

The *Matrei-Mühlau* group of knives, with a downturned blade profile, organic handle facings, and a short stop/guard at the intersection between blade and handle (Figure 50.d;g) is known from several areas of Europe, particularly north of the Alps during the Early Urnfield period (Müller-Karpe 1949/50), with a core distribution area in northern Tirol (Map 67), southern Germany and northern Italy (Hohlbein 2008a; Bianco Peroni 1976: 16-19; Jiráň 2002: 32; Říhovský 1972: 37-38). The Period IV (HaA-HaB1) *Poznań-Starołęka* type (Figure 50.h) is a local variety common to Poland (Gedl 1984: 30-31), though it shows some similarities in form to the *Matrei* type knives. *Matrei* knives are also recorded from lake-dwellings of the northern Circum-Alpine region, at Zurich-Alpenquai, Mörigen, and Estavayer-le-Lac (Bernatzky-Goetze 1987; Mäder 2001a). These pieces can be interpreted as imported items to the lake-dwelling region.

Of the 56 *Matrei* (including 3 *Poznań-Starołęka*) knives charted, the majority are from burial contexts. Four pieces are known from lake-dwellings in the northern Circum-Alpine region, while another example is known from the river Inn in southern Germany. Few pieces are known from terrestrial settlements or hoards.

Decoration occurs on 18 of these knives (32%), and these are mostly from northern Italy. Where applied, decoration consists of inscribed lines along the length of the blade, with curvilinear motifs on the *Zwischenstück*. Occasional circles, half circles, and herring bone styles are seen, e.g. on the pieces from Missiano, Clés, and Ortucchio (Bianco Peroni 1976: Plates 2-4). Unfortunately contextual information is not available for many of these pieces from northern Italy, and so corroboration between context and decoration cannot be observed.

Fontanella

The *Fontanella* type knife (Figure 50.c) is somewhat similar to the *Matrei* type, though does not have the stop/guard, and has a more undulating, S shaped profile (Bianco Peroni 1976: 19-20). This form is largely concentrated in northern Italy (Map 68), with a similar distribution to the *Matrei* type, relating to the Italian Final Bronze Age (bronzo-finale), or Early Urnfield (HaA) in terms of northern Alpine chronologies. A single knife of this type has been recorded from the nCA, at Hauterive-Champréveyres, and has been interpreted as an imported object (Rychner-Faraggi 1993; Bellintani, P 2013: 789-90).

Of the eight recorded Fontanella knives five are from burial contexts, and single pieces are known from a hoard at Tragno (Brentonico; IT), and lake-settlement (Hauterive-Champréveyres; CH), while contextual information is unavailable for the final example. Decoration consisting of lines running along the blade length and small circular eyes is present on those from Fontanella Grazioli, and hashed triangles and zig-zag pattern from Castellace (Bianco Peroni 1976: Plate 4-5).

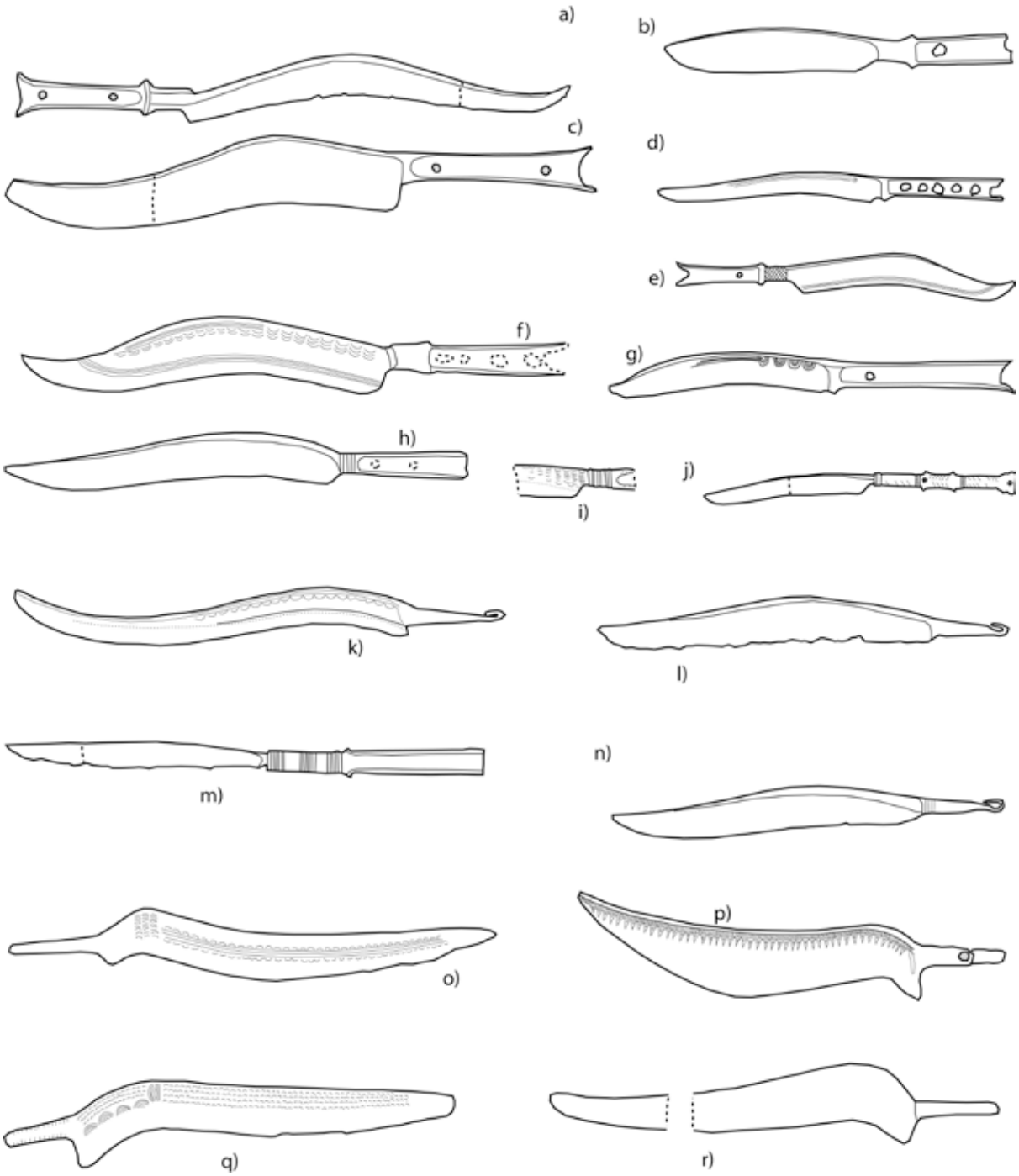

Figure 50: Late Bronze Age knives. a) *Pfatten-Brzeźniak* [Brzeźniak]; b, e, f, i) *Pfatten* [b = Freudenberg; e = Hagnau; f = San Pietro; i: = Bük]; c) *Fontanella* [Fontanella Grazioli]; d) *Matrei-Mühlau* [Gernlinden]; g) *Matrei* [Missiano]; h) *Poznań-Starołęka* [Poznań-Starołęka]; j) *Ehingen* [Mainz-Erbenheim]; k, l, n) *Ennsdorf* [k = Banie; l = Libčeves; n = Ennsdorf]; m) *Aub* [Niederursel]; o, q, r) *Hadersdorf* [o = Wrocław-Grabiszyn; q = Velké Číčovice; r = Hadersdorf am Kamp]; p) *Este* [Como Cà Morta] (re-drawn from: a, h, k, o) Gedl 1984: 41, 47, 101, 112; b, n, r) Říhovský 1972: 131, 164, 243; c, f, g, p) Bianco Peroni 1976: 40, 56, 35, 347; d, e, j, m) Hohlbein 2008: 343, 357, 47, 39; i) Prüssing 1982: 269; l, q) Jiráň 2002: 155, 178).

Pfatten, Pfatten-Brzeźniak

The *Pfatten* type knife (Figure 50.b;e;f;i), as described by Müller-Karpe (1949/50: 322), has a cylindrical spacer (*Zwischenstück*) between the blade and handle, with a small stop guard (*Heftwulst*), and continues the style of *Matrei* and *Fontanella* knives into the Late Urnfield (HaB) period. Distribution of this knife extends across central Europe (Map 69), particularly in the eastern Circum-Alpine region, and spreads to northern Germany and southern Scandinavia (Jiráň 2002: 35-37). Regional variations of this knife can be noted within their general area of distribution, suggesting localized manufacture in different regions, for example in Poland the *Pfatten-Brzeźniak* variant (Figure 50.a) – with oval or quadrangular *Zwischenstück* – are known from contexts relating to Period IV (HaA-HaB) (Gedl 1984: 28-29;

Hohlbein 2008a: 313). Other variants and concentrations are known from the eastern Alpine region and northern Italy (Thrane 1972: Fig. 16; Říhovský 1972: 39; Bianco Peroni 1976: 21-23). Although Thrane (1972) mentions a south Germany and Switzerland variant, later authors (e.g. Rychner 1979) have not discussed knives from Switzerland in such terms (see below).

Of the 18 examples recorded here five are from burial contexts, with two known from wetland contexts, and two from lake-dwellings of southern Germany (Hagnau-Burg and Rosen Insel). Three examples do not have contextual information available. Again, with such a high proportion of objects without contextual information, it is difficult to discern any correlation between context and decoration, which occurs on 50% of the knives in the form of lines, crosses, and half circles along the upper section of the blade and on the blade ridge. An elaborately decorated example, with inscribed duck/water-bird symbols is known from Vadena (Bianco Peroni 1976: no. 58).

Socketed knives

Late and Final Urnfield (HaB2-3, Period V) knives with socket handle attachment (*Tüllen*) are known from a broad section of Europe (Map 70, Map 71), particularly western and central areas (Hansen 1991; Hundt 1978), though examples are also known from Poland, where they have been interpreted as imported items (Gedl 1984: 62). As with the full- and *Phantasie* grip knives, a large corpus of material has resulted in various types being defined for different regions. The blade form, and occurrence of spacing area on many of these knives illustrates the influence of other knife types, e.g. as *Baumgarten*, on their design and manufacture (Hohlbein 2008a: 373; Říhovský 1972: 73). However, socketed knives are not confined to the final phase of the LBA (HaB), as examples of the *Etting* and *Stadecken* types, relating to the Early Urnfield phase illustrate (Hohlbein 2008a: 318-24).

Rheda-Wiedenbrück

Hohlbein (2008a: 327-41) defined socketed knives from northern Germany under the group *Rheda-Wiedenbrück* (Figure 51.z), as having a slightly conical socket which does not extend into the blade section, and an arched blade ridge on the approach to the handle. Twenty-one examples of this knife are listed, and a clay mould is known from Ameln that may have been used to create this type of knife. These knives are mostly known from burials (9) and hoards (7), with 2 examples from rivers and three without information. Only four of these examples are decorated, which includes linear patterns of the blade ridge (e.g. Reken (D)), and incized loops around the socket (e.g. Asseln (D)).

Han-sur-Lesse

Three examples of the *Han-sur-Lesse* socketed knife (Figure 51.a1) are listed, two of which are from hoards (Hochstadt (D); Havelte (NL)), and a find complex (Hans-sur-Lesse (BE)). In this form of knife the socket extends further into the blade area, causing a widening of the blade, and a stop guard is present. The example from Hochstadt has a line decorated blade ridge and band decorated socket.

Este

A single type *Este* socketed knife is recorded from Villach (AT) (Říhovský 1972: 73). With a very broad blade this knife shows more similarity to socketed knives of northern Italy (Bianco Peroni 1976: 45-50) than other items of Europe north of the Alps, and it's association with a *Calliano* type sword (see Sword Types) may suggest a migrant individual from northern Italy.

Neunkirchen

One item is listed under Jiráň's (2002: 62-63) *Neunkirchen* type (Figure 51.v), which shows good similarities to many of the socketed knives from central Europe. Unfortunately no context is available for this undecorated piece. This knife has been interpreted as an imported object to the area due to a lack of comparable objects in the area, while similar pieces can be seen in examples from northern Germany (Jiráň 2002: 63; Prüssing, P 1982: 142-48).

Tüllenmesser

In addition to these socketed knife types, a number are recorded without type information, simply as *Tüllenmesser* (Figure 51). These are distributed across central Europe, though are more common in the western region than the eastern (Thrane 1972; Sprockhoff 1956), and they appear to be a particularly special form in the nCA lake-dwelling region (Rychner 1987: 63), where moulds have been found at the settlements Mörigen (CH) and Châtillon (Lake Bourget, FR) (Bernatzky-Goetze 1987; Prüssing, P 1982: 147; Wyss 1967). Over 50% of these knives are without specific context information, but a large group of these (28) are reported from Lake Bourget (Kerouanton 2002: 94). The remaining knives are known from hoards (31%), burials (6%) and lake-dwellings (7%), and three pieces as isolated finds (2%).

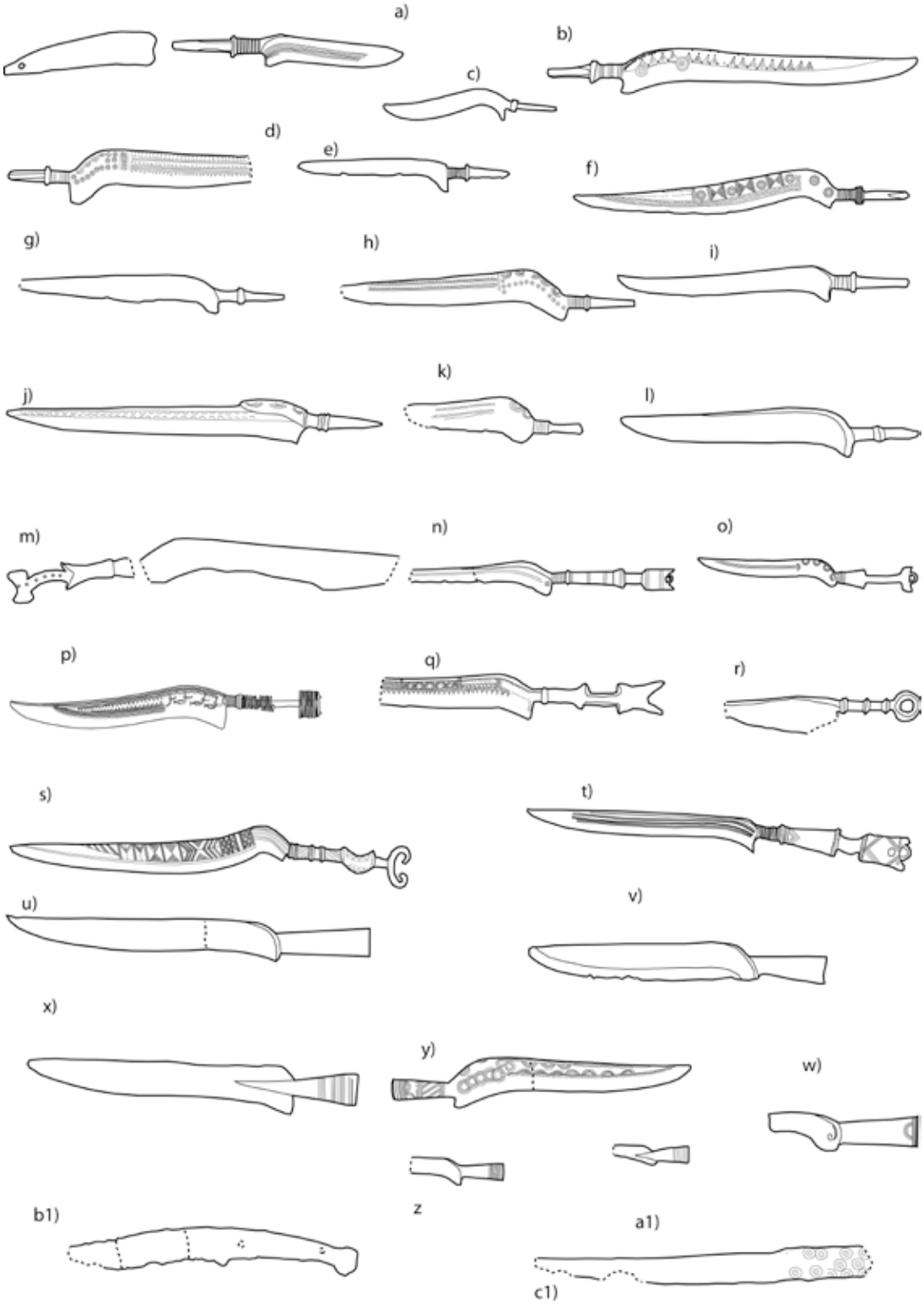

Figure 51: Late Bronze Age *Baumgarten* and *Wien-Leopoldsburg* type knives: [a =Mörigen; b = Mörigen; c = Este; d = Trzcinica Mała; e = Přes; f = Kletnice; g = N/A; h = Besice; I = Schwesing; j = St Aubin; k = Haassel; l = Hadersdorf am Kamp. *Phantasie* and full grip knives: m) Wrocław-Grabiszyn [Wrocław-Grabiszyn]; n) Mradice [Mradice]; o) Grassau [Haunstetten]; p) [Vadena]; q) [Vadena]; r) Ronzano [Ronzano]; s) Reisenburg [Reisenburg] t) [Auvernier]. *Socketed* knives [u = Szolpino; v) Neunkirchen [Třebovle]; w = Aurich; x = Auvernier; y = Sterley; z) Rheda-Wiedenbrück [Hochstadt]; a1) Han-sur-Lesse [Hochstadt]. *Early Iron Age knives*: b1) Pronounced ridge [Zurich-Höngg]; c1) Shallow ridge [Zurich] (re-drawn from: a, b) Bernatzky-Goetze 1987: Plate 12.7, 12.9; c, p, q, r) Bianco Peroni 1976: 363, 361, 77, 89; d, m, u) Gedl 1984: 117, 144, 146; e, g, h, n, v) Jiráň 2002: 203, 186, 179, 13, 223; f, l, s) Říhovský 1972: 250, 271, 281; i, k, w, z) Prüssing 1982: 263, 259, 286, 287; j) Pleiner 1979: Plate 6.1; o, z, a1) Hohlbein 2008: 58, 376, 389;. t, x) Rychner 1979: Plate 113.4, Plate 113.1; b1, c1) Drack 1973: Plate. 28.4, Plate 29.5).

Decoration on these items is unusual (c. 11%) and usually consists of ribbing or linear incisions around the socket (e.g. Bahnsen; Baven; Leiferde). Two examples from northern Germany show richer decoration, with a piece from Aurich showing *wellenband* style decoration (Prüssing, P 1982: no.286), as seen on spearheads from the Circum-Alpine region (see Section 5.4.1.2). The knife from Sterley (Prüssing, P 1982: no.287) shows a variety of *wellenband* in combination with spiral design typical of Nordic metalwork, such as razors (Kaul 2004).

Full grip

Full grip knives are those which have a cast handle, attached to the knife blade, and differ from the *Phantasie* knives through their absence of broad spaces in the handle. The knife may have been cast as a single piece object with solid handle, or cast as separate handle and blade with looped tang and assembled and secured with a rivet to form a single object.

Aub

Aub type full grip knives (Figure 50.m), with circular *Zwischenstück* and double T handle, are known from southern Germany (Map 72) in Middle to Late Urnfield contexts (HaA2-HaB1) (Hohlbein 2008a: 93-101). Comparable examples are also known from Volders (AT) (Hohlbein 2008a: 100), Poland (Gedl 1984: no.79), Bouclans (FR) (Passard *et al.* 1984) and a possible comparable item is known from Cortaillod (CH) (Hohlbein 2008b,a: 101). A two-sided mould for this knife type is known from northern Germany, suggesting a local production region (Hohlbein 2008a: 100). However, in contrast to the *Phantasie* grip knives, several of the *Aub* knives have separately cast handles and knives, such as those from Gerlinden, Piering and Niederursel. Separation of the blade and handle illustrates that the blade itself would only be recognized as a tanged knife comparable to Bauer's group 1 (Bauer, I *et al.* 2004: 67) and Rychner's type 1 (Rychner 1979).

Of the eight *Aub* knives recorded, four are from burial contexts, with others from wetland (Rettenbach) and lake-dwelling contexts, while context information is unavailable for one item (Winterstein (D)). Several of the blades have decoration on their ridges, featuring crosses and perpendicular lines (e.g. Piering and Aub), similar to that seen across central Europe and on many of the tanged knives from Switzerland. Thus, it is possible that other examples of this knife were present in the northern Circum-Alpine region, but their handles have been lost, in which case the survival of only the knife blade instead of the hilt would indicate that they were combined with organic handles instead of metal ones of the *Aub* type. The full grip knife from Montlingerberg (CH) shows some similarities to this form, particularly the piece from Niederursel (D).

Ehingen

The *Ehingen* type (Figure 50.j) full grip knife has a long, metal, handle with multiple ridges along its length, either as a single piece or with separately cast blade (Hohlbein 2008a: 104-09). Four pieces are recorded from southern Germany (Map 72), of which two are isolated finds, one has no context information and the final one is from a cremation burial (Ehingen (D)). Associated finds in the cremation burial indicate that this is an Early and Middle Urnfield (HaA) period knife. Decoration occurs on the ridge of two of these knives (Ehingen; Unterhausen (D)), in similar style to that on the *Aub* knives. Where the knives are manufactured separately from the handles, they would again be classified in Rychner's type 1 (Rychner 1979) and Bauer's group 1 (Bauer, I *et al.* 2004: 67). Indeed, several instances of the Ehingen knife have been proposed by Holbein (Hohlbein 2008b) as occurring in lake-dwellings of the nCA, in particular at Thonon le Bains (FR), Auvernier (CH), Forel (CH), Estavayer-le-Lac (CH), and Champittet (CH), which demonstrates the involvement of the region in circulation networks of the period.

Ronzano

Ronzano full grip knives (Figure 51.r), with three knots/bulges on the handle and terminating in a ring are known from 8th century BC contexts in northern Italy (Bianco Peroni 1976: 28-30). An example is also known from north of the Alps (Map 72), at the lake-settlement Grésine on Lake Bourget (FR) (Kerouanton 2002). This piece may be interpreted as an import to the area (Kerouanton 2002), and exchange networks between the two areas are further attested by an Italic type fibula from Grésine (see Section 5.4.2.5). In addition to the Grésine example, two are from burial contexts in Bologna, one is from a river (San Lazzaro di Savena) and one with unspecified location near Modena. Only the knives from Modena and San Lazzaro di Savena show decoration, which consists, respectively, of longitudinal ridge lines on the blade face and ridge hatchings.

Phantasie grip

Solid cast full grip knives are known from a broad section of central Europe north of the Alps (Map 73), and frequently termed *Phantasie* grip knives (Jockenhövel and Smolla 1975; Kromer 1956). These knives relate to the Late and Final Urnfield (HaB2-HaB3, Period V) and have a blade similar in style to the *Baumgarten* type knives, with *Zwischenstück* and broad gap in the handle profile, which may have been filled with an organic material (Hohlbein 2008a: 117-20). Comprising an assemblage of over 50 pieces, several different types have been detailed for areas of Europe, such as southern Germany, Poland, the Czech Republic and Austria (e.g. Hohlbein 2008a; Gedl 1984; Říhovský 1972), typically depending on whether the handle terminates in a ring or horns.

Grassau

Eleven examples Hohlbein's *Grassau* type (Figure 51.o), with horn terminus, (Hohlbein 2008a: 118-24) are listed, from southern Germany, and the northern Circum-Alpine region (and a possible occurrence at Hauterive-Champréveyres (Rychner-Faraggi 1993: 60), here listed as *Tüllenmesser*), and one example from south of the Alps (Vadena (IT)). No clear deposition pattern is apparent in this type, with pieces from burial contexts, lake-settlements, terrestrial settlements, and wetlands, and as single finds. Decoration occurs on three of these pieces, consisting of half circles, lines, and hashed triangles along the blade (Dotternhausen (D); Haunstetten (D); Vadena), and circular eyes on the handle sides (Dotternhausen).

Karmin/Wrocław-Grabiszyn

Two knives of Gedl's type *Karmin/Wrocław-Grabiszyn* (Figure 51.m) are recorded from Poland, from a hoard at Karmin, and a bi-metal example (bronze handle: iron blade) from a cremation burial at Wrocław-Grabiszyn (Gedl 1984: 60). These pieces are very similar to the *Grassau* type, and the piece from Karmin is decorated with half-circles and longitudinal lines in a garland along the blade.

Mradice

Jiráň's (2002: 19-20) type *Mradice* (Figure 51.n) is represented by a single example from a settlement layer at Mradice (CZ), and is another example terminating in horns. This piece has a small wire loop between the two horns – likely for the attachment of other decorative hangers of fasteners. The blade is decorated with a circular "eye" and longitudinal lines, while circular bands adorn the handle and *Zwischenstück*.

Reisenberg

The *Reisenberg* type (Figure 51.s) knife is represented by a single example from a cremation burial at Reisenberg (AT) (Říhovský 1972: 71-73). This is a richly decorated knife, with triangle, herring bone, and check patterns running along the length of the blade face and ridge. The handle of this example terminates in a simple antenna form.

Bayerisch-Gmain

Phantasie grip knives with terminal rings are also known from across central Europe, for example Hohlbein's type *Bayerisch-Gmain* (Hohlbein 2008a: 125-26). These knives are found in burial contexts (4) and as single finds (2) in central and southern Germany. Comparable pieces are also known from Poland (Gedl 1984: 67-73).

In addition to these types of knife, a large number (56) are simply termed as "full-grip" or "*Phantasie* grip", and include a range of forms, with loop-, horn-, and antenna terminals, and solid cast open or closed handles (Figure 51). These knives are spread across central Europe, in a variety of contexts. Similar quantities (10 to 14 pieces; 17% to 25%) are known from burials, lake-settlements, hoards, and as isolated finds, while none are recorded from terrestrial settlements. Decoration is recorded on 11 of these knives, which are present in each of the context types, indicating no particular correlation between decoration and deposition. These knives were not necessarily made as a single piece, as an example demonstrated by Rychner (1987: 64) to have been two separate pieces welded together illustrates.

Griffdorn

Knives with straight handle tangs/spikes became extremely popular across the whole of central Europe during the Late and Final Urnfield period. In contrast to the looped tang varieties of the earlier periods, these knives were intended to the forced into an organic handle, e.g. antler or wood, without other means of securing their connection.

Hadersdorf

Tanged knives of the *Hadersdorf* (Figure 50.o;q;r) type are known from Poland (Gedl 1984: 52-53), and similar forms are recorded from across central Europe (Map 68) including the Czech Republic, Austria, northern Italy, Hungary, and Germany (Říhovský 1972: 61-64; Jiráň 2002: 53-54). Without a spacing area or guard, the knives have a distinctly humped blade on the approach to the handle, and relate to the Late and Final Urnfield (HaB2-HaB3) or Period V (Jiráň 2002: 53-54). A knife of similar form to this is known as a single find from, but un-connected to the settlement Arbon-Bleiche 2 (CH) (Hochuli 1991; Jiráň 2002: 54). In terms of the typological scheme used in Switzerland, these pieces show similarities to Rychner's forms 2.2/2.3 and Bauer's groups 3 and 4.

From an assemblage of eight pieces (excluding the single find from Arbon-Bleiche), six are known from burial contexts, one from a settlement (Velké Číčovice (CZ)) and one as a single find (Stare Czarnowo (PL)). Four of the pieces are decorated, with lines, half circles and circles along the length of the blade and along the blade ridge. In particular, the decorated piece from Wrocław-Grabiszyn (PL) shows similar decoration motives to other pieces known from the northern Circum-Alpine region, and central Europe in general.

Ennsdorf

The *Ennsdorf* type knife (Figure 50.k;l;n) is an elegantly proportioned tanged knife of Period IV (HaA2-B1), with a lightly undulating profile and without spacing area (Gedl 1984: 49-50; Jiráň 2002: 48-49; Říhovský 1972: 48-49), and is found across central Europe (Map 68). In terms of typologies applied in Switzerland, comparable pieces can be found in Rychner's group 2.1 (Rychner 1979) and Bauer's group 2 (Bauer, I *et al.* 2004: 67). Eight of the

recorded examples are from burial contexts, with single examples from a river (Písty (CZ)), settlement (Polepy (CZ)), and hoard (Brloh (CZ)). Two isolated finds account for 10% of the assemblage, while find context information is unavailable for six of the knives.

Inscribed decoration is present on nine of the examples, and consists of the lines and crosses along the blade ridge, typical for their period of circulation. The piece from Banie (PL), with half circles adjoining a line running along the length of the blade, shows decoration similar to many of the pieces knives from central Europe and the Circum-Alpine region.

Este

Late Bronze Age and early Iron Age tanged knives of the *Este* type (Figure 50.p), without *Zwischenstück* or guard, were localized to northern Italy (Map 68), particularly the Po Plain, between 8th and 7th centuries BC (Bianco Peroni 1976: 69-72), and show many similarities with the *Hadersdorf* type north of the Alps. A mould for this type of knife is known from the vicinity of Trento in the southern Alpine foreland (Bianco Peroni 1976: no. 349). The isolated knife from Arbon (see above) has also been compared to the Este type, but is most likely a locally manufactured piece in the northern Circum-Alpine region (Hochuli 1991).

Nine of the ten examples recorded are from burial contexts (seven alone from Este), with the remainder known from the large San Francesco hoard at Bologna. Bianco-Peroni (Bianco Peroni 1976: 69-72) lists other examples, though lacking find locations; these have not been recorded here.

Most of these knives are undecorated, though a single example with dogs-tooth decoration running along the upper edge of the blade is known from the "tomba del carrettino" at Como Ca' Morta (Bianco Peroni 1976: no.347). The tang on this example evidently broke during use, and was been repaired by riveting the two pieces together.

Baumgarten / Wien-Leopoldsburg

The *Baumgarten* type knife (Figure 51), with a long, relatively flat backed, broad, triangular section blade with a bulge on its approach the handle, spacing area between the blade and handle (*Zwischenstück*), and guard before the handle (Gedl 1984: 54) is known from Late and Final Urnfield (HaB2-B3, Period V) contexts across large areas of Europe (Map 74). Although some differences occur between the *Baumgarten* and *Wien-Leopoldsburg* types, sufficient similarities are noted between them that they should be considered as the same form of knife (Gedl 1984: 54). Numerous examples of this Period V (HaB2-HaB3) knife are recorded from Germany, Austria, France, Switzerland, northern Italy, the Balkan region, and Poland (Gedl 1984: 54-55; Říhovský 1972: 64-71; Tackenberg 1971: Map 22; Hundt 1978; Bianco Peroni 1976: 72-73; Prüssing, P 1982: 128-33; Jiráň 2002: 54-59). Many of the knives from the Circum-Alpine region show characteristics of this type of knife, though in the typological studies of the region they fall into Bauer's groups 4 and 5 (Bauer, I *et al.* 2004: 67), and Rychner's group 2 (Rychner 1979).

With 126 recorded objects (excluding all un-typed from the Circum-Alpine region) these knife types form one of the largest groups studied here. Nearly 40% of these examples are known from burial contexts, while hoard finds account for 15%. Settlement finds are very uncommon, with only three, and a single object from a lake-settlement at Concise (Lake Neuchâtel). Single finds are almost as frequent as hoards (15%) and may indicate isolated deposition (cf. Fischer, V 2012: 115). Unfortunately a high number of these knives do not have associated context information (31%).

The minority, only 37, of the *Wien-Leopoldsburg / Baumgarten* knives are decorated. However, where defined, more of the *Wien-Leopoldsburg* are decorated (20 of 32) than the *Baumgarten* (17 of 94). Decoration consists of the typical triangles, lines, circles and half circles running along the length of the blade face. Ribbing, grooves, and incized lines around the *Zwischenstück* are seen on many of these knives (33 recorded) and find comparable decoration in much of the bronze work from lake-dwellings north of the Alps. Of the decorated knives the majority are known from burial contexts (24; 64%) with three from hoards (8%), while isolated finds are unusual (13%), and none are recorded from settlements (Říhovský 1972: 71).

Knife groups of Switzerland

Discussion of knife types in Switzerland has largely used a separate typological system to other areas of central Europe, detailing a series of forms instead of named types (e.g. Rychner 1979: 79-80; Mäder 2001a; Bauer, I *et al.* 2004: 67; Bernatzky-Goetze 1987: 81-84). These can be divided into broad categories based on their handle attachment method and blade shape: looped tang (*durchlochtem Griffdorn*; Rychner 1; Bauer 1); spike (*Griffdorn*; Rychner 2; Bauer 2-5); socketed (*Tüllen*; Rychner 3); full- or *Phantasie* grip (*Vollgriff* or *Phantasiegriff*; Rychner 4). Knives with simple tang/spike have been further divided into sub-forms dependent upon the blade shape and presence of spacing area (*Zwischenstück*) and stop/guard at the handle (*Heftwulst*), which have also been used as developmental and chronological indicators (Rychner 1990; Ruoff 1974: Plates 35, 36).

Knives with a looped tang show good comparison to blades from the *Aub* type, and would have been attached to handles of an organic material. The simple

tang pieces show characteristics similar to many of the knife types from central Europe, and many of these types are referred to as being part of the "Pfahlbaumesser" group (e.g. Jiráň 2002: 57). In particular, the Late and Final Urnfield pieces (HaB) with spacing area and stop guard show great affinity with the *Baumgarten*/*Wien-Leopoldsburg* type. Manufacture of such items in the lake-dwellings of the northern Circum-Alpine region is attested by moulds from Mörigen (Bernatzky-Goetze 1987: Plate 136, 37), Eschenz Insel-Werd (Brem *et al.* 1987), and Zurich-Alpenquai (Wyss 1967). Decoration on these pieces follows similar styles to those described in other regions, with longitudinal lines, hatched triangles and circles on the blade face, and lines and crosses along the ridge present on many of the knives. Ribbing on many of the *Zwischenstück* of the later forms (Rychner types 2.4-6; *Baumgarten*) is comparable to ribbing seen on many pieces of bronze work, such as spear and arm/leg-rings from the lake-dwelling region during the LBA (Vogt 1952).

A small group of items are known from outside of the lake-dwelling region which show good comparison to forms frequently found in the lake-dwelling settlements, and have thus been termed "*Palafittique*" knife or "*Pfahlbaumesser*" in the literature (Map 75). Two of these pieces are listed in Germany, at Baasdorf (Wüstemann 2004: no.451; Sprockhoff 1956: Plate 13.6) and, within the lake-dwelling region, at Unteruhldingen-Unterösch (Schöbel 1996: 156). A further six are listed from central and eastern France (Cordier 2002). These pieces correspond well in form to those of Bauer's group 2 and Rychner's form 2, and the decoration of ridge lines and crosses also relates to decoration seen in the lake-dwelling region.

Including a number of blade fragments, almost 350 items are charted from Switzerland (Map 76 to Map 80). Of these, the vast majority (c. 97%) are known from lake-dwellings, with few examples as single finds or from terrestrial settlements and hoards. It is possible that some of the pieces from lake-dwellings represent pieces from hoards or as isolated depositions, particularly around Lake Geneva and Neuchâtel (Fischer, V 2012: 115). No examples are recorded from burials, and this may be a reflection of the current lack of knowledge concerning burials from the lake-dwelling region (see Section 6.1). However, when considering other knife types, burial contexts are still uncommon for the region (Map 162), and the deposition of knives in isolated contexts would suggest that they performed a different social function.

Knives with Iron sections

Several knives are known from central Europe, and the northern Circum-Alpine region, that are a combination of iron and bronze elements. This can be in the form of iron inlay decoration (as seen on 2 examples from Mörigen (Bernatzky-Goetze 1987: Fig. 125.6-7), as small fixings, such as from Dotternhausen-Plettenberg (Hohlbein 2008a: no.57), or as blades, for example from St-Aubin (CH) (Pleiner 1979), Albersdorf (D) (Prüssing, P 1982: no.194), and Tellingstedt (D) (Prüssing, P 1982: no.291). Bronze objects with iron decorative inlay, such as arm-/leg-rings, pins, and swords are known from lake-dwellings of Switzerland during the final phases of the LBA (see Section 5.4.3.2), and may represent an early adoption of this material (Pleiner 1979). The form of these two examples from Mörigen (Bauer group 5; *Baumgarten*) places them in the HaB2-HaB3 period.

The combination of iron blades with bronze handles shows the reverse situation, where bronze is being retained to provide a decorative function, and retain the form of typical LBA bronze knives (e.g. Wrocław-Grabiszyn (PL)). In these cases the use of iron blades may have performed a social function as indicators of status, via the ability to procure this metal and support its manufacture, but also demonstrates an awareness of the potential benefits (hardness and edge retention) of iron compared to bronze for cutting objects.

Early Iron Age

Although bi-metallic knives are known from the Late Bronze Age and early Iron Age, consisting of bronze handle elements with inserted iron blades (e.g. St Aubin, Teugn, Albersdorf), it has been argued that once iron become fully adopted into society the previous Bronze Age knife forms, such as the *Baumgarten* type, were rapidly abandoned (Hohlbein 2008a: 373). Iron Age knives are seldom detailed in artefact lists, and little typological classification has occurred. Furthermore, archaeological preservation becomes much more significant for iron pieces, and where items are found they are often in a highly fragmented and degraded condition, making typological analysis problematic. However, a short catalogue of finds from central Switzerland (Map 81) was created during the 1970s (Drack 1973: 157-62), dividing knives into two broad categories: *Pronounced Ridge* and *Shallow Ridge* (Figure 51.b1, c1).

Handle attachment on these knives consists of either riveted handle plates (e.g. Zurich and Knutwil (both CH)) or tangs (e.g. Eschenbach (CH)) for insertion to organic materials. A bronze handle plate knife from Unterlunkhofen (CH), with zig-zag decoration on the knife ridge, is evidently from the early Iron Age (HaC) and shows little resemblance to Late Bronze Age forms. Iron knives from possible lake-settlement contexts on Lake Constance (e.g. Unteruhldingen-Stollenwiesen; Hagnau-Burg; Immenstaad am Bodensee; Konstanz-Rauenegg (all sites in Germany) (Schöbel 1996)), again in fragmentary and degraded condition, show some

similarity to the *Shallow Arch* group, and may represent stray finds in these areas (Map 75). A single example, from Unteruhldingen-Stollenwiesen, shows longitudinal line decoration along the face of the blade.

The knives recorded from central Switzerland show a clear strategy of deposition in burials. In contrast to the Late Bronze Age situation in the northern Circum-Alpine region, all of the knives listed by Drack (1973) as relating to the early Iron Age are known from burial contexts.

Distribution

Through studying the distribution of these knife types, a number of assertions can be made regarding the exchange and communication networks in which lake-dwelling communities of the northern Circum-Alpine region were involved. Connections between the Three Lakes region, Lake Geneva, the Lake Bourget region and northern Italy are indicated through the occurrence of *Fontanella*, *Matrei*, and *Ronzano* type knives, and are further supported by other metalwork and jewellery pieces (e.g. razors and glass beads). Exchange networks extending into central France are suggested through the occurrence of the "*Palafittique*" knives in hoards and along river routes, and are again supported through other materials, such as leg-/arm-rings, spearheads, and swords.

Of the Late and Final Urnfield period knives, such as the *Baumgarten* type, with a wide distribution, it has been suggested that they were not manufactured in each of the regions they are found, but should be seen as imported objects, with moulds and styles providing an indication of manufacturing zones (Prüssing, P 1982: 133). Lake-dwellings of the northern Circum-Alpine region were amongst these manufacturing areas, as indicated by the occurrence of moulds for these types of knives (e.g. Mörigen, Auvernier, and Zurich-Alpenquai). Decoration on these knives is of a relatively standardized form across the whole of the central European Urnfield culture, consisting of lines, crosses, hatched triangles, half circles, and circular 'eyes'; all patterns that are seen on other forms of metalwork, particularly ring jewellery, in the northern Circum-Alpine region. Unusual figurative decoration, in the form of water birds or ducks, is observed on some pieces from northern Italy, such as from Vadena, but this type of decoration was not circulated to regions north of the Alps.

Considering the *Phantasie* handle and *socketed* knives together, there is a clear distinction between the areas of circulation for these pieces: *socketed* knives in the west and *Phantasie* grip in the east, although there are occasional outlying examples, such as *Phantasie* knives in France from hoards at Juvincourt, Amiens, Petit-Villatte, and a burial at Auvenay. *Socketed* knives are more numerous than *Phantasie* knives, with their main concentration in northern Germany and France, with instances in Poland and the Czech Republic. One clear area of overlap is the northern Circum-Alpine region, particularly around Lake Neuchâtel and Lake Bourget. Moulds for socketed knives from the region, e.g. Mörigen, clearly indicate the local manufacture of these objects. Although no moulds for *Phantasie* grip knives are known from the region, the concentration of pieces in the northern Alpine forelands would suggest local manufacture (Hohlbein 2008a: 123-24; Thrane 1972: 189). A single *Phantasie* handle knife from the southern Alps/northern Italy (Vadena) indicates exchange and communication networks between the lake-dwelling region and communities in northern Italy.

Use and deposition

The functional uses of knives may have been as tools, cutlery, cultic items, or less likely, weapons (Hohlbein 2008a: 368; Bernatzky-Goetze 1987: 81-84). The termination of many pieces in rings, including some of the *Phantasie* grip type, and bored holes through the end organic handles of *griffdorn* knives (e.g. Mörigen), suggests that these items were intended to be hung for storage or worn on belts. Decoration on knives would indicate that they held a more socially charged value than, for examples, razors, on which decoration was an uncommon occurrence (see Section 5.4.2.1). Of the Late and Final Urnfield (HaB2-B3; Period V) knives, e.g. the *Baumgarten* and *Wien-Leopoldsburg* types, decoration is most frequently observed on knives placed in burials while finds from hoards and settlements are rare (Říhovský 1972: 71).

Outside of the northern Circum-Alpine region the vast majority of the knives detailed here are known from burial and hoard contexts (Table 27). In particular, knives with a spacing area and stop/guard (*Baumgarten* type) were frequently incorporated in burials and hoards (Prüssing, P 1982; Hohlbein 2008a; Klug-Treppe 2008; Hansen 1991). Inside the northern Circum-Alpine region most of the knives recorded are known from (or in the vicinity of) lake-settlements (cf. Klug-Treppe 2008; Hohlbein 2008a). Clearly different approaches were taken to the deposition of these items in different areas of central Europe, indicating different social attitudes towards their value and function. However, this may also be a reflection of the, as yet largely unknown, burial practices of the lake-dwelling communities, though it should be noted that in some of the few cemeteries found near lake-settlements, such as Le Boiron and Vidy-Chavannes, no knives were found in the burial assemblage (Beeching 1977; Moinat and David-Elbiali 2003). The inclusion of many decorated and un-decorated knives in the assemblages from lake-settlements is contrary to the decorated = burial and un-decorated = settlement association seen elsewhere in central Europe, and suggests that some of the knives

from lake-dwelling contexts may have been in specific depositions.

When included in burials the knives are representative of the personal equipment of the individuals entombed (Klug-Treppe 2008), though there is no clear gender association of the objects. In burials from Haunstetten (D) male associations are evident (Wirth 1998: 117), while knives in hoards and burials from Germany (e.g. Kattenbühl; Haunstetten; Künzing) can be identified with both male and female associated objects (Prüssing, P 1982: 142-48; Schopper 1995: 40-43). During the Middle Bronze Age the deposition of knives in burials may have been as a substitute for, and fulfilled the same function as, daggers (Hansen 1991: 70). During the LBA such a substitutive effect is unlikely given the single edged form of the knives, and the predominance of the sword, instead of dagger, as an elite weapon. Instead, the knives, representing personal equipment, may have been used as indicators of identity, with the knife form and decoration, such as iron inlay or iron blade sections signifying individual status. Knives are particularly well represented in burials from Künzing (D) relating to the Early Urnfield (HaA), and can be seen in up to 20% of contemporary cemeteries from the Urnfield area, and frequently in association with other status indicators, such as swords and bronze vessels (Schopper 1995: 40-43).

Table 27: Find contexts for knife variants from all regions. A = Area; B = Burial; H = Hoard; C = Cemetery; D =Deposition; Sett = Settlement; L/M/R = Lake, Moor, River; L-D = Lake-dwelling; N/A = Not available; Sgl = Single find; (?) = possible attribution.

Type	A; N/A	B (?)	H (?)	C	D	Sett (?)	L/M/R	L-D (?)	Sgl
Griffzung								6	
Matrei	8	22 (3)	3 (1)	1		1	4	4	6
Fontanella	1	3	1	1		1	1		
Pfatten	3	6	2	2		1	3	3 (1)	
Poznań-Starołęka		2							1
Socketed	61	6	33 (5)				1	12 (1)	1
Rheda-Wiedenbrück	3	7 (2)	7				2		
Han-sur-Lesse			2		1				
Este		1							
Neunkirchen	1								
Etting		2							
Stadtecken		1							
Full grip	2	7	2 (2)					3	2
Aub	1	4					1	1	1
Ehingen	1	1							3
Ronzano	1	3					1	1	
Phantasie	8	3	4 (1)			2		13	5
Grassau		3	1	2		1	2	3	1
Karmin		1	1						
Reisenberg			1						
Bayerisch-Gmain		4		2					2
Griffdorn	8	36 (2)	10	3		4	6	268 (3)	11
Hadersdorf		4		2		1			1
Ennsdorf	5	9	1			1	1		2
Este		9	1						1
Baumgarten	31	35	17 (1)	8		2		1	10
Wien-Leopoldsburg	6	10	1	7		3 (1)			4
nCA groups						1		137 (3)	
Griffplatten								3	
Grifftang									1
Palafittique			5				2		1
LBA Iron		2 (1)	1			2		8	
LBA Fragments	1	2						19(1)	
IA Pronounced ridge		8							
IA Shallow ridge		18							
Total	**141**	**209 (9)**	**93 (10)**	**28**	**1**	**20 (1)**	**24**	**481 (9)**	**53**

The early Iron Age saw a change in deposition practices in the northern Circum-Alpine region, with all of the iron knives recorded from central Switzerland occurring in burial contexts (Drack 1973). Several finds of similar style iron knife blades from Lake Constance may suggest an alternative deposition practice in the region, but, as mentioned earlier, the eroded nature of these blades makes identification of form and dating problematic. The increased deposition of knives in burials reflects the use of knives from other areas of central Europe and northern Italy, and also the more visible burial practices of communities in the early Iron Age northern Circum-Alpine region than those of the Late Bronze Age. Changed deposition practices may also be linked to new knife forms, socially acceptable for inclusion in burials, following the adoption of iron and abandonment of LBA style knifes (Hohlbein 2008a: 363-67).

Concluding remarks

The study of Late Bronze Age knife types from the northern Circum-Alpine region has illustrated trade and communication links between the region and central Europe and northern Italy. Networks of exchange between northern Italy, Lake Bourget and Lake Neuchâtel are indicated by several knives of typical north Italian type, e.g. *Ronzano* and *Fontanella*. Other forms, e.g. *Matrei* type, suggest links to northern Italy and the eastern Alps/northern Tirol region, and may have been linked to the circulation of metal ores (Sperber 2004: 322). The interaction of lake-dwelling communities of the northern Circum-Alpine region in several exchange spheres is suggested by the occurrence, and local manufacture, of *Socketed* and *Phantasie* handle knives in the region. These types show contrasting intensities of distribution in western and eastern central Europe respectively, with a significant overlap in the lake-dwelling communities. Furthermore, decoration on LBA knives common to the lake-dwelling region, consisting of circular 'eyes', hashed triangles and crosses/lines along the blade ridge, and with half-circle decoration on the blade and a ribbed *Zwischenstück*, became common across central Europe (Sperber 2004: 309). Regional manufacture, or working, of knives outside of the Circum-Alpine region is also attested through moulds in various locations (e.g. Ameln (FR); Tetín (CZ)) and regionally specific type decoration, such as Nordic style motifs on a socketed knife from Sterley (D).

The deposition of knives in the Late Bronze Age shows regional variation between the northern Circum-Alpine region and other areas of Europe. Within the northern Circum-Alpine region the majority of knives are recorded from lake-settlement contexts, but there may also represent single depositions within the lakes or vicinity of the settlements (Fischer, V 2012: 115). Outside of the Circum-Alpine region knives were more frequently deposited in burials and hoards, in association with both male and female related equipment. In these burials and hoards the knives may have represented the personal equipment of individuals (Klug-Treppe 2008), and have been used to symbolize identity and social status. During the early Iron Age deposition in burials becomes the dominant practice in the northern Circum-Alpine region. Although this is a direct reflection of the increased representation and understanding of burial practices during of the EIA when compared to those of the LBA, it also represents the new social function knives as objects of identity in the region.

The use of iron is represented during the Late Bronze Age on several pieces, either as inlay decoration (Mörigen) or as composite pieces with iron blades and bronze handles (e.g. St Aubin (CH); Aurich (FR); Tellingstedt (D)). The combination of iron as a decorative element reflects practices evident on other objects from the northern Circum-Alpine region, while the use of iron blades and bronze handle elements indicates the adoption of the new metal for functional purposes in addition to decorative (see Section 5.4.3.2). The rarity of these bi-metallic objects may indicate that they were used as status indicators; as indicated by the example from Albersdorf (D), where multiple pieces of horse gear, toilet equipment, and a sword were found in association (Prüssing, P 1982: no.194), all of which suggest a high status individual.

5.4.2.3: Sickles

In contrast to many of the other metalwork discussed, sickles are primarily a utilitarian object essential for agricultural production. While prehistoric sickles of flint are known, it is the cast bronze sickles which are of interest here. Bronze Age metal sickles have received considerable attention in the *Prähistorische Bronzefunde* series, particularly central and eastern Europe. Primas (1986) listed over 2000 examples from Switzerland, southern Germany and Austria, a figure which has grown since her catalogue was published. As with other sections of the PBF series, one of the main functions of this catalogue was to classify sickles into different types and variants according to their form.

Late Bronze Age

Two broad categories of sickles can be defined based upon their hafting method: knob sickles (*Knopfsicheln*), generally relating to the Early to early Late Bronze Age (BzA-HaA), and flange sickles (*Zungensicheln*), found from the late Middle Bronze Age (BzC) onwards (Primas 1986). Of the LBA sickles from the Circum-Alpine region numerous types of sickle for example the *Auvernier* type (Primas 1986: 163), and variants, e.g. *Pfeffingen-Wollishofen* (Primas 1986: 137), take their name from lake-dwellings where they have been found. The distribution of various types of sickles around the Circum-Alpine region demonstrates the involvement of lake-dwellings in intra- and inter-regional exchange and communication networks.

For example, relatively isolated finds of the *Uioara–Kuchl*, *Böhmisch Bayerische-Linz*, *-Mintraching*, *-Langengeisling*, and *-Přestavlky* types in western Switzerland demonstrate connections to southern Germany and Austria, where these types are prevalent (Primas 1986 Fig. 128.B; 129.B). Alternative variants, such as *Pfeffingen-Pfeffingen*, *-Asperg*, and *-Estavayer* show relationships of export to surrounding regions, and southern Germany in particular (Primas 1986 Fig. 131). Instead of charting the central European distribution of various sickle types, a method which has been undertaken for other material group categories, in this case only the distribution within the northern Circum-Alpine region will be discussed. The reasons for this are twofold: first, if it is accepted that sickles were primarily utilitarian objects with low symbolic value (Bernatzky-Goetze 1987: 85-86; Gedl 1995: 2) it is logical to assume that sickles may not have travelled very far from their location of origin, as demonstrated by a largely regional distribution of many forms. Second, a more interesting pattern may be observed by considering the occurrence within the Circum-Alpine region of sickles identified as being manufactured in the same mould (Primas 1986: 6).

Pfeffingen group

The *Pfeffingen* group of sickles (Figure 52.a-f), as defined by Primas (1986: 124), covers the first half of the Late Bronze Age (BzD-HaA) and includes the types *-Asperg*, *-Cortaillod*, *-Estavayer*, *-Neuchâtel*, *Pfeffingen*, *-Wollishofen I* and *-II*. Of seven variants, *Asperg*, *Pfeffingen*, and *Estavayer* are found in Switzerland, southern Germany, and the Rhine valley of western Germany (Map 82 to Map 87). Forms *Wollishofen* and *Cortaillod* are found exclusively with Switzerland, while *Neuchâtel* is represent in south-western Germany with a single example from a hoard at *Asperg* (Primas 1977: no.1207). Within the northern Circum-Alpine region the majority of these sickles are known from the western region of Switzerland, with few examples from the eastern part and south-west Germany. Most of the sickles are recorded from lake-dwellings, with some also from the 'highland' settlement of Montlingerberg, but no examples are recorded from hoards.

Böhmisch-Bayerische group

The *Böhmisch-Bayerische* group of sickles (HaA-HaB) comprizes a number of types (Figure 52.g-k), including *-Langengiesling*, *-Linz*, *-Mintraching*, *-Pischelsdorf*, *-Přestavlky*, *-Weidachwies* (Primas 1986: 102-05). Low numbers of these are known from the Circum-Alpine region (Map 88), though their main area of distribution lies in central and eastern Germany and the Czech Republic (Primas 1986: 117 and Fig. 29.B; Říhovský 1989). Within the Circum-Alpine region this sickle form is found in hoards, e.g. Oberkulm-Birch (CH), burials, e.g. Wangen an der Aare (CH) and lake-settlements.

Boskovice group

The LBA (HaB1-B2) *Boskovice* group of sickles (Figure 52.l-p) consists of numerous types (Primas 1986: 144), of which the most relevant for this study are *-Boskovice*, *-Corcelettes*, *-Herrnbaumgarten I* and *-II*, *-Mainz*, and *-Mimmenhausen*. Forms of the *Boskovice* group are found in the Circum-Alpine lake-dwelling region (Map 89 to Map 91), Germany, France, Poland, the Czech Republic, the Carpathian Basin and Italy (see Primas 1986: 163; Říhovský 1989: 77-88; Gedl 1995: 80-82; Petrescu-Dîmboviţa 1978). Several examples of the *Corcelettes*, *Herrnbaumgarten*, *Boskovice*, and *Mimmenhausen* type sickles are also known from eastern Germany (Primas 1986 Fig. 132). In the nCA a contrast can be drawn between the eastern and western halves, with only a few examples of the *Corcelettes*, *Herrnbaumgarten* and *Mimmenhausen* forms in the eastern half section, while numerous instances of each variant are found in the western area. Although the majority of find locations from the Circum-Alpine region are lake-dwelling contexts, some sickles from this group are also known from hoards, for instance at Basel-

Elisabethenschanze (Primas 1977), and those from the metalwork hoard at Auvernier-Nord (Fischer, V 2012: 58-60).

Auvernier group

Late Bronze Age (HaB2-B3) sickles of the *Auvernier* group (Figure 52.q-w) are the most numerous in the region of study, with over 200 examples recorded, divided between the types -*Auvernier I* to *IV*, -*Hauterive*, -*Homburg*, -*Karlstein*, -*Mörigen I* to *III*, -*Portalban*, -*Reupelsdorf*, and -*Villingen* (see Primas 1986: 163). European distribution of this sickle group extends from the Carpathian basin to Denmark and from the Czech Republic to France (Primas 1986: 181; Petrescu-Dîmboviţa 1978; Thrane 1975; Millotte 1963), though regional distributions can be observed for specific types (Map 92 to Map 98). The *Villingen* type is common to the eastern half of the northern Circum-Alpine region, but unknown in the west, while the *Hauterive* form shows the reverse situation. *Homburg* form sickles are centred on western Germany, with some occurrences in both the east and west of Switzerland. Type *Portalban* is only represented in western Switzerland, while *Reupelsdorf* extends from the Lake Geneva region to central Germany. The *Auvernier* and *Mörigen* type sickles are predominantly found in the region of Lake Neuchâtel, though examples are also known for northern Switzerland, and around Lake Zurich and Lake Constance.

Further afield, isolated instances of the *Auvernier* and *Mörigen* sickles occur in central and southern Germany (Primas 1986: 181-82 Fig. 133), and also from the hoard at Ray-sur-Saône in eastern France (Millotte 1963 Fig. 42, 43). Within the nCA the majority of these sickles are known from lake-dwelling contexts, with instances also from hoards, such as Auvernier-Nord and Basel-Elisabethenschanze.

Imported sickles

The occurrence of some foreign types of sickles in Swiss lake-dwelling contexts (Map 99), for example fragments of *Hallstatt* (eastern Alpine region) and *Brentonico* (northern Italy) sickles (Figure 52.x,y) in the large hoard from Auvernier-Nord have been seen as indications of the circulation of sickle fragments, and old material, outside of their main region of distribution (Primas 1986: 40). Further imported examples are known from Grandson-Corcelettes and a founder's hoard from Geneva includes a fragment of a *terramare* type sickle (Primas 1986: 40).

Manufacture

A number of stone sickle moulds are known from the nCA in addition to the actual sickles they were used to create. The majority of these stone moulds are for sickle types of the final phase of the Late Bronze Age (HaB2-HaB3), and multiple examples are known from lake-dwellings of western Switzerland (Primas 1986: 7), and also of Lake Zurich (see Section 5.4.3). Sickle moulds in lake-dwellings can be taken as indications of local manufacture of specific types of sickles; for example, a mould of the *Pfeffingen-Pfeffingen* type from Eschenz Insel-Werd falls within the general distribution are of this type. A mould for *Auvernier-Mörigen III* sickles from Zurich-Alpenquai falls outside of the dominant distribution area (Lake Neuchâtel) for these sickles. Multiple moulds are known from settlements around Lake Neuchâtel, particularly Grandson-Corcelettes and Auvernier, indicating local manufacture of the *Pfeffingen-Pfeffingen*, *Pfeffingen-Estavayer*, *Boskovice-Mainz*, *Auvernier-Auvernier*, and *Auvernier-Mörigen* sickles. Further indications of local manufacture are the findings of several sickles that can be tied to moulds, for example the mould from Mörigen cast a sickle from the same site, and an *Auvernier-Hauterive* mould from Auvernier has been linked to three sickles from Auvernier and Auvernier-Nord (cf. Primas 1986).

The identification of sickles cast in the same mould, effectively 'sibling' sickles, based upon form, dimensions, weight, and casting points, may provide indication of local exchange and distribution networks. Primas (1986: 8) identified several examples of such sibling sickles, particularly from the northern Circum-Alpine region lake-dwellings (Map 100). In eastern Switzerland 'sibling' sickles are known from within the same settlement at Zug-Sumpf and Zurich-Alpenquai, and also from a pit at Unterägeri. Similar intra-site sibling sickles are known from the west of Switzerland at Morges-Grande Cité, Grandson-Corcelettes, Auvernier, Auvernier-Nord, Neuchâtel-Le Crêt, Hauterive-Champréveyres, and Mörigen.

Inter-site sibling sickles exist between various settlements on lakes Neuchâtel, Biel, and Murten indicate the local movement of sickles, while similar sickles from Sissach (hilltop settlement) and Concise attest to their movement over larger distances. Sibling sickles found at different sites may have a number of possible causes:

1. Manufacture by migrant metal-workers travelling between sites with stone moulds
2. Manufacture of sickles at central sites, with subsequent exchange and circulation to local satellite settlements
3. Mobility of individuals between sites, relocating to new settlements with their personal equipment

Mobile metal-workers have been suggested as an aspect of Late Bronze Age metal-working (Bauer, I and Northover 2004: 12), but whether they would move

between settlements with a collection of (bulky) stone moulds is debatable (see Section 5.4.3). A model of migrant metal workers fits well with the use of clay moulds, which would not require transportation from site to site. It should also be questioned as to who was actually responsible for the production of moulds: metal workers or other members of society.

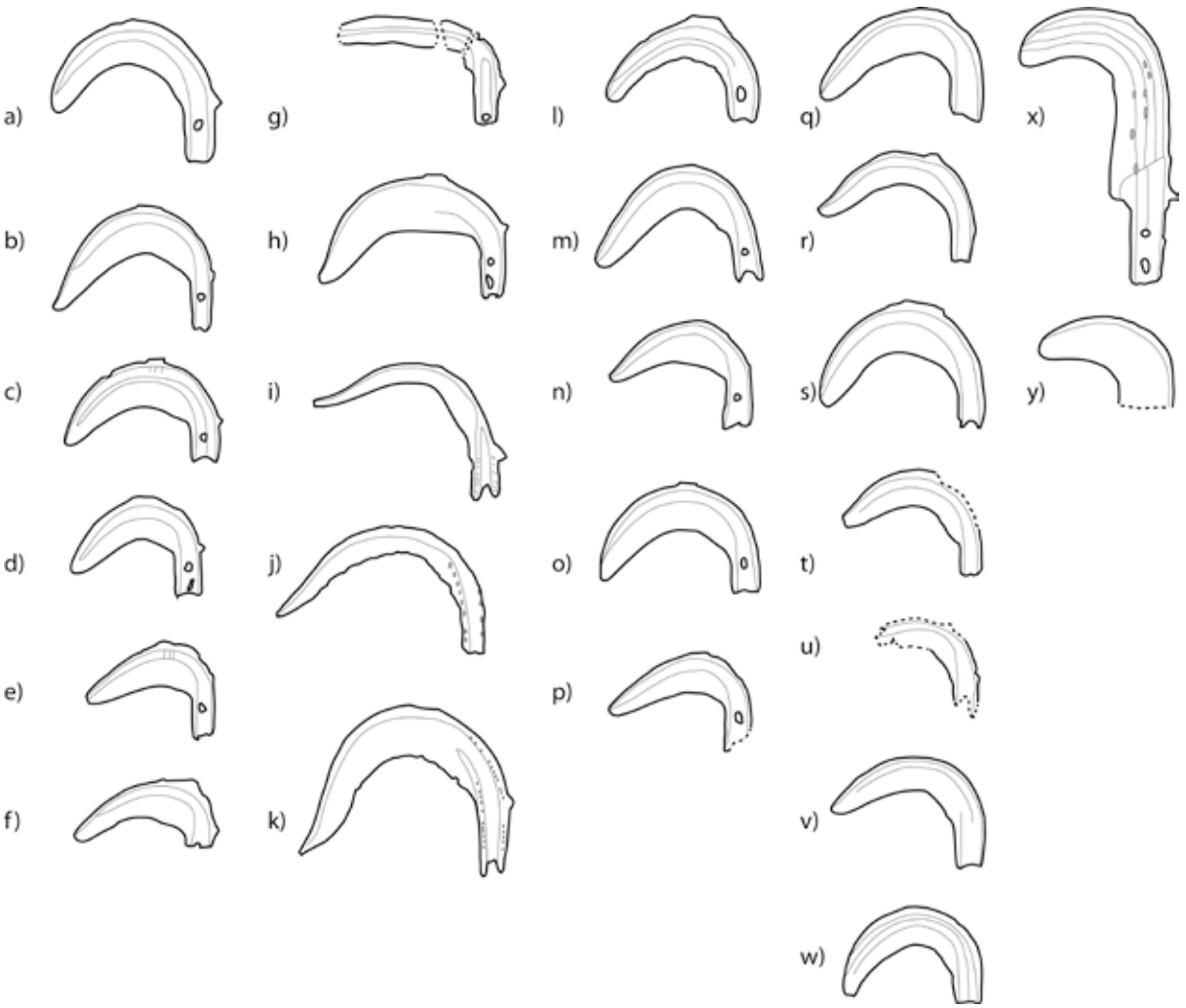

Figure 52: Late Bronze Age sickle types. a) Pfeffingen-Pfeffingen [Zug-Sumpf]; b) Pfeffingen-Asperg [Cortaillod]; c) Pfeffingen-Estavayer II [Muntelier]; d) Pfeffingen-Neuchatel [Estavayer le Lac]; e) Wollishofen [Mörigen]; f) Cortaillod [Cortaillod]; g) Böhmisch-Bayerische-Langengiesling [Wangen and der Aare]; h) Böhmisch-Bayerische-Mintraching [Gals-Zihlbrucke]; i) Böhmisch-Bayerische-Pischelsdorf [Pischelsdorf-Klum]; j) Böhmisch-Bayerische-Weidachwies [Hohenaschau-Weidachwies]; k) Böhmisch-Bayerische-Linz [Marzoll Turk]; l) Boskovice-Mimmenhausen [Grandson-Corcelettes]; m) Boskovice-Herrnbaumgarten [Grandson-Corcelettes]; n) Boskovice-Boskovice [Mainz-Weisenau]; o) Boskovice-Corcelettes [Auvernier]; p) Boskovice-Mainz [Grandson-Corcelettes]; q) Auvernier-Hauterive [Auvernier-Nord]; r) Auvernier-Homburg [Auvernier-Nord]; s) Auvernier-Villingen [Zug-Sumpf]; t) Auvernier-Portalban [Grandson-Corcelettes]; u) Auvernier-Reupelsdorf [Morges]; v) Auvernier I [Auvernier]; w) Auvernier-Mörigen I [Mörigen]; x) Brentonico [Hallstatt]; y) Brentonico [Grandson-Corcelettes] (re-drawn from Primas 1986: no. 1056; 1103; 1203; 1217; 1247; 1236; 708; 734; 775; 786; 799; 1487; 1307; 1338; 1354; 1455; 1556; 1593; 1547; 1603; 1612; 1652; 1639; 2053; 2054).

Individual, and community, mobility within lake-settlements has been proposed under the *Hausplatz* and *Siedlungsplatz* concepts (see Section 4.5 (cf. Ebersbach 2013)), and it is easy to imagine that individuals would move their personal equipment with them during relocation phases. Such mobility may have resulted in the widespread distribution of sickles cast in the same mould between various settlements. Instead of providing indications of local exchange systems, distribution of sibling sickles in this situation suggests social and community links between settlements, and possibly 'familial' connections which may have facilitated and enabled the relocation of households between settlements.

The circulation of sickles manufactured at a local/regional central location(s) would seem more logical than the transport and use of moulds over larger distances. However, the motivations for circulating what is effectively a purely functional object over not

inconsiderable distances remain unknown. Larger lake-settlements such as Auvernier, Grandson-Corcelettes, Hauterive-Champréveyres, and Mörigen may have been metal-working centres with specialized abilities, and rights, to produce metalwork which was then circulated to smaller satellite settlements (cf. Dunning and Rychner 1992: 69). Although sickles may have been circulated locally, they should not be seen as objects intended to be traded over larger distances. Local manufacture for local use should be envisaged instead (Primas 1986: 33-35), the result of which is the multitude of regional variations. Where examples of sickles are seen significantly outside of their main region of occurrence, such as instances of the *Auvernier* group, these may represent objects moved through individual mobility, or objects exchanged as part of a larger collection of metalwork.

Symbolism and use

The un-decorated nature of sickles, in contrast to objects such as ring jewellery and knives, suggests that they were of relatively low symbolic value, and confirms their interpretation as primarily a functional object for agricultural harvesting (Gedl 1995: 2; Bernatzky-Goetze 1987: 85-86). The predominant occurrence of sickles from the nCA in settlement contexts provides further indication of a functional nature (Table 28). However, the placement of sickles in hoards, e.g. at Auvernier-Nord and Basel-Elisabethenschanze, and many examples outside of the Circum-Alpine region (e.g. Petrescu-Dîmboviţa 1978; Říhovský 1989), indicate that other depositional practices were followed, and some social symbolism was associated with sickles. The large hoard from Auvernier Nord, consisting of (amongst other objects) multiple sickles, axes, knives, ring jewellery, and fragments thereof, may be interpreted as a 'founders' hoard of mixed objects (cf. Fischer, V 2012: 59), similar to French LBA hoards, such as Ray-sur-Saône (Millotte 1963). The bronze hoard from Basel-Elisabethenschanze contained multiple sickles, arm-/leg-rings, axes and spearheads (Primas 1977: 52-53). Two sickles are known from a burial assemblage at Wangen an der Aare (HaA1 period), in association with fragments of a sword, a razor, a belt buckle, arms and a needle, indicating sporadic use of sickles as a sign of social identity. Three sickles are also known from a Middle Bronze Age burial at Vaumarcus (Neuchâtel, CH) (Fischer, C 1998). The frequent occurrence of sickles in hoards, either founders, storage, or votive in nature (cf. Harding 2000: 352-68) suggests that some symbolism was attached to the deposition of sickles (Říhovský 1989: 6), but they were evidently deemed unsuitable (for the most part) for inclusion in burials, as evidence by the low numbers from burials in the Circum-Alpine region and further afield (e.g. Říhovský 1989: 6).

Primas (1986: 37-43, 1997) has argued that beginning in the Late Bronze Age, sickles were deliberately fragmented into portions of equal weight and/or size in order to circulate as a form of 'currency' (also Sommerfeld 1994). Deposition of fragmentary sickles in hoards may thus represent the hoarding of wealth in the form of bronze to be re-cast into different objects or exchanged for other commodities. This use and exchange as 'currency' provides a further opportunity for sickles to extend out of their manufacturing area and region of dominant distribution. As has been observed with many other types of material culture in this study, it is difficult to assign definitive contexts to many objects from many of the old excavations, and some of the objects from lake-dwellings may represent hoards within these settlements, similar to the hoard from Auvernier-Nord (Fischer, V 2012), or votive deposits (Primas 1986: 35).

Table 28. Find contexts for discussed sickle type groups. A = Area; B = Burial; H = Hoard; L-D = Lake-Dwelling; N/A = Not available; S = Settlement; Sgl = Single find; SH = Settlement hoard.

Sickle Group	A	B	H	Lake	L-D	L-D Hoard	River	S	SH	Sgl	N/A
Pfeffingen	5		6	2	158	0	0	3	0	3	4
Böhmisch-Bayerische	4	2	30	3	10	0	3	0	7	10	2
Boskovice	4	0	24	3	80	0	0	1	0	0	3
Auvernier	12	0	24	0	179	22	0	3	0	0	1
Total	**7**	**2**	**84**	**8**	**427**	**22**	**3**	**7**	**7**	**13**	**10**

Concluding remarks

The distribution of Late Bronze Age sickles in the northern Circum-Alpine region has shown that sickle types are regionally specific, with only a few examples of 'foreign' sickles. Such regionalism is to be expected from what is a predominantly functional object with low symbolic or exchange value. Local manufacture in lake-dwellings of both eastern and western Switzerland is identified through the occurrence of stone casting moulds in both areas. These lake-dwelling may have been local manufacture centres, from where smaller

settlements and population groupings could have obtained metalwork objects through local exchange and circulation networks, as identified through the occurrence of 'sibling' sickles. The distribution of 'sibling' sickles may also provide an indication of social mobility and the movement of households and settlements under the '*Siedlungsplatz*' and '*Hausplatz*' concepts (see Section 4.5.3). A clear disparity is evident between the quantity of sickles recovered from the eastern compared to the western region.

The limited distribution of 'foreign' sickles within the northern Circum-Alpine region, such as the *Brentonico* type, and the occurrence of typical west Switzerland forms in central Germany, such as the *Auvernier* group, provide indications for the circulation of sickle fragments as a form of 'proto-currency', as proposed by Primas (1986; also see Sommerfeld 1994), on both an import and export basis to the lake-dwelling area. Such exchange may have formed part of the circulation of metal stock throughout Europe, and have accompanied, or facilitated, the circulation other objects of material culture (e.g. swords, ring jewellery, bronze vessels, glass and amber beads) in addition to numerous goods not preserved in the archaeological record.

From the deposition contexts of sickles and sickle fragments in the northern Circum-Alpine region it is difficult to draw any clear conclusions, because so many of the examples are from lake-dwellings without specific contextual information. Examples from hoards at Auvernier-Nord and Basel-Elisabethenschanze may represent the inclusion of these objects in 'founders' hoards, as seen at other sites (e.g. Ray-sur-Saône, FR). The occurrence of sickles in a burial context from Wangen an der Aare is unusual and isolated occurrence in the region. Clearly, sickles are less emblematic of individual, social, or community identity than objects, such as leg-/arm-jewellery, which were included in burials of the same period. Within metalwork hoards from the Late Bronze Age contexts in the region of Lake Neuchâtel, there is a clear progression of contents over time, with sickles only becoming a significant aspect of these collections during the Late and Final Urnfield periods (Fischer, V 2012: 115).

5.4.2.4: Arm- and Leg-Rings

Large ring jewellery is one of the most commonly found bronze objects from Late Bronze Age contexts in the northern Circum-Alpine region (see catalogue of Pászthory 1985), though other parts of Europe have not been as extensively catalogued as they have been for other material culture objects, e.g. Razors. The majority of these finds from Switzerland are from lake-dwellings, which makes further considerations of find assemblages difficult, but outside of Switzerland they have been frequently found in hoards. Finds of arm-/leg-rings in burial contexts have led to the conclusion that ring jewellery was a section of material culture with predominant female associations (e.g. Wells 1998: 250; Schopper 1995). With so many rings recovered, it is possible to define several types. As with the other metal work objects considered in this study, only objects relating to the Late Bronze Age and early Iron Age are considered, and specific focus is given to the northern Circum-Alpine region.

Late Bronze Age

A number of types of arm rings-relating to the Late Bronze Age are evident, some of which are found in considerable quantities, e.g. *Corcelettes* and *Mörigen*, while others are found in fewer numbers, e.g. *Boiron*. Low numbers of 'foreign' type rings are observed, such as the *Vénat* and *Pourrières* types. Not all types of arm- and leg-ring from the northern Circum-Alpine region are discussed here, but in order to provide a suitable indication of the distribution of the rings, several un-typed examples are also charted. A single ring with jet bead adornment is known from Unteruhldingen-Stollenwiesen, indicating the incorporation of novel materials into material culture. Several examples of razors manufactured from arm-/leg-rings have been discussed in the Razors section, and to avoid double representation these are not mapped here, but are discussed regarding the use and symbolism of ring jewellery.

Zerba & Pourrières

The *Zerba* and *Pourrières* arm-rings were, respectively, utilized during the Italian Final Bronze Age and Middle Urnfield period (Pászthory 1985; Cordier 2002: 26-28; Paltineri and Rubat Borel 2008). The *Zerba* type is mainly distributed in northern Italy (Map 101), with outliers in the nCA (Lullin (FR)) and eastern France (Larnaud). The *Pourrières* type show some similarities to the *Zerba* type in both form (thin triangular cross section) and decoration, and may show the influence of northern Italian styles in Urnfield region object manufacture. These rings are mostly found in the Alpine region of eastern France, and the lake-dwelling region of western Switzerland (Map 101), again attesting to the possible influence of trade connections to northern Italy (Table 29).

The *Zerba* type is mainly found from burial (including cemetery) and hoard contexts, while the *Pourrières* type is mainly recorded from lake-settlements and hoards (Table 29). This is likely a reflection of the current state of research in the two main regions of their distribution (burials in northern Italy, lake-dwellings in the nCA), and also the cultural practices of the communities utilising the rings and the current 'invisibility' of the lake-dwellers funerary practices.

Cortaillod

The *Cortaillod* type leg-ring (Figure 53.e), relating to 9th and 10th centuries BC (HaB1-B2), are a solid type arm-ring of oval shape, with decoration consisting of concentric circles (eyes) divided into separate zones by areas of vertical lines, applied either by hand or through the use of punches and stamps (Pászthory 1985: 152). A sub-group of these rings, the -*Sursee* variant, is recorded from a hoard at Sursee-Landzunge (Weidmann 1983).

In terms of distribution, the *Cortaillod* leg-rings are common in western Switzerland, and particularly Lake Neuchâtel (Map 102), with few examples in eastern Switzerland. Some comparable examples are known from France, for instance from the hoard at Baume-les-Messieurs and Larnaud, but the present absence of comprehensive catalogues covering all LBA arm-/leg-rings from France, southern Germany, and Austria may mask this distribution. Given the predominance of these rings around Lake Neuchâtel, localized production has been proposed, and the instances from the hoards of eastern France were likely influenced by the style, or imported, from the Neuchâtel area (Pászthory 1985: 156).

The majority of the *Cortaillod* type rings are from lake-dwellings (Table 29), with hoards forming the second highest find context (including all 16 *Cortaillod-Sursee*). Eight rings are known from burial contexts, including fragments of a ring from the tomb 2 at Vidy-Chavannes. These fragments were found in association with what are probably fragments of a *Pfahlbauperlen* (see Section 5.2.1.1), and identified as the burial of a male individual aged between 35 and 45 (Kaenel and Klausener 1990; Moinat and David-Elbiali 2003).

Auvernier

The *Auvernier* type arm ring is an oval shaped hollow ring with shaped C cross section, large ends, and rich geometric decoration (Pászthory 1985: 181) consisting of triangles, zig-zag lines, and cross hatch patterns (Figure 53.a). These 9th to 10th century arm-rings have some comparability to the *Réallon* type arm-rings from France (Pászthory 1985: 184), which can be found from central to eastern France and around Lake Geneva (Map 103),

and also an example from Shoebury (UK; not mapped). The distribution of the *Auvernier* type rings is predominantly confined to the three lakes region of western Switzerland (Map 104), with some examples from the Alpine Rhône valley, and Lake Geneva, and also in the large hoard at Saint Yrieix in western France.

The majority of *Auvernier* rings are, again, from lake-dwelling contexts, with few in burials or and hoards (Table 29). It is significant to note here that two of the examples from hoards are recognized as hoards within lake-dwellings, in this instance from Auvernier-Nord (Pászthory 1985: no.1194, 1213). The recognition of hoards within lake-dwellings raises the issue that many of the arm-/leg-rings from 19th and early 20th century excavations of lake-dwellings may well relate to hoards that were simply not recognized as such at the time of excavation (see Fischer, V 2012, 2011). Given the predominance of these ring types around Lake Neuchâtel, localized manufacture has been proposed, with possible regionalized finishing process around Lake Geneva (Pászthory 1985: 184).

Homburg

The *Homburg* type of Late Bronze Age ring is found in both arm and leg types, and both oval and saddle (*Schaukel*) form (Pászthory 1985: 173). Decoration on these rings consists of cast ribs/ridges distributed on the rings outer face (Figure 53.g). With over 180 examples recorded, and a possible 23 further instances defined as either *Homburg* or *Balingen* type, the *Homburg* type of ring jewellery is one of the most numerous types recorded, and spreading from western France and England to Poland, is one of the most widespread types. Concentrations of finds can be seen in the Rhine valley of western Germany, in southern Germany and eastern Switzerland around lakes Constance and Zurich, in western Switzerland and Lake Neuchâtel, and central France (Map 105). The hoard of Petit-Villatte (FR) and the surrounding instances of *Homburg*/*Balingen* rings along the Loire and Seine valleys may indicate local exchange routes. Concentrations of these rings in the east and west of Switzerland have been taken as an indication of localized finishing (Pászthory 1985: 175), but the possibility, and probability, of multiple regions of manufacture should not be excluded given the multiple concentration centres of these objects.

In contrast to the majority of the Late Bronze Age types ring jewellery discussed here, the *Homburg* types is mostly known from hoards (mainly in western central Germany), with only a small number of the known rings recorded from lake-dwelling contexts, and from a lake-dwelling hoard at Auvernier-Nord. Very few of these rings are recorded from burials (Table 29).

Balingen

The *Balingen* type ring is somewhat similar in decoration to the *Homburg* type, having cast ribs and ridges on the outer face of the ring, grouped into bands with close spacing (Pászthory 1985: 168). The ring is known in both hollow (*Hohl*) and solid (*Massive*) forms (Figure 53.b;c). Excluding the 23 examples listed as *Homburg*/*Balingen* (discussed above) the distribution of these rings corresponds well with the *Homburg* type, with examples in the United Kingdom, central France, and western central Germany, in addition to the northern Circum-Alpine region (Map 106). For Switzerland a further division can be seen between the hollow and solid ring forms, with more of the hollow variety than the solid form present in the western Switzerland/Lake Neuchâtel region, and the reverse situation present in the eastern Switzerland/Lake Zurich region.

Outside of the northern Circum-Alpine/lake-dwelling region, the majority of the *Balingen* rings are from hoards, with one example recorded from a burial. From within the Circum-Alpine region, the majority of the *Balingen* rings (solid and hollow) are from lake-dwelling contexts, with only few recorded from hoards and hoards within lake-dwellings (Table 29).

Corcelettes

The *Corcelettes* type leg-ring (Figure 53.d) is a large ring with incized decoration consisting of a network of eyes connected with lines, and divided into distinct zones by vertical lines and triangle motifs, applied freehand or with stamps (Pászthory 1985: 186). With 218 examples, this group of leg rings is the largest form discussed from the Circum-Alpine region. Instances of richly decorated rings comparable to the *Corcelettes* type extend the distribution of this type to western France and the Rhine valley of western Germany (Map 107), while their distribution in the northern Circum-Alpine region is focussed on western Switzerland, and particularly Lake Neuchâtel (Map 108). While other instances in western Switzerland occur in the Alpine Rhône valley (Aigle, Ollon, Sion), the only recorded example in eastern Switzerland is from the 'highland' settlement of Montlingerberg. In light of the intensive distribution around Lake Neuchâtel, localized production has been proposed, particularly at the settlements of Auvernier and Corcelettes (Pászthory 1985: 199), with the few examples from other areas of Switzerland being imported from there.

Given that these rings are predominantly from the west of Switzerland, it is not surprising that they are mostly recorded from lake-dwelling contexts (Table 29). While very few examples are recorded from burials, approximately 20% of the rings are from hoards, or which almost half are from a lake-dwelling based hoard. Thus, it is possible (and probable) that some of the 158 examples from a lake-dwelling should be seen as objects from un-recognized hoards (see Section 1.5).

Mörigen

With over 150 examples the *Mörigen* type arm-/leg-ring (Figure 53.k) was another of the most popular ring types from the northern Circum-Alpine region during the Late Bronze Age (HaB2-B3). These rings are of the hollow form, with cast ribbing decoration on the outer face, and defined end-zones with varying types of decoration including incized parallel lines and zig-zag bands (Pászthory 1985: 209). Regional differences or preferences may be seen in the choice of end-zone decoration, for instance the ribbed form appear to be more common around lakes Neuchâtel, Murten, and Biel, while the triangular decoration is more frequent at the lake-dwellings around Auvernier (Pászthory 1985: 209-17).

This ring type is predominant in the northern Circum-Alpine region (Map 110), and a few examples are recorded from northern France (Map 109), but it must be remembered that there are not comprehensive catalogues of Late Bronze Age arm- and leg- rings from France, most of Germany, and Austria. However, for the area of Germany were such a catalogue exists – Hessen and Rheinhessen (central Germany) – no instances of the *Mörigen* type are recorded (Richter 1970).

Again, these rings are mostly from the western Switzerland lake region, and the vast majority are reported from lake-dwelling contexts (Table 29). Only four examples are listed from lake-dwelling hoards, considerably less (both in number and proportionally) than the *Corcelettes* type, a factor also seen in the number from terrestrial hoards (9). In light of their intensive occurrence around Lake Neuchâtel, and the findings of a mould for, and half fabricated example of, the type ring at Auvernier and Grandson-Corcelettes respectively, local manufacture on Lake Neuchâtel has been proposed (Pászthory 1985: 217).

Sion

The Late Urnfield (HaB2-B3) *Sion* type arm-ring (Figure 53.j) is another variety manufactured as both solid and hollow forms, again decorated with cast ribbing and incized lines, and with stamp like ends (Pászthory 1985: 160). These rings are common to the west of Switzerland, with fewer examples in the eastern part of the northern Circum-Alpine region (Map 111), though there appears to be differential preference for the solid (*Massive*) rings in the eastern area, and hollow (*Hohl*) rings in the Lake Neuchâtel region (cf. Pászthory 1985: 163). Possible fragments have been noted from the hoard at Ray-sur-Saône (FR). Given the dominance of Lake Neuchâtel in the distribution of these rings, manufacture in the area, and possibly at Grandson-Corcelettes, has been proposed (Pászthory 1985: 163-64).

As with other arm rings that are principally recorded from the three lakes region of western Switzerland, most of these rings are from lake-dwelling contexts (Table 29). Only one ring is recorded from a hoard (Ray-sur-Saône (FR)), and three from a burial (Sion).

Vinelz

Vinelz type rings (Figure 53.i) of the LBA (HaB2-B3) are also known in both solid and hollow forms, with ribbed and incized decoration, and large plate ends (Pászthory 1985: 165). Of the 61 examples of this arm-ring type, 60 are from lake-dwellings (Table 29), one of which is from Zurich-Grosser-Hafner, with the remaining 59 in the western Switzerland lake region (Map 112). The final example only has a regional area defined as a find location – "Valais" – in the Alpine Rhône valley. Such a dominance of Lake Neuchâtel in the distribution of these rings is a clear indication of their local manufacture (Pászthory 1985: 168).

Boiron

In addition to the 'ring' type of arm and leg jewellery, the *Boiron* type (Figure 53.l) represents an example of Final Urnfield period 'band' type jewellery, with a flat cross section as opposed to the almost circular form of the ring types (Pászthory 1985: 200). Decoration on these arm bands follows a similar principle to other arm- and leg-rings, such as the *Corcelettes* type, utilising incized eyes, lines, and rhomboid patterns (Pászthory 1985: 200).

Although only 12 of this type of arm-band are known, and a further example from Auvernier which has been converted into a razor (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1), all of them come from the Lake Neuchâtel and Lake Geneva region (Map 113). However, in contrast to other types of rings discussed here, these are mostly known from burial, or probable burials contexts (and cemeteries), while only three of the examples are from lake-dwellings (Table 29). Where recorded, associated goods with the arm-bands include further examples of arm-/leg-rings and -bands, and fibulae (Montreux (CH)). It is difficult to propose a manufacture region from so few examples, but Pászthory (1985: 201) suggested Montreux as a possible location.

Guévaux

The Middle and Late Urnfield period arm-band of the *Guévaux* type (Figure 53.n), with rolled ends and longitudinal ribbing, is rare outside of Switzerland (Map 114), though examples are known from France (Grotte des Buissières, Meyrannes) and southern Germany (Pfeffingen)(Pászthory 1985: 47). Nine examples are recorded from within Switzerland, only one of which comes from eastern Switzerland (Zurich-Wollishofen), with the remainder from lake-settlements around lakes Neuchâtel and Murten (Table 29).

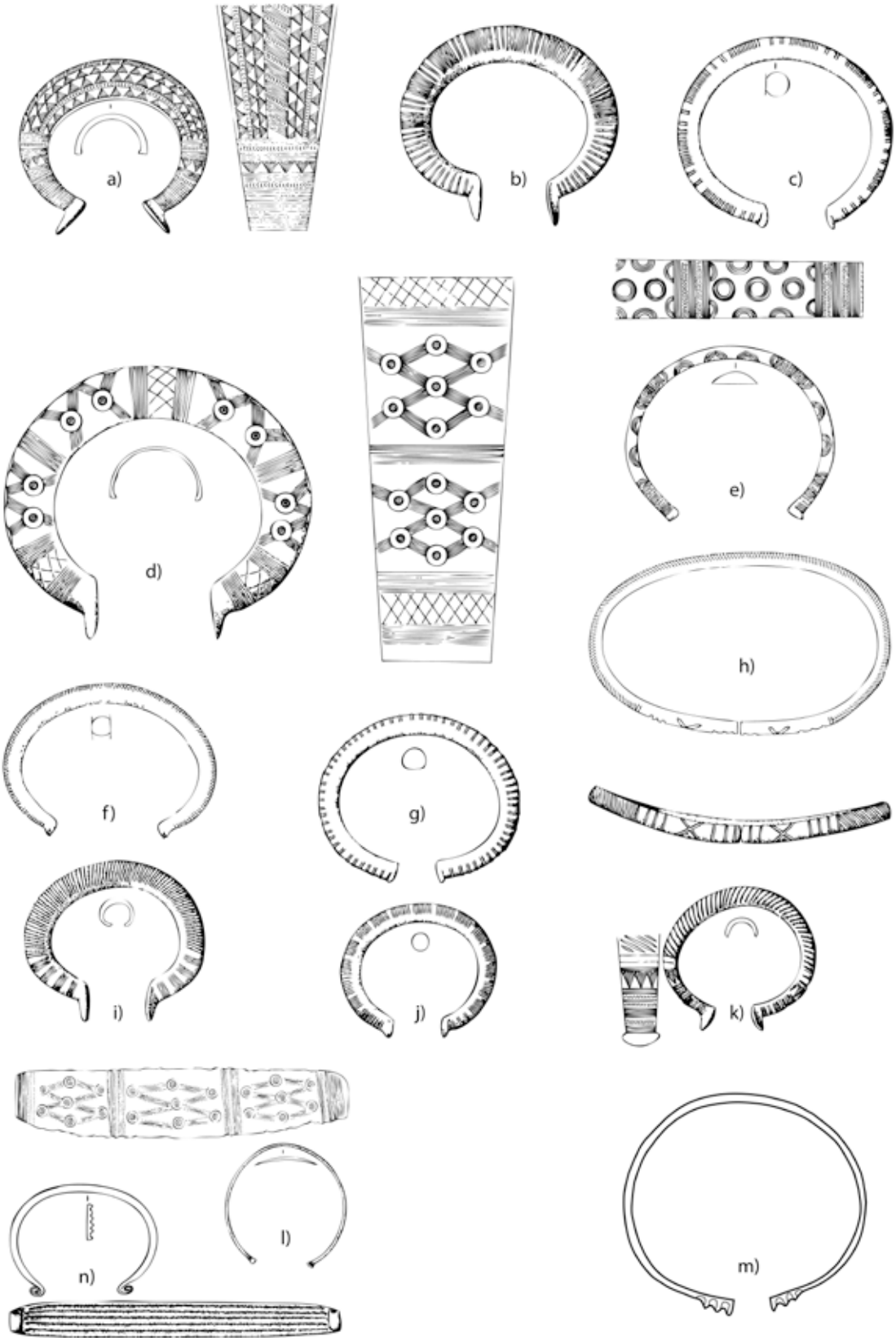

Figure 53: Late Bronze Age arm- and leg-ring types. a) Auvernier [Charey-Montabec]; b) Balingen hollow [Mörigen]; c) Balingen solid [Zurich-Wollishofen]; d) Corcelettes [Grandson-Corcelettes]; e) Cortaillod [Consice]; f) Evenly ribbed [Mörigen]; g) Homburg [Grandson-Corcelettes]; h) Schaukel [Zurich-Alpenquai]; i) Vinelz [Mörigen]; j) Sion [Zurich-Grosser Hafner]; k) Mörigen [Montlingerberg]; l) Boiron [Tolochenaz]; m) Vénat [Vénat] (after m) after Coffyn et al., 1981: 15; remainder Pászthory 1985: no. 1216; 1096; 1077; 1251; 857; 1159; 1124; 1714; 1014; 941; 1544; 1441).

Table 29: Find contexts for Late Bronze Age arm-/leg-rings. A = Area; B/H = Burial or hoard; C = Cemetery; CB = Cremation burial; H = Hoard; IB = Inhumation burial; L-D = Lake-dwelling; L-DH = Lake-dwelling hoard; L/R = Lake or river; N/A = Not available; S = Settlement; SH = Settlement hoard; Sgl = Single find; VD = Votive deposit.

Type	L-D	L-DH	H	B/H	IB	CB	C	S	SH	L/R	VD	Sgl	A	N/A
Cortaillod	37		9			8				5		1	2	
Cortaillod-Sursee			16											
Auvernier	29	2	5			3								
Auvernier-Réallon	2		6							1				
Homburg	35	1	111	25	1	3			1	3		1		1
Homburg/Balingen			10											13
Balingen			77	16		1			1	1		1		1
Balingen hollow	16	1	1											
Balingen solid	33	1	1											
Corcelettes	158	21	23		2	5				1		4	1	3
Mörigen	129	4	9			3	2				3	1		
Sion	10		1			3		1						1
Sion hollow	34									1				
Vinelz	60												1	
Boiron	3					6	3							
Guévaux	9													
Vénat	2		229							1				
D cross section	27	1					1			4		3		
Schaukel	7		8							1				
Evenly ribbed	7					1						1		
Rhomboid section	30					4				1				
Single & Un-typed	17	8												
Zerba	2		36			7	31	1						17
Pourrières	12		8							1		6		
Total	**645**	**39**	**505**	**41**	**3**	**37**	**6**	**1**	**2**	**19**	**3**	**12**	**4**	**19**

Vénat

The *Vénat* type arm-ring is one of the most abundant group of arm-rings considered, with 232 examples, though it is also one of the least represented groups of the nCA. A solid ring with incized decoration on the outer face, and cast grooves in the end-zones (Figure 53.m), the distribution of this ring is extensive in France, with examples also known from the Channel Islands and Portugal (cf. Coffyn *et al.* 1981: 48). The majority of these rings are known from hoards (229) of central and western France (Table 29), with a few examples from hoards in eastern France and the Jura region (Map 114). Three examples are known from the area of western Switzerland: two from Lake Geneva, one of which comes from the lake-settlement Genève-Eaux Vives (FR), and one example Nidau, Lake Biel.

These arm-rings provide an interesting contrast to ring types such as *Corcelettes* and *Balingen*, in that they are indications of 'foreign' influence and goods imported into the lake-dwelling region, as opposed to the exportation that is seen in other types. Given the low number of these rings present in the lake-dwelling region, bulk importation should not be envisaged. Rather, they may represent possessions of mobile members of society, brought with them from other locations, or exchanged in a low volume gift circulation.

Un-typed and individual rings

In addition to the above defined varieties of Late Bronze Age ring jewellery, a selection of un-typed or non-specific rings provide further indications of object circulation in the northern Circum-Alpine region. For example, 16 *Schaukel* (saddle) rings of the LBA (HaB2-B3) are known from the area (Map 113), in both the east and western parts of Switzerland, and also southern Germany, including at the lake-dwelling settlement of Roseninsel (D). Of the examples catalogued here, 50 per cent are from hoards, with the remainder from lake-dwellings (Table 29).

Arm rings with a D form cross-section but of specific type are recorded from both the eastern and western halves of the northern Circum-Alpine region (Map 115). Of the 36 examples catalogued, the majority are from lake-dwellings or lake contexts (Table 29), with a single example from the Auvernier-Nord hoard. A similar pattern is observed in the distribution of rings with a rhomboid cross section (Map 115), with many examples around Lake Neuchâtel, but also from Lake Constance,

and the lake-settlement Hagnau-Burg (D). While most of these rings are from lake-dwellings (Table 29), several are from burial contexts, particularly at Ascona (Ticino) in southern Alpine Switzerland, where they were found in association with other arm-rings, fibulae, and glass beads (Pászthory 1985: no.1860-1862).

Rings with ribbed decoration on the outer face in an even pattern (Pászthory 1985: 177-78) show a distribution extending across the northern Circum-Alpine region (Map 115), in both lake-dwellings and a burial (Ollon). In addition to representation on the lakes of eastern and western Switzerland, two examples of this ring form occur from the Alpine Rhône valley (Ollon and Saxon).

A further 25 various single examples and un-typed arm-/leg-rings are recorded from lake-dwellings and lake-dwelling hoards of both the regions of Lake Neuchâtel/Lake Biel/Lake Murten and Lake Zurich/Lake Constance (Map 113, Map 115). Despite the apparent under-representation of the eastern half of Switzerland in some of these ring jewellery types, e.g. *Corcelettes* rings, such jewellery was in use in this region. Styles and designs may have been rejected, but the concept was still embraced. A single ring from Unteruhldingen-Stollenwiesen (D) is interesting, as it is adorned with a small jet bead (Schöbel 1996: Fig. 34.16), adding further weight to the possible local manufacture of jet objects in the region of Hagnau-Burg (see Section 5.2.4), and attempts to incorporate this material into the Late Bronze Age assemblage.

Early Iron Age

Arm rings of the early Iron Age are known in various materials, including clay and lignite, in addition to the traditional bronze rings. Of interest to the study here are the bronze arm rings dating to the HaC and HaD phases, with particularly reference to types which are found in the former lake-dwelling region. In contrast to the Late Bronze Age types, which are fairly numerous, these early Iron Age rings are rather sparse, with each type having less than 20 examples recorded. Some of the rings show continuation in both form and decoration to Late Bronze Age ring jewellery, such as the *Valangin* and *Belp* types, indicating cultural continuation in the northern Circum-Alpine region between the Late Bronze and early Iron Age. Discontinuity is seen in deposition contexts, which is not surprising given that most of the LBA rings are from lake-dwellings – a settlement form that did not survive the transition to the early Iron Age. Instead, most of the early Iron Age arm-/leg-rings discussed here are from burial contexts. Not all of the ring types of the early Iron Age are discussed here (cf. Schmid-Sikimić 1996). Types have been selected for their temporal and spatial relevance to the discussion of Late Bronze Age ring jewellery.

Schötz

The *Schötz* type arm-ring (Figure 54.c) of the HaC-HaD period has a D-shaped cross section, with stamp like ends and ribbed decoration (Schmid-Sikimić 1996: 41). The decoration on these rings, and particularly the example from Otelfingen (CH), show a continuation of the Late Bronze Age decoration style (Schmid-Sikimić 1996: 44). The 17 examples recorded here, all from the north-central area of Switzerland (Map 116), are mostly found in burial contexts, with two single finds and one un-recorded find location (Table 30). Associated objects with these arm rings include further arm- rings and bands, hanging jewellery, rattles, and, from Unterlunkhofen tumulus 37, fragments of an iron razor.

Valangin

Nineteen examples of the HaC period *Valangin* type arm-ring (Figure 54.c) of twisted wire with hook and loop ends (Schmid-Sikimić 1996: 45) are catalogued here, of which seven come from the northern Circum-Alpine region (Map 116), with the remaining 12 from the large metalwork hoard at St. Yrieix (no.211). The examples from the Circum-Alpine region are confined to the region around Lake Neuchâtel, and provenance from burials (Table 30). Associated goods in these burials, where recorded, consist of belt work, secondary arm rings, and lignite arm rings.

Some comparable rings to this type are seen in Late Bronze Age under Pászthory's (1985) type "*Hackenverschluss*", with examples from lake-dwellings such as Mörigen, Genève-Eaux Vives, and Grandson-Corcelettes. Further Late Bronze Age examples may be seen in hoards from France, such as St Yrieix.

Belp

The *Belp* type arm-band (Figure 54.a) has rolled ends end longitudinal ribbing (Schmid-Sikimić 1996: 47). Similar form arm-bands of the LBA *Guévaux* type are known from Auvernier (Rychner 1979 Fig. 91.9), Estavayer-le-Lac, and Zurich-Wollishofen. Within the nCA, these arm-bands are found in burials from central Switzerland (Map 117) and around Lake Thun (Hilterfingen), and also in the Alpine Rhône valley (Lens and Sion). Un-provenanced examples (Table 30) are recorded from the vicinity of Lake Neuchâtel (Cressier/Cornaux). Where recorded, associated goods in the burials with Belp type arm bands include secondary arm rings, hanging jewellery, and also a spear head in the burial 'Hünegg' from Hilterfingen (Schmid-Sikimić 1996: no.59-60).

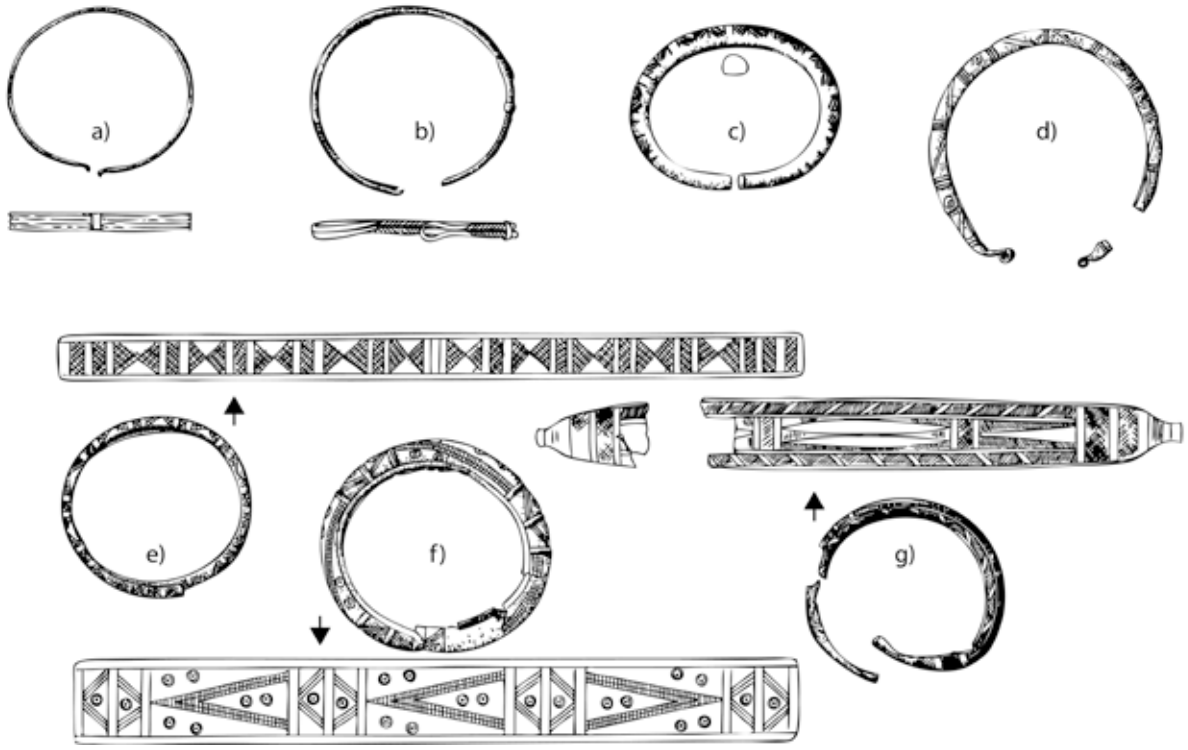

Figure 54: Arm-ring types of the early Iron Age. a) Belp [Belp]; b) Valangin [Valangin]; c) Schötz [Subingen]; d) Gorgier [Önsigen]; e) Subingen [Bern]; f) Lyssach [Lyssach]; g) Lausanne [Bofflens] (re-drawn from Schmid-Sikimić 1996: 56; 52; 35; 71; 73; 85; 104).

Table 30: Find contexts for early Iron Age arm-/leg-rings. N/A = Not available.

Type	Cremation Burial	Tumulus Burial	Hoard	Inhumation Burial	Burial	Tumulus	Single find	N/A
Schötz	2	12					2	1
Valangin		3	12	2	1			1
Belp		2			5			3
Subingen		8			2			1
Gorgier					2			4
Lyssach		5		2				
Lausanne				2	2	9		1
Total	**2**	**30**	**12**	**6**	**12**	**9**	**2**	**11**

Subingen

A second type of arm-band is the *Subingen* variety (Figure 54.e) with triangular and zig-zag incized decoration, dating to HaC-HaD (Schmid-Sikimić 1996: 50-54). While these arm-bands have comparable examples in southern France (Schmid-Sikimić 1996: 54; Courtois 1968), within the Circum-Alpine region 11 examples are recorded from the central area of Switzerland (Map 116), primarily from burial contexts (Table 30). Associated objects in these burials include further examples of arm- bands and rings, hanging jewellery, rattles, small rings, and belt work.

Gorgier

Only six examples of the *Gorgier* type arm-band (Figure 54.d) with rolled ends and decorated with incized eyes and lines (Schmid-Sikimić 1996: 49) are mapped (Map 117). These examples come from the region of Lake Neuchâtel and Lake Geneva, with a single ring from the north of Switzerland (Oensingen). Of these examples only two examples have contextual information (Table 30) and were found together (at Gorgier).

Lyssach

The *Lyssach* type arm-band (Figure 54.f), also with eye and line decoration is somewhat similar to the *Gorgier* type (Schmid-Sikimić 1996: 52). Only seven examples of this type are mapped from the Circum-Alpine region

(Map 117), all of which are confined to the western-central area of Switzerland, between Lakes Thun and Biel, and all come from (assumedly female) burial contexts (Table 30). Associated objects in these burials include secondary arm-bands, belt work, lignite arm-rings, jet beads and hanging jewellery (Schmid-Sikimić 1996: 53).

Lausanne

The final type of early Iron Age arm-ring to be discussed is the *Lausanne* type (Figure 54.g), which has triangular and linear decoration and stamp like ends (Schmid-Sikimić 1996: 58). Within the Circum-Alpine region these rings are concentrated in the west of Switzerland, between lakes Neuchâtel and Geneva, and in eastern Switzerland between lakes Constance and Sempach (Map 116). The examples from eastern Switzerland, and particularly that from Hemishofen have comparable objects in southern Germany (Schmid-Sikimić 1996: 64). Of the 14 recorded instances, 13 are from burial contexts (Table 30), interpreted as female burials through the associated goods (Schmid-Sikimić 1996: 60), such as arm-rings, hanging jewellery, rattles, finger rings, and needles.

Manufacture

From the above discussion of various types of Late Bronze Age and early Iron Age arm-leg- rings, four different forms are readily evident:

1. Hollow rings
2. Solid rings
3. Bands
4. Wire rings

The first three forms could have been manufactured using casting techniques, while the twisted wire rings were certainly made from drawn wire. As mentioned above, a half fabricated ring and clay mould of the *Mörigen* type have been recovered from Grandson-Corcelettes and Auvernier, while a stone mould for arm-bands is known from Grandson-Corcelettes (Colomb and Muyden 1896: Plate 34.1). In contrast to the hollow and solid rings with markedly curved cross-section, it would have been possible to cast the arm-bands as a flat sheet, and then hammer them to the required circular shape with a relatively flat cross-section. Casting experiments utilising clay moulds and the lost wax method to create hollow arm-rings of the *Corcelettes* type have been conducted through publication of the find materials from Hauterive-Champréveyres (Rychner-Faraggi 1993: 51-52), indicating how the casting process may have worked and that fine decoration could be applied during the casting process.

Several of the rings discussed here, and particularly of the Mörigen type, show evidence of repair (Pászthory 1985: Mörigen type: no. 1623, 1632, 1636, 1641, 1643, 1668, 1671; Corcelettes type: no. 1259, 1288, 1298, 1361). These repairs consist of pairs of holes drilled through the ring either side of the failure point, allowing the two portions of the ring to be bound together with wire. Whether these failures occurred during the use of the rings or during the manufacturing process is unknown, but repair was obviously an acceptable action.

Decoration

Decoration on the arm-/leg-rings and bands can be divided into two categories: external (on the outer face), and internal (on the inner face). While the external decoration can readily be interpreted as decoration motifs, internal “decoration” consisting of simple, non-repetitive markings in low numbers, are more likely to represent maker’s marks or guidelines.

External

The decoration on individual types of rings has been discussed in their own section, as have the possible methods of decoration application, such as freehand, casting, and stamping. The range of designs seen on the Late Bronze Age rings, including eyes, triangles, ribbing, and linear hatching, are typical for the period and can be seen on other material culture objects such as knives and ceramics The rings from Sursee-Landzunge have been divided into different groups based on the number of lines (either 3 or 4) used to make individual components of the decoration, such as the circular eyes (Weidmann 1983). Such differences may be attributed to different manufacturing zones or different manufacturers. Individual craftsmen/decorators and varying levels of expertize may also be recognized, though not traced or identified, through the standard of decoration on the rings; some decoration is clearly of a higher standard than others, and different qualities of decoration may represent ‘apprentice’ or ‘master’ decorators (Figure 55). Decoration with inscribed eyes, lines, and rhomboids, for example on the *Boiron* type, were not exclusive to the Circum-Alpine region, France and Germany, but have also been found on ring jewellery from further afield, such as in hoards from Romania (Petrescu-Dâmboviţa 1998: 156-58: no.1861-1865).

In addition to the inscribed and cast decoration, iron inlay decoration is also known on LBA arm/leg-rings. Such application would have required the casting of channels in the ring, which were then filled with small quantities of iron. Iron inlay decoration was used on a variety of objects during the Late Bronze Age, including swords, horse gear and pins (see Section 5.4.3.2). While not unique, such inlay decoration was not common, and would have served to individualize the rings to which it was applied, and would also have identified the rings owner and/or wearer.

From the early Iron Age ring jewellery it is evident that not only ring form (e.g. *Valangin* and *Belp*) show continuity from the LBA, but also decoration in the use of inscribed eyes, triangles, rhomboids and grooves in repetitive rectilinear patterns on rings such as type *Lyssach* (Schmid-Sikimić 1996: 3; see also Dunning and Rychner 1992: 87). Further indications of continuation of arm-/leg-ring styles between the two periods are provided by findings of Late Bronze Age pottery styles with arm-rings of the *Schötz* type, and other goods found in association with ring jewellery, such as glass and jet beads, spiral rolls, and bronze wire (Schmid-Sikimić 1996: 3, 20). The continuation of repetitive patterns on ring jewellery is at odds to the increasing differentiation of design on belt-plates commented upon by Wells (1998: 251), suggesting that these jewellery objects may not have played a significant part in creating individually specific social identities through the use of unique designs, but would have been involved in creating 'standardized' social identities, marking, for example, life stages or social status (Schmid-Sikimić 1996: 5).

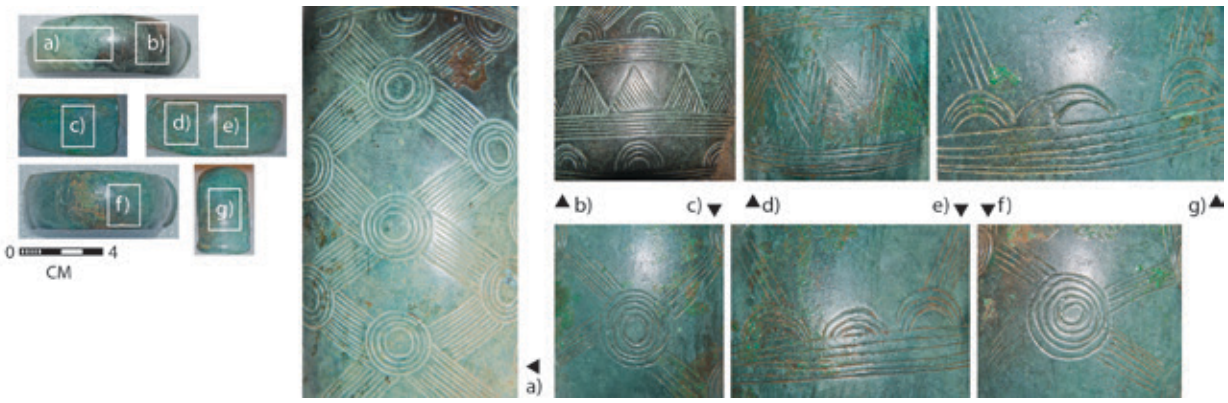

Figure 55: Varying quality of decoration on Late Bronze Age arm- and leg-rings. Higher standard a) and b); lower standard c) to g). (Photos and graphic by author. Artefacts from Museum of Culture, Basel. Inventory no: a/b = I21431; c-e = I21433a; f-g = I21433b).

Internal

Internal markings exist on over 60 of the Late Bronze Age arms rings discussed above, particularly on the *Homburg*, *Balingen*, *Cortaillod* and *Corcelettes* types (Table 31). With examples from Zurich-Wollishofen, Grandson-Corcelettes, Concise, and Hauterive-Champréveyres, rings with internal markings exist across the northern Circum-Alpine region. Consisting of single, or multiple oblique marks, possibly made with a chisel, rings with these marks from Hauterive-Champréveyres have been interpreted as makers' marks (Rychner-Faraggi 1993: 52 "de la marque de fabrique d'un artisan"). However, such an interpretation seems a little limited, as the only difference between the markings is an increased numbers of lines.

An alternative function for such internal markings has been proposed for examples from Sursee-Landzunge (Weidmann 1983) and the Bullenheimerberg (Hagl 2008): they were used to ensure the correct positioning of rings on the wearer. Such marking may have been of assistance, or essential, to ensure the correct positioning of rings in a sequence, creating patterns across rings in their external decoration (Hagl 2008: 38; also Siepen 2005; Nagler-Zanier 2005). Rings with internal markings from Sursee can be group into pairs with two, three, five, and six marks on their inner face, leading to suggestions that they were intended to be worn in pairs (Weidmann 1983), on opposite arms/legs on an individual (or possible on two different people?). An aspect which may be extrapolated from the use of internal markings to ensure the correct positioning of rings, is that individuals were dressing themselves with the rings; if they were being dressed by a second person, then they would be able to see if the external decoration on the rings was in the correct order. The need to reproduce the correct pattern in ring decoration may be seen through the practice of creating arm-spirals and neck-collars in northern Europe (e.g. Teržan 1996; Kubach 1973 Plate 112.b2, 117.a2). These objects appear as multiple objects when worn, but are actually single pieces, ensuring that the decoration always occurs in the correct sequence across its multiple parts.

Symbolism and use

Arm and leg jewellery are typically seen as objects with female associations, for both the Late Bronze Age (e.g. Pászthory 1985: 254; Wells 1998: 250) and the early Iron Age (Schmid-Sikimić 1996: 5). Such an interpretation is easier for the Iron Age where most of the rings occur in burial contexts, and either human remains or associated goods provide indications that the entombed was female. However, such interpretation is more difficult for

the Circum-Alpine region during the Bronze Age, as most of the ring objects come from lake-dwelling contexts, where such associations are unavailable (Table 32). Of the few examples which are from burial contexts in the nCA, and of those Late Bronze Age types discussed here (Table 33), associated goods found in association with the rings include fibula, glass beads, needles, fingers, and arm- and leg-rings.

The frequent findings of multiple, paired arm- and leg-rings in burials, for example from Sion and Tolochenaz, suggest that these objects were intended to be worn in similarly decorated pairs (Weidmann 1983). A discrepancy occurs between the frequencies of rings in burials and hoards, in that many more pairs occur in hoards, for example those from Bullenheimerberg and Sursee-Landzunge. These multiple depositions may represent a gathering of individuals, with multiple persons wearing paired rings represented (see Fredengren 2011; Fontijn 2002: 244), makers' hoards, or an individuals' ring collection. If it is accepted that rings were worn in one or two pairs, based upon the burial evidence, then the apparent requirement of utilising internal markings to ensure correct patterning would be somewhat redundant. A difference may be seen in the variety of rings with internal markings – which are generally solid cast and narrow in breadth, such as the *Homburg* and *Balingen* types – raising the possibility that these types of rings were intended to be worn in greater numbers than the broader hollow cast type. Furthermore, it is possible that the rings deposited in burials represent only a small portion of the ring jewellery that a person may have used during his/her life. This selective deposition corresponds with the supposition that arm-/leg- rings may have been used at, and represented, different life stages of individuals (Schmid-Sikimić 1996: 5; Fontijn 2002: 239-46).

Table 31: Rings with internal markings.

Site	Ring Type	Quantity	Number of marks
Concise	Cortaillod	2	3
Grandson-Corcelettes	Homburg	1	8
Hauterive-Champréveyres	Cortaillod	1	2
Mändlfeld	Schaukel	1	6
Nächstenbach-Weinheim	Homburg	4	2/2/4/5
Nidau	Evenly Ribbed Exterior	1	3
Nyon	Schaukel	2	3/18
Ockstadt	Homburg	1	3
Pfedelbach	Homburg	4	2/2/3/4
Saxon	Evenly Ribbed Exterior	1	4
Seinsheim Bullenheimer Berg	Homburg	17	1/1/1/1/1/2/2/2/3/4/5/6/7/8/8/9/11
Seinsheim Bullenheimer Berg	Balingen	18	1/1/2/2/3/3/3/4/4/5/5/6/6/6/7/8/11/
Sursee - Landzunge	Cortaillod-Sursee	8	2/2/3/3/5/5/6/6
Zurich-Alpenquai	Balingen Massiven	4	2/3/4/5
Zurich-Alpenquai	Evenly Ribbed Exterior	1	5
Zurich-Wollishofen	Cortaillod	1	2
Total		**77**	

Further indications for the utilisation of arm-/leg-rings in pairs can be seen where multiple examples of the same type of ring with highly similar, bordering on identical, decoration are known, for example intra-site at Sursee-Landzunge and Bullenheimerberg (also Pászthory 1985), and inter-site from Auvernier and Hauterive-Champréveyres (Rychner-Faraggi 1993: 51). Such repetition of designs would make an aesthetically pleasing impact on observers, and would allow the flowing of decoration across adjacent rings (as per the Bullenheimerberg rings with internal markings). That the rings were intended to be displayed, seen and observed is evident through their external decoration, but the actual function and symbolism of the rings remains unknown. The fact that only a small proportion of graves have ring jewellery has been taken as an indication that only a small proportion of the female population would have worn the rings in life (Wells 1998: 250).

Occasional examples of rings in burials are found where male objects are inserted in the burial goods, for instance the iron razor fragments from the Iron Age burial at Unterlunkhofen (Schmid-Sikimić 1996: no.41) and a spearhead from an Iron Age burial at Hilterfingen (Schmid-Sikimić 1996: no. 59-60). In these cases it may be possible that the tumulus burial goods have become mixed and represent separate burials, or are double burials representing both female and male individuals. A *Corcelettes* ring from Vidy-Chavannes, found in association with glass fragments, ceramics, and a

grinder, is from the cremation burial of a c. 35-year old male (Kaenel and Klausener 1990: 72), indicating that arm- and leg-rings were not exclusively female during either the LBA or the EIA. Such a cross gendering of arm-/leg-rings is seen in several examples where they have been converted into razors (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1). The re-use of rings to make razors may be the result of simply recycling broken material, though, as has been mentioned above, rings with repair works are known. Thus, it should not be assumed that the ring/razor conversions occurred on simply broken objects, but may have occurred for social or symbolic reasons. For example, it may be possible that the rings were utilized during childhood stages of males, and then converted to razors during adulthood. However, with only a few examples, without associated objects, to work from, such a suggestion is purely conjectural.

Table 32: Find contexts recorded for the entire Bronze Age arm-/leg-ring jewellery from Switzerland (after Pászthory, 1985: 253).

Context	North/East/Tessin	West	Total
Burial	169	109	278
Hoard	168	91	259
"Settlement"	143	1320	1463
Single find	9	6	15
River	0	5	5
Area with undefined context	37	34	71
Unavailable	-	-	105

Table 33: Summarized find contexts for Late Bronze Age arm- and leg-rings from Switzerland of the discussed types.

Context	East	West	Total
Burial	3	38	41
Hoard	16	25	41
"Settlement"	56	561	617
Single find	-	6	6
River/Lake	-	9	9
Area with undefined context	-	3	3
Unavailable	-	5	5

Concluding remarks

The brief study of Late Bronze Age and early Iron Age arm-/leg-ring jewellery has illustrated a number of points regarding distribution and deposition practices. From the recorded examples, and Bronze Age rings in general, there is a clear distinction between the eastern and western parts of the northern Circum-Alpine region (mainly Switzerland). Significantly more rings are known from the western area, and particularly around Lake Neuchâtel (Table 32). This unequal distribution may be an anomaly of regional research and excavation levels, but there also appear to be localized preferences for different types and forms (see *Balingen* and *Mörigen*), and covers both the LBA and EIA examples. It is also evident that during the early Iron Age communities were still utilising the areas and regions were lake-dwellings were previously constructed; a total de-population of the area did not occur following the abandonment of the lake-dwelling tradition. On a wider level it is evident that the Circum-Alpine lake-dwelling communities were involved in exchange networks across Europe, through the distribution of ring types such as *Corcelettes*, *Homburg*, and *Balingen*. These exchange relationships were not only export based (assuming the local manufacture of many arm-ring type, e.g. *Corcelettes*), but also import based, as seen in the few instances of the *Vénat* and *Pourrières* type rings (cf. Cordier 2002: 26-28).

On a functional basis, the decorated arm-/leg-rings are clearly intended to be worn and displayed, most likely in single or multiple pairs. Decoration style and placing was significant, and practices were taken to ensure that patterns were correctly aligned and orientated. However, varying standards and quality of decoration can be seen on different pieces. Some rings show evidence of iron inlay decoration, which may have been utilized as a way of differentiating between individuals' status levels, as may the jet bead adorned example from Unteruhldingen-Stollenwiesen.

In terms of deposition, a clear distinction can be made between the Late Bronze Age and Iron Age practices. During the Iron Age rings are predominantly placed in burials, while in the Late Bronze Age most of the rings are from lake-dwelling contexts. However, many of these rings from lake-dwellings may actually be from hoards, or burials, within, or in the vicinity of the settlement (cf. Fischer, V 2011, 2012). Where human remains or

associated goods exist in burials with arm-/leg-rings, it is generally assumed that the entombed individual, and therefore association of ring jewellery, is female. However, male associations are also indicated through associated objects and anthropological analysis, such as from a LBA cremation burial at Vidy-Chavannes (Kaenel and Klausener 1990: 72), and EIA burials at Unterlunkhofen and Hilterfingen (Schmid-Sikimić 1996: no.41,59,60).

The biography of arm-/leg-ring jewellery from manufacture to deposition may have been linked to various life- and biographical stages of individual owners, but not always linked in their deposition practices. The low number of LBA rings from burials suggests that it was not essential for the rings to be deposited with their owners, and could instead be moved to a different biographical track through deposition in hoards or conversion to other objects. Similarly, minor breaks or damage did not mean that rings were redundant or beyond social use, as repairs to numerous examples indicate.

5.4.2.5: Fibulae

Bronze Age fibula are another category of object that has received a significant level of attention in the *Prähistorische Bronzefunde* series, particularly for south-eastern Europe, though the catalogue is far from complete for the central, northern and western Europe. Of particular relevance to this study are the volumes covering southern Germany, Austria and Switzerland (Betzler 1974), and Italy (Eles Masi 1986). Although violin type fibula are known from the Middle Bronze Age, it is only the Late Bronze Age and early Iron Age types which are of interest here, and only those types which are found in the northern Circum-Alpine region will be addressed. The function of fibulae would have been two-fold – both a decorative object as jewellery and ornamentation, and also a functional object as clothing fastener. Their role as decoration accounts for, and is demonstrated by, the variation and elaboration of design and style that occurs over time, with many instances being adorned with other 'precious' materials (e.g. glass and amber) during the LBA and EIA.

Late Bronze Age

Fibulae of the Late Bronze Age (HaA-HaB) detailed here can be divided into three broad categories: Plate (*Platten*), Arch (*Bogen*). A further group – snake (*Schlangen*) fibula – is also mentioned with several instances, while earlier fibula, such as the *Peschiera* type are also known, from sites such as Grandson-Corcelettes (Betzler 1974: 11). The distribution of these different forms of fibula provide an indication of the various exchange and communication networks in which communities of the Circum-Alpine region were involved, and their depositional context may provide an indication of the value attached to those objects.

Platten Fibulae

The only *Platten* (plate) fibula (Figure 56.a) recorded from the Circum-Alpine region comes from a possible hoard in the lake-settlement Grandson-Corcelettes (Betzler 1974: 64; Sprockhoff 1966). Several examples are known from Gambach and Haimbach in southern Germany (Map 118), with their main area of distribution occurring in northern Germany and southern Scandinavia (Sprockhoff 1966; Betzler 1974: 64-65; Hansen 1991; Laux 1973: 46-50). However, fibula and a mould are also known from Romania (Bader 1983: 39-40). Concerning the examples from the Rhine-Main area, local, emulative, manufacture has been proposed (Hansen 1991), while the object from Grandson-Corcelettes may represent an item imported from the Nordic area, particularly given its possible association with a bronze hanging vessel decorated in typical southern Scandinavia style (see Sub-section ZONED BOWLS in Section 5.4.2.6). In terms of dating, the example from Grandson Corcelettes likely relates to late Period IV or early Period V in terms of the Nordic chronology (Sprockhoff 1966; Betzler 1974: 65), or HaB1-HaB2 in the Circum-Alpine chronology (Figure 7).

Bogen Fibulae

Mörigen

Large arch fibulae with deep ribbing (*Rippen* fibula) are represented north of the Alps by the *Mörigen* type (Figure 56.b-d). Within the nCA region these fibulae are found in both terrestrial- and lake-settlement contexts, with five known from Mörigen (Map 119, Map 122), and one from a valley settlement at Ramosch. A further find, unfortunately without context, is known from Egg-Stirzental (Betzler 1974: 74-76). These type of fibulae are also known, in greater numbers, from the southern Alps and the Po Plain, where they are predominantly known from burial contexts, occasionally in pairs (e.g. Bologna San Vitale burial 777) in female burials (Betzler 1974: 75-76; Eles Masi 1986). While the examples from north of the Alps relate to the Final Urnfield (HaB3), elaboration and modification of the type (Mörigen A and B, and Cà Morta) occurred in northern Italy extending their period of use into the Iron Age (Golasecca 1b-1c/HaC) (Eles Masi 1986: 41-43; Lunz 1974: "Rippen fibula mit grossen Bügelscheiben"). Given the main distribution of these pieces in northern Italy, the items from north of the Alps have been interpreted as imported objects (Bernatzky-Goetze 1987; Putz 2011: 157), and the similarity between the five pieces from Mörigen has led to the suggestion that they may have been manufactured in the same location (Betzler 1974: 76; Primas 1970: 92).

Bogen

The largest individual group of fibula discussed here is the *Bogen* (arch) group, which can be subdivided into various types (Figure 56.e-p). Several fibulae with varying size and shape arch, with or without linear incision decoration are known from sites in the northern Circum-Alpine region (Map 121). Examples of large fibulae are known from lake-settlements at Estavayer-le-Lac and Saint Blaise, and also a cremation burial at Ascona (Ticino, CH) in association with three arm-rings (Betzler 1974: 72). Small fibulae, and small fibulae with angled arches, are known from Grandson-Corcelettes, Zurich-Wollishofen, and a probable lake-settlement on Lake Murten (CH) (Betzler 1974: 72-73). The larger of these pieces have comparable examples in northern Italy relating to the Late and Final Urnfield (*arco semplice* forms) (Betzler 1974: 72), while the smaller fibulae have been interpreted as locally manufactured items north of the Alps, during the LBA (Betzler 1974: 73).

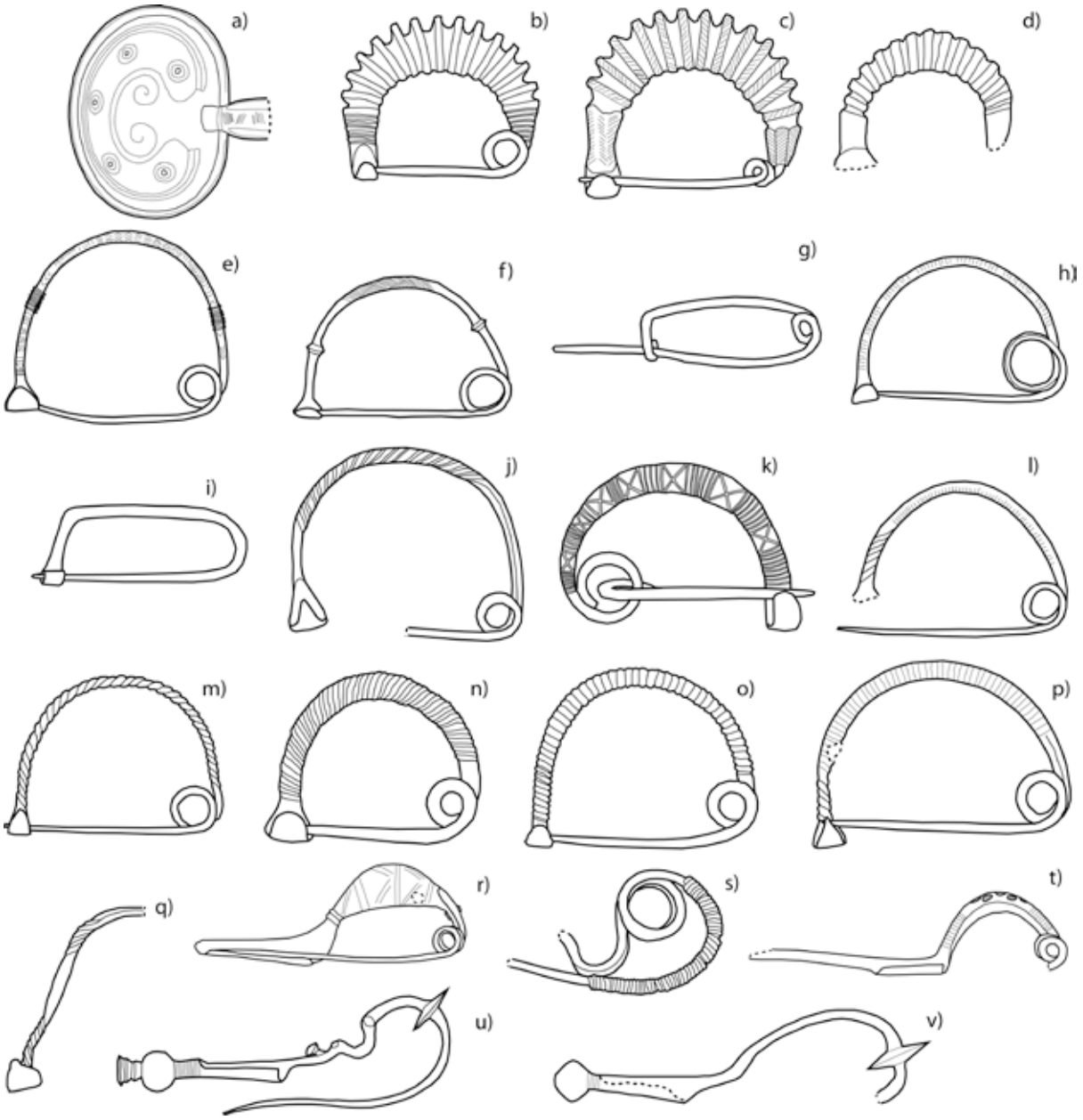

Figure 56: Fibula types of the Late Bronze Age and Iron Age. *Late Bronze Age:* a) Platten [Grandson-Corcelettes]; b) Mörigen [Mörigen]; c) Mörigen A [Dercolo]; d) Mörigen B [Baldaria]; e) ribbed knot [Vallamand-Dessous]; f) two knot [Estavayer-le-Lac]; g) Estavayer-le-Lac [Estavayer-le-Lac]; h) large arch [Estavayer-le-Lac]; i) small arch [Lake Murten]; j) twisted arch [Ascona]; k) Valais [Sion]; l) Wollishofen [Zurich-Wollishofen]; m) twisted arch [Capriana]; n) twisted arch with enlarged foot plate [Garda]; o) false torsion [Bissone Pavese]; p) false torsion with twisted end section [Biassono]; *Iron Age:* q) Fontanella [Fontanella Grazioli]; r) Navicella [Rasuns]; s) Schlangen [Riddes]; t) Sanguisuga [Este]; u) Dragon head with end plate [Albate]; v) arch with end plate [Este] (re-drawn from: a, b, e, f, g, h, I, j, k, l, s) Betzler 1974: 134, 162, 144, 143, 181, 148, 154, 138, 156, 142, 186b; c, d, m, n, o, p, q, r, t, u, v) Eles-Masi 1986: 333, 335, 74, 93, 114, 129, 120, 743, 1859, 2466, 2365).

Torsion

Fibulae with twisted arches (*torsion* fibula) are known from several lake-settlements north of the Alps (Map 120), for example, Zug-Sumpf and Estavayer-le-Lac, and also from the upland settlement Savognin-Padnal (Betzler 1974: 65-66). Examples in a, possibly female, burial context are also known from the sCA, at Ascona (Betzler 1974: 66). Fibulae similar in style to this piece are also known from Slovakia (Novotná 2001), the central Balkans (Vasić 1999: 51-53), and northern Italy (Eles Masi 1986: 15-16). The examples from northern Italy (*arco semplice* (Map 120)) are mainly known from burial contexts, with few examples from settlement (Frattesina; Mariconda di Melara) and hoard (Capriano) contexts (Eles Masi 1986). Torsion fibula from both north and south of the Alps relate to between the 11th and 9th centuries BC (Betzler 1974: 66-67; Eles Masi 1986: 15-

18), with those from the central Balkans with (two loops) being slightly later (Vasić 1999: 52).

Wollishofen

The *Wollishofen* type arch fibula (Figure 56.l), known from Zurich-Wollishofen (Map 122), has incized line decoration across a large portion of the arch, and is twisted near the fastening plate. Pieces with similar incized decoration on the fibula arch – or *false torsion* – with (and without – e.g. the *Fontanella* type (Figure 56.q) (Map 121)) twisting towards the arch foot are known from numerous sites in northern Italy (cf. Eles Masi 1986: 20-25). The majority of these pieces are known from burial contexts, with two from settlements (Ceresara; Frattesina) (Eles Masi 1986). Given the dating of other objects from Zurich-Wollishofen, and those from northern Italy, this piece relates to the late 11th and 10th centuries BC (Betzler 1974: 68).

Estavayer-le-Lac

Bogen fibulae of the *Estavayer-le-Lac* type are known from lake-settlements north of the Alps (Map 120) around both Lake Neuchâtel (CH) and Lake Constance. Similar in basic form to violin bow fibula with an extended pin, these fibulae are broadly dated to the Late and Final Urnfield period (HaB) (Betzler 1974: 80-83). The similarity of these fibula to earlier types, and lack of distinctive features make comparison to other regions difficult, and it is possible that they are the product of local manufacture north of the Alps (Betzler 1974: 82).

A particular fibula with two knots on the arch is known from Estavayer-le-Lac (Betzler 1974: 68-69), the only instance of this type in the main region of study, though a comparable piece, with two groups ribs instead of a single ridge forming the 'knots', is known from Vallamand-Dessous (Betzler 1974: 71). These items are more commonly found in northern Italy and the eastern Alpine/Balkan region during the Middle and Late Urnfield period (HaA2-HaB1) (Betzler 1974: 70-71; Vasić 1999: 45-46). In their main area of distribution these fibula are often found as single items, and also pairs, in (assumed) female burials (Betzler 1974: 69).

Valais

Two *Valais* arch fibula are known from burial contexts in the Alpine Rhône valley (Map 122). These fibulae with thickened, richly decorated arches, and hanging pins (Figure 56.k) can be dated to the LBA through associated objects (particularly Sion-Maison Torrenté) such as *Sion* type arm-rings (see Sub-section SION in Section 5.4.2.4). Fibula with similar pin attachment are known from the west Balkan region, though none are noted from northern Italy (Betzler 1974: 74; Eles Masi 1986).

Schlangen Fibulae & Foot plate

Two *Schlangen* fibulae, one from the lake-settlement Nyon-L'Asse (CH) and one from Riddes (CH), and a fragment of a foot plate, from Montlingerberg (Betzler 1974: 83-84), are known from the nCA (Map 123). These fibula types are common to the Italian peninsula during the 10th and 9th centuries BC, and should be seen as imported objects to these sites north of the Alps (Betzler 1974: 83-84).

Early Iron Age

Increasing numbers of fibulae were circulated to regions north of the Alps from northern Italy during the early Iron Age (HaC-HaD), indicating exchange and communication links between the two regions (Pauli, L 1971; Putz 2011). Occurrence of imported fibula in *Fürstensitze* (e.g. Üetliberg and Châtillon-sur-Glâne), where other imported objects, e.g. Attic ceramics, are also known (Guggisberg 1991), may indicate that these objects were transported via the south of France and the Rhône (see Section 5.3.2). However, the distribution of other fibulae, and Iron Age bronze work vessels (see Sub-section IRON AGE in Section 5.4.2.6), suggests that trans-Alpine routes were also utilized, linking the southern Alpine Golasecca culture to those regions north of the Alps (Pauli, L 1971: Fig. 11). Several *Navicella* fibulae (Figure 56.r) are recorded from north of the Alps (Map 124), though the main distribution of these is in northern Italy during the 8th and 7th centuries BC (Eles Masi 1986: 85-143; Trachsel 2004: 271-74). During the late 7th century BC *Sanguisuga* fibulae (Figure 56.s,t) were manufactured in the north of Italy, particularly at Este and Bologna (Trachsel 2004: 274; Eles Masi 1986: 76-83, 144ff), and several examples are again recorded north of the Alps. The occurrence of *Sanguisuga* fibulae with coral inlay and *Bogen*/*Dragon* fibulae with head discs (Figure 56.u) further attest to communication and exchange links between the two regions (Map 124, Map 125). In northern Italy these fibula are mainly found in burial contexts, often in multiple numbers, and in association with arm-rings, ceramic vessels, and pins (Eles Masi 1986). While *Sanguisuga* and *Navicella* types were associated with female objects, *Schlangen* fibula are found in association with male artefacts in the Golasecca cultural region (Primas 1970: 92-94). Recorded examples from north of the Alps are mainly in burial contexts, though pieces are also known from settlements (e.g. Üetliberg, Châtillon-sur-Glâne, and Montlingerberg (all CH)).

Function and deposition

In purely functional terms the main use of fibulae was to fasten items of clothing, though given the levels of decoration applied, they were also clearly intended to be items of jewellery. During the Iron Age, fibulae were frequently adorned with other items, such as rings and chains on the larger varieties of *Raupen* fibulae (Eles Masi 1986: 44-48; Betzler 1974: no.165;167) and *Navicella* fibulae (Eles Masi 1986: no.1036;1037), or

adorned with amber and glass (Eles Masi 1986: 53, 153). However, the recurrent deposition of fibulae in burials and hoards indicates that there was also a social function to their use. They may have been indicators of gender and identity, with specific types and varieties used by male and female individuals (cf. Primas 1970: 92-94; Schmid-Sikimić 1996: 22; Betzler 1974: 4). The majority (60%) of the fibula listed by Betzler (1974) for southern Germany, Switzerland and Austria are known from burial contexts, with 10% from hoard finds, and the remainder from a combination of settlements, single finds, or unknown context. Yet, of the examples listed for the northern Circum-Alpine region the majority are from lake-dwelling contexts, a likely reflection of the non-recognition of hoards in lake-dwellings in 19th and early 20th century excavations (see Section 1.5), and the *Bogen* fibula from a small hoard at Zug-Sumpf serves to show that they were deposited in such contexts within lake-dwellings. Working on the Rhine-Main region, Hansen (1991) suggested that fibula, and also metal work in general, deposition practices changed over time, with more objects deposited in burials than hoards during the Early and Middle Urnfield (HaA), while the situation was reversed during the Late and Final Urnfield period (HaB). This is a similar situation to that seen in the northern Circum-Alpine region for other objects, for example swords, as has already been detailed (e.g. Sub-section DEPOSITION TRENDS in Section 5.4.1.1).

The *Platten* fibula from Grandson-Corcelettes, possibly placed in a hoard along with a hanging vessel with Nordic style decoration, was deposited in a manner more typical of its native area and use (see Section 7.8) in the north of Europe where this type of fibula is predominantly deposited in hoards (Table 34). The hoard at Grandson-Corcelettes (with at least two Nordic style objects) may represent the personal equipment of a migrant individual disposing of objects in their traditional manner. Alternatively, this hoard could represent the disposal of imported objects by a community member(s) aware of the intended biography and deposition of these pieces, and the fulfilment of that biography despite the spatial separation from the area of production. The probably locally manufactured *Platten* fibula mould from Geoagiu (Romania) illustrates how far single objects of this type may have travelled, and how their meaning could be transferred and translated across significant distances (Bader 1983: 41). Other fibula of the LBA in the northern Circum-Alpine region do not appear to have retained their intended biography (Table 34), with objects typically deposited in burials south of the Alps, such as the *Mörigen/Raupen* fibula, instead found in settlement (possible hoard) contexts. In contrast, Iron Age fibula north of the Alps are found in both burial contexts and in settlements, a transfer of not only the object from south of the Alps (where they are occasionally found in settlements) but also their accepted use and intended biographies.

Table 34: Find contexts for fibula types detailed in text. A = Area; L-D – Lake-Dwelling; L-DH = Lake-dwelling hoard; N/A = Not available.

Type	Settlement	Hoard	Burial	L-D	L-DH	Lake, River	Single find	A, N/A
Bogen	2	1	5	6	1	2		4
Arco Semplice, -Torsion	4	2	75	1				4
Estavayer-le-Lac				5				1
Fontanella			1					
Mörigen	2	1	25	5				12
Platten	1	92	2		1		1	3
Zurich-Wollishofen		1	4	1				
LBA Schlangen	6			1				1
Valais			2					
IA Head Disc	5		16					13
Navicella	1		7					
Sanguisuga	3		68					24
Total	**24**	**97**	**205**	**19**	**2**	**2**	**1**	**62**

Concluding Remarks

The study of Late Bronze Age and Iron Age fibula from the northern Circum-Alpine region has illustrated exchange and communication networks between the north and south of Europe flowing through the area. Some varieties of fibula, such as *Spectacle* fibula of the LBA and EIA, are not recorded from the northern Circum-Alpine region, and their distribution indicates an alternative exchange and communication network between northern and southern Europe (cf. Betzler 1974: Fig. 83; Pydyn 1999: 57, Fig. 72; Pabst 2011). Most fibulae in the northern Circum-Alpine region of the LBA show Italian influence, and may represent imported products (e.g. *Mörigen* type), but some locally manufactured (e.g. *Estavayer-le-Lac* and individual

Bogen type) objects are also possible. Many of these LBA fibulae in the northern Circum-Alpine region are known from lake-settlements or lakes, and not in burial contexts as they are typically found south to the Alps. The similar style of the five *Mörigen* fibulae (from Mörigen) suggests a single manufacturing area (Betzler 1974: 76; Primas 1970: 92). These items may represent a single importing event to the settlement. If the pieces were imported at different times, a greater range in style may be expected due variation between their acquisition times.

During the early Iron Age greater numbers of fibulae travelled from the Italian peninsula to regions north of the Alps, particularly the *Navicella* and *Sanguisuga* types (Putz 2011), where they were deposited in burials more frequently than during the Late Bronze Age. Burial goods found in association with fibulae have been used to suggest different gender associations for fibula types (Primas 1970), providing further indication of the social roles and identities that may have been symbolized through their use.

A single Nordic type *Platten* fibula from a possible hoard at Grandson-Corcelettes, in association with a northern style bronze hanging vessel (Sprockhoff 1966), may represent the personal equipment of an immigrant individual in the settlement. Alternatively, these pieces may show the exchange, through gift or 'trade', of not only physical objects, but also their social symbolism and intended life-trajectory and biography, with deposition by a native of the northern Circum-Alpine region. However, deposition of metal objects in hoards during the LBA (HaB) in the Urnfield area (particularly Germany and Switzerland) is not uncommon, and several *Platten* fibulae from the Rhine-Main region are also known from hoards; in this light the inclusion of the Grandson-Corcelettes fibula in a hoard may be seen as standard local practice for metal work deposition. Yet, fibulae are an uncommon object in the lake-dwelling region and occurrence in hoards even rarer; clearly this specific deposition held some significance.

5.4.2.6: Bronze Vessels

Precious metal vessels, e.g. cups, are known from the end of the Neolithic and Early Bronze Age in northern Europe, such as the gold vessels from Ringlemere (UK), Eschenz (CH), and Lan ar Croaz (FR) (Needham *et al.* 2006: 83-92), and silver cups from northern France (Needham *et al.* 2006: 93-95). Precious metal vessels are exceptional objects, and more information may be observed through the distribution of bronze vessels – cups, bowls, and buckets – that became common across northern Europe during the Middle and Late Bronze Age (Jacob 1995). During the Iron Age, bronze pouring jugs (*Schnabelkannen*) are seen as luxury goods imported to regions north of the Alps from Etruscan communities in central Italy (Vorlauf 1997). Over 400 vessels of various recognized types from the LBA and EIA contexts in central and eastern Europe and the Italian peninsula are discussed here.

Late Bronze Age

The distribution of several Late Bronze Age metal vessels – *Jenišovice* and *Fuchsstadt* cups - was detailed by Thrane (1965, 1976), and expanded upon and updated by numerous authors for different areas of Europe in the PBF series. Bronze vessels were manufactured from single or multiple sections of bronze plate, hammered and beaten to the desired shape. Styles of decoration and motifs, applied to some of these vessels, have been used to suggest regional manufacturing locations, and exchange and communication networks from their distribution. In addition to cups, bronze buckets – *Hajdúböszörmény* and *Veio-Gevelinghausen-Seddin* type – are found in contexts from both the Late Bronze Age and early Iron Age (Schumacher-Matthäus 2008; Patay and Petres 1990; Prüssing, G 1991), indicating a continuation of use and style across the two periods.

Zoned bowls

A group of bronze vessels, simply termed as *zweizonen-*, *dreizonen-*, and *mehrzonenbecken* depending upon their shape (Sprockhoff and Höckmann 1979), relating to the final period of LBA (HaB3) are common in northern Europe (Map 126). These are round bottomed, plate work bowls with a pair of vertical handles on the rim, enabling the vessels to be suspended, and have been termed both 'hanging vessels' and 'belt boxes'. The distribution of these vessels is primarily in northern Europe (Denmark, northern Germany), with outlying instances in southern Germany (Kaiserslautern), central France (Petit Villatte) and Switzerland (Grandson-Corcelettes). The decoration on the examples from Grandson-Corcelettes and Magleby Nørrekjaer (DK) provides an indication of social connections between the two regions. On the Grandson-Corcelettes example, wave-like motifs are seen on the underside of the vessel (Figure 57.b), a decoration form typical of Late Bronze Age material from Denmark, e.g. the Magleby Nørrekjaer bowl (Sprockhoff and Höckmann 1979: 19, 116; Thrane 1975). Furthermore, on the side of the Magleby Nørrekjaer bowl decoration occurs in the form of spiral bands typical of the northern Circum-Alpine region (Figure 57.a), where they are found on objects (e.g. spearheads) during the Late Urnfield (HaB2) period (Tarot 2000: Plate 12).

Cups: Fuchsstadt & Jenišovice

The *Fuchsstadt* (Figure 57.c) and *Jenišovice* (Figure 57.d) cups are relatively similar in form, these are sheet-work bronze cups with single attached handles, and in the *Jenišovice* cups decorated with punched dots (Thrane 1965, 1976). The main difference between the two types is the body form of the vessel, with *Fuchsstadt* being undecorated, squatter and with a rounded body, while *Jenišovice* have flatter body walls with an angular shoulder (Martin 2009: 53, 63). The *Fuchsstadt* cup (HaA2-HaB1) is often seen as an intermediary stage between the earlier *Friedrichsruhe* cup (BzD-HaA2) and the later *Jenišovice* cup (HaB1-HaB3) (cf. Martin 2009: 46-52, 58-59, 66-72).

The *Fuchsstadt* type cups are predominantly distributed in southern Germany, with some spread into northern Germany, Denmark, France, Poland and the Carpathian Basin (Map 127). Two cups of this type are known from the lake-dwelling region at Bevaix (Lake Neuchâtel, CH) and Mörigen (Lake Biel, CH) (Martin 2009: 168). When comparing the distribution of *Jenišovice* and *Fuchsstadt* cups it is evident that there is an element of exclusion in their area of circulation – particularly with reference to southern Germany.

Bronze cups of the *Jenišovice* type are distributed across central Europe from the Carpathian basin to northern Germany, Denmark and France. Few examples are recorded from southern Germany (Patay and Petres 1990: 63), though some are known from Switzerland, particularly around lake Neuchâtel, and in Austria (Map 128). Thrane (1975, 1965) defined four variants of this cup based upon their base, decoration, and handle form, and noted that the primary distribution of variants 1 and 2 was in the Circum-Alpine region. This distribution was also noted by Patay (1990: 63-64), in that most of the *Jenišovice* cups from the Carpathian Basin are decorated, while those from Switzerland and Denmark are frequently un-decorated or without handle buckle. Thus, two separate manufacturing zones, one in the Carpathian basin and the other in Denmark or the Circum-Alpine region have been suggested (Thrane 1975: 137; Patay and Petres 1990: 63-64; Martin 2009). Archaeometric analysis of *Jenišovice* cups from Grandson-Corcelettes and Onnens indicated that these vessels were manufactured from a regional variety of bronze alloy, and were unlikely to have been imported objects (Rychner and Kläntschi 1995: no.743-744).

From the lake-settlement Zurich-Alpenquai a further fragment of bronze vessel of un-typed form, possibly a cup, is known (Mäder 2001a: Plate 44.4). The vessel shows good comparisons to objects from Grandson-Corcelettes and Onnens, and probably relates to the Late Urnfield period (HaB1) (Mäder 2001a: 45).

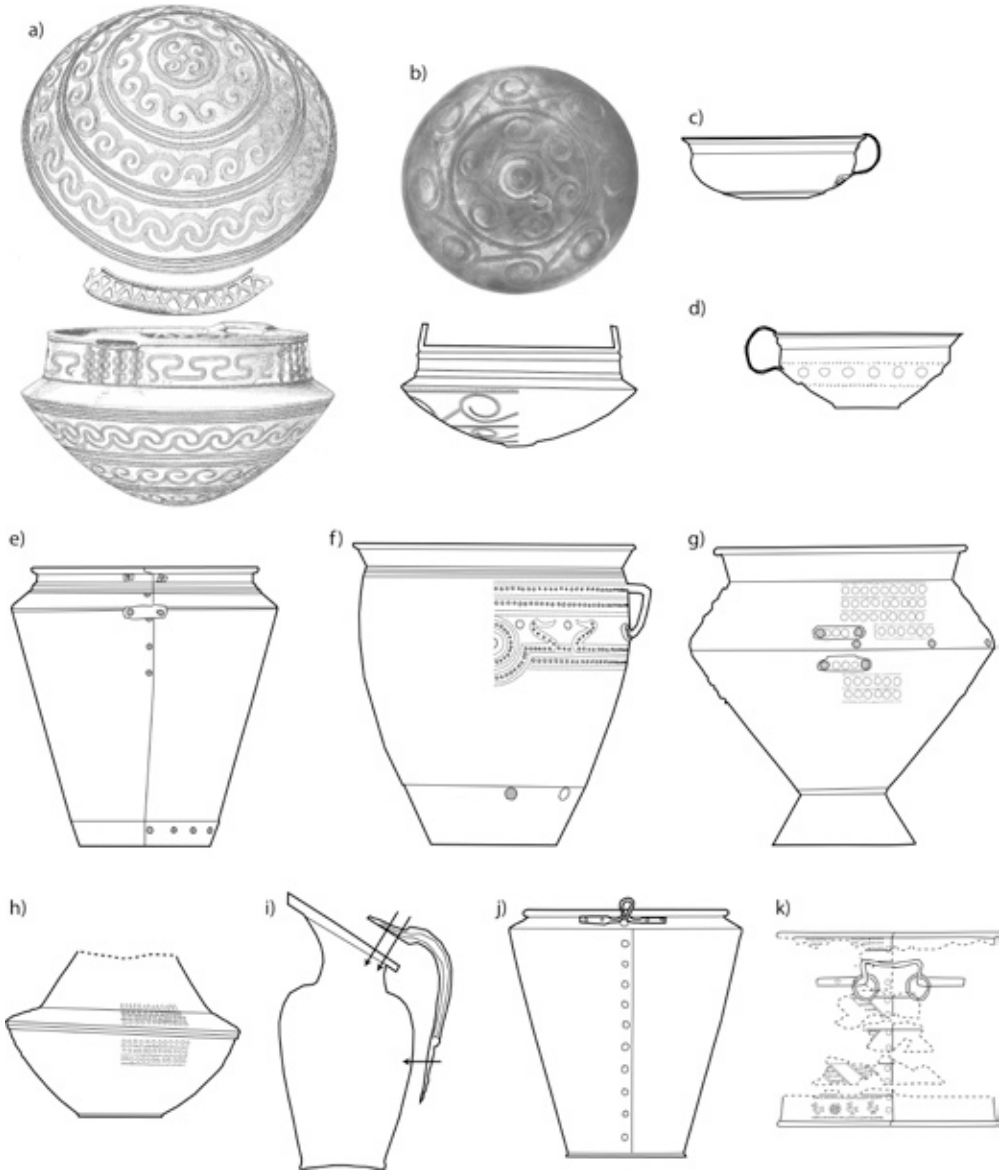

Figure 57: Late Bronze Age and early Iron Age bronze vessels. *Late Bronze Age:* a) Mehrzonenbecken [Magleby Nørrekjaer]; b) Zweizonenbecken [Grandson-Corcelettes]; c) Fuchsstadt [Braunsbedra] d) Jenišovice [Grandson-Corcelettes]; *Late Bronze Age and early Iron Age:* e) Kurd [Aichach]; f) Hajdúböszörmény [Granzin]; g) Veio-Gevelinghausen-Seddin [Seddin]; h) Amphora [Bullenheimerberg]; *Iron Age:* i) Schnabelkannen [schematic]; j) Rheinischen [Bell]; k) Cistern [Tannheim] (after: a, b) Sprockhoff and Höckmann 1979: Fig. 204, 324; c, f, g) Martin 2009: 60, 134, 138; d) Thrane 1965: Fig. 8e; e, j, k) Jacob 1995: 307, 324, 390; h) Hagl 2008: Fig 19; l) Vorlauf 1997: Fig. 16). Deocration illustrated in representative areas.

Table 35: Find contexts of 'hanging vessels' or 'belt boxes'. L-D = Lake-dwelling; N/A = Not available.

Form	Hoard(?)	Area	Burial/Hoard	Burial	L-D	Moor	Burial?	Lake	N/A	Total
Zweizonen	3(5)	5	3	8	2	5			2	28(33)
Dreizonen						1	2	1		4
Mehrzonen				1		2				3
Hanging	1									1
Total	**4(9)**	**5**	**3**	**9**	**2**	**8**	**2**	**1**	**2**	**36(5)**

Table 36: Find contexts for Fuchsstadt, Nádudvar and Jenišovice type cups. L-D = Lake-Dwelling; N/A = Not available; Sgl = Single find; N/A = Not available.

Type	Hoard(?)	Area	Burial/Hoard	Burial	L-D	Moor	Burial?	River	Lake	Sgl	N/A
Fuchsstadt	28(1)			20						2	19
Nádudvar	3										
Jenišovice	14			7	1			1			1
Jenišovice 1	29	1		2	2						8
Jenišovice 2	8			1						1	8
Other					3						
Total	**82(83)**	**1**		**30**	**6**			**1**		**3**	**36**

Situla: Kurd & Reiseneimer

Kurd type situla (Figure 57.e), as defined by von Merhart (1952), are conical bronze vessels made from several bronze sheets riveted together, varying in size with early objects smaller than the later ones (Patay and Petres 1990; Merhart 1952: 29; Jacob 1995: 98). Similar objects have also been listed under the term *Reiseneimer* (literally 'travelling buckets'). In terms of dating, the type covers the LBA (HaA-HaB), though examples which date to the early Iron Age are also recorded here. This may be due to the inclusion of old material in deposits (e.g. Žbince (Novotná 1991: 57)), uncertain dating of contexts, or the difficulty of identifying vessel types from fragmentary remains. The distribution of the type covers central Europe, from the Danubian region and Carpathian basin (Map 129, Map 132), where they originated from (Borgna 1996: 153), to southern Germany, Switzerland, and northern Italy (Prüssing, G 1991: 52), where they may have been locally manufactured (Borgna 1996: 153).

Situla: Hajdúböszörmény

The *Hajdúböszörmény* type metal situla (Figure 57.f) is the stylistic and temporal successor of the *Kurd* type (Martin 2009: 99). The vessel is differentiated from the earlier *Kurd* type by wall, shoulder ribbing, and size - the *Kurd* type being smaller (Martin 2009: 97, 99; Merhart 1952: 33). Typical decoration on the vessels includes the sun-bird-boat combination, punched from the inside of the vessel (Novotná 1991: 58). The main distribution of this situla ranges from the Carpathian basin to northern Germany, Denmark, and the Po Plain (Map 130) during the Late and Final Urnfield periods (HaB1-HaB3). Handle fragments from Zurich-Wollishofen may be remains of a *Hajdúböszörmény* type bucket or part of a *Kurd* type vessel (Merhart 1969; Primas 1990b, 2004). No other finds are recorded from the northern Circum-Alpine region. These vessels are believed to have been manufactured in the Carpathian basin, given their main distribution in that region, and exported to other areas, though local manufacture or secondary working may also have occurred in other locations, for example one of the vessels from Granzin (D) (Martin 2009: 101; Novotná 1991: 59).

Amphora: Veio-Gevelinghausen-Seddin

Richly decorated bronze amphora of the *Veio-Gevelinghausen-Seddin* type (Figure 57.g) form a small corpus of objects dating to the Late Bronze Age (HaB2-HaB3) and early Iron Age (HaC). Similar to the situla types, they are made from several sheets of bronze riveted together, in this case to form a bi-conical amphora, and decorated with punch dots (Jockenhövel 1974a). These vessels are mainly distributed across northern Germany, Denmark, and Poland, but examples are also known from the Carpathian Basin, and central Italy (Map 130). Some of these vessels from north of the Alps may have been imported from Italy (Von Hase 1989), or locally manufactured in the north, e.g. the Herzberg example (Martin 2009: 104). None are known from the northern Circum-Alpine region. A group of vessels simply termed as "drinking vessels" (Schumacher-Matthäus 2008) from sites in central Italy (Como Ca'Morta, Colognola ai Colli, Pizzo Pede - Narce), the Czech Republic (Hostomice) and Romania (Buza), are found in association with *Veio-Gevelinghausen-Seddin* amphora at Hostomice and Colognola ai Colli.

From the hoard at Seinsheim-Bullenheimerberg (D), a bronze amphora was used as a container for the objects of hoard F-K1 (Hagl 2008: 131) has decoration similar to the punched dots and circles typical of a *Veio-Gevelinghausen-Seddin* vessel (e.g. Seddin) (Hagl 2008: 107-08). The vessel is of an unusual nature, but is dated to the Final Urnfield period (HaB3) by the objects contained within the hoard.

Table 37: Find contexts for Kurd, Hajdúböszörmény, and Veio-Gevelinghausen-Seddin type vessels. A = Area; B = Burial; H = Hoard; L-D = Lake-Dwelling; N/A = Not available; S = Inland settlement; (?) = possible classification.

Type	H(?)	B/H	B (?)	L-D	Moor	Single find	River	Lake	S	Cave	A	N/A
Hajdúböszörmény	10(1)		3(10)	1		1						9
Kurd	9		10(1)	2						2	1	14
Veio-Gevelinghausen-Seddin	2		3(2)		1				1		1	
Total	**21(22)**		**16(13)**	**3**	**1**	**1**			**1**	**2**	**2**	**23**

Iron Age

A range of bronze vessels were used and circulated during the early and later Iron Age, one of the most well-known forms of which are the Etruscan *Schnabelkannen*. However, there are other forms which show continuation of the Late Bronze Age vessels, for example various *Kurds* and buckets, and were manufactured north of the Alps, e.g. *Rheinischen* situla. Furthermore, unique objects also demonstrate connections between Europe north of the Alps and the central Mediterranean, for example the well documented Hydria from Grächwil (Bern): an imported Greek type vessel probably dating to 580-570 BC (cf. Kaenel 2005).

Schnabelkannen

The bronze *Schnabelkannen* (pouring jug (Figure 57.i)) spread northwards from the Etruscan area of central Italy during the Iron Age, particularly from the late HaC and HaD (6th century BC) periods (Vorlauf 1997). Of the *Schnabelkannen* charted here, the vast majority are known from burial contexts in the Italian peninsula, with numerous examples from the central Rhine valley of western Germany, and rarer instances in east Germany, central France, and Switzerland (Map 131). These vessels are typical of the Etruscan culture of central Italy, and were exported from there to communities north of the Alps, though utilising a different route to that suggested for the Attic pottery (see Section 5.3.2), which mainly entered central Europe from the south of France (Guggisberg 2011; Wells 1980). Distribution of the bronze jugs clearly indicates a trans-Alpine route, crossing through to southern Switzerland, creating a small cluster of vessels in the western Po Plain and around Arbedo (CH), and continuing north along the Alpine river valleys. However, no examples are recorded from the former lake-dwelling areas of the northern Circum-Alpine region.

In addition to the bronze *Schnabelkannen*, several instances of emulative clay vessels are known, from the Po Plain, Austria, eastern Germany, and the Rhine valley (Map 131). These vessels are not exclusive to areas where bronze *Schnabelkannen* were unavailable, and are known from sites which have 'original' vessels, such as the Dürrnberg (D), Como Ca'Morta (IT), and Arbedo-Cerinasca (CH). The creation and utilisation of clay *Schnabelkannen* may have been an attempt to continue the utilisation of *Schnabelkannen* at periods when they were unavailable, or by individuals who were unable to procure them as a result of exclusion from circulation networks or insufficient status. The occurrence of clay *Schnabelkannen* fragments, but no 'original' bronze vessels, and the presence of Attic ceramics at the Heuneburg (D) *Fürstensitz* may provide an indication of emulation due to the utilization of different exchange and circulation networks.

Table 38: Find contexts for Iron Age bronze vessel types. B = Burial; H = Hoard; N/A = Not available.

Type	B(?)	H	Settlement	B/H	Single find	Cemetery	River	Area	N/A
Schnabelkannen	157(8)	1		1	13				16
Clay Schnabelkannen	5(1)		1						8
Situla	4	1							
Rheinischen Situla	34		1		4	1	2		2
Cistern	62	2(2)	1	1	1				8
Total	**262(9)**	**4(2)**	**3**	**2**	**18**	**1**	**2**		**34**

Buckets

Bronze situla of the Iron Age (HaC) with shoulder ribbing are known from southern and western Germany, from burials and hoards (Martin 2009: 106-07; Jacob 1995: 104-05). A 'decorated' bronze vessel from Choryń (PL) relating to the Iron Age (HaC-HaD), found in a hoard along with *Kurd* vessel indicates continued use of multiple bronze vessels in hoard deposition in the area of Poland during this period.

The so-called *Rheinischen* situla (Jacob 1995: 105; Drack 1977: 103), with iron inlay/attachments around the rim of the vessel, are distributed primarily in the Rhine valley of western Germany and southern Germany (Map 132), and several examples are recorded from north-eastern Switzerland (Drack 1977). The majority of these vessels are known from burial contexts, with two examples from the Heuneburg (D) fortified settlement, and several dredged from rivers (e.g. the Rhine). Where included in burials, these vessels frequently appear as the single metal vessel in the assemblage, with wooden and ceramic cups and bowls (Jacob 1995: 110).

Cistern

Iron Age fixed handle cisterns are known from central Europe (Map 132) in Late Hallstatt (HaD) and Early La Tène (LTA) contexts, particularly southern Germany, and also at Urtenen (CH), and from Poland and Austria, but their main distribution is in central Italy (Stjernquist 1967: Karte 1). Similar flat bottomed, ribbed wall, vessels with swing handles attached to the top (instead of fixed handles on the side) are more common, and are known from across central Europe (Jacob 1995: 113-19; Martin 2009: 107; Kytlicová 1991: 117; Stjernquist 1967), though not from the nCA. These vessels are almost exclusively known from burials (particularly in Italy), with, apart from Appiano and San Maurizio, hoard and settlement finds appearing in Europe north of the Alps. Objects associated with these vessels frequently include multiple fibula, iron swords and spearheads (in Italy), arm and neck jewellery, and bronze vessels (outside of Italy). They may have formed a drinking service consisting of two large vessels, two open bowls and two cups, as seen at Tannheim (Jacob 1995: 120).

Deposition

Different deposition practices for bronze vessels can be seen between the Late Bronze Age and early Iron Age, reflecting contrasting utilisation of the objects during these time periods. Regional variations may also be seen in the deposition of individual types, particularly during the LBA. Concerning vessels from the northern Circum-Alpine region, these are mainly known from lake-dwellings and lack specific contextual information, making consideration of their deposition difficult.

LBA zoned bowls

Zoned bowls are known from burial contexts and hoards (Table 35), with some from lake-dwellings of the northern Circum-Alpine region. Associated objects with these bowls include work equipment, such as chisels and awls, occasionally spearheads, and frequently arm and neck rings (Sprockhoff and Höckmann 1979). One of the examples from Grandson-Corcelettes was found with a spearhead, a *Balingen* type arm-ring, two winged axes, a richly decorated arm-ring, and ceramic sherds (Sprockhoff and Höckmann 1979: no.434). The inclusion of broken fragments in the large hoard from Petit Villatte (Cordier and Bourhis 1996) suggests these vessels were deposited in both 'founders' and social/votive hoards.

LBA cups

The *Fuchsstadt* and *Jenišovice* cups from central Europe are known, predominantly, from hoards (and burials for *Fuchsstadt*), with very few from settlements (Table 36). In fact, the only cups recorded from settlements are those from the lake-dwellings of the northern Circum-Alpine region, where metal vessels of other types also occur. When included in burials, particularly of the Early and Middle Urnfield period (HaA-HaB1), cups often occur as single items with few other bronze vessels (Martin 2009: 136-53), though the rich, HaB3 period, 'Königsgrab' at Seddin is an exception (Martin 2009). In contrast, when included in hoards, bronze cups are frequently present in multiple numbers, for instance from Dötzingen (4 examples), Štramberk (12), and Jenišovice (14). Associated objects in hoards, such as weapons, fibula, small rings and knobs, but few arm-/neck-rings, suggest both female and male associations with the cups (Kytlicová 1991: 47-55). Where included in burials, the cups may represent the individual equipment of the entombed (typically male by associated objects) person; multiple deposition in hoards may illustrate the collective, communal, deposition of drinking equipment at a social prescribed event in which numerous individuals partook (Martin 2009: 139-40). Where the finds from lake-dwellings fit into this depositional pattern is unclear. Single and multiple cups are known from the same settlement, e.g. Zurich-Alpenquai (2 *Jenišovice*) and Bevaix (1 *Fuchsstadt*), but they lack information regarding associated objects.

LBA situla & amphora

Bronze situla of the LBA are recorded mostly from hoards, some from burials, and very few from settlement (lake-dwelling) contexts (Table 37). In both hoards and burials, the vessels are frequently found with single/multiple cups, sieves and ladles, indicating that they formed part of a drinking service (Martin 2009: 97, 100; Jacob 1995). The deposition of vessels in burials may have indicated the social status of the individual: that they had sufficient rank and resources to utilize such objects. Alternatively, through deposition in hoards multiple pieces may have reflected the social gathering

of several individuals at a consumption or other symbolic event (cf. Fredengren 2011). The fragmentary remains of *Kurd* and *Hajdúböszörmény* type situla from Zurich-Wollishofen may be an indication of the retention and circulation of fragmentary pieces of metalwork as a 'proto-currency', in a similar manner to the circulation of fragmentary sickles (cf. Primas 1986, 1990b: 87).

Veio-Gevelinghausen-Seddin type amphorae are known from both burial and hoard contexts, but the low number of these vessels recorded makes further elaboration difficult. However, decoration on both this amphora, and the *Hajdúböszörmény* type situla, includes the sun-bird-boat motif, indicating an increasingly symbolic and 'ritual' function for the vessels (e.g. vessels in Martin 2009; Novotná 1991; Jacob 1995). This function has been suggested as being related to annual solar and lunar cycles, based upon the number of large and small punched dots used to decorate the vessel (cf. Martin 2009: 103; Hagl 2008: 109; Schumacher-Matthäus 2008).

Early Iron Age

Considering all of the Iron Age (HaC-LTA) vessels mapped in this study, the vast majority of them are known from burial contexts (Table 38), in both the Italian peninsula and central Europe. Few vessels or fragments are known from settlement contexts, one exception being the fragments of clay *Schnabelkannen*, handled cistern, and *Rheinischen* situla from the Heuneburg. The inclusion of bronze vessels in burials (particularly male judging by the inclusion of weapons) during the Iron Age expands the practice seen in the LBA, at the expense of deposition in hoards, and represents the increasing elite and status symbolism associated with consumption practices. Deposition in burials provides greater emphasis on the status of the individual than does the communal deposition in hoards (e.g. Náklo), and represents the ability of the entombed to host drinking parties and, later *Symposia*, or their control of cultic practices (Stjernquist 1967: 122-27, 37). In regions north of the Alps the use, and display, of these vessels would also have symbolized the communication networks of elites and their ability to procure and control the movement of 'foreign' materials (Prüssing, G 1991: 5).

Function and symbolism

The function of bronze cups, bowls, situla, and jugs is widely acknowledged, and somewhat self-evident, to have been in the containing and serving of beverages (Martin 2009: 106). On the other hand, the purpose of such consumption practices is more difficult to ascertain. The decoration on many of the LBA and EIA vessels, comprising the sun-bird-boat motif suggests a ritualized function, potentially with funeral ceremonies (Hagl 2008: 108; Patay and Petres 1990: 16; Martin 2009: 140). The inclusion of bronze vessels in LBA-EIA burials may provide an indication of the entombed person's social status, reflecting their ability to host drinking events and the consumption of alcohol (Prüssing, G 1991: 5; Venclová 2006; Borgna 1996).

During the LBA, bronze vessels are known from burials, and, primarily, in hoards. The symbolism associated with deposition in hoard contexts would have differed from their deposition in burials, reflecting communal practices and multiple individuals through the collection of many cups together (cf. Fredengren 2011). Decoration of bronze serving vessels, particularly amphorae and situla such as those from Bullenheimerberg (D) and Seddin ((D) with a series of punched dots) has been interpreted as the utilisation of these vessels as a 'calendar' (Hagl 2008: 109). The deposition of these calendric vessels in hoards may have formed part of their utilisation and ceremonial use.

In hoards and burials, of both the LBA and EIA, weapons were frequently included with the bronze vessels, indicating a possible male association (Patay and Petres 1990: 16; Stjernquist 1967: 126). In burials these represent the personal equipment of the individual, but in hoards, e.g. Hajdúböszörmény (HU), multiple weapons (in excess of 20 swords) suggest that many individuals are again represented. Such practices may indicate deposition following social acts involving multiple members of a community (cf. Fredengren 2011).

Concluding remarks

The study of selected Late Bronze Age and Iron Age bronze vessels illustrates some of the social connections in which communities of the northern Circum-Alpine region, and central Europe, were involved. Cups, buckets, and bowls of the LBA illustrate that lake-dwellings north of the Alps utilized exchange networks to central and northern Europe, particularly the hanging vessels from Grandson-Corcelettes and the situla from Zurich-Wollishofen. During the Iron Age there are some bronze vessels from the northern Circum-Alpine region (Drack 1977), but they are found in few numbers when compared to Italic/Etruscan imports in central Europe, as indicated by the *Schnabelkannen* and handled cisterns, and other vessel types not detailed here, such as *Perlrandschalen* (Frey 1991; Bartoloni *et al.* 2000; Putz 2011; Roymans 1991).

Deposition practices of bronze vessels change between the LBA and IA in that more hoard depositions occurred during the LBA, and more burials in the IA. Such evolution may be connected to the increasing individualisation and hierarchisation of society during the Iron Age, as represented through the occurrence of wagon burials, *Fürstensitze* and *Fürstengraben*, and would represent the status of the entombed individuals (Vorlauf 1997; Novotná 1991: 58; Wells 1998). Vessels of

the Iron Age from the northern Circum-Alpine region comply with this deposition model (Drack 1977). The LBA deposition in hoards appears to depict communal deposition, not only through the placement of multiple cups, but also through associated objects, such as weapons and arm-rings, deposited in many numbers.

Late Bronze Age metal cups from the northern Circum-Alpine region are mainly from lake-dwelling sites, and lack information regarding associated objects and reliable context. A hanging vessel from Grandson-Corcelettes was found in association with a spear head, *Platten* fibula, arm-rings and ceramic sherds (Sprockhoff and Höckmann 1979: no.434; Fischer, V 2005) and may represent deposition in hoard or burials, for which little information is known from the lake-dwelling communities.

5.4.2.7: Horse gear

Archaeozoological evidence indicates that domesticated horses were present in settlements of the late Neolithic in both eastern and eastern Switzerland (Schibler and Studer 1998: 176). Findings of horse bridal gear from Early (e.g. Schönholzerswilen and Toos-Waldi (Bürgi 1982; Lanzrein 2009) and Late Bronze Age settlements (see below) provides clear indication of the utilisation of horses for riding and traction during the Bronze Age. Further indications for the use of horses for traction in the northern Circum-Alpine region is provided by the inclusion of wagons in burials from the beginning of the Late Bronze Age (BzD period), for example at Kirchenfeld (Bern) and St-Sulpice (Vaud) (Hochuli and Maise 1998: 301-03), and horses drawing wagons have been identified in rock art from the southern side of the Alps in Valcamonica (IT) (Anati 1994: 167). However, carts and wagons are not evidence of the use of only horses for traction: cattle were also used, as also shown by their depiction in rock art from Valcamonica (Anati 1994: 127). Horse gear finds do not provide a direct indication as to how horses were used, but their form and deposition contexts may suggest the social status of horse ownership, cultural connections, and the changing value of horses over time.

Late Bronze Age and early Iron Age horse gear

Horse gear types of the LBA and EIA, relevant to the Circum-Alpine region, can be divided into two broad categories: those of antler and those of metal. These two groups of horse gear can be further divided into various types according to their shape, e.g. bar; half-moon; angled; and horse shaped. Antler and metal bits were in contemporary use, and in Italy both bronze and iron bits are found in similar forms from the EIA (HaB north of the Alps) onwards. Variants of horse gear are named, as are many other types of material culture, after sites where they were first discovered, and so several from the northern Circum-Alpine region are named after lake-dwellings, for example the *Mörigen* and *Auvernier* types. Similar attributions are seen in many of the pieces from Italy, for instance the various *Bologna* types. Such titles do not assert that those pieces were manufactured at the site from which they take their name. In fact, manufacture of antler horse gear would leave little remains other than half-fabricated objects (e.g. Böheimkirchen (AT) and Füzesabony (HU) (Hüttel 1981: 106)), and no moulds for bronze pieces are so far known from the Circum-Alpine region (though an example is known from Ukraine (Dietz 1998: 196)).

Antler horse gear

Four types of antler bits relevant to the northern Circum-Alpine region are considered, *Spiš*, *Auvernier*, *Mörigen* (Hüttel 1981) and *Type 12* (Dietz 1998). While other antler piece variants are known, these groups are distributed within the Circum-Alpine region. Except for type *Spiš* (EBA-MBA), the variants relate to the Late Bronze Age and early Iron Age(HaB-HaC).

Table 39: Find contexts for LBA antler horse gear pieces. HS = 'Highland' settlement; L-D = Lake-dwelling; N/A = Not available; Sgl = Single find.

Type	Quantity	Burial	Hoard	L-D	Sgl	Moor/Lake	HS	Settlement	N/A
Spiš	19						3	15	1
Auvernier	6			6					
Mörigen	36	1	3	13	1	2	12	4	
Type 12	3	2						1	
Total	**64**	**3**	**3**	**19**	**1**	**2**	**15**	**20**	**1**

Spiš

The *Spiš* type of cheek pieces (Figure 58.c) can be subdivided into several varieties, such as -*Tószeg* and -*Tei* (Hüttel 1981: 82), though all share a common bar form, being partially curved due to the shape of their parent antler, with large oval borings in the middle section of the piece to allow for attachment to the rest of the bridle. In terms of distribution (Map 133) the majority of this type are known from the Carpathian Basin (Hüttel 1981), Slovakia, the Czech Republic, Hungary, and Ukraine (for references Bąk 1992: 203) with three instances in southern Poland (Bąk 1992), and a single example from the EBA/MBA settlement at Toos-Waldi (CH (Lanzrein 2009: 58-59)). Several instances of antler pieces from Italy show some similarities to the Spiš type (Hüttel 1981: 183), though are not classified as such (here listed *Spiš?*). These pieces may show influence of the communities of the Carpathian/Danubian region in the style of horse gear in use in Italy during the Early Bronze Age.

Auvernier

The *Auvernier* type gear (Figure 58.a) utilizes the shape of their parent material, and has three borings to allow the attachment of the rest of the horse gear (Hüttel 1981: 122-23). All of the six examples of this type are

from the lake-dwellings of western Switzerland (Map 134) dating to the Middle and Late Urnfield period (HaA-HaB). However, similar forms of horse gear are known across a large area, for instance in the *terramare* region of northern Italy (Peroni 1997: 665; Hüttel 1981: 185 - IC), in the United Kingdom, and in the Balkan peninsula (Hüttel 1981: 123).

Mörigen

The *Mörigen* type cheek piece (Hüttel 1981: 117-21), again curved due to the shape of the parent antler, has borings in two planes, to allow for the attachment of the horse bit and rest of the bridal gear (Figure 58.b). Although distribution of the pieces in central Europe extends from Hungary to Denmark and northern England (Map 133), they are most commonly found in the northern Circum-Alpine region (Map 134). The majority of these pieces are known from settlements, both lake-dwellings and inland settlements, with few from burials or hoards. Dating evidence from settlement finds suggests that these pieces belong to the HaB period, and particularly HaB3 in the Circum-Alpine region (e.g. Mörigen), and also in the EIA (HaC) in southern Germany (Legenfeld (Kossack 1954: 151). Although most of these pieces are known from settlements, and hence lack the same level of material association that can be identified in burials and hoards, paired examples (thus representing the two cheek-pieces of a single bridal) are known from Grandson-Corcelettes and Mörigen (Hüttel 1981: 118).

Type 12

Cheek pieces of Dietz's type *12* (Dietz 1998: 156-57) show similarities to Huttel's *Mörigen* type (Figure 58.d). Three examples are recorded from the Black Sea and Caucasus region (Map 133), two from a burial (Čečelievka, UA) and one from a settlement at Zmejskoe (RU) (Dietz 1998: 156). Comparable pieces, and thus also comparable to the *Mörigen* type, are known from a broad area, including central Asia and China (Dietz 1998: 157), relating to the late 2nd and early 1st millennium BC.

Metal horse gear

Metal bridal equipment of the LBA and EIA is again divided into various sub-types dependent upon their form. Horse equipment from the Italian peninsula is found in both iron and bronze, though the metal used does not provide a significant distinction between equipment types, as some are found in both bronze and iron (e.g. *Horse-shaped Veji)*. However, some types are known either in iron or bronze (e.g. *Half-moon Bologna* [iron] and *Half-moon Romagnoli* [bronze]), but these are not numerous and thus definition based on material must be treated with caution.

Horse shaped

Late Bronze Age and early Iron Age bridal pieces with horse form decoration are largely known from the Italian peninsula (Map 135), with a single example north of the Alps from Zurich-Alpenquai (Mäder 2001a: 45). Examples from Italy can be divided into sub-variants dependent upon form and decoration (Von Hase 1969: 6-15). Variants considered here are *Veji*, *Bologna*, *Vetulonia*, *Volterra*, and *Cerveteri* (Figure 59).

The *Veji* type is the most numerous variant, with Hase listing 24 examples (Von Hase 1969: 6-10), of which 23 are mapped (location of the final piece unknown). Predominantly found in burial contexts, typological dating of associated grave goods places these pieces in the Italian EIA (Phase Bologna II, IA II-III; HaB3), and are spatially confined to the Villanovan culture in central Italy, with outlying examples at Vadena/Pfatten in the southern Alps, Bologna north of the Apennines, and Tolentino in the east.

Only three examples of the *Bologna* type are recorded (Von Hase 1969: 10-11) – all known from burials in the locality of Bologna, and again dating to the EIA (Bologna II / HaB3). The *Cerveteri* type is also represented by three examples, dating to the EIA (Von Hase 1969: 14-15), and localized to western central Italy. Between four and seven instances of the *Vetulonia* type equipment were recorded by von Hase (1969: 11), one of which has a find location simply listed as 'Italy'. Fragments of this type found from the Piazza San Francesco hoard (Bologna) represent a minimum of two pieces, but possibly four. The remaining two examples are from a burial in Vetulonia, which again, relate to the Italian EIA (Bologna II-III/HaB-HaC).

Although 18 examples of the *Volterra* type were recorded by von Hase (1969: 11-14), only 12 examples have defined find locations and contexts. These 12 examples are mostly from the Villanovan culture region of western central Italy, though isolated examples are also known from north and east of the Apennines. Objects associated with this type (where included in burials), indicates they were in use during the phases II and III of the Italian EIA (HaB-HaC).

Associated goods, for example weapons, bronze vessels and jewellery, included with each of these horse gear variants suggest that the equipment was included in both male and female burials. Horses were not only associated with male identities during the early Iron Age of central Italy, but also female; however, in all cases horse equipment was still reserved for the burials of high status individuals (Dore 2004; Von Hase 1969).

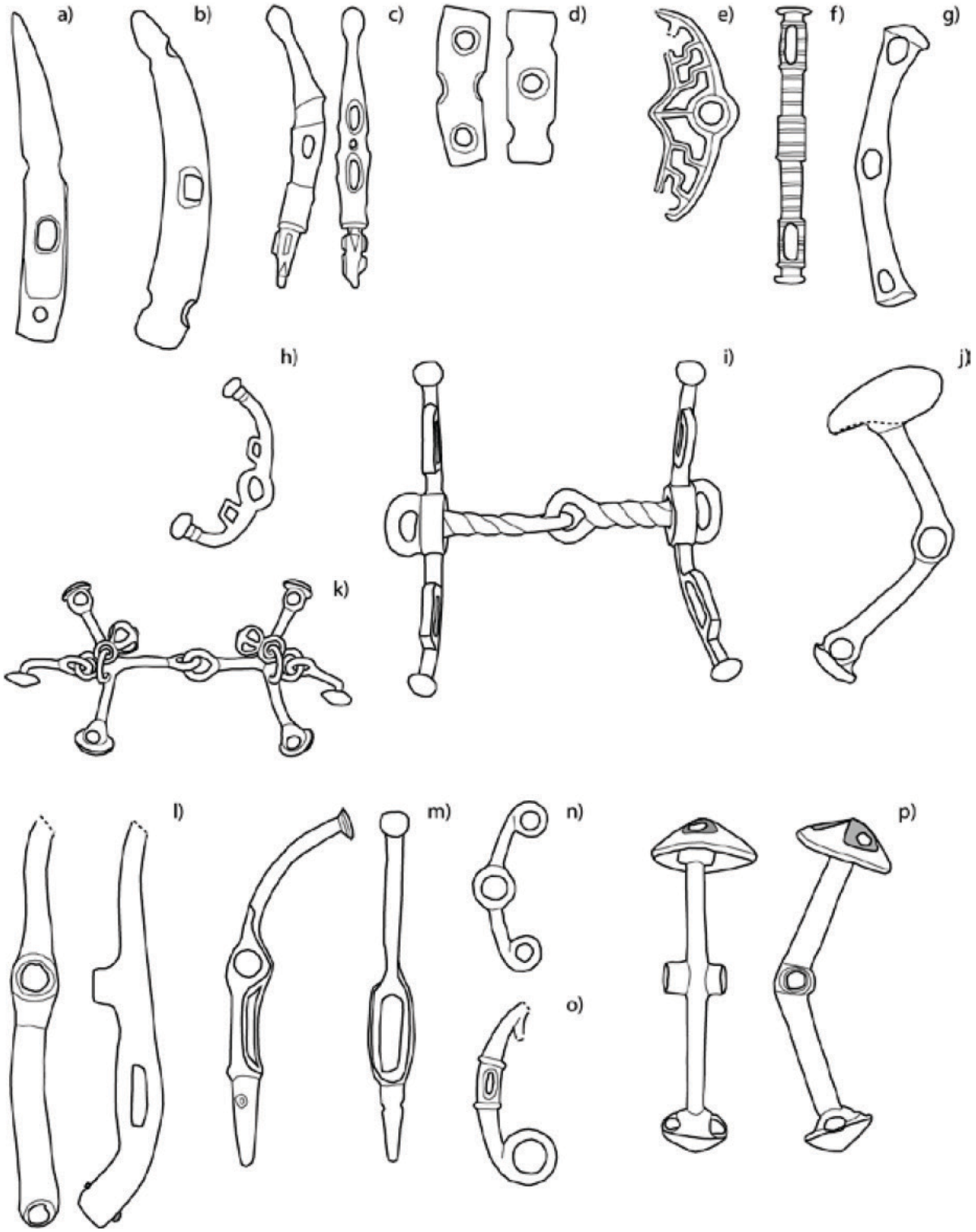

Figure 58: Late Bronze Age horse gear types from central Europe. a) Auvernier type [Auvernier]; b) Mörigen [Mörigen]; c) Spiš [Spišsky Štvrtok]; d) Type 12 [Čečelievka]; e) Halbmond Romagnoli [Bologna]; f) Stangenknebel Estavayer [Estavayer le Lac]; g) Type 8b [Koban]; h) Bogenknebel Bologna; i) Stangenknebel Corcelettes [Mörigen]; j) Type 10 [Seržen'-Jurt]; k) Angled [Zurich-Alpenquai] l) Mengen Kaisten [Königsbronn]; m) Larnaud Bevtofte [Bevtofte]; n) Halbmond Bologna [Bologna]; o) Brillen Mörigen [Mörigen]; p) Angled [Runden-Burg] (re-drawn from: a, b, c, f, l, l, m, o) Hüttel 1981: 166, 142, 72, 237, 245, 182, 211, 228; d, g, j) Dietz 1998: 611, 559, 588; e, h, n) von Hase 1969: 151; k) Mäder 2001: 43.6; p) Kluge 1986: Fig. 2).

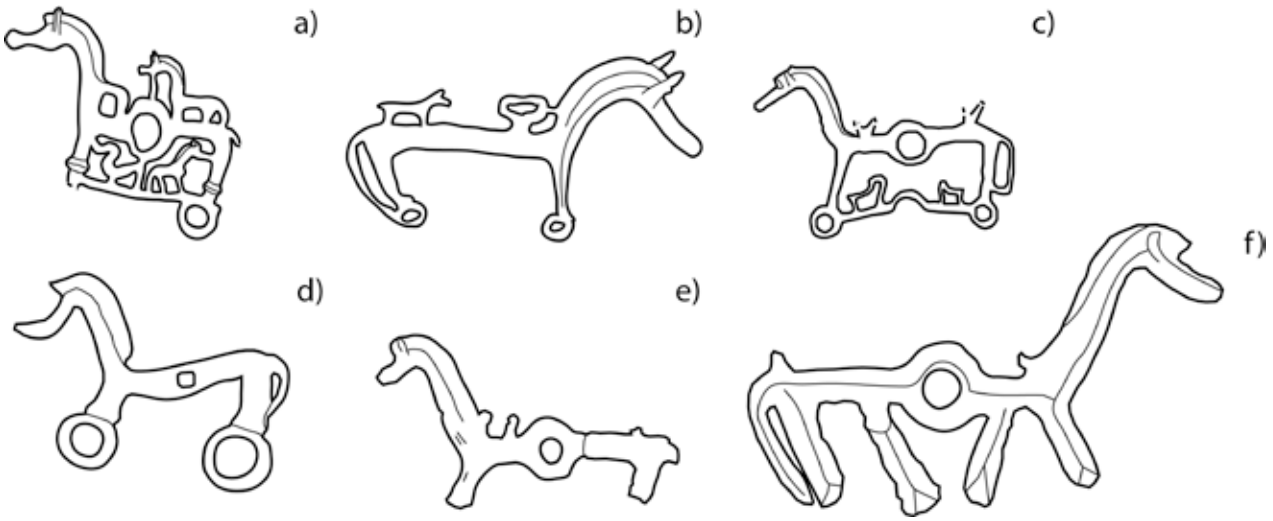

Figure 59: Late Bronze Age and early Iron Age horse shaped (Pferdchen) horse gear from Italy and Zurich-Alpenquai. a) Volterra type [from Volterra]; b) Cerveteri [Vetulonia]; c) Vetulonia [Vetulonia]; d) Veji [Vadena]; e) Bologna [Bologna]; f) Zurich-Alpenquai [Zurich-Alpenquai] (re-drawn after a, b, c) von Hase, 1969: no.37, 55, 27; f) Mäder 2001: 43.5; d, e) von Hase 1969: 9a, 26.).

The horse shaped piece from Zurich-Alpenquai shows some similarities to the pieces of type *Veji*, and also those of the *Bologna* type (if the bird models are ignored). However, a significant difference is seen in that the Alpenquai example has four legs, compared to the two in the Italian examples, suggesting that this may be a local manufactured piece in the Italian style (Mäder 2001a: 45). A further example of a horse-shaped piece of horse gear is known from a hoard of the EIA at Komitat Zólyom (SK), and may also represent local manufacture, mobility, or exchange systems (Kossack 1954).

Bar pieces

Twenty-seven examples of the Early Urnfield (HaA) *Mengen-Kaisten* and *Mengen-Kaisten nahestand* cheek piece (Figure 58.l) are recorded (Hüttel 1981: 127-33). Made of bronze, with through holes and an end-socket to allow for the attachment of the remaining bridal gear, the distribution of this type extends from Switzerland to Sweden, and Denmark to Hungary (Map 136), though local manufacture in the 'true' *Mengen-Kaisten* pieces in the northern Circum-Alpine region is possible (Hüttel 1981: 133). The examples from Switzerland and southern Germany are found mostly from burial contexts, while those from northern and eastern regions are from hoards (Table 41). In burial contexts, associated objects include multiple pieces of horse gear, indicating single or pairs of horses in the burial (e.g. Saint Sulpice, CH and Königsbronn, D).

Table 40: Find contexts of Late Bronze Age and early Iron Age horse-shaped bridal gear. N/A = Not available

Type	Quantity	Iron	Bronze	Burial	Hoard	Lake-Dwelling	N/A
Veji	23	6	17	18			5
Bologna	3			3			
Vetulonia	4/6			2	2/4		
Volterra	12	1	11	5			7
Cerveteri	3			2			1
Other	3			1	1	1	
Total	**48/50**			**31**	**3/5**	**1**	**13**

Table 41: Find contexts of various Late Bronze Age metal horse gear types. F-G = Find group; L-D = Lake-dwelling; N/A = Not available; R = River; Qty = Quantity; Sgl = Single find.

Form	Type	Qty	Iron	Bronze	Burial	Hoard	L-D	R	F-G	Sgl	N/A
Bow											
	Bologna	10	2	8	7						3
Half-moon											
	Bologna	8	8		7	1					
	Ronzano	8	7	1	6						2
	Romagnoli	6			4						2
Angled	Type 8b / 8	15			9	1				2	3
	Type 10	8			8						
Bar											
	Mengen Kaisten	14			11	13			3		
	Larnaud-Bevtofte	7			3	3				1	
	Spectacle	9			5	1	2	1			
	Corcelettes	3					3				
	Estavayer	2					2				
Total		**90**	**17**	**9**	**59**	**19**	**7**	**1**	**3**	**3**	**10**

In contrast to the socketed ends of the *Mengen-Kaisten* pieces, the *Larnaud-Bevtofte* type (Figure 58.m) has tenon like ends, which would have been inserted into the socketed section of other parts of the bridal gear (Hüttel 1981: 137-43). Of the seven examples mapped here, distributed from eastern France to Denmark and Slovakia (Map 136), equal numbers are found in burial and hoard contexts (Table 41) relating to the Middle to Late Urnfield (HaA2-HaB1), with a single example known as an isolated find (Günzburg (D)). No examples of this type are identified from the lake-dwelling region of the northern Circum-Alpine region, though somewhat comparable objects are known from northern Italy (Hüttel 1981: 143). The origin, and design tradition, of this type has been interpreted as the middle Danubian region, which was transferred to the west through communication and exchange routes (Hüttel 1981: 141-43).

Spectacle and bow/arch

Six *Spectacle* type cheek pieces (Figure 58.o) are known from the northern Circum-Alpine region (Map 137), two of which are known from the LBA lake-dwelling Mörigen, and four from two burials at Chavéria. In these burials the cheek-pieces formed a complete set of bridal equipment in association with other horse gear, along with *Gündlingen* type swords (see Sub-section IRON AGE in Section 5.4.1.1), and other rich bronze work (Hüttel 1981). Two examples are known from central Germany: the example from the Ockstadt hoard (D) was found in association with many objects, including 28 arm-/leg-rings (Richter 1970), two spearheads, multiple tools (axes, chisels, sickles), and casting cakes (Herrmann 1966), and a river find is known from Helmstedt (D). The objects found in association with these *Spectacle* cheek-pieces indicate that they were deposited at the very end of the LBA (HaB3) and beginning of the EIA (HaC) (Hüttel 1981: 151). Comparable to these pieces of horse gear are the bow/arch and half-moon types of cheek pieces from Italy, such as at Vadena/Pfatten (Hüttel 1981: 152-53).

Ten examples of the Italian *Bologna* type of bow/arch horse gear (Figure 58.h) are recorded, seven of which are from burial contexts relating to the EIA (Table 41), and distributed across the Villanovan culture area of central Italy (Map 137). These pieces are often found in pairs, creating a complete piece of head gear for one horse, or multiple pairs, indicating the presence of multiple horses in the burial equipment (Von Hase 1969: 23-25). Other goods included in burials provide indications or high status individuals, such as gold fibula, and amber and ivory objects in the central inhumation burial at Monile d'Argento (Vetulonia (IT)) (Von Hase 1969: no.124). Both male and female associations are indicated through weapons and spindle whorls in the Circolo dei Lebeti (Vetulonia) central cremation (Von Hase 1969: no.125-128).

Half-moon

The *Bologna* type half-moon equipment (Figure 58.n) is represented by eight examples, seven from burials, and one from the Piazza San Francesco hoard (Bologna) (Von Hase 1969: 25-26). Dating to the Bologna II-III phase (HaB3-HaC), all of the examples are from the locality of Bologna (Map 137). Associated burial goods include remains of wagons, razors, axes (e.g. Benacci Caprara Grave 53), knife blades (e.g. Guglielmini Grave 5), and other pieces of horse gear.

The *Ronzano* type of half-moon variety is relatively similar to the Bologna type in form, and also

contemporary in both temporal and spatial distribution (Von Hase 1969: 26-27). Eight examples are recorded, six from burial contexts, and the remaining two from probable burials but lacking contextual information (Table 41). Associated goods in the burials include second pieces of horse gear, knife blades (e.g. Castelfranco) and fibula (e.g. Ramonte).

Four examples of the *Romagnoli* type of half-moon bridal gear (Figure 58.e) are known from burial contexts from the vicinity of Bologna (Map 137), and two un-provenanced examples from Volterra (Von Hase 1969: 27-28). Associated goods include fibula, spindle whorls, needles (and needles with glass bead heads), bronze vessels, and a symbolic axe (e.g. Romagnoli Grave 10) (Von Hase 1969: nr. 27), date the horse equipment to the EIA phases II and III (HaB3-HaC).

Angled

Dietz's types *8b* angled bar (Dietz 1998: 139-43) and *10* angled bar with socket borings (Dietz 1998: 148-50) horse gear (Figure 58.g, j) are, within her study region, distributed across the Caucasus area (Map 138). These pieces are predominantly recorded from burials, and date to the LBA-EIA (10^{th}-7^{th} centuries BC). Associated burial goods include second pieces of horse gear (indicating a complete harness), daggers and sharpening stones (e.g. Plovdosovchoz-Dubovaja Rošča (RU)). A single type *8* piece is known from the hoard at Biharugra (HU). Some similarities are evident between these type *8b* and *10* pieces to angled bridal pieces from several sites in central Europe, such as from Frög (AT) (Metzner-Nebelsick 1992), Haslau-Regelsbrunn (AT) (Müller-Karpe 1959: Plate 143) and Runden Bergs, Urach (D) (Kluge 1986; Pauli, J 1994). One significant difference to the pieces from Runden Bergs and Frög is their inlay decoration, in iron (Frög) and tin bronze (Runden Bergs), in the terminal knobs of the pieces (see Section 5.4.3.2 (also Berger, D 2011)).

These angled pieces in central Europe have frequently been interpreted as Thraco-Cimmeranian influence in the region (Kluge 1986; Kossack 1954; Trachsel 1996; Pydyn 1999), and their distribution in the Carpathian Basin would suggest such a connection, and, in turn, connections further east to the region around the Black Sea. Further influence of Thraco-Cimmeranian/eastern cultures in the horse equipment of central Europe is seen in the occurrence of broken/two part bit-pieces, such as at Mörigen and Zurich-Alpenquai (Figure 58.h, I, k), which are uncommon in the LBA of central Europe, but more frequent in the Carpathian Basin, when compared to single piece bar bits (Trachsel 1996). Comparable pieces to the bridal gear from Zurich-Alpenquai, found in a possible hoard with a chisel, gouge, knife, winged axe and arm-ring fragment near house 28 (Viollier *et al.* 1924: 49), have been identified at Fügöd, Gigen, Biharugra (Chochorowski 1993: 72-77) and the *type II* piece from Kamyšta-Fluss (Dietz 1998: 164-65), providing an indication of their eastern origin (Map 139).

Singular types

A pair of *Estavayer* type cheek pieces are known from Estavayer-le-Lac (Map 139), in the form of a straight bar with three through borings (Figure 58.f). These two pieces continue the style of the antler pieces with borings at right angles, instead of having all borings facing the same direction, as seen in the examples from the Caucasus and central European angled pieces (Hüttel 1981: 158). Three pieces of the *Corcelettes* type (Figure 58.i) are recorded (Hüttel 1981: 161-63), all from the lake-dwellings of western Switzerland (Map 136) (Grandson-Corcelettes (2 pieces) and Mörigen (1)). The bar pieces with large eyelets at either end are known with both straight bits (Grandson-Corcelettes) and broken bits (Mörigen) indicating a combination of eastern influences with more local forms, with similar styles of cheek pieces are known from a Final Urnfield period (HaB3) hoard at Wallerfangen (Trachsel 1996: 188; Kolling 1968: Plate 44-48; Hüttel 1981). A cheek piece of un-typed form is known from a HaC period burial at Plátěnice (no.53), found in association with a Gündlingen sword (Novák 1975: no.191).

Decoration

Many of the cheek pieces discussed here are decorated, either as part of their form (e.g. the horse-shaped pieces) or as moulded or inscribed decoration (e.g. *Spiš*, *Mörigen*, bar pieces from Estavayer-le-Lac). Where decoration is inscribed on antler pieces, motifs consist of typical LBA forms including zig-zag lines, triangles, and simple parallel grooves (*Mörigen*) and also concentric circular eyes (*Spiš*). No apparent differentiation occurs between the deposition of decorated and undecorated objects occurs. Decoration with metal inlay is seen on the angled pieces from Frög (AT) and Runden Bergs near Urach (D), and follows a similar pattern of other pieces of bronze metal work from the northern Circum-Alpine region (e.g. knives, ring jewellery), with small sections of iron or alternative mixture bronze used to create contrasting colours. Again, there is no apparent differentiation between decorated and undecorated objects, with these examples coming from a rich burial context and an upland settlement.

Deposition

Contrasting deposition practices are evident for antler pieces compared to metal ones (Table 39 - Table 41), with the former more predominant in settlement contexts and the latter more common in burial contexts (cf. Hüttel 1981: 123). In the lake-dwelling region this differentiation breaks down, as metal pieces are commonly found in lake-dwellings. This distribution is

probably influenced by, and also a reflection of, the general lack of evidence for burial rites in the lake-dwelling communities during the Late Bronze Age. Differences in deposition contexts for antler and metal bridal gear may be a reflection of the status of individual horse owners, with metal gear being used by higher status persons, and organic pieces by those of lower status. However, it should be remembered that the ability to own/use a horse is seen as an indication of a high social standing (e.g. Schibler and Veszeli 1996: 327), so these status differences would be within an elite group. An alternative explanation for the different deposition practices may be a distinction between 'mundane' equipment for daily use (antler) and 'special' equipment (metal) for social occasions, and inclusion in burial contexts, where the physical material would enable them to survive the cremation process (if cremated) and also provide a greater display of wealth.

Symbolism

The low presence of horse bones in LBA settlements in the northern Circum-Alpine region (up to 8% of the bone assemblage), indicates that they were not particularly utilized as a meat resource, and also that they were relatively uncommon in communities (Schibler and Studer 1998: 176; Schibler and Veszeli 1996: 327-28). Where found, bridal gear provides an indication of the fact that individuals, and communities, during the LBA were utilising horses for both traction and transport purposes, typically by a social elite who were able to support the breeding, upkeep, and training of these animals. Thus, when included in burial contexts horse gear is seen as an indication of the high status nature of the individual entombed, a fact that is often supported by the occurrence of wagons and other high status objects in those burials. Typical associated burial items in the LBA suggest a male identification with horses (e.g. Frög tumulus K (Tomedi 1992)). However, male associations are not exclusive, and during the EIA in central Italy female objects are found in connection with horse gear (Dore 2004). The decoration on many pieces of equipment, and the other objects attached to the equipment (e.g. rattles on the Zurich-Alpenquai piece (Figure 58.k), and discs (Bernatzky-Goetze 1987: 94)), illustrate that horse gear was intended to be displayed, and to be both seen and heard. In social events the status of individuals would be clearly seen by observers through the display of the horse itself, and any adornment would have provided intra-elite status definition.

The Late Bronze Age and early Iron Age horse-shaped cheek pieces from Italy (and also Zurich-Alpenquai) provide, as a display of status, an element of symbolic redundancy: utilising a horse shaped piece on a horse replicates the horse symbolism instead of adding to it (but see also below and Section 7.10). The combination of sun-bird symbolism with the horse-shaped pieces (e.g. selected instances types *Bologna*, *Veji*, *Vetulonia* (Von Hase 1969: 6-15)), and also other material, such as belt plate work from Fliess (Sydow 1995: Fig 3.4), shows the increasing 'ritual' symbolism associated with horses during this period. The vast majority of these horse-shaped pieces (as is most of the horse gear from Italy (Von Hase 1969)) are known from high status burial contexts. Malnati (2004: 251) suggested that the inclusion of a horse-shaped cheek piece in burial 34 at Benacci-Caprara (Bologna) was used to identify the entombed individual as a horse or chariot rider. Perhaps this reveals the symbolism of these horse bits – they were used to replace the horse in burial practices, and became symbolic representations of the status and ability for the entombed.

Concluding remarks

The study of different types of bridal equipment found in Late Bronze Age contexts in the northern Circum-Alpine region has provided an indication of exchange and communication networks in which communities from this region were involved. The occurrence of broken bit pieces at the lake-settlements Zurich-Alpenquai and Mörigen suggests links to eastern Europe, where this type of bit was more common during the LBA. The example from Mörigen has been combined with typical central European type cheek pieces, the *Corcelettes* type, suggesting local manufacture or re-combination. The horse-shaped cheek piece from Zurich-Alpenquai shows similarities to pieces from the Italian peninsula, though with some significant differences in form (i.e. four legs instead of two), and may represent localized manufacture of an emulative object, with some adoption of design.

Deposition of LBA horse gear in the lake-dwelling region north of the Alps, of both antler and metal pieces, is predominantly in settlement contexts, with very few from burials or hoards. This is in opposition to the situation in the rest of central Europe and the Italian peninsula, where bridal gear is mostly known from burial and hoard contexts, with fewer from settlements. This regional difference is likely to be a result of the general absence of evidence for the burial rites utilized during the LBA by the lake-dwelling communities of the northern Circum-Alpine region. The increased occurrence of wagon burials during the early Iron Age (Pare 1992: Fig 134), and presence of bridal gear in burials without wagons (Kossack 1954; Pare 1992), in central Europe mirrors the deposition in the Italian peninsula. However, within the former lake-dwelling region horse gear is less common, with few burials with horse gear reported (Pare 1992: 232-36, 346-47; Kossack 1954).

Archaeozoological evidence from the lake-dwelling region indicates that horses were a relatively rare occurrence in the Circum-Alpine area during the Late Bronze Age, suggesting that they were kept and utilized by only a small section of communities (Schibler and Veszeli 1996). Such an interpretation is supported by the occurrence of horse gear in burial contexts, albeit not in the northern Circum-Alpine region. It may be possible to identify different status levels within the horse gear types, with organic (antler) pieces used by lesser elites and metal by higher elites, or different status/quality objects used for different functions: antler for mundane functions, metal for social functions.

5.4.2.8: Keys, Locks, and Identity

From a number of lake-dwellings of the northern Circum-Alpine region a range of interesting objects have been discovered (Figure 60), which have widely been interpreted as keys (Speck 1981c; Vogt 1931). Most likely made using the lost wax method, some with plastic decoration incorporating the typical Late Bronze Age water-bird motif (e.g. Zurich-Alpenquai, -Grosser Hafner) and the ribbing typical of Late Bronze Age lake-dwelling metalwork (e.g. Mörigen), these pieces vary in both length and curvature. Keys are an exceptionally rare find from Late Bronze Age contexts, and are almost exclusively found in lake-dwelling settlements, but examples have also been discovered at the 'highland' settlement Montlingerberg (Switzerland), and a possible example from a hoard at Hohenhewen (Germany). Early Iron Age keys are known from several sites north and south of the Alps, from burial contexts and hoards (Map 140).

Wooden doors have been recovered from the northern Alpine Neolithic period lake-settlements of Robenhausen (Lake Pfäffikon, CH (Eberschweiler 1990b)), Pfäffikon-Burg (Eberli 2010) and Zurich-Opéra (CH (Bleicher *et al.* 2011)), but show no evidence of locking mechanisms. Possible simple wooden locks were recovered during the excavation of Wasserburg-Buchau (D), suggested as being used in conjunction with keys of the above type, as a bar lock which could be operated using the key through a small hole in the door face (Figure 61).

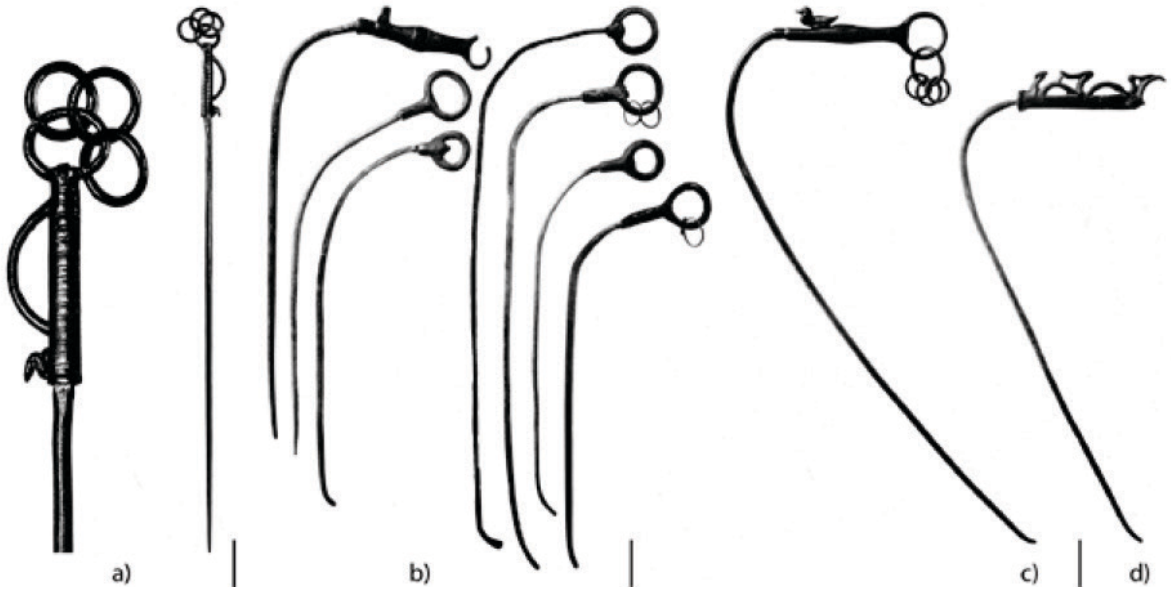

Figure 60: Keys found at the Late Bronze Age lake-dwellings of a) Mörigen; b) Zurich-Wollishofen-Haumesser; c) Zurich-Alpenquai; d) Zurich-Grosser Hafner (after Speck, 1981: 3, 6, 8).

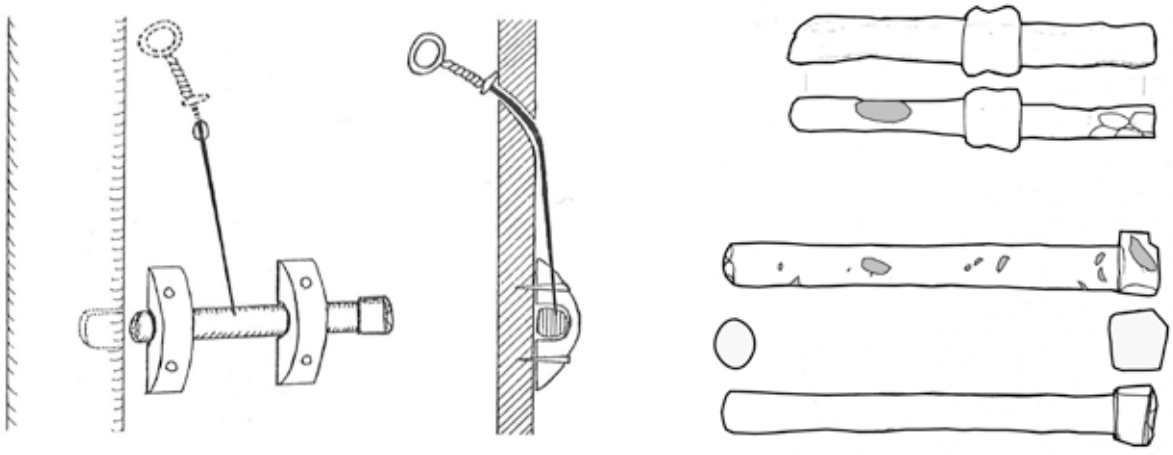

Figure 61: Possible locks from Wasserburg-Buchau (right, length 25.4 cm and 32 cm; re-drawn from Kimmig 1991) and the possible method for using the keys and locks (after Speck, 1981: 10).

The keys found in early Iron Age burial contexts, again rare instances, illustrate that there are no particular social associations which may be identified through the inclusion of keys in the burial assemblage. Keys are known from Burial 271 at Este with the remains of an adult man, a woman, and child, from a burial at Dürrnberg (AT) with a child, with a couple (male and female) at Most-Soci (SI), and with separate male/female burials at Tolmin (SI). A common feature across all of these burials is their apparent status as rich burials (Teržan 2004: 224), and also the fact that the keys occur as single items in these burials: one person or family possessed one key. In contrast to the deposition of single keys in the early Iron Age, multiple instances of keys relating to the Late Bronze Age are known from several lake-dwellings north of the Alps; for example at Zurich-Wollishofen-Haumesser, from where 13 were recovered. The occurrence of keys in lake-dwellings has been interpreted as a practice of votive offerings (Teržan 2004: 223; also Müller, F 1993). However, the deposition context only depicts the culmination of the social practices, and not the causes for the prevalence of keys in these communities.

Keys north of the Alps

As keys are exceptionally rare from Late Bronze Age contexts north of the Alps, and none are so far known from south of the Alps, it is difficult to determine whether they represent an indigenous innovation in communities of the nCA, or were simply imported from elsewhere. It is also possible that keys manufactured from other materials, such as wood, were used prior to the bronze keys discussed here, but there is currently no evidence for this. The above mentioned key from Mörigen (Figure 60), with typical LBA lake-dwelling groove decoration on the handle, suggests a local manufacture of the key. The water-bird motif was widespread across Europe through the Late Bronze and early Iron Ages but relatively uncommon in the nCA (see Section 6.2.3), and the torsion decoration on examples from Wollishofen-Haumesser (Figure 60), Zurich-Grosser Hafner and -Pressehaus (Speck 1981c: Fig. 7) are reminiscent of torsion, and false torsion, fibula from both north and south of the alps (see Section 5.4.2.5). The 'highland' settlement of Montlingerberg (CH), situated on a river valley trade route, shows extensive evidence of inter-regional contacts (e.g. Sections 5.1 and 5.2.1.1), and links to the Laugen and Melaun cultures of the southern Alpine region (Steinhauser-Zimmermann 1989; Frei, B 1955).

It has been theorized that the concept and use of keys may have been transferred between the regions south and north of the Alps through this trade route and via Montlingerberg (Speck 1981c: 238-39). Whether or not the keys from north of the Alps, and lake-dwellings in particular, represent indigenous innovation or importation of ideas may be of secondary importance, as the material culture from lake-settlements displays many indications of foreign contacts. However, the keys may also be indicative of changing social structures in the lake-dwelling communities during the Late Bronze Age.

Keys as indicators of social structures

The adoption of keys in Late Bronze Age society may be connected to several factors, which can be grouped into two categories. Firstly, demographic influences, which relate to the increasing settlement size, density and population evident in some lake-dwellings. Secondly, social influences, concerning the control of access and the display of power and status.

Settlement size and individual security

The process of increasing settlement density, settlement size, and (in some researchers opinions) 'proto-urbanism' (Arnold 1990a) evident in Late Bronze Age lake-settlements may provide an indication for the adoption of keys and locking systems by the inhabitants of those settlements. It could be argued that with an increasing population density and settlement size, individuals were spending more time further away from the settlement core (and their dwellings) and felt the necessity to secure their houses and possessions. An examination of excavated and estimated settlement sizes from Early and Late Bronze Age contexts indicates a complex situation (Table 42). It is evident that some of the LBA settlements from which keys have been recovered are comparatively small, such as Greifensee-Böschen, while other were quite large, e.g. Zurich-Alpenquai and -Wollishofen-Haumesser.

However, settlement size itself is only one factor which may have influenced the desire to secure structures. Increasing 'foreign' relations, evidenced through material culture, may have introduced new members to societies, from either distant regions or local communities. This may have induced members of the lake-dwelling communities (and sites such as Montlingerberg) to secure their dwellings if they were distrustful of the 'immigrant' members of the community. Such a supposition is purely speculation, and a xenophobic attitude or outlook is not evident through the material culture, which illustrates a ready adoption and incorporation of a number of 'foreign' elements of material culture.

In support of a widespread individual desire to secure households, and to the detriment of the concept of keys as prestigious objects (see below), are the 13 keys recovered from Zurich-Wollishofen-Haumesser, and the multiple instances from Montlingerberg and Morges, which suggest they may have been relatively common in these communities. While the possible size of

Wollishofen-Haumesser and number of structures at the site are unknown, it is clear there were 13 keys in use at the site. The design of the keys/locks would mean that the effectiveness of locking buildings/structures would have been reduced; the locking system proposed for the keys (Figure 61) is so simple, and keys of such similar design (Figure 60) that any of the keys would have been possible to open any of the locks. In this light the function of the keys becomes more symbolic in their ability to represent control and access to areas and to permit or deny entrance into buildings, rather than a functional ability to do so.

Table 42. Examples of settlement sizes from Early and Late Bronze Age settlements. (Data from Primas 2008: 39; Bernatzky Goetze 1987: 13-17; Steinhauser-Zimmermann 1989; Rychner-Faraggi 1993: 11; and the Database of the Palafittes UNESCO World Heritage Site application 2009).

Period	Site	Size (m^2)	No. Buildings	Form	Key/Lock
EBA	Concise	> 2 500	18/23	Compact	
	Siedlung Forschner	≈ 12 000	≈ 25	Loose	
LBA	Greifensee-Böschen	≈ 2 500	24	Loose	K
	Bevaix Sud	≈ 4 500	≈ 20	Compact	
	Cortaillod Est	≈ 5 200	≈ 27	Compact	
	Unteruhldingen	≈ 12 000	≈ 80?	Compact	
	Wasserburg-Buchau	≈ 14 000	?	Loose	L
	Zurich-Alpenquai	≈ 28 000	?	Compact	K
	Grandson-Corcelettes	> 40 000	?	Compact	
	Mörigen	≈ 16 000?	?	?	K
	Montlingerberg	≈ 26 000?	?	?	K
	Hauterive-Champréveyres	≈ 8 700/ ≈ 9 300		Compact	
	Frattesina	≈ 100 000	?	Loose	
	Wollishofen-Haumesser	≈ 24 000	?	?	K

Hierarchy and power

The early Iron Age keys known from northern Italy and Slovenia (the south-eastern Alpine region) occur in rich burial assemblages, illustrating that while the individuals buried need not have been of a particular social group (e.g. man or woman, elder or child), they were of high status. It is also recorded from antiquity that key holders were seen as 'temple guardians' with special religious and social roles (Tomedi 2002: 1224-26). Possible Iron Age keys without associated deposition context are recorded from the Heuneburg (outer settlement and fortified settlement (Sievers *et al.* 1984: 68; Kurz 2000: 112)) occur in un-stratified deposits likely relating to the HaD period, and also from Oggelshausen-Bruckgraben (Köninger In Preparation: Table 7.84), relating to the early Iron Age (see Section 4.3.4). Unfortunately the majority of keys from Late Bronze Age contexts are predominantly from 19th and early 20th century excavations, with little context and associated finds. Furthermore, the apparent lack of differentiation in structures from Late Bronze Age lake-dwellings makes the identification of special buildings that may have been the domain of social elites difficult (cf. Dunning and Rychner 1992: 69). One exception to this trend is the settlement of Greifensee-Böschen, excavated in the late 20th century, with a large central platform supporting two buildings (see Section 4.3.2). Found near the perimeter palisade and some 60 metres from the double building platform, there are again no associated finds listed for the key, making it a single find within a settlement. Associated finds with the single key from the LBA-EIA hoards at Dürrnberg (AT) and Grossweikersdorf (AT) suggest that these hoards were no different from other Late Bronze Age hoards, containing sickles, axe heads, and spears; the only unusual element are the possible keys.

While it may not be possible to identify special structures to which access was controlled through the use of locks, there are some hints at features to which access may have been restricted. At Zurich-Alpenquai and Greifensee-Böschen, and also Eschenz Insel-Werd , several fragments of what were apparently exceptionally large storage vessels have been recovered (Primas 2004: 119). The internal distribution of the these large pots (Zurich-Alpenquai: "hut" (house) 18 (Mäder 2001a: 91); Greifensee-Böschen: structures H-J; L; M; N; O; R; W (Eberschweiler *et al.* 2007: Plate 68-76); Insel-Werd: settlement perimeter and centre (Primas *et al.* 1989: 27)) indicates that numerous individuals had the ability to store large quantities of goods – or that goods were stored in multiple locations by a central authority. In the case of individual resource hoarding keys/locks would be beneficial to secure the stockpile, while in the case of centralized stockpiling they would control access to the resources to specific members of the community.

The symbolic function of keys and locks is possibly the most significant factor to be considered, with the low quantity of keys recovered, and their fine decoration,

being seen as an indication that they were not mundane objects, but utilized in special situations and circumstances (Van Willigen 2011). However, the nature of these circumstances is open to question, and it must be remembered that 'ritual' and mundane activities and practices in prehistory often overlapped (e.g. Bradley 2005). In communities where social differentiation was apparently very limited, i.e. lake-dwellings at least in terms of physical architecture, the possibility to control access to structures and resources would have provided a significant indication of social status. Whether this was simply the control of an individual's dwelling or a communal structure for use at certain times by the whole (or sub-sections of) community, the individuals in a position to control that access would have taken on a special significance in the community, and this would have acted as a method of social identification and segregation. The fact that so many of the keys are terminated in loops – over 50% of the Late Bronze Age examples – raises the possibility that the keys were designed to be worn. Hanging from a belt the large metal rods would have provided an ostentatious display of the fact that the wearer had the ability to secure areas and control whom had access to those locations and the materials and resources contained within. Thus, the occurrence of keys in settlements may indicate increasing hierarchisation and segregation of the community, with the desire of individuals and elites to exert more ostentatious authority over other members of the community.

5.4.3: Metal working in the northern Circum-Alpine region

Throughout the discussion of metalwork material culture, repeated instances of local manufacture in the lake-dwelling communities have been detailed. The clay and stone moulds from lake-settlements for sickles, knives, needles, ring jewellery, ornaments, spears, swords, axes and chisels are direct indications of the manufacture of these objects in, or around, the settlements (Map 141 and site numbers list). Furthermore, the numerous metal working implements, such as chisels, punches, hammers, and an anvil from Zurich-Wollishofen (Heierli, J 1886), provide indications of the working, modification, and decoration of objects. Within the northern Circum-Alpine region, lake-settlements are well represented in terms of metal-working indicators, and although they are not the only type of sites with such artefacts, they have been considered as metalwork production centres due to the high number of moulds known from them (Dunning and Rychner 1992: 66). Casting moulds and equipment are known from a range of sites in within the Circum-Alpine region and beyond (e.g. southern Germany, Poland, and France). For example, from the LBA hoards at Fresné la Mère and Génelard (both FR) fragments of moulds, anvils, hammers, and chisels are known (Jockenhövel 1980: Plate 68; Mohen 1988). In southern Germany and Austria evidence of metal working is known from a wide range of site types, including 'highland' fortified settlements (e.g. Runden Bergs), and open lowland settlements (Jockenhövel 1983). One of the functions of hilltop and fortified sites in the Alpine region may also have been to control the routes of access to ore sources (Winghart 1998), though in the north of Europe fortified sites are well represented as metal working centres, e.g. Biskupin (Van Den Boom 2000). Association of metalwork production in possibly high status (represented by fortification and enclosure) residential centres is not surprising given that the control of metalwork production is typically seen as one of the foundations of status in the Bronze Age (Van Den Boom 2000; Winghart 1997; though cf. Kuijpers 2009).

It is important to remember that the manufacture of metalwork objects incorporates numerous other technologies, actions, activities and skills, particularly the procurement and refinement of metal ores, but also the acquisition and production of suitable material for moulds, the collection of wood for fuel, and the manufacture of metalworking tools (Holdermann and Trommer 2011; Pearce 1997; Kuijpers 2009). Thus, metallurgy and the production of metal objects created a significant economic web, incorporating different areas of Europe (i.e. ore producing areas) and sections of society. The separation of mining communities from, and support by, other sections of society has been well discussed (e.g. Schibler *et al.* 2011; Sperber 2004; Pearce 1997), but the local separation of tasks should also be considered. For example, the individuals who produced the moulds for objects may not have been the individuals using those moulds to manufacture artefacts: the skill sets for creating a negative of an object in stone (or clay) are different to those required for melting, alloying and pouring the bronze and may, or may not, have been separated between artisans (cf. Heeb 2009). Ethnographic studies typically emphasize the marginality and ritualized status of metal - typically iron, though similar systems may have existed for bronze - workers (see Hingley 2006: 121, 1997), and male dominance of the knowledge and practices (Primas 2004: 122; Brown 1995). However, while metalworkers may have been in a marginal position in society, they were central to the potential biographies of metal objects: they were responsible for creating material culture artefacts and inscribed them with potential functions, symbolism, and use-life through the selection of material used and style/form produced (Fontijn 2002: 28-30; Joy 2010: 51).

The marginal nature of metalworking during the Late Bronze Age is further suggested by the scarcity of information relating to the actual *process* (melting, casting, and finishing) of metalworking. Moulds and tools indicate the presence of metal-workers, but do not suggest where they actually worked. From Hauterive-Champréveyres (CH) a fragment of burned clay with adhered copper oxide (Primas 2004: 117; Rychner-Faraggi 1993: 21) and a tuyère and bronze casting slag from Wasserburg-Buchau (D) (Kimmig, W 1992) indicate metal manufacture activities in the lake-settlement vicinity, and at the 'highland' settlement of Runden Bergs (D) a specialized metal working area has been suggested (Pauli, J 1994). At Mörigen (CH) a lake-shore workplace has been postulated (Bernatzky-Goetze 1987: 16; Primas 2004: 117), and at Hauterive-Champréveyres a high concentration of casting jets, slag and mould fragments may indicate a metalworking area on the perimeter of the settlement (Rychner-Faraggi 1993: 30-31). Metalworking activities situated towards the perimeter of settlements tallies more comfortably with the ritualized, secretive, nature of metalworking detailed in ethnographic studies (e.g. Brown 1995; Childs and Killick 1993; Rowlands, M J 1971), than does inner-settlement working, as indicated by the occurrence of mould fragments in one of the dwellings from the older phase of Zug-Sumpf (Seifert 1997: 123-24). However, the occurrence of moulds and metalworking equipment inside dwellings does not indicate that the activity took place there, and ethnographic research shows that working areas are frequently cleaned after use, and equipment moved to other storage locations instead of being left at their use location (e.g. Murray 1980).

The isolation of metalworking sites outside of settlements may also be explained by a migratory nature of metalworkers, who travelled between settlements

(Bauer, I and Northover 2004: 12; Menotti 2012: 331; Rubat Borel 2006b: 263), and may not have possessed a fixed, inner-settlement area. Yet, when migrant workers came to a village they would have needed a place to occupy and reside; it is possible that dwellings may have been constructed specifically for such tasks, and this would have permitted the metal worker to leave objects in a settlement during periods of relocation and employment at other sites. Analysis of mould material from Zurich-Alpenquai (stone) and Zug-Sumpf (clay) indicates that they were manufactured from materials available in the region of the settlement, and not transported over significant distances (Bonzon 2004; Weidmann 1982). While moulds may be locally manufactured, the objects that they create may not be local, for example a double sided mould for a socketed axe and *Baumgarten* style knife from Zurich-Alpenquai, would produce an axe with good comparisons in the Danubian region and Hungary (Primas 2004: 125).

5.4.3.1: Metal sources

Bronze as a raw material, or its constituents tin and copper, formed one of the fundamental exchange objects of the Late Bronze Age. However, the fact that bronze was the raw material for many forms of manufactured material culture means that few indications of the form in which *raw* bronze was circulated, or the routes along which it travelled, survive in the archaeological record. The distribution of bronze ingots (see below) suggests that at least some bronze may have travelled various communities and parts of Europe, but the other exchange forms may have also been utilized – for example sickles (see Sub-section 5.4.2.3). Archaeometric analysis of metal objects provides the opportunity to identify sources of metal, and thus exchange and communication networks along which raw materials circulated. Analysis of a large corpus of material from lake-dwellings of the nCA has shown several significant developments in metallurgy in the area during the Bronze Age (Rychner and Kläntschi 1995). Analysed artefacts suggest regional variation of bronze composition between western, central and eastern Switzerland. These areas formed distinct manufacturing and use zones, with limited exchange of objects between them (Rychner and Kläntschi 1995: 69), as can be seen in the distribution of artefacts and forms, but some inter-regional exchange did occur – not only in physical objects, but also in the style and decoration concepts (e.g. arm-/leg-rings). Through the analysis of the chemical characteristics of metalwork, Rychner and Kläntschi (1995) suggested that during the early Late Bronze Age (BzD-HaA1) a possible west Alpine source of copper was used in the western area of Switzerland, but during the later LBA (HaA2-HaB2/B3) a different copper source was utilized – so-called "*fahlerz*" copper – with a likely (though not certain) source in the eastern and southern Alpine region (Northover 1982; also Sperber 2004; Rychner and Fasnacht 1998).

In terms of copper ore extraction, the only significant evidence for such activities in Switzerland during the Bronze Age are from the Grisons (Graubünden) region (Rychner and Kläntschi 1995: 86). Mining and smelting activities are also known to have occurred in the Lower Inn Valley (Mauk; AT) (Schibler *et al.* 2011) and the southern Alpine valleys (Pearce and de Guio 1997; Pearce 1997, 2007). A single *Pfahlbauperlen* from the smelting site Mauk A suggests that the site was linked, directly or indirectly, to the Po Plain and/or the lake-dwelling communities of Switzerland and southern Germany (see Section 5.2.1.1). The distribution of ingots may also provide an indication of metal sources on a regional level. For example, the *pick-shaped* ingots (*pani a piccone*) common to northern and central Italy are occasionally found outside of this region, in Switzerland, France and Germany (Bietti Sestieri 1997: 389; Pearce 2007: 90, 106). A fragment of *oxhide* ingot, usually found in the Mediterranean region (Jones, M R 2007), has also been recorded at considerable distance from their main region of circulation, i.e. in Germany (Primas and Pernicka 1998). The limited distribution of these types of ingots in the northern Circum-Alpine region, and occurrence of *plano-convex* and *bar* ingots at numerous sites (Map 142) suggests that, at least locally (northern Alpine region), smelted copper was being utilized in the region. However, ingot form is not necessarily linked to production zones, as shown by a mould from Zurich-Alpenquai, which may have been used to produce three ingots of different size and mass (Weidmann 1981).

The study of Rychner and Kläntschi, is also interesting as they assert that inter-period recycling of old metal was a limited practice during the Bronze Age (Rychner and Kläntschi 1995: 86-88), although some clear examples of this practice exist during the HaB2/B3 period (Rychner and Kläntschi 1995: 61). This assertion is in contrast to the suggestions of Bauer and Northover (1996; 2004: 21), who argue that the recycling of metal may have been of importance to the community at Zug-Sumpf, to produce objects for local consumption. Indications of the conversion of old material into recycled stock are the agglomerate block from Grandson-Corcelettes (Wyss 1967), and bronze waste and/or slag from Auvernier-Nord, and Grandson-Corcelettes or Yvonand (Rychner 1984: 75). Thus, although intra-period recycling of bronze would appear a possible, but uncommon, practice inter-period remanufacture of objects does not appear to have occurred. Once formed into functional pieces, objects were given a potential biography that did not include the opportunity of recycling (and total destruction), but instead resulted in final, and permanent, deposition in hoards, burials, or as votive 'offerings'. This lack of potential for re-casting is clearly indicated by the attempts to repair numerous objects

(e.g. arm-/leg-rings) which could have been re-cast into new objects once broken/damaged, and the conversion of one object to another without melting down the original (e.g. the razors with arm-/leg-ring decoration (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1) and a sword-spearhead from Mörigen (Tarot 2000: no. 421)).

5.4.3.2: Iron

In addition to bronze working, evidence of iron working, in the form of decorated and prestige objects, is evident during the Late Bronze Age (Map 143). The adoption of iron in societies has been seen as a gradual process, with the use of bronze declining as iron was increasingly utilized (Needham 2007; Collis 1997: 74; Speck 1981a; Snodgrass 1980). The widespread development and utilisation of iron technology is seen to have caused significant changes to the social structure and power bases in Iron Age communities, with correspondent de-valuation of the bronze industry (Needham 2007). Where this iron came from is currently unknown, though some iron ore sources in Switzerland (Figure 62), for example Ferreyres, show prehistoric exploitation (Curdy 2008). It is possible that small quantities of iron could have been discovered during agricultural activities (Hingley 1997: 10). The identification of an iron forge at Sévaz-Tudinges (CH) and imported Attic ware pottery from the area (Mauvilly and Ruffieux 2008b; Kaenel 2005: 53) suggests that while occurring in marginal locations (Hingley 1997), iron workers may have held a socially elevated position (Curdy 2008).

Iron as an indicator of social status during the Late Bronze Age may be evidenced through the inclusion of an iron sword in a burial at Singen-Hohentwiel (D) (Kimmig, W 1979), and the presence of 'raw' iron on top of cremation burial 5 at Augsburg-Haunstetten (D) (Wirth 1998). The presence of other objects in the Augsburg burial, such as a *Pfahlbauperle*, fibula and spiral rings, may indicate a high status individual – with possible connection to the procurement, exchange, or working of iron.

Considering the types of iron objects from LBA contexts in the northern Circum-Alpine region, and other areas of central Europe , there is a clear preference for bladed objects – swords, daggers, knives, and spearheads (Chart 1). However, on swords the iron is rarely used for the blade (exceptions at Singen-Hohentwiel (D), Mörigen (D), Neudegg (D), and Rivoli-Veronese (IT)), but in small quantities for decoration on the hilt. In contrast, on knives (e.g. St Aubin (CH)), daggers (e.g. Klein Neundorf (D)), and spears (e.g. Nidau (CH)) iron is also used as the blade. Other objects, such as ring jewellery and horse gear feature small amounts of iron used as inlay decoration. Although no iron or iron adorned fibulae are recorded with in the nCA, several iron pins are known. The use of inlay decoration is not confined temporally to the Late Bronze Age or by material to iron; other metals, for example gold, tin, bronze and lead, were used as decorative elements in larger objects (Berger, D 2011), and plant material and crushed bone were applied to pottery during the Bronze Age (see Section 5.3.1).

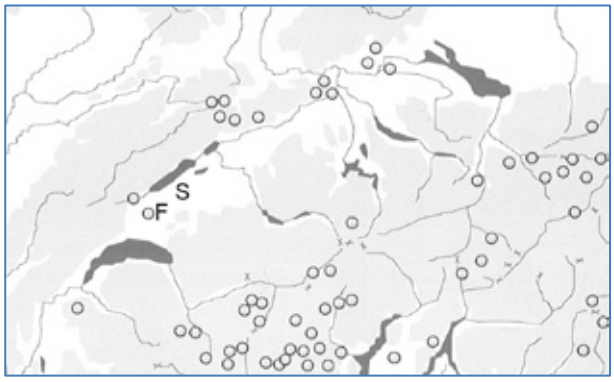

Figure 62: Distribution of iron ore deposits in Switzerland. F = Ferreyres; S = Sévaz (after Curdy 2008: Fig. 322).

The early use of iron as inlay instead of the object base may be a reflection of the metal working techniques required, and also indicate that this was practiced by bronze smiths developing an extended range of skills (Speck 1981a). While it would have been relatively easy to create small objects, such as knife blades, the production of larger profiled objects, such as the sword from Hohentwiel and the spear head from Nidau, would have required more technical knowledge of how to create such shapes without casting techniques (Maddin *et al.* 1977). The cast arm-/leg-rings in use during the Late Bronze Age would have been very difficult to create in iron, unlike the application of small pieces of iron inlay.

In terms of function, the use of inlay decoration has no performance impact upon on object: the reasons for this application must be social. The majority of the pieces

with iron decoration are those traditionally considered to be indicators of status – swords, spears, daggers, and horse equipment. Ring jewellery and knives are very well represented in the archaeological record and may not be indicators of status *per se*, but the inclusion of iron on such a small minority of these highly visible objects may suggest they would have socially differentiated their wearer/user through the combination of various colours on a single piece, and also have increased the social power and effectiveness of those objects (Joy 2010: 38).

5.4.3.3: Lake-Dwellings as metalworking centres

Within the northern Circum-Alpine region the majority of these iron and iron decorated objects are known from lake-dwelling contexts. This may be a reflection of past excavation and research favouring an over representation of lake-shore and wetland sites compared to 'terrestrial' (inland) sites; however, non-ferrous metalwork objects are known from a range of inland sites in the region, as seen in the previous discussions of material culture groups. Thus, the inclusion of iron in objects at lake-settlements may indicate that those communities were early adopters of the new material and technology, that they were able to procure this knowledge through their inclusion and control of exchange and communication networks, and also that they were centres for both bronze and iron working. The proportionate size and influence of these centres may be indicated by the number of objects, e.g. ring jewellery, found at the sites (Dunning and Rychner 1992: 69): the more objects recovered, the larger the settlement with greater population, access to resources, and influence in the surrounding area. On this principle it would appear that settlements such as Auvernier-Nord, Mörigen, Zurich-Wollishofen-Haumesser and -Alpenquai were more influential than, for example, Zug-Sumpf, Ürschhausen-Horn and Greifensee-Böschen. However, this may not be a full representation of the situation, as demonstrated by Hauterive-Champréveyres, which has a range of imported prestige objects (glass and amber beads) but relatively few metalwork objects and large ring jewellery.

The role of the lake-dwelling communities as metalworking and distribution centres can be seen through the distribution of various forms of objects, e.g. arm-/leg-rings, knives, spearheads, and swords, extending across France, southern Germany, and Austria to northern Germany and Scandinavia and beyond. Although few objects were distributed to the south Alpine region, low numbers of selected objects were imported from this area – such as razors and fibulae – and Frattesina may have played a role in the circulation of these objects to the communities north of the Alps (Pearce 2007: 103). The inclusion of a number of 'foreign' items in lake-settlements of the northern Circum-Alpine region is not unusual: for example a western European axe at Auvernier (Primas 2008: 126; Rychner 1979: Plate 124.7), the Nordic *Platten* fibula at Grandson-Corcelettes, and the angled horse bit from Zurich-Alpenquai. These objects serve as indicators of the distance that objects travelled during the Bronze Age, as do the *Mörigen* type razors and horse gear from the United Kingdom. Situated in river valleys and areas with high agricultural potential, lake-dwelling communities would have been able to use their productivity to support metal working activities and their position on a lacustrine-riverine network to distribute products throughout the region (cf. Primas 1977: 48).

The so-called '*Pfahlbau route*' has often been used to discuss trade, exchange, and communication routes between the northern Alpine lake-dwelling region and northern Europe (e.g. Kristiansen 1993: 143, 1998: 161; Jockenhövel and Wolf 1988: 548). However, the role of the lake-dwelling communities in such a route should not be over-emphasized and the high representation of these sites compared to others in nCA must be remembered. As mentioned above, the occurrence of moulds indicates that a wide range of settlements were manufacturing bronze artefacts. The widespread distribution of knives such as the *Baumgarten* type (one of the *Pfahlbau* group of knives) when compared to the limited extent of the arm-/leg-rings typically found in the lake-dwellings, suggests that the '*Pfahlbau route*' was not a single exchange and communication route, but a network of numerous local routes stretching from southern Scandinavia to the Alps.

5.4.3.4: Concluding remarks

The high number of metal objects found in lake-dwelling contexts may provide an indication of the relative status of individual settlements compared to others (Dunning and Rychner 1992), and also serves as an indication that these settlements were involved in the circulation of high quantities of metal objects. The occurrence of many items related to the manufacture of objects, such as moulds, anvils, hammers, chisels, punches, casting remains and ingots indicate that manufacturing process may have occurred within the vicinity of lake-settlements. In this respect lake-settlements are not unique, and such objects are found in a wide variety of settlements and locations (Jockenhövel 1983). Possible metalworking locations, towards the perimeter of the settlement, have been identified at Hauterive-Champréveyres and Mörigen. Industrial locations in the perimeter of the settlement may not only have fulfilled practical purposes, e.g. reducing the risk of accidental fire, but also served to keep the practice segregated from society and maintain secretive or legitimising social structures, as seen in many ethnographical studies of iron-working (e.g. Brown 1995; Rowlands, M J 1971).
Archaeometric studies have suggested that the recycling of metal stock was an uncommon practice during the

Late Bronze Age (Rychner and Kläntschi 1995), despite the occurrence of some indications for the melting of various objects together, for example the large agglomerate mass of objects from Grandson-Corcelettes comprising arm-/leg-rings, sickles, spearhead and axes (Wyss 1967). The repair or conversion of (possibly broken) objects of one form, e.g. arm-/leg-rings, into another, e.g. razors, as opposed to their melting and conversion into new objects suggests two possibilities:

1. Migrant metalworkers were not present at the time of breakage and immediate re-use was required, resulting in repair or conversion
2. Permanent destruction of the object – and associations that it incorporated – was socially unacceptable, while repair or the conversion into another object retained the object associations and social function

Of these two the latter would appear more likely, as even if objects broke when a metal worker was not present in the village they could have been temporarily stored until such an individual returned to the settlement. Furthermore, the effective repair of objects, and conversion into other forms, would have required some knowledge of metal-working and the appropriate tools to hammer sheets flat and drill holes through ring walls. It is, therefore, possible that these repairs and conversions were undertaken by metal artisans, and not the objects owners.

Metal objects decorated with iron are known from numerous Late Bronze Age lake-settlements in the northern Circum-Alpine region. Inlay decoration, utilising a variety of metals, on bronze work is known throughout the Bronze Age (Berger, D 2011). The use of iron on these objects, such as sword hilts, arm-/leg-rings, and pins, and the for blades of knives, may be seen as a method of displaying social status, with a very small minority of objects decorated in such a manner and their frequent inclusion in rich burials in other parts of Europe attesting such a function. The number of bi-metallic objects from lake-settlements indicates that these communities were the ‘pioneer’ iron adopters in the nCA. Pioneer adoption may reflect the social status of these settlements and the role of some of them as metal-working centres, as inhabitants were able to procure the new material and channel the exchange routes along which it was transported.

5.4.4: Artefact Deposition

Intentional deposition of material culture objects during the Late Bronze Age can be divided into three forms: in burials, in hoards, and as 'votive offerings'. A clear division is evident in the material culture groups acceptable for different forms of deposition: metal objects are found in hoards, burials, and as votive offerings; ceramic material is generally only found in the burial sphere, though can be used as a containers of metalwork in hoards (e.g. Rachelburg-Flintsbach (Möslein 1998/99), Vénat (Coffyn *et al.* 1981)). From the study of different forms of metal objects in the nCA during the Late Bronze Age, it is evident that the majority of discussed objects are from lake-settlement contexts, with some from hoards outside, and within, lake-settlements (Chart 2).

5.4.4.1: Hoards

The deposition of metalwork in hoards is known throughout the Bronze Age, with bar and ingot hoards common during the Early phase, assemblages of broken objects common during the Middle Bronze Age, and mixed hoards known from the LBA (Görmer 2006). Research on these hoards has produced a significant corpus of literature; the majority of it reviewed in this work (see e.g. 2000: 352-68).

Factors often cited for influencing the deposition of metalwork in collective assemblages (hoards) are the storage of wealth during times of unrest, the collection of material for use in manufacturing processes (founders hoards) or unknown 'ritual' and 'votive' reasons (Görmer 2006; Harding 2000: 354; Falkenstein 2011). Viktoria Fischer (2012: 40) has suggested that hoards and burials may overlap in social function in some areas, and that the social intentions behind deposition could be both sacred and profane. Whatever the motivation for the deposition of metalwork, it is impossible to deny that these collections would have represented a significant expenditure or cost on behalf of those individuals depositing objects. The value of materials deposited in hoards can, after Falkenstein (2011: 95), be considered as the culmination of several spheres of valuation:

1. Material — Value of the raw material (bronze)
2. Use — Value of the object as a useable item
3. Prestige — Value of the object as a social item
4. Ideal — Value of the object as perceived by owners and observers

The social value of deposition of objects must have exceeded the cumulative value of the actual objects, either through the visual consumption of objects creating an enhanced social status (greater than the status of possessing the objects) or the social need for deposition on ritual, votive or symbolic grounds exceeding the social and functional value of objects and the cost to replace them.

Hoards and depositions of metalwork, and their possible occurrence in lake-dwellings, are a feature that has been frequently mentioned in the previous discussions of specific forms of material culture. Excluding lake-settlement finds (see below), hoards are a relatively uncommon occurrence in the lake-dwelling region of the northern Alpine forelands (especially Switzerland (Dunning and Rychner 1992: 71)) during the Late Bronze Age (Map 144). There are, however, notable exceptions, such as at Basel-Elisabethenschanze (CH) and Kerzers (CH). The location of hoard deposition in the environment covers a wide range of situations, from open terrestrial sites to within 'highland' settlements and from caves to moors (Görmer 2006: 293).

During the early Iron Age (HaC) a decline in the number of hoards is evident across central Europe, as social elites were increasingly buried in tumuli with greater numbers of grave goods and weapons (Kristiansen 1998: 76; Görmer 2006: 292; Roymans 1991). This situation is also highlighted in the nCA by a change in deposition practices for swords: during the Late Urnfield (HaB) these were mainly deposited in hoards and wetland locations; from the final stages of the Urnfield (late HaB3) and early Iron Age swords are predominantly found in burials contexts (see Sub-section DEPOSITION TRENDS in Section 5.4.1.1 ((cf. Primas 2004; Torbrügge 1959; Fontijn 2002: 221 ff; Kubach 1994: 70)).

Material groups included in hoards and depositions of the LBA cover the main groups of socially significant objects, such as ring jewellery, knives, spearheads, metal vessels, axes, pins, and swords. Razors appear to be an item uncommonly deposited in hoards (see Sub-section SYMBOLISM AND USE in Section 5.4.2.1), with exceptions being those of Vénat-St. Yrieix (Coffyn *et al.* 1981), and from the large early Iron Age (c. 7th century BC) hoard at Bologna (Bianco Peroni 1979: no.475).

Cultural communication and influences can be suggested through the composition of some hoards, such as that containing the hanging vessel/belt box and possibly the *Platten* fibula at Grandson-Corcelettes (see Sections 5.4.2.5 and 5.4.2.6). These 'foreign' objects attest to inter-regional connections not only through the occurrence of the imported objects, but also through their inclusion in a hoard deposition – the typical method for deposition in their main centres of production (Table 34; Table 35 (cf. Sprockhoff and Höckmann 1979)). The early Iron Age (6th century BC) hoard from Fliess (AT) is a further example of inter-regional connections influencing deposition, with indications of influence from the northern Balkan/south east Alpine region in its composition, and also connections with the Golasecca culture of the southern

Alpine/north-western Italian valleys, and the inner Alpine valleys (Sydow 1995). Included in this hoard is a fragment from a bronze vessel, decorated with a combination of what would appear to be a solar-barge and horses – reminiscent of the combination of horses and water-birds on Villanovan horse gear (see Section 5.4.2.7).

Lake-Dwelling hoards

Throughout the discussion of metalwork objects reference has been made to the recent works of Viktoria Fischer (2011, 2012), who has argued that many of the objects recovered from lake-settlement contexts may in fact form part of hoards (or other social deposition) in a concentrated social environment, instead of being spread across a larger landscape as more evident in terrestrial settlements (Figure 63). This argument is not new; it has already been pointed out by Primas (1977: 53), arguing that if the 'excavations' during the 19th century had recorded more contextual information, then it would have been possible to identify different deposit types (also see Dunning and Rychner 1992).

The occurrence of hoards in lake-dwellings corresponds to the occurrence of hoards in 'highland' fortified settlements of the early LBA, such as at Bullenheimerberg, Dresden-Coschütz, Bleibeskopf, Ehrenbürg, and Rachelburg-Flintsbach (all D) (Kubach 1994; Möslein 1998/99; Falkenstein 2011). Hoards in these settlement contexts consist of both broken objects and also finished objects, with an apparent distinction between jewellery (female) items deposited intact, while tools and weapons (male) were deposited in a fragmented state (Falkenstein 2011). Furthermore, some of these hoards, such as at Hesselberg and Schwanberg, occur in the containing wall of settlements, suggesting a 'ceremonial' or 'ritual' function according to Falkenstein (Falkenstein 2011: 88-89).

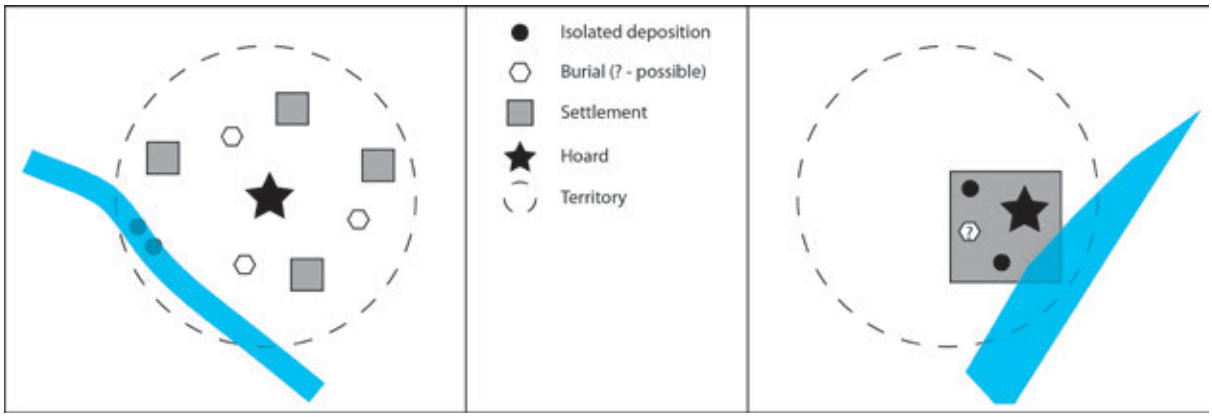

Figure 63: Locations for deposition in terrestrial (inland)- and lake-settlements. In terrestrial areas (left) hoards, depositions and burials are spread across the landscape in the vicinity of settlements and hamlets, in a process of "juxtaposition". With condensation of settlements and inhabitants at lake-dwellings (right), juxtaposition is replaced by a process of "superimposition", and hoards, depositions, and possibly burials, are made within the settlement (re-drawn from Fischer, V. 2012: Fig. 146).

A small hoard assemblage (arm-rings, axes, spearhead) is also recorded from Wasserburg-Buchau (D) – near the perimeter palisade surrounding the settlement (Reinerth 1928; Kimmig, W 1992) – has been suggested as showing influence from the Mediterranean region in its composition (Nebelsick 1997). At Zurich-Alpenquai (CH) small collections of metal objects were recorded (e.g. bridal gear and spearheads), which may represent small depositions (Mäder 2001a). A large concentration of metalwork is known from Auvernier-Nord (CH), where from excavations between 1968 and 1975 nearly 24 kg of metalwork were recovered from an area of ca. 6,000m^2. Of this total, over 14.5 kg were recovered from an area of just 14m^2 (Rychner 1984). The collections from both Zurich-Alpenquai (Mäder 2001a: 69-73) and Auvernier-Nord (Figure 64) occur within the settlement area, and not along the perimeter of the settlement. Thus, a range of deposition locations with lake-settlements are evident, as they are in 'highland' settlement contexts.

Discussing the high occurrence of metalwork in lake-settlements and their surroundings in the northern Alpine region, Müller (1993: 86) suggested that these Bronze Age societies should not be seen as having a 'throw away' culture in which metalwork was casually lost or discarded, particularly due to the cost of producing metalwork. Moreover, the depositions of objects were intentional social actions, not simply the discard of redundant/broken objects or accidental loss (which may account for a limited quantity of material) (Müller, F 1993: 86). In settlements, unless built directly

above some water depth, recovery of accidentally dropped objects would have been relatively simple; the recurrent deposition of objects in a similar location (e.g. at Auvernier-Nord or Zurich-Wollishofen-Haumesser) suggests multiple, repeated, intentional depositions of 'offerings', as are known from other wetland contexts (cf. Menotti 2012: 190-92).

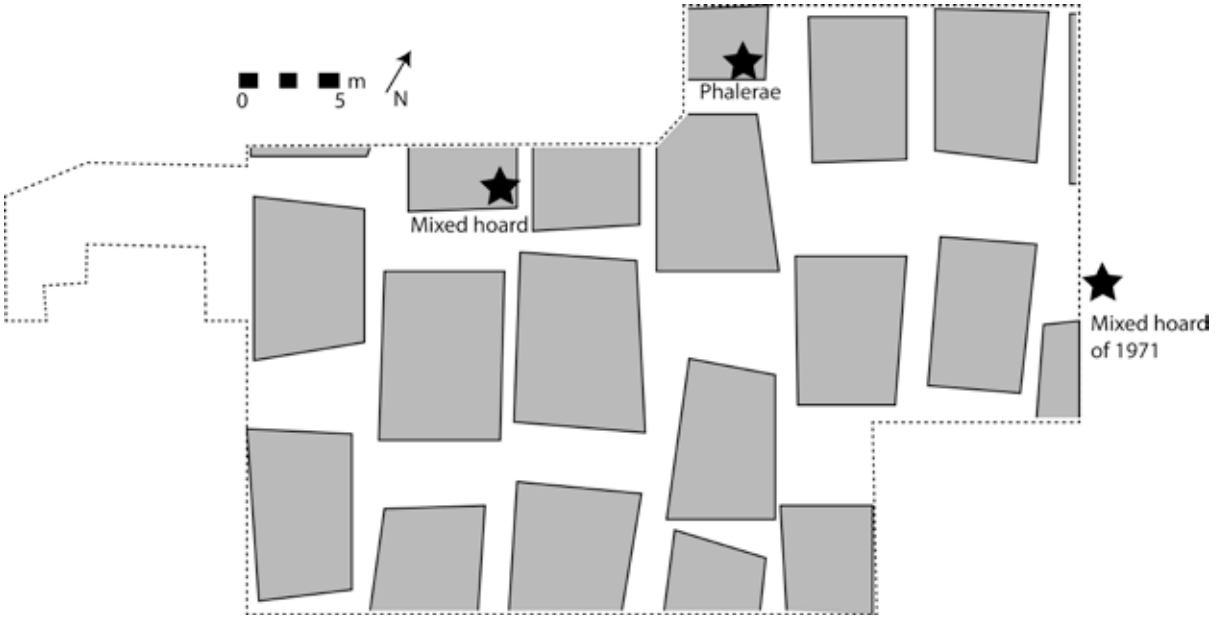

Figure 64: Location of metalwork hoards (star) within the settlement and buildings (grey) at Auvernier-Nord (re-drawn fromafter Rychner, V 1987: Figs. 2, 3).

Furthermore, some objects suggest a specific 'ritual' aspect to the deposition of materials. An unusual anthropomorphic wooden figurine from Wasserburg-Buchau, unfortunately without context information, may have been related to the deposition of metalwork (see above) at the site (Kimmig, W 1992). From Grésine (FR) possible elements of a wagon and a small bronze vessel, which shows some similarities to the "*Stangentrichter*" in Switzerland and southern Germany (Map 148), are recorded (Kerouanton 1996: 98). Such objects are rare outside hoard and burial contexts, particularly in the Carpathian Basin and southern Germany, though are well known from other lake-dwellings, for example Zurich-Alpenquai and Grandson-Corcelettes (Mäder 2001a: 41-45). The deposition of these objects in (or the vicinity of) lake-settlements should be seen as part of a socially symbolic practice, possibly even part of the burial rite of the communities, and not simply lost or discarded objects.

Müller (1993: 86) has suggested that the quantity and types of bronzes found in lake-dwelling settlements is an argument against the abandonment of settlements as the result of flooding 'disasters', but in fact represents cultural practices. However, the social reasons for the deposition of artefacts may have been connected to environmental aspects, which cannot be observed in the archaeological record.

It should also be noted that some finds of metalwork may relate to the abandonment of settlements or structures. Ethnographic research shows that in situations of rapid abandonment of buildings objects can be left behind (e.g. Deal 1985). This may account for some of the finds from within structures (particularly those built directly on the ground), though social considerations may also account for such objects (for example abandonment following the death of household members (cf. Kent 1984: 29, 139)). The 9th century BC lake-settlement Ürschhausen-Horn provides a very interesting example, as exceptionally few metal artefacts were found during excavation. A stone mould from the site (for pins/needles) clearly indicates that metalworking occurred in the vicinity of the settlement (Nagy 1999). It is possible that the majority of metalwork items were removed as socially valuable objects from structures prior to their intentional and planned abandonment, as may also be seen in the distribution of pottery (see Section 4.3.1). Yet, there is a considerable difference between the number of bronze objects recovered from this site and that from other lake-dwellings.

Differences in composition can be seen in the hoards/depositions in lake-dwellings of western Switzerland: around Lake Geneva a large proportion of pins (c.48% of assemblage) were deposited, while in the

Lake Neuchâtel/Biel/Murten region rings were more common (c.54 %) (see Fischer, V 2011: 1302, 2012: 115). Divergent preferences for deposition over such a short distance, and also over time, provide a clear indication of how the social value and treatment of objects varies between communities and regions. When compared to depositions and sites in other parts of central Europe, for example southern Germany, the contents of those hoards in western Switzerland show a reduced quantity of weaponry, and particularly swords (see Section 5.4.1.1 (cf. Fischer, V 2011: 1307)). This is a pattern which encompasses the whole of Switzerland, with the vast majority of Late Bronze Age swords and spears known from lake-settlement and wetland contexts (Table 43), in contrast to their central European counterparts. However, it is also significant that despite the high number of swords and spears known from lake-dwelling contexts, terrestrial settlement finds are un-known or more limited. Clearly the deposition of these objects in settlement contexts should not be considered the norm, and those examples from lake-dwellings likely reflect an alternative deposition practice (see Section 5.4.4.3).

Table 43: Find contexts for swords and spears from Switzerland. B = Burial; B/H = Burial or hoard; H = Hoard; L-D = Lake-Dwelling; Sett= Inland settlement; Sgl = Single find; W = Wetland

Object	Region	B	B/H	H	L-D	W	Sett.	Sgl	Other	Total
Swords	CH	0	0	5	35	12		6	6	64
	Europe	53	2	83	2	57	10	52	66	325
Spearhead	CH	1		8	88	6		34	1	138
	Europe	11		89		27		23	95	245

Curated objects

Within the metalwork depositions in lake-dwellings of western Switzerland (e.g. at Mörigen, Genève-Eaux Vives, and Auvernier-Nord), a small proportion of artefacts (2.6 %; mainly pins), are apparently outside of their period of circulation and use; objects relating to the Early and Middle Bronze Age, and Early Urnfield period appear in Late and Final Urnfield period settlements and depositions (Fischer, V 2011: 1301-02, 2012: 124-28). These "relics" have been interpreted as 'heirlooms' curated across multiple generations before being deposited in the final stages of the Late Bronze Age (Fischer, V 2011: 1301-02). However, the occurrence of relics in depositions need not imply that they were circulated for extended periods of time; they may have been recovered during re-occupation of the lake-shores and re-used in contemporary deposition practices (cf. Hingley 2009).

If it is assumed that these objects were inherited and curated over several generations, they may provide some interesting aspects to the consideration of the biography of lake-settlements and how sites were chosen. The deliberate retention of small numbers of objects would have represented a link to past generations, and could have been utilized as a legitimizing technique to demonstrate rights to, and history of, settling in particular locations. Such methods might have been essential if attempting to (re)occupy specific '*Hausplatz*' under a mobile settlement pattern (see Section 4.5) as the ownership of specific objects would have signified membership of specific households and lineages. The choice to deposit these 'relics' at a specific time may have signified the death (symbolic or actual) of households or individuals, though not necessarily the end of the *Hausplatz*, as new, contemporary objects may begin a curation process as heirlooms within the context of a 'new' household. Conversely, the findings of objects by chance through daily activities may have provided indications of past settlements, and suggested locations for future settlements and depositions (see Sections 2.5 and 4.5.1.3).

5.4.4.2: Single item depositions

In addition to the deposition of grouped objects, single pieces of metalwork were deposited in rivers and wetland locations (Görmer 2006: 293). These pieces may have been deposited in such locations to make their recovery impossible, signifying an effective permanent removal of the objects from social circulation, and effectively acting as a votive offering (Görmer 2006: 293-94; Fischer, V 2011: 1307; Rychner 2001; Müller, F 1993). However, it has also been argued that they would have remained as 'visible' objects, particularly in the lake-shore area, and it was only social convention and practices that prohibited their recovery (Rychner 2001). In this sense 'visible' is a relative term, because depositions in hoards, burials, or isolated were always visible to the observers of, and participants in, the deposition (Larsson 2001: 169). In the case of burials the deposition would have been prominent, and hoards may have been located near significant features in the landscape. To individuals who understood the social context and structure of deposition practices, hoards, and their possible/probable location, would have been visible in the cultural landscape. Thus, the decision not to recover objects from their deposition is always guided by social convention. The occasional recovery of objects from burial contexts is known through the occurrence of

'robbed' graves, though how quickly after deposition such activities occurred is unknown. They may have been robbed after a significant period of time, or objects may have been removed shortly after their deposition (Polin 1984; Keswani 2004: 99; Kimmig, W 1988: 24-25, 269; Riek 1962: 51-53; Fischer, C 1997).

Working with Late Bronze Age material from the Netherlands, Fontijn (2007: 76-77, 2002: 273-76) has argued that deposition of single items or small assemblages in isolated locations consisted of objects that were not incorporated into the burial ritual: in this case weapons and imported items. A dichotomy existed in societies between local and imported objects, the maintenance of local traditions and practices and the need to import objects and materials from external regions, resulting in the different treatment of 'local' and 'foreign' materials and the identities that they symbolized (see Sub-section SYMBOLISM in Section 5.4.1.1 (Fontijn 2002: 272-74; Kristiansen 2011)). Different deposition practices for local and foreign materials would have negotiated the dichotomy and kept the local and foreign spheres separate in society (Fontijn 2002: 279; also Bradley 1990: 132-35). Within the lake-dwellings of the nCA various forms of imported material culture have been recognized, some of which show deposition in regional practices (e.g. knives) and others show some similarity to their native land (e.g. *Platten* fibula). The placement of local and imported objects in similar practices suggests that there was not such a concern with segregating 'local' and 'foreign' identities in the lake-settlements, possibly because these communities straddled and directed exchange routes linking the regions north and south of the Alps.

Deposition of items in the landscape, both as individual objects and hoards, may have been used as a mnemonic device to perpetuate the memory of events or persons through society (Fontijn 2007: 77), as illustrated by ethnographic studies in Melanesia (Rowlands, M 1993; Kuchler 1987; Küchler 1993). Such memories may have related to individual persons – through the deposition of individual items – or collective communities and events – by the deposition of multiple items representing multiple actors through relational associations (cf. Fredengren 2011). While the location to deposit items would have been guided by social considerations and, probably, natural features in the landscape, the practice of depositing objects would have created the social landscape in which daily life occurred – thereby structuring other events, and suggesting places for actions (Larsson 2001). Thus, the practice of deposition was essentially a way of creating time and place marks in the landscape (see Section 2.5). On personal scale, knowledge of where to deposit objects, and create place marks, could have been used as a method of legitimation for social elites (Fontijn 2007: 81).

The deposition of metalwork in wet- and moorlands of the northern Circum-Alpine region is most common during the Late Bronze Age (BzD-HaB3), with an increase of deposited swords during the Late and Final Urnfield (Uenze, H P 2002: 442-44). In other areas of Europe riverine deposition is particularly significant, with great quantities of metalwork recovered, for example, along small sections from the Rhine, Main, Thames, Danube and their associated tributaries (Kubach 1994; Bradley 1990; Falkenstein 2005: Fig. 7; Torbrügge 1972). With the end of the Urnfield period, and beginning of the Iron Age, an increasing number of isolated depositions were made in terrestrial contexts, away from wetland environments, indicating a change in the social guidelines structuring deposition practices and locations (Uenze, H P 2002: 445; Bauer, S 2002: 1067; Dunning and Rychner 1992: 83). During the La Tène period depositions were again increasingly made in wetland locations, such as around Greifensee (CH), in the River Limmat (Zurich), and at La Tène and Nidau (CH). Deposition at these locations over extended periods of time indicates that they formed significant places in the social landscape (Uenze, H P 2002: 450).

Continued deposition of material along the lake-shore (or at other locations) and concentrations of small objects (e.g. pins/needles) over extended periods of time may represent 'sacred' locations that gained importance for the ritual practices of the nearby lake-dwelling communities (Bauer, S 2002: 1074; cf. Falkenstein 2005). Fluctuations in the lake water-level may have influenced the rate of deposition in specific locations as access was intermittently interrupted. However, the apparent asynchronous deposition and abandonment cycles at different settlements, e.g. Zurich-Alpenquai and -Wollishofen-Haumesser, is an indication that the settlements were not abandoned solely due to lake-level rise (see Section 1.1.3 (cf. Bauer, S 2002: 1074-75; Bleicher 2013)). If lake-level rise were the driving factor, synchronous abandonment cycles would be expected in settlements in the same region and lake.

For southern Germany during the Early Urnfield period (HaA, see Figure 7 for chronology overview), Falkenstein (2005) has suggested that a segregation is evident in the materials deposited in flowing water compared to standing water: male associated objects in the flowing and female in standing. The deposition of weapons, i.e. spears and swords, occurred overwhelmingly in riverine locations, while jewellery, knives, and needles were placed in greater numbers in standing water (Table 44). It is conspicuous that razors were deposited in neither flowing nor standing water; this is a further indication of the ambiguous social function of these objects (see Sub-section SYMBOLISM AND USE in Section 5.4.2.1). It is also interesting to note that some of these objects, such as knives and ring-jewellery, are cross-gender objects, occurring in both male and female burials for a range of

age groups (e.g. examples in Schopper 1995). Their deposition in both flowing and standing water is an extension of these dual associations, in some cases representing male aspects in others female.

Table 44: Percentage of Early Urnfield (HaA) objects deposited in standing compared to flowing water. (Data from Falkenstein, 2005).

Object Group	Standing (c. %)	Flowing (c.%)	Number of Objects
Spear	0	100	31
Sword	5	95	146
Sickle	5	95	16
Axe	15	85	91
Jewellery	20	80	26
Knife/Dagger	40	60	39
Needle/Pin	50	50	140

5.4.4.3: Fragmentation

Much of the metal-work found in hoards and burial depositions of the Late Bronze Age occurs in broken condition. While some breakage could occur accidentally, the deliberate fragmentation and destruction of objects is evidenced through the nature of damage: swords bent in half, sickles cut into small pieces, knives snapped across the blade and axe heads cut in half (e.g. Nebelsick 1997; Fontijn 2002). The occurrence of broken and fragmented spearheads in lake-settlements, e.g. Mörigen, Grandson-Corcelettes, and Auvernier-Nord, is further evidence of the intentional, structured deposition of material in these settlements (Rychner 2001).

Traditional views of object fragmentation have seen the practice as ways to remove the social function of objects and allow the value of the metal to be accessed – particularly when collected in 'scrap' hoards (e.g. Brück 2006: 90). However, fragmentation should also be seen as a way to re-negotiate social ties and values through the deposition and exchange of incomplete objects (Brück 2006; Chapman 2000). A good example for the circulation and curation of socially significant fragmented metalwork during the Bronze Age is illustrated through the apparent finding of two parts of a single sword deposited (c. 3km apart) on opposite sides of a river valley in the UK (Ford *et al.* 1998). While identification of parts of the same object from different sites is exceptionally rare, this example highlights the potential that may exist in the current record of swords, spears, and sickles from central Europe to identify the circulation of fragmentary objects.

It has been suggested elsewhere (Fischer, V 2011: 1303) that many of the metalwork objects from lake-dwellings show deliberate damage and destruction, which may have represented an attempt to replicate the effects of metal objects damaged during cremations. However, the occurrence of intentionally damaged objects in hoards and depositions from regions where cremation burials are known (i.e. outside of the lake-dwelling region (Nebelsick 1997)), suggests that other social factors may have influenced these practices of damage and destruction.

During the final stages of the Bronze Age and particularly the early Iron Age (HaC) swords were increasingly included in burials, but unlike other burial goods, were intentionally broken and damaged (see Sub-section DEPOSITION TRENDS in Section 5.4.1.1). Fontijn (2002: 235; also Nebelsick 1997: 166) has argued that this continues the LBA avoidance of placing swords in burials as they symbolically destroyed, rendering the object a passive part of the identity of the entombed individual. Damage of swords in burials during the LBA is in contrast to those which were deposited in riverine of wetland contexts, where the significant majority are undamaged: of the 119 recorded by Falkenstein from southern Germany only six were fragmentary and two showed signs of burning (Falkenstein 2005). Such a pattern is not so evident in the finds from Switzerland, where of the 54 Late Bronze Age swords recorded in this study nearly 50% show signs of intentional damage or fragmentation (Table 45). This includes deliberate snapping of the blade into multiple pieces, bending of the blade, and the retention of only the hilt and lower section of the blade. When compared to the deposition practices in the surrounding regions (e.g. southern Germany), it is evident that the fragmented swords from wetland or lake-dwelling contexts in Switzerland show patterns of fragmentation similar to those deposited in burials or hoards outside of Switzerland. The remainder (undamaged swords) were deposited in a condition comparable to wetland or riverine deposition. Thus, the swords from lake-settlement contexts represent a combination of burial/hoard and wetland style depositions; suggesting both forms of deposition existed within the lake-settlements.

Table 45: Quantity of fragmented HaB period swords from the nCA and other regions of Europe.

	Northern Circum-Alpine region			Rest of Europe		
Sword type	Fragmented	Intact	Total	Fragmented	Intact	Total
Auvernier	4	1	5	6	21	27
Calliano		1	1	1	2	3
Locras		5	5	2	8	10
Mörigen	15	8	23	17	95	112
Tachlovice		4	4	6	33	39
Tarquinia	1	7	8	4	26	30
Weltenburg	2	5	7	6	25	31
Corcelettes				1	4	5
Zürich	1		1	2	9	11
Total	**23**	**31**	**54**	**45**	**223**	**268**

Concerning the deposition of spears – again primarily in lake-dwellings – most of these objects are in an un-fragmented/-damaged condition. Of the 719 spears recorded by Tarot (2000), only 161 of these are in a non-diagnostic, fragmentary condition. Extrapolating the findings from his horizons 4 (HaB1) and 5 (HaB2/B3) there are 56 intact with 13 fragments, and 105 complete and 24 fragmentary spearheads respectively. A minority of spearheads were deposited in a broken state, which is comparable to depositions of spears in other areas of northern Europe (see Jacob-Friesen 1967).

The fragmentation of some objects may have fulfilled a more practical than symbolic role, such as sickles which may have been partitioned to create a standard basis for the circulation of metal (Primas 1986; Bradley 2005: 151). For other objects, such as swords, the deliberate destruction and fragmentation is likely to hold more socially symbolic relevance. In the catalogues of Bronze Age swords from southern Germany, Austria, and Switzerland (Schauer 1971; Krämer 1985) deposition of fragments including sections of the hilt are more common than fragments solely of the blade – at a rate of 5:1 (Bradley 2005: 154-55). This selection may have occurred because the hilt of the sword was closely associated, particularly when decorated and singularized, to the identity of the owner, and so became a signifier for them, whereas less specific/identifiable blade sections could be re-worked into new objects – or deposited in other locations (Bradley 2005: 155).

The occurrence of razors manufactured from pieces of arm-/leg-rings also suggests the deliberate fragmentation of certain artefacts (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1). It is possible that the ring jewellery was fragmented and converted at specific life stages of their owner. As suggested above, ring jewellery may have held both female and male associations, and it is possible that the rings could have been cut into pieces and converted when the owner reached a certain age. Although few examples of these ring-razors are known (cf. Jockenhövel 1971, 1980), many more fragments/portions of rings with clean cuts (indicating deliberate fragmentation as opposed to accidental damage or breakage) are recorded from the northern Circum-Alpine region. Such a conversion resulted in the change of a socially significant object to an apparently insignificant one, indicating that the rings were only relevant until a certain point of the owners' life, at which time they became superfluous and could be destroyed and either deposited or re-used.

5.4.4.4: Concluding remarks

From the above discussion it is evident that the deposition of metalwork is the same in lake-dwellings as it is in terrestrial locations, a fact which has also been emphasized in recent studies (e.g. Fischer, V 2011, 2012). In Fischer's (2011: 1308-09, 2012: 143-44) argument, the main difference between the deposition practices in terrestrial sites and lake-settlements is a condensation, or "superimposition", of practices into the confined area of lake-settlements instead of spread across the landscape, "juxtaposition", in terrestrial situations (Figure 63). This point returns to the fundamental question of why hoards and depositions were made. Instead of considering the traditional arguments of protecting wealth or caching materials, reasons should be sought from a more theoretical perspective: hoards and depositions were *placed* – and they were deliberately placed whether or not it is possible to recognize the principles behind the choice of location – to turn *spaces* into *places* (see Section 2.5 (cf. Ballmer 2009, 2010)). For the members of society, making depositions would have populated their landscape with social meaning and memories, and would have guided future actions and possible activity locations. The purpose of depositions within settlements, therefore, is somewhat unclear as settlements would have already represented a significant feature on the social landscape, though they may have formed *time marks*, linking certain individuals

and events to the settlement. The deposition of old and/or curated material may have been significant in the creation of these time and place marks, and the association of identities with events (see Section 2.5).

Regarding the deliberate fragmentation of material in hoards and depositions, it is clear that both fragmentary and intact objects were deposited within the vicinity of lake-settlements in the nCA. Some of these materials, e.g. swords, may represent part of the burial custom in those settlements (cf. Fischer, V 2012), or 'votive' depositions in watery locations (cf. Falkenstein 2005) dependent upon their condition. In a study of fragmentation rates in hoards from different environmental locations, Nebelsick (1997) has observed a difference between those contained within settlements (decreased fragmentation) and those in open areas (increased fragmentation). The assemblages detailed by Viktoria Fischer (2012: 58ff) from Auvernier, Grandson-Corcelettes, and Hauterive-Champréveyres are mainly composed, with the exception of sickles, of intact objects, even though the overall percentage of fragmented items is quite high (ibid: 105ff). The increased fragmentation of sickles may be a result of their (possible) use a currency form (see Sub-section SYMBOLISM AND USE in Section 5.4.2.3 (Primas 1986; Sommerfeld 1994)).

The deposition of material in wetland environments and lake-shores in the northern Circum-Alpine region is not a constant feature of the Bronze Age, and, just as for the occupation of lake-settlements, alternating phases of deposition/non deposition can be observed. For example, swords show increased rates of deposition in wetlands during BzD and HaB2/HaB3, with the opposite during HaA-HaB1 and HaC (see Sub-section DEPOSITION TRENDS in Section 5.4.1.1). Deposition in wetlands during BzD may represent a ritual association, at a stage when the lake-shores were not occupied. Intensive occupation during HaB2/HaB3 may mask the rate of object deposition due to placement within settlement locations. However, that the same pattern occurs outside of the lake-dwelling region (e.g. in southern Germany and the Main area) indicates fluctuating symbolic associations with wetland/riverine contexts. A decline in deposition of objects, such as pins, during the Late Urnfield (HaB3) has been interpreted as a de-sacralisation of the lake-shore environment (Uenze, H P 2002; Bauer, S 2002). Such a change in attitudes towards the lake-environment may have arisen from the increased occupation of the area, or increasing unpredictability of the environment connected to the well-discussed climatic decline during the 9th century BC (e.g. Magny 1992). Whatever the reason, a change in attitudes occurred towards deposition in wetland environments at the end of Bronze Age and beginning of the Iron Age, and such practices would not re-appear (to a significant level) in the former lake-dwelling region until the La Tène period (without lake-dwelling occupation).

In light of the occurrence of hoard deposition within lake-dwellings and highland/fortified hilltop settlements, and the apparent low degree of fragmentation in both of these settlement types, it could be argued that lake-settlements are the lowland equivalent of fortified hilltop sites. Both types of settlement have significant evidence for metalworking (see Section 5.4.3), show connections to inter-regional exchange routes (e.g. Montlingerberg, CH), and represent concentrated settlement locations within the landscape. In reference to material culture objects, it is interesting that the only site north of the Alps, other than a lake-settlement, at which a key has been identified is the hilltop settlement Montlingerberg (see Section 5.4.2.8). This suggests that similar social structures, and the significance of access restriction and containment, may have existed at this hilltop settlement and contemporaneous lake-settlements. While hilltop locations may have been easily defendable and imposing sites in landscape with high visibility, lake-shore settlements could have effectively controlled trade routes running along riverine/lacustrine routes in the Alpine forelands: hilltop sites were visible and prominent locations in the Alpine valleys in terms of terrestrial and riverine transport, while lake-settlements were the same in respect to riverine and lacustrine transport.

5.5: Weights, Balances, and Weighing

At several Late Bronze Age lakeside settlements a number of weights have been found (Map 145, Map 146). In contrast to loom- and fishing-weights, these small, globular weights are made from stone or metal (lead or bronze) with loops for their attachment to unknown equipment ((Figure 65)). The physical mass of these objects varies between less than one hundred grams and slightly over 1 kilogram. It has been suggested that some of these weights are related in both style and mass to weights found at various *terramare* sites, and also settlements in southern Italy (Pearce 2007: 97), of the Italian Middle and Recent Bronze Age[32] (Cardarelli *et al.* 1997), while others belong to a "lake-dwelling" (*Pfahlbau*) system of weights (Pare 1996: 503-05).

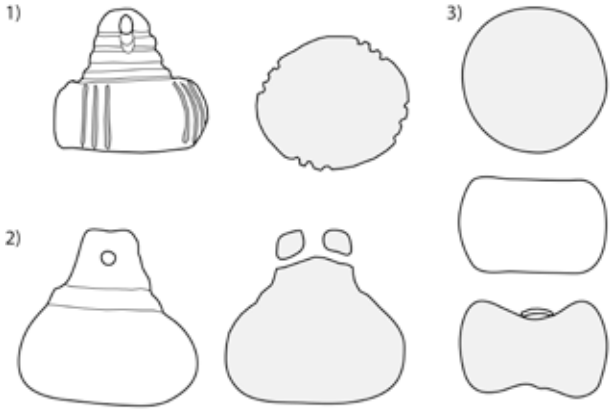

Figure 65: Small weights from Mörigen (1 (c.5 x 10cm) and 2 (c.10 x 20cm), made of stone (re-drawn from Bernatzky-Goetze 1987: Fig. 173. 11, 12)) and Auvernier (3, made of lead (re-drawn from Rychner 1979: Fig. 130.11)). Sizes: 1 = c. 5cm; 2 = c. 10cm; 3 = c. 6cm, 731g.

In association with these weights several artefacts which have been interpreted as balance scales should be discussed. Possible balance bars made of bronze have been found at the Late Bronze Age lake-settlement Grandson-Corcelettes ((Figure 66)) and a probable early Late Bronze Age (BzD2) inhumation burial from Richemont-Pépinville (FR). Similar objects, and supposed balances, made from bone and horn, have been identified in Late Bronze Age burial contexts from sites in France (Roscio *et al.* 2011; Peake and Séguier 2000) and the Republic of Serbia (Pare 1996).

However, it must be noted that weights are not a unique feature to lake-settlements during the Late Bronze Age of central Europe; numerous weights have been found from sites spreading from central France to the Czech Republic and beyond (Map 147; (Pare 1996)).

[32] Broadly equivalent to Bronze Age period C the beginning of Hallstatt A north of the Alps, dating to between 1500 and 1200 BC (see Section 1.4).

5.5.1: Terramareans abroad

The occurrence, in lake-side settlements north of the Alps, of a balance and weight system with a possible connection to that used in the *terramare* south of the Alps, invites questions as to the possible trade connection between the two areas, particularly taking into account that the *terramare* are widely considered to have entered a process of decline and abandonment before the Late Bronze Age lake-shores north of the Alps were (re)occupied during the Late Bronze Age (see Section 1.1.3). Such a temporal disparity should not be regarded as evidence of a migration, or partial migration, of people from the *terramare* to regions north of the Alps. Rather, this is simply a system continuation beyond the temporal setting of one settlement region to the era of another; the weight system was not tied to the *terramare* and survived the decline of those settlements, as can also be seen in the continued use of similar weights at Frattesina (Pearce 2007: 97). Thus, linking the *terramare* to the lake-settlements north of the Alps through weight systems alone is difficult. However the trade links between northern Italy, Frattesina, and the lake-dwellings north of the Alps during the Late Bronze Age is well recorded, with particular reference to the circulation of the *Pfahlbauperlen*, *Allumiere* beads, and metal work objects.

5.5.2: Travelling Traders

The generally accepted transmission of the weighing system from the south to north of the Alps occurred through individuals involved in trade and exchange processes. As has already been discussed there were well documented trade links between the regions north and south of the Alps during the Bronze Age (see Chapter 3). The use of scales and weights by traders travelling to foreign parts has been proposed by Pare (1996), with the support of findings of 'foreign' objects such as shell from the Mediterranean found as '*Tascheninhalte*' (small personal equipment contained in small pouches) in Denmark (Hvidegård, Copenhagen), and a sharks tooth from Mannheim-Seckenheim (D). While the containing pouches from Scandinavia discussed by Pare do not include weighing equipment, he draws some parallels between these collections of items and the items often found in association with weights and scales, and suggests that they may have originally been contained within wooden boxes, with metal hinges (Pare 1996: 449) or locking methods (Roscio *et al.* 2011: 185), such as Marolles-sur-Seine (FR). The role of social elites in the exchange of materials and weighing is further supported by the recurrent finding of weights from the BzD period in rich burials and associated with swords, bronze vessels, wagons, horse equipment (Pare 1996: 465-70), amber and gold (Roscio *et al.* 2011: 174-76). Weighing equipment may also be linked to metal-working artisans, for example the second

set of weights from burial 298 at Le Petit Moulin (FR) were found in association with possible polishing and grinding stones, a bronze hammer, and a half fabricated dagger (Roscio *et al.* 2011).

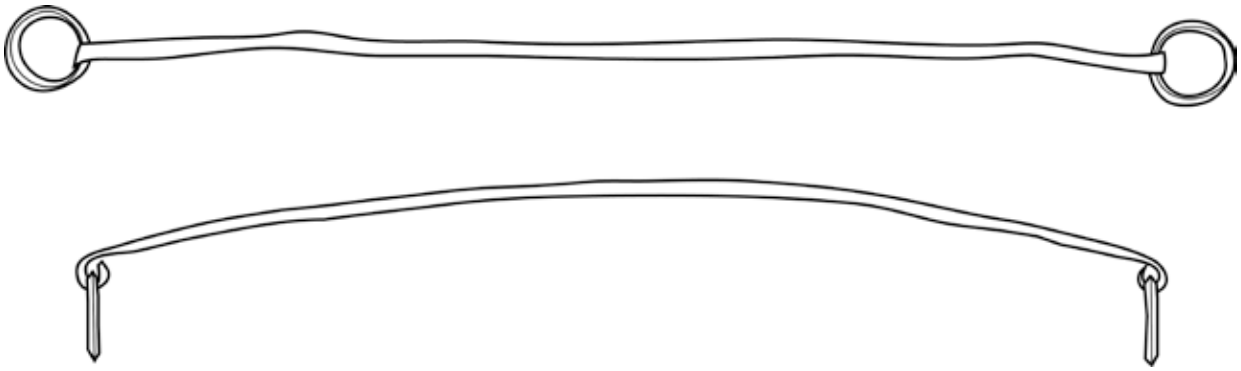

Figure 66: Supposed balance scale from the Late Bronze Age lake-settlement Grandson-Corcelettes. Length = c.20cm (re-drawn from Primas 2004: Fig. 10).

The same materials which have been used to interpret the elite and 'trader' status of individuals buried with weighing equipment have also been identified as possible substances which would have been weighed: amber, gold, pigments and spices, while their generally low mass of weights has been used as an argument against metal manufacturing processes (Pare 1996: 470). Unworked amber has been found as *Tascheininhalt* from southern Scandinavia, and processed form from Hurlach (FR; 3 beads) and Marolles sur Seine (1 bead) (see Pare 1996). Whether amber is a material which would have been exchanged on a weight basis is questionable. The quantity of amber pieces found at Bjerre (see Section 5.1) would suggest that amber may have been exchanged on a larger scale than weight, and it would be more logical (from a modern perspective) to exchange amber on a piece basis, given that one of the main uses of amber was to work pieces into objects such as beads, then the dimensions of pieces would have been a more significant factor of exchange than their mass. However, moving away from the amber producing region of the Baltic it may have become more common to use the weight of amber pieces as an exchange medium as the quantity of amber decreased. Other uses of amber, such as medicinal or burning, may have required the weighing of pieces, though these practices are not preserved archaeologically. Other objects of jewellery, such as the *Pfahlbauperlen*, with irregular dimensions and mass are more likely to have been exchanged on a piece basis rather than a weight basis, either as complete or partial sets of jewellery, particularly given the relatively low numbers of these beads which have been found in most locations.

On the other hand, some materials may have been exchanged based on their weight, for example gold and small quantities of iron during the LBA. There is an abundance of artefacts considered of a high status nature, such as swords and horse gear, which were ornamented and decorated with small quantities of iron during the latter half of the LBA (see Section 5.4.3.2). These small pieces may have moved in low volume circulation and required weighing to provide an indication of their value as a novel material.

Circulation and exchange of bronze and copper is unlikely to have utilized the weights under discussion here due to their low mass, and the occurrence of ingot forms of varying types throughout the Bronze Age, such as *oxhide* ingots, rib ingots, and the later pick ingots (see Section 5.4.3.1). However, the Middle Bronze Age practice of fragmenting sickles to pieces of semi regularized mass (Primas 1986: 37; Primas and Pernicka 1998) suggests a quasi-currency status and exchange medium which may have been weighed, though the semi-regularized size would suggest a more visual than mass based 'value' identification.

5.5.3: Increasing commoditization in the Late Bronze Age

The occurrence of weights and scales from the Late Bronze Age raises questions with regards to the supposed gift exchange systems driving the circulation of goods between elites. Primas (2004: 130) has suggested that the introduction of weighing systems should not be seen as the end of gift exchange between elites, but rather a decline in exclusivity of gift exchange. The transition to an exchange system in which objects are weighed implies an increasing commodification of particular objects. As discussed above, the identification of those objects is difficult, though some categories of goods have been identified. Weighing systems are only required to weigh one class of goods in an exchange system, with the value of the weighed good being equated to a quantity of reciprocated goods, thus

commoditisation of goods becomes 'contagious', with expanding categories of objects being seen as equivalent to weighed objects. The increasing commoditisation of exchange, expected instant return, and equivalence of values implied by the adoption of weight systems may have had far reaching social consequences.

The significance of a gradual replacement or reduction of gift exchange systems should not be underestimated; if relatively minor events such as the introduction of new materials can have significant and unforeseen social consequences (cf. Herbich and Dietler 2007; Sharp 1954), then the consequences of the introduction or adoption of new social practices could be profound. The gradual replacement of a gift exchange with a commodity exchange system during the Late Bronze Age would have led to a reduction in the social ties formed through gift giving and acceptance, which may have led to a reorganisation of social connections, trade routes, and inheritance systems, leading to a subsequent relocation of the lake-dwellers. The trade connection between the lake-dwelling communities north of the Alps and population centres of northern Italy can be seen as directly responsible for the transmission and development of the weighing concept and for influencing social change in the lake-dwelling societies through a process of acceptance and incorporation of both goods and concepts. It must be remembered that there is evidence of weights from the Early Late Bronze Age north of the Alps, but these are generally restricted to weights with low mass. The examples from the lake-dwellings have a higher mass, suggesting that they were used for different functions (Pare 1996: 510), and that during the latter part of the LBA weighing, and thus commodity exchange, was less restricted to elite spheres and more commonplace.

For the early Iron Age there is an absence of archaeologically recovered weighing equipment, with the exception of two possible weights from a cremation burial at Oberndorf (D) (Torbrügge 1965). Weighing systems are only observed again from the 7th century BC in Greece, the 6th century in Italy, and not until the late Hallstatt and early La Tène period in northern/central Europe (Pare 1996: 509). Thus, following the decline of the lake-dwelling settlements, change in copper supply networks and increased use of iron, and the re-organisation of the north-south trade routes at the end of the Late Bronze Age there may have been a return to a more gift based economy and a reclassification of luxury and prestige goods towards objects which were less amenable to quantification by mass, such as Greek/Etruscan pottery, bronze work, wine and oil. This return to old trade traditions was not enough to trigger a re-population of the lacustrine areas.

6: Religion, Rituals, and Symbolism

Ritual and religion are, as detailed in Hawkes' (1954) 'ladder of inference', one of the most difficult aspects of prehistoric society to understand from the archaeological record. Some of the best indicators for 'ritual' and 'religious' practices are the burial structures and remains encountered throughout European prehistory, from which burial goods and treatment of the bodies provide indications of cultural attitudes and practices. The study of material culture items from the lake-dwelling regions of Switzerland has shown that objects were seldom deposited in burial contexts in these communities during the Late Bronze Age (see Chapter 5). In fact, due to the limited number of burials associated to the lake-dwelling communities their funerary practices are poorly understood (Primas 2004: 113). Some cemeteries are however known, for example Le Boiron (Beeching 1977), and burials at Vidy-Chavannes (Kaenel and Klausener 1990; Moinat and David-Elbiali 2003).

6.1: Burial Practices

When considering burial traditions of any period, it is important to remember that the burial rites were not carried out by the individual placed in the burial, but by the members of society who survived them; that "the dead do not bury themselves, but are treated and disposed of by the living" (Parker Pearson 1999: 3). Thus, the objects which were placed in burials as offerings and goods may not only have represented the personal belongings or identity of the individual, but signify the relationships and roles that they held and fulfilled in society (Parker Pearson 1999: 84; Joy 2010: 76; Fontijn 2002: 241). However, burial goods need not be biographical in the strictest sense, but also symbolically biographical, as argued by Whitley (2002) for warrior burials in Greece: individuals were buried with the ornaments of warriors because the position they held in society dictated that they *were* warriors, despite the fact that their age and physiology suggests they (possibly) *were not*. The objects chosen for inclusion in burials may have been specifically made for this purpose, to recreate identities that were destroyed in cremation process (Parker Pearson 1999: 85; Fontijn 2002: 240), and also as a display of wealth and power to observers of the burial; not only of the individuals entombed, but also those performing the ceremonies. Burials were also arenas for political and social deception, for example the Bronze Age trunk burial at Borum-Eshøj (DK), in which a dagger was placed inside a sword scabbard in the burial, both deceived observers of the ceremony with the false deposition of a specific item, and deprived the buried individual of their appropriate items (Parker Pearson 1999: 85-87).

Cemeteries and burials associated with Late Bronze Age lake-settlements are very uncommon, which makes a comparative analysis of burials and their incorporated items difficult. The few examples which are known (Table 46) show that while a range of 'accessory' goods were included in burials (for example glass beads, arm-/leg-rings, needles, and plain ceramics), 'functional' objects such as arrows, spinning whorls, fish hooks, razors, knives, swords/weapons, and richly decorated ceramics were seldom deposited in this manner (see Section 5.4.4 (cf. David-Elbiali and Moinat 2005: 161-62; Primas 2004)). The low number of burials and relatively low frequency of deposition at these locations suggests that a small proportion of the communities living in these regions are represented. Inland cemeteries of the nCA from the Late Bronze Age (Table 46), illustrate a similar pattern and frequency of burial, and also continuity and re-use of Middle Bronze Age cemeteries (e.g. Morat-Löwenberg). Small, short duration cemeteries are evident in southern Germany, where they have been interpreted as a reflection of short duration, mobile, settlement trends (Brestrich and Wahl 1998: 307), which may be similar to the mobile pattern evident for lake-settlements (see Section 4.5).

Table 46: Selected burials and cemeteries related to lake-dwellings and inland settlements within the northern Circum-Alpine region. L-D = Lake-dwelling. (Data from Beeching 1977; Kaenel and Klausener 1990; Moinat and David-Elbiali 2003; David-Elbiali and Moinat 2005; Hapka 1995; Pousaz *et al.* 2000; Hofmann 1991; Hofmann Rognon and Doswald 2005; Boisaubert and Bugnon 2008; Bouyer and Boisaubert 1992).

Site	Dating	Inhumations	Cremations	Qty	L-D or Inland association?
Le Boiron	HaB	X	X	36	L-D
Vidy-Chavannes	HaB-HaC	X	X	16	L-D
Saint Prex-La Moraine	HaA2		X	<60	L-D
Cortaillod-Aux Murgiers	HaA1		X	2	L-D
Le Landeron-Les Carougets	HaB1-HaB2	X	X	1	L-D
Delémont-En La Pran	HaB1		X	40	Inland
Morat-Löwenberg	HaB	X		1	Inland

Excavations in advance of the A1 motorway in western Switzerland revealed a higher inland settlement density for the Bronze Age than had previously been assumed (Boisaubert *et al.* 2008: 446). Particularly intensive areas of occupation over distances of less than 10km in the hinterland of Estavayer-le-Lac and Lake Murten were identified, yet few cemeteries were found in these regions (Mauvilly 2008: Fig. 1). It is possible that these cemeteries may have been utilized by more than one settlement community within the area, and they do not only relate to the closest settlement. Evidence from Late Bronze Age settlement/cemetery separation in other regions, such as Frattesina/Il Narde in the Po Plain, separated by c. 800 metres (Salzani and Colonna 2010), and Rhenen/Remmerden (NL) separated by less than 1km (Fontijn 2010: 139), and suggestions of up to 5km separation in central Switzerland (Brun 1992: 195), indicates that not inconsiderable distances occurred between communities and their cemeteries. During the Iron Age separation between some burials and the supposedly associated settlement becomes even greater, particularly for elite burials, such as between the Hochdorf and Hohenasperg (D) at c. 12km, and possibly even further (cf. Brun 1992: 199-201). Thus, it is quite possible that the lake-dwelling communities utilized some of the cemeteries within the lake-hinterland, as may be indicated by some of the (rare) items included in burials – e.g. arm-/leg-rings and glass beads at Le Boiron (Beeching 1977) and Vidy-Chavannes (Kaenel and Klausener 1990; Moinat and David-Elbiali 2003).

Human remains, but not burials, are known from locations within several LBA lake-settlements of the nCA. The most well recorded remains are from Ürschhausen-Horn (CH) and Wasserburg-Buchau (D), where, respectively, remains of a 7 year old girl and of seven individuals were recovered (cf. Baumeister 2009: 11, 53). However, these instances do not appear to be burials *sensu strictu*, but, possibly, ritualistic offerings in significant places within the local environmental setting. Occurring at the edge of the lakeshore, they may have been deposited as an offering or sacrifice in an attempt to prevent water level rising further[33]. Fragments of human bones, typically cranial, are known from a number of lake-settlements, both Neolithic (proportionately more) and Bronze Age (less), though such occurrences are still not common (Andrey 2006). Some of these fragments, such as from Grandson-Corcelettes, show impressions which may be a result of combat (Andrey 2006: 152-53). The relative abundance of cranial bones compared to other skeletal parts may be the result of 19th century unsystematic 'excavation' and poor identification of human bones (Andrey 2006: 158). Alternatively, this may be the result of cultural selection, with specific remains within lake-settlements utilized for social legitimization practices. Human remains could have performed the function of 'heirlooms' as purely symbolic or functional items, creating links to deceased individuals and past identities in the present (c.f Bonogofsky 2003; Shapland and Armit 2012). However, with a low number of individuals represented (minimum of 201 individuals from Lakes Neuchâtel, Murten, and Biel in the study of Andrey) across the Neolithic and the Bronze Age, if such a practice occurred it can be considered neither common nor widespread.

Burial practices may illustrate an element of conservatism within societies, with retention of familiar materials and objects in the funerary domain. For example, the Hohmichel group of burials, related to the Heuneburg (D) fortified settlement, include few imported ceramic materials, i.e. Attic ware, despite the common occurrence of these in nearby high status settlements (e.g. the Heuneburg). However, burial traditions can also be innovative, with varying dominance of cremation and inhumation traditions (Arnold 2002). The example of Attic ware not being included in burials of the northern Circum-Alpine region may not only be a result of maintenance of traditional ceramics for the burial sphere, but also a result of the forms Attic ware imported: drinking and feasting vessels (cf. Bradley and Smith 2007). The rise of drinking and feasting as a social political sphere during the Iron Age created increased value and significance for imported feasting equipment in the sphere of the living, removing the equipment from the burial practices – especially when compared to LBA type cups (see Sub-section FUNCTION AND SYMBOLISM in Section 5.4.2.6 and Section 7.7). However, the use of imported Etruscan *Schnabelkannen* in Iron Age burials north of the Alps demonstrates that some drinking equipment was still utilized in the burial sphere, and would appear to contradict the previous supposition. Exoticism and 'foreignness' did not automatically convey high status or burial functions on objects; knowledge of the objects intended functions in their 'homelands' also influenced how items were used in new cultural settings.

While the burial traditions in central Europe north of the Alps were generally dominated by inhumation practices during the Iron Age (Arnold 2002), the situation is not so clearly demarcated during the Bronze Age and early Iron Age. Cemetery and burial evidence in the northern Circum-Alpine region from the Middle and Late Bronze Age shows a general trend of development from inhumation burials under tumuli (BzB), through cremation under tumuli and in extended graves (BzC), to the typical Urnfield period cremation with remains contained in an urn without burial mound (BzD and later) (Fischer, C 1997). However, Vidy-Chavannes, Le Landeron-Les Carougets, and Le Boiron show that

[33] Personal communication, H. Gollnisch-Moos 02.10.2012.

cremation and inhumation practices were used simultaneously during the Late Bronze Age.

In a comparative study of early Iron Age burials, Lüscher (1993: 109-111), noted differences in the dominant burial tradition between eastern and western Switzerland, with cremation remaining dominant in the former, while inhumation predominates in the latter. Significantly, there appears to be no overlap of use between the LBA and EIA in any of the cemeteries studied (Lüscher 1993: 111, 143). This lack of Bronze Age-Iron Age continuity is illustrated by the establishment of 31 new cemeteries during the HaC period, many of which remained in use throughout the Iron Age. Furthermore, while some flat burials are recorded from the early Iron Age (e.g. Cressier-Balastiere) a trend towards increasing the visibility of burials is evident, with small tumuli used again to mark graves (e.g. Gals-Jolimont), old (MBA) tumuli were also re-used as burial locations (e.g. Cressier-La Baraque) (Dunning and Rychner 1992: 83; Arnold 2002; Lüscher 1993). This return to 'visible' burials, which may have begun during the LBA at sites such as Ossingen-Im Speck and Rafz-Im Fallentor (Fischer, C 1998: 320), should be seen as both a formative factor in, and an effect of, changing social conditions which led to increasingly hierarchical burial practices in the Iron Age, finally culminating in the richly furnished wagon burials and *Fürstengraben* associated with the *Fürstensitze* fortified settlements (Dunning and Rychner 1992: 83).

Early LBA (BzD-HaA) high status wagon burials, of the *Hart an der Alz* type, in which the wagon was cremated along with the entombed individual, are recorded in the northern Circum-Alpine region (Pare 1992: 23-28). Such practices apparently fell out of fashion during the Urnfield (HaA-HaB) period in the nCA, though numerous pieces of (possible) wagon fittings (the *Egemose* type) are known from the vicinity of Lake Neuchâtel and at Zurich-Wollishofen (Pare 1992: 28-30). A decreasing frequency of wagon burials in Europe north of the Alps during the early Iron Age has been seen as a reflection of increasing elite control and restriction of the access to, and use of, wagon symbolism (Pare 1992: 202-04). Horse equipment found in wagon burials (and burials without wagons) in central Europe frequently occurs as pairs of equipment (suggesting two horses). This indicates that the wagon symbolism was imported from neither eastern Europe, where horse ideology was based around a single horse rider-warrior, nor northern Italy, where two wheeled chariots were commonly included in burials and may have signified warfare and power (Pare 1992: 195-202, 1991). Thus, the northern central European wagon burials were not simply imported ideology, but reflect a symbolism associated to the features and functions of wagons (possibly trade, carrying, transport) and were ritualized into local symbolism, such as the Trundholm sun chariot model and kettle wagons (e.g. Acholshausen (D)) (Pare 1992: 14, 177-95).

Despite the well discussed correlation between house urn burials in northern Germany/Poland and northern/central Italy, which was probably transferred along routes of cultural connection and exchange running through the Alpine region (Bradley 2002; Müller, R 2000; Sabatini 2013: 137-38; Kristiansen 1998: 235), such burials are unknown from the northern Alpine forelands. This phenomenon may be explained through the consideration of what actually happens during a specific burial event. As has already been detailed, it is the surviving community and individuals who perform the burial itself, ascribing identity and incorporating objects as they see fit. Evidence from Greece and Etruria suggests that it was female members of communities who were responsible for the preparation of the deceased for burial (Nash Briggs 2007: 24-25). Thus, the movement of women from northern Italy to northern Germany/Poland through marriage practices may explain the occurrence of some house urn burials in northern Europe – assuming that they outlived their husbands, children, or other community members and were responsible for the completion of burial rites – to bury them in their native (Etruscan) manner (cf. Nash Briggs 2007; see also Jockenhövel 1991). The tradition may then have expanded within the region through parent-child traditional teaching, social interaction, and population spread. Absence of these burial types in the northern Circum-Alpine region could be a result of burial traditions in which women were not responsible for the preparation of the deceased and the performance of the burial rite, or different networks of marriage partners, which did not include northern and central Italy.

6.2: 'Ritual' material culture

A second possibility to observe ritual and symbolic actions is through the occurrence of unusual material culture. For example *Stangentrichter* have been discussed as unusual and enigmatic objects of uncertain function (Mäder 2001a: 41-45). These objects are particularly prevalent in the Carpathian Basin, upper Danube valley, and lake-dwellings of the nCA (Map 148). Clear differences in deposition are recorded between the regions, with preference for hoards in the Carpathian Basin and burials in the Danube valley (Mäder 2001a: 44). Various functions for these items have been proposed, including funnels, needles, jewellery, and parts of horse or wagon equipment (cf. Mäder 2001a: 41-43). The distribution of these objects suggests communication links between the three regions, with either movement of objects or circulation of concepts with subsequent local manufacture possible. The rarity of objects indicates that they may have held specific symbolism related to a small section of the society, either through status as elites (possibly as horse riders if

a bridal function is accepted) or through symbolic status and position (assuming a 'ritual' function).

While the *Stangentrichter* are enigmatic items, other objects have a more recognisable function, though occur in forms and contexts which suggest that they were not purely practical equipment, for example fire dogs and zoomorphic drinking vessels.

6.2.1: Firedogs or 'moon idols'?

Firedogs "*Feuerböcke" or* 'moon idols', "*Mondhorn"* (see Primas *et al.* 1989: 126-48) are known from many Late Bronze Age settlements in the northern Europe (Map 149) and the northern Circum-Alpine region (Map 150). These objects have been interpreted as functional objects, cultic pieces, and instruments for recording lunar and solar calendars (Primas *et al.* 1989: 132-33; Kerner 2001, 2007, 2004). Evidence in support of the latter is provided by examples from Zurich-Alpenquai and -Wollishofen-Haumesser, which apparently demonstrate good alignment to lunar cycles (Kerner 2001). Lunar and solar cycles would have held significance for prehistoric communities; not only concerning agricultural practices, but also for 'religious' functions (Kerner 2001: 108), as also demonstrated by the sun-bird-ship symbolism of the LBA. Decoration of the firedogs, or the various markings used to form the lunar calendar, typically symmetrical along the centreline of the piece and only on one side (Kerner 2001: 132), may provide indications that these were not intended as calendric systems; if they were to be used as calendars or time markers, then repetition of design systems may be expected – but this is not the case. The number of these objects found in single sites may also argue against such a function – especially if it is assumed that the ability to record calendar events would represent an element of social status. For example, a minimum of 36 are known from Eschenz-Insel Werd (Primas *et al.* 1989: 127-28), and at least 50 from Ürschhausen-Horn (Nagy 1999: 76).

Considering the potential population of 300 individuals at Ürschhausen-Horn (Gollnisch-Moos 1999), this suggests a ratio of 6:1 (people:'moon idols') if all of the objects were in use at the same time, meaning that a relatively high proportion of the community may have been able to record calendar cycles; thereby negating any prestige that could have been obtained from such practices. Finally, the manufacture of the firedogs was evidently rather careless, without thorough processing of the clay before moulding into shape (Primas *et al.* 1989: 128). This suggests a hurried and non-specialized, possibly household, manufacture, which may, or may not, be at odds with a specialized function of the finished object.

A functional use of the firedogs may account for their typical fragmentary condition, particularly in light of their low quality manufacture; exposure to high temperatures in hearths may have caused the object to fracture due to airspaces in the clay. Intended use of the objects in hearths could have influenced decisions to manufacture the objects in relatively poor quality, though the decoration applied to the pieces clearly demonstrates that they were to be viewed and observed, and also that they were not manufactured entirely without care. Although, few of the firedog fragments recovered from archaeological contexts have come from within hearths (e.g. two from Eschenz-Insel Werd) most of them are known from settlement pits and areas, and occasionally in burials (Primas *et al.* 1989: 133). Clearly these objects were more than just functional, though the symbolism associated with them, other than possible calendric functions, remains unknown.

6.2.2: Drinking vessels

Zoomorphic and double-ended drinking vessels (*vase a libations*) or infant drinking bottles (*Sauggefässe*) are known from several settlements within the northern Circum-Alpine region (Map 151). These vessels may show some influence from the bird shaped vessels (*Vogelgefäss*) typical of the Carpathian Basin and eastern central Europe, though less obviously zoomorphic and more stylized, showing greater similarity to vessels from central Germany, Austria and the Czech Republic (Eibner 1973). Findings of these vessels in child burials, e.g. Wien-XI-Simmering (Grave 1) (Eibner 1973: 176-78) and Gundersheim (Kubach 1973: no. 1407), supports their use as infant feeding/drinking vessels, though they are also recorded in adult burials (Eibner 1973: 178-81). Iconographic and written evidence from the middle ages provides further evidence of ceramic vessels, similar in design to the Bronze Age examples, being used as child's drinking utensils (Eibner 1973: 190-93). Examples from the nCA are from lake-settlement and 'highland' (inland) settlements, and settlement finds are also recorded outside of the region (Eibner 1973: 181-82).

Decoration on these vessels includes linear grooves around the base of the neck, linear grooves on the body, and often circles or half circles surrounding the nozzles. In light of its decoration and form, the vessel from Üetliberg was described as having a "realistically modelled breast" (Bauer, I *et al.* 1991: 132). However, the occurrence of circular bumps and protuberances surrounded by concentric circles is not only confined to these 'drinking vessels' but appears on other ceramics during the Late Bronze Age, as '*Buckelverzierung*' (e.g. Kimmig, W 2000 Plate 19.311, -315, 21.331; Fischer, C 1997 Plate 46.173, 47.178, 50.211; Seifert 1997 Plate 36.626, 37.662; Unz 1973). The same design and symbolism principles can even be seen, in the *Pfahlbaunoppenperlen* (see Section 5.2.1.1), and in two-dimensional form as the circular 'eye' decoration on

many forms of arm-/leg-ring jewellery and knives. Whether these vessels were utilized as children's drinking or libation vessels is still unclear (Primas 2008: 187), though in the case of the former it must be noted that these objects are rather uncommon when compared to other vessel types. The vessels must have held some form of social significance for their inclusion in burials, though what this significance is remains unknown. Finally, decorative similarities to the sun-bird symbolism extant across central Europe during the Late Bronze Age and early Iron Age may indicate a 'ritual' function.

6.2.3: Symbolism

During the Late Bronze Age, the sun-bird-boat symbolism became widespread across central Europe, and was represented frequently on bronzework, for example razors, buckets and amphorae (Jung and Maraszek 2001; Tomedi 2002). Such representations are however relatively uncommon in the lake-dwelling communities of the northern Circum-Alpine region. Although the buckle decoration on ceramics and concentric circular/semi-circular designs on many bronze objects (e.g. knives and ring jewellery) may represent solar symbols, bird representations are uncommon. Exceptional examples include the tin bird model from Hauterive-Champréveyres (Schweizerisches Landesmuseum 2004: Fig. 111), the ceramic bird vessel with plant inlay decoration from Zurich-Alpenquai (Schweizerisches Landesmuseum 2004: Fig. 68) (Map 151), and the birds/ducks modelled on the handles of keys from Zurich-Alpenquai and -Grosser Hafner (see Section 5.4.2.8). The rarity of these objects and decoration indicates that they fulfilled a specific role in society for use in certain circumstances and occasions. It is possible that one of the reasons for the scarcity of water bird symbolism, with associations to both death and the afterlife (e.g. Kaul 2004; Tomedi 2002), in the lake-dwelling communities of the nCA is related to their close connection to the lake and wetland environments. The communities were effectively residing in the habitat of the water bird (and therefore of death), possibly making incorporation of such symbolism into social practices more difficult. As effective trade and social centres the lake-settlements therefore largely inhibited the importation and influence of the bird symbolism in the whole of the northern Circum-Alpine region (cf. Section 2.6.1).

6.3: Concluding remarks

The distribution of early Iron Age burials in the northern Circum-Alpine region clearly indicates that the lake regions were not totally abandoned with the decline of the lake-dwelling tradition (Dunning and Rychner 1992: 78; Boisaubert *et al.* 2008; Lüscher 1993). Burials and cemeteries throughout the Late Bronze and Iron Age were used to create social spaces in the landscape, in order to construct identities and display the status and power of individuals and communities. However, the surviving evidence suggests that the lake-dwelling communities had, to some extent, disposed of the need to create specific places in the landscape for burial practices. Circumvention of this requirement may, partly, have been achieved through the retention of some human remains within settlements (Andrey 2006), while the remainder was disposed of in an unknown location – perhaps even within the lake after possible cremation (cf. Menotti 2012: 194-98).

The occurrence of human remains within settlement contexts, even small bone fragments, should not be considered as casual disposal, but symbolically charged acts (cf. Chapman 2000: 140). Utilization of cemeteries further inland from the lake-shore and settlement, possibly in conjunction with inland settlements, would have provided a separate place for burial practices, but would not have created a visible link between settlement and location, thus lacking some of the resonance of permanence, tradition, ancestry, stability, and legitimacy that may have been provided by burial grounds located in close proximity to the utilizing community(ies). A return to visible burials, although not necessarily in prominent locations within the landscape (Lüscher and Müller 1999: 259), and use of them over several centuries (e.g. Unterlunkhofen (CH) (Lüscher 1993)) may have been a social method to create structural links between individuals and communities as well as between the environment and the landscape of settlements. The transition from Urnfield burials to tumulus burials between the LBA and EIA not only created visible and permanent monuments in, and social ties to, the landscape, but also required control of communal labour to construct the mounds (cf. Eggert 1988). This demonstrates the status and ability of emerging elites to control, organize, and support labour resources required to create such monuments (Lüscher and Müller 1999: 250).

The few wagon burials from the nCA show that these practices were indigenous developments in central Europe, drawing influence from neither the Carpathian Basin nor the Italian peninsula. Such burials do, however, illustrate levels of social stratification, with rich assemblages for the social elites, particularly during the Iron Age. The apparent disappearance of such practices during the Late Bronze Age corresponds to the appearance of horse and wagon equipment in the nCA lake-settlements. Such a transition may reflect an increasing presence and less stringent control of horse and wagon equipment in communities, leading to a de-valuation of the objects as symbols of elite status, while outside of the lake-dwelling region they were retained in burial practices and as social indicators.

The various types of unusual material culture from lake-dwellings, e.g. firedogs/moon idols and drinking vessels, may represent either specific ritualistic/cultic practices or profane actions. Both explanations have reasonable archaeological support, though it is clear that the lake-dwelling communities played a significant role in their use and deposition. Drinking vessels may have been used as infant feeding devices or in adult drinking ceremonies, practices which may have influenced the circulation of Late Bronze Age metal vessels (see Section 5.4.2.6). The 'firedogs' may have been used as such (in fireplaces), but may also have been involved in calculating the passage of time and lunar cycles, which would have held social and cultural significance for agricultural and religious practices; their exact function is, however, difficult to extrapolate. Similarly, *Stangentrichter* fulfilled an unknown function in the Late Bronze Age communities, but their occurrence in the nCA lake-settlements, southern Germany, and the Carpathian Basin demonstrate networks of exchange and communication along which either the concept of manufacture and use or *Stangentrichter* themselves travelled.

Water bird and solar-boat symbolism of the late Bronze Age is uncommon in the northern Circum-Alpine region, though some examples are known, however, from lake-dwellings (e.g. Zurich-Alpenquai and Hauterive-Champréveyres). Designs, possibly representing the solar symbol of the sun-bird-ship combination, on the other hand, are seen on many objects of the Late Bronze Age (particularly HaB1-B2). Whether these circles (eyes) and half circle designs truly represent a selective adoption of the sun-bird-boat symbolism according to specific cultural settings and domains (within the water-bird environment and regular use of boats), or simply a circular design is unclear. It is, however, apparent that the wetland environment maintained a symbolically significant position; from the sword remains (and other objects, cf. Bauer, S 2002; Fischer, V 2012: 116) recovered in the vicinity of many lake-settlements, it is clear that depositions in wetland environments, similar to those observed in central Germany and Austria, were practiced by the lake-dwelling communities (see Section 5.4.4.1). Circular design elements on material culture objects (e.g. ceramics, arm-rings, belt plates) continue throughout the Iron Age, in combination with other geometric elements to create complex and repetitive designs, and draw influence from motifs and emblems used during the Late Bronze Age (e.g Schmid-Sikimić 1996; Dunning and Rychner 1992: 86-91; Berger, L and Schindler 1999: 229-30).

Part III: Discussion, Reflections and Conclusions

7: Exchange Networks and Biographies of Objects

In order to combine the dataset to provide indications of the routes along which objects travelled, and the ways in which their values changed along the routes, a combination of GIS analysis and Multiple Correspondence Analysis has been conducted. The distribution, and more specifically density distribution (see Conolly and Lane 2006; Wheatley and Gillings 2002), can be used to suggest routes along which objects travelled from their centres of production to other areas of Europe. Utilising the Kernel Density function of ESRI ArcMap 10, produces a density figure based on the number of objects within a specified distance. Past studies have shown how individual mobility accounted for the dispersal of objects over several hundred kilometres from their main region of circulation (e.g. Jockenhövel 1991). Clearly such a wide search area would mask any regional object densities and possible routes of exchange and communication. In a recent study of ceramic urn lids in Poland, Kniesel (2013) suggested that the known distance for a day's march in the Roman army, 24km, would be a suitable estimate of travelling distance. While this distance may be a little optimistic for small trading expedition, it would allow for vagaries of transport method, while also not being too constrained a search area. Evidence from the Lake Neuchâtel region shows that objects cast in the same mould were circulated over various distances (see Map 100), particularly around the 25km region (e.g. Grandson-Corcelettes ↔ Cortaillod; Estavayer-le-Lac ↔ Montilier [34]), though some objects travelled larger distances (e.g. Grandson-Corcelettes ↔ Basel-Elisabethenschanze). With the support of potential travelling rates, and distances travelled by some objects cast in the same mould, a search radius of 20-25km has been used for the density mapping functions in the following GIS analysis.

Correspondence Analysis (CA) and Multiple Correspondence Analysis (MCA) (Shennan 2006: 308-60) have been increasingly used in archaeological research as a method to highlight underlying trends in assemblages and distributions (e.g. Doppler *et al.* 2010). While Correspondence Analysis is a statistical method best applied to absolute quantities, MCA is a qualitative method for use where strict values cannot be applied or for summed/grouped values. Many of the assemblages studied here contain fragmentary objects, in which case it is difficult to quantify how many individual objects they represent. Furthermore, this deliberate (or accidental fragmentation during deposition) may mask a concern with the presence of objects, rather than a specific number, in an assemblage as identity ascribing material culture. Therefore MCA shall be used to provide an indication of how similar, on a presence/absence basis, assemblages containing specific objects of material culture from different regions of Europe are, in order to highlight changing value associations between regions.

The MCA charts consist of two data series plotted along two axes: *Variables* and *Observations*. In this study variables are the objects/artefacts recorded as summed categories (see below) on a presence (-1) and absence (-0) basis. Both the present (-1) and absent (-0) points are plotted in the chart to provide an indication of which variables influence the clustering of observations. Observations are the individual assemblages recorded. Objects which form the specific focus of an MCA are excluded from the analysis plot, unless included as a specific category to address their co-occurrence, but it is the objects found in association with them that are included in the analysis. In certain Analysis plots some objects have been recorded as single items in assemblages, and some object categories are represented by only single assemblages; in these situations such records are used as *supplementary* observations or variables to prevent them influencing the chart area and skewing the distribution. Depending upon the intention of the chart, the variables are sometimes excluded from the display (e.g. Chart 20) to allow a clear visualization of observation clustering and segregation.

To record each of the object classes in the MCA would create too great a diversification, and so material objects are grouped into classes depending on their function (Table 47), and utilising other recognized classifications (e.g. Gauthier 2003; Verger 1991). This also has the effect of making regions more directly comparable, as some objects are present in some regions and absent in others (e.g. arm-spirals in northern Europe, absent in the nCA), despite the fact that they perform the same principle function (arm-jewellery).

[34] ↔ is used to denote between sites/settlements/areas, i.e. between Grandson-Corcelettes and Cortaillod.

Table 47: Division of material culture objects into variables categories for Multiple Correspondence Analysis.

Category	Objects (where not self-explanatory in Category title)				Abbreviation
Weapons	Sword	Spear	Dagger	Chape	W
	Armour				
Tools	Sickle	Axe	Hammer	Chisel	T
	Anvil	Gouge			
Utensils	Razor	Knife	Toilet equipment		
Large Jewellery	Arm rings	Leg rings	Neck rings		L
Horse	Horse gear	Wagon equipment			H
Small jewellery	Beads	Small rings	Anhangers/ornaments	Chain	O
	(amber)	(glass)	(gold)		
Fasteners	Fibulae	Needles			F
Bronze vessels					BV
Ceramic					C
Beads	(Bead jewellery items where not listed in Small jewellery (e.g. for *Pfahhlbauperlen* MCA))				B
Amber/Glass/Gold	(Listed seperately for specific material groups where predominant in multiple assemblages (e.g. for *Schnabelkannen* MCA))				AGG
Organics	Animal bones				R
Inorganic	Stones				I
Domestic	Spinning whorls	Whet stones	Grinding stones	Calcified bread	D
Metal working	Casting jets	Ingots	Casting cakes		M
Small metal work	Non-descript fragments				A
Keys					K

7.1: Amber

Amber is one of the most widely discussed objects in terms of exchange materials during prehistory, due to its easy identification in the archaeological record, relatively secure assumptions of provenance in the Baltic region, and an apparent luxury status in Europe extending across both time and space. The social biography of amber, with relevance to southern Scandinavia/Denmark, has already been discussed (see Section 5.1): from a prestige object utilized in burials during the Neolithic, to a dual prestige object/exchange commodity in the Early Bronze Age, before assuming a primarily commodity status to be utilized in exchange systems with central and southern Europe to access metalwork and other materials not available locally during the Late Bronze Age, as typified by the large amber hoard at Bjerre (Beck and Shennan 1991; Bech 1997; Earle 2002).

Circulation of amber south through Germany during the Late Bronze Age created several areas of higher distribution density (Map 153), such as around Friedrichsruhe (D), Rühlow (D), Henfenfeld (D), along the Rhine valley from Karlsruhe (D) and Strasbourg (FR) to Freiburg (D). Further to the east, isolated higher densities are observable in Austria, the Czech Republic, and Hungary. Several areas of higher than standard density occur in Switzerland, around Lake Neuchâtel (primarily due to concentrations at Hauterive-Champréveyres and Auvernier) in the west, and in the east at Montlingerberg. The majority of amber finds from the Late Bronze Age are recorded as beads from rich burial contexts, suggesting that they retained a high social value as they travelled southwards away from their natural origin.

While archaeometric studies have indicated that alternative sources of amber were utilized during prehistory, for example from Sicily, this exploitation was apparently very limited in quantity and extent (Beck and Hartnett 1993; Murillo-Barroso and Martinón-Torres 2012; Cultraro 2005); it was in fact primarily amber from the Baltic that was circulated to the Italian peninsula and the Mediterranean. Extensive evidence of the manufacture of amber beads at sites such as Campestrin di Grignano (12^{th}-11^{th} century BC (Salzani 2009)) and Frattesina (Bellintani, P 1997) highlights the fact that raw/unworked/unfinished amber was being circulated not only into the Baltic hinterland, but deliberately left unworked on its journey to the southern Alpine region. The well-known unusual gold covered amber bead from Zurich-Mozartstrasse (Gross *et al.* 1987: 149), and a half-worked bead from Wasserburg-Buchau (Stahl 2006: D186) also suggest that localized amber working occurred in the northern Circum-Alpine region. Such circulation practices demonstrate a dual-value regime for amber, similar to that seen in Denmark during the early Bronze Age: both prestige material and commodity at the same time. As amber was moved southwards in

the form of raw material a fraction was retained and transformed into regional bead styles, while the remainder was left unworked for utilisation in further exchange systems. Greater ambiguity was applied to amber following its processing in northern Italy (e.g. at Campestrin or Frattesina) as the foreign exchange commodity was transformed into local prestige jewellery (e.g. *Allumiere* and *Tiryns* beads) and circulated further south to the Mediterranean, and even back to the northern Circum-Alpine region, (i.e. Hauterive-Champréveyres and Montlingerberg). Thus, for communities in the nCA amber would have taken various values and identities depending upon the stage of its journey from the Baltic to southern Europe, and potentially a return north of amber that they have already handled and assisted in its journey south (Table 48).

Table 48: Potential value and identity of amber at different stages of the exchange route between northern and southern Europe, with specific reference to the northern Circum-Alpine region.

Action	Form	Value	Identity	Direction
Import	Raw / Unworked	Commodity	Foreign	nCA
Import	Processed / Beads	Gift / Prestige	Foreign / Local	nCA
Manufacture	Beads	Prestige / Commodity	Local	nCA
Export	Processed / Beads	Gift / Prestige	Foreign?	North-South?
Export	Processed / Beads	Gift / Prestige	Local	nCA
Export	Raw / Unworked	Commodity	Foreign	North-South
Import	Raw / Unworked	Commodity	Foreign	N Italy
Import	Processed / Beads	Gift / Prestige	Foreign / Local	N Italy
Manufacture	Beads	Prestige / Commodity	Local	N Italy
Export	Processed / Beads	Commodity / Gift	Local	North-South / South-North
Import	Processed / Beads	Gift / Prestige	Foreign	nCA

A different amber distribution pattern can be observed during the Iron Age (Map 154), with 'hot-spots' located in Poland (particularly at Komorow-Gorszewice), the Czech Republic, Hungary, Austria, and Slovenia, while unmapped (by Stahl 2006; De Navarro 1925) find locations occur in Croatia (see Palavestra 2005, 1993). This density distribution may indicate routes of amber circulation between the Baltic region and the Iron Age manufacturing sites in northern Italy, such as Verucchio (IT) (Bietti Sestieri 1997: 397). Other areas of heightened density occur along the Rhine valley, central Switzerland, in Ticino, and Lake Geneva, and may indicate routes of amber transport between northern Italy, northern Germany and Denmark. Central Germany shows relatively high, and widespread, density, potentially suggesting extensive intra-regional redistribution of amber away from primary north-south-north exchange routes. The circulation of amber from northern Europe to the Italian peninsula during the Iron Age is similar, in several aspects to the movement seen during the Late Bronze Age, with raw/unworked amber directed south for processing. Once worked into beads and objects, many of these items were, as during the LBA, re-directed to northern Europe as specific prestige items, for example the wooden Sphynx with carved amber face from Asperg-Grafenbühl (D) (Zürn 1975), or more widespread social objects, such as needles and fibula with attached amber segments and beads, as seen at numerous burials in the southern and northern Alpine region, e.g. Hallstatt (AT), Buch am Erlbach (D), Böblingen (D), Arbedo-Cerinasca (CH), Trüllikon (CH) (see Stahl 2006).

Beads for use in necklaces, or stings of beads, remained the most numerous types of amber objects during the Iron Age north of the Alps, but it was also increasingly used as adornment for other items. Not only needles and fibulae, but also swords, for example at Chaffois "La Censure" (FR), Marainville-sur-Madon "Cheim de Naviot" (FR), Hallstatt grave 573 (AT) (Stahl 2006; Gerdsen 1986: no. 287) were adorned and elaborated with amber. While there are examples of such elaboration during the Bronze Age, for example the needle from Zurich-Mozartstrasse (CH) and a dagger from Bresinchen (D), such practices of object elaboration become more prevalent in the Iron Age. This may suggest a re-organisation of the values associated to amber, with less importance given to the associations and identities that may have been accumulated in the amber pieces as they were circulated, while more emphasis was placed on the 'foreign' nature of the material and the power and influence required to direct and access the routes along which it travelled.

It is evident that during the Bronze Age amber was circulated from the north of Europe to the Italian peninsula, but relatively little processed amber was re-circulated north of the Alps. For this period amber retained regional and 'local' functions, utilized in locally specific practices, primarily resulting from the extraction of raw amber for processing as it travelled from north to

south. As increased numbers of objects travelled north during the Iron Age, following their processing and manufacture in northern and central Italy, a possible transfer of value schemes between the south and north occurred; changing from gift, to be circulated and retained in form, to commodity for utilisation, and embellishment of, other objects as indications of power and status.

The Baltic region is conspicuously absent from both the Late Bronze Age and early Iron Age amber distribution densities, suggesting that this material was not frequently utilized as either an object of cultural significance or trade medium by the communities of this region. Even during the intensive exchange systems moving amber from the Baltic to the Italian peninsula in the Iron Age, amber is a rare occurrence in Poland, with the significant exception of Komorow-Gorszewice. This cemetery shows other material connections to southern Europe, for example an Ins type razor (see Section 5.1 and Sub-section EARLY IRON AGE in Section 5.4.2.1 (cf. Kniesel 2013: 164-65; Malinowski, T 1974, 2005), and it is possible that this was a key node on the amber route, responsible for the collection of amber from various northerly communities to begin the long journey to the Mediterranean.

7.2: Glass

The so-called *Pfahlbauperlen* glass beads are one of the most easily identifiable foreign objects from Late Bronze Age settlements, burials, and hoards in the northern Circum-Alpine region and beyond (see Section 5.2.1.1). Manufacture of these glass beads, and also other colour and form variants, is currently only recorded for sites from the Po Plain, such as Frattesina (Bellintani, P and Stefan 2008; Angelini *et al.* 2006), though the beads can also be found in the far north of Germany (Jennings 2012b; Bellintani, P 2011; Mildner 2008). The manufacturing centres in the Po Plain are easily identifiable by the high density in this area, as are the lake-settlements of western and eastern Switzerland, and southern Germany (Map 155). *Pfahlbauperlen* are conspicuously absent from the region of the western Po Plain, although glass beads forms relating to earlier stages of the Bronze Age are found (Bellintani, P and Residori 2000: 486-88). This absence may be a result of different cultural associations and exchange networks in the area, or a result of differing archaeological representation between the eastern and western Po Plain.

A route of high distribution density if apparent along the Adige valley, crossing the Alps between Italy and Austria in the region of the Brenner Pass, and continuing along the Inn valley, from where exchange routes could continue either east or west. Despite the exceptionally high concentration of *Pfahlbauperlen* around Lake Neuchâtel, there is no apparent high density route linking the Po Plain and western Switzerland/Lake Neuchâtel. While the Adige-Brenner-Inn path shows higher density than surrounding areas, it does not approach the high quantities observed in either the eastern Po Plain or around Lake Neuchâtel, suggesting that a 'down-the-line' exchange mechanism (see Section 2.6.1 and Figure 9) between these two regions was not in place, but a direct connection may have existed between the two zones (Jennings 2012b). This direct link may have been a trade relationship, a gift relationship between elites, or through migrant individuals (e.g. traders, bride circulation). The apparent lack of *Pfahlbauperlen* in the western Po Plain is interesting in regard to the movement of these beads to Lake Neuchâtel and western Switzerland, as a route incorporating the Rhône valley Alpine passes of north-eastern Italy would have provided a more direct connection to western Switzerland/Lake Neuchâtel. Such a route may be suggested through the distribution of razors and fibulae (see Sections 5.4.2.1 and 5.4.2.5), though *Pfahlbauperlen* were evidently excluded from this exchange network.

A further, short, route of higher *Pfahlbauperlen* density is observed along the route of the Rhine valley, from Lake Constance to eastern France and western Germany, extending to the region of Strasbourg, with potential extension to Mainz and further to northern Germany and southern Scandinavia. By this stage of the exchange route, the distribution density of the *Pfahlbauperlen* is at reduced levels, suggesting that a 'down-the-line' exchange system may have been used to transport the objects – either as gifts or 'commodities'.

Biographies of *Pfahlbauperlen* began with their manufacture, utilising local resourced materials, at settlements in the Po Plain during the Italian Final Bronze Age [35] (Bellintani, P and Residori 2000: 490; Angelini *et al.* 2006), not as a novel industry, but as a development of older glass working techniques. Some of these beads were utilized within the settlements where they were manufactured, and incorporated into, typically female, burials (Bellintani, P and Residori 2000: 490). The *Pfahlbauperlen* were often combined with other forms of glass beads or amber beads to form larger necklaces of jewellery objects (e.g. Frattesina-Il Narde, Osteria dell'Osa (IT)) and may have been used as both signifiers of social status and personal identity (cf. Bellintani, P 2013). The beads possessed both a commodity value, particularly to their manufacturers, and a prestige, social, and, potentially, gift value to their consumers, users, and wearers.

[35] Typically interpreted as the 11th to 9th centuries BC (see Section 1.4).

As the beads were circulated to Europe north of the Alps, they were still included in burials, but in fewer numbers (e.g. from burials at Innsbruck-Mühlau, -Wilten, -Hötting (AT)) but they were combined with other types of beads, such as stone and amber. Inclusion of rich equipment in burials suggests that the beads held significant social value, for example a collection of over 200 amber beads, several gold objects, and numerous spiral rolls from Ilmendorf-Geisenfeld (D) burial 304. *Pfahlbauperlen* are also present in burials which contained few other objects, e.g. Le Boiron burial 37 (Beeching 1977), and also beads in a molten or fragmentary condition indicating they were included in the cremation process, such as from Marzoll (D) (Mildner 2008) and Vidy-Chavannes (CH) burial 2 (Moinat and Elbiali 2003). Thus, the beads were not only used as objects for the creation and assignation of personal identity and to demonstrate status (where combined with other objects), but may also have been considered prestigious in their own right as 'foreign' objects and, due to the communication networks and relationships they incorporated, to be the sole indicators of status or identity, thereby negating the need for other objects[36] to be incorporated in the burial practice.

Once circulated north of the Alps, *Pfahlbauperlen* were also included in other forms of deposition, such as inclusion in hoards and deposition within settlements. Many of the finds from lake- and inland settlements of the northern Circum-Alpine region were recovered from unstructured deposits without clear associations, such as at Mörigen, Zurich-Alpenquai, Üetliberg, Montlingerberg, and Hagnau-Burg. Other examples are known from within the vicinity of other beads, for example at Ürschhausen-Horn 18 jet beads were found within the same house area and position as a *Pfahlbauperlen* (Nagy 1999: 92), suggesting they may have been formed into a single necklace (or other jewellery object). Whether this necklace was intentionally deposited within the house area upon abandonment (or other event), or accidentally lost/left behind is unknown. Settlement finds are also recorded from other areas of the Circum-Alpine region and southern Germany; for instance at Leipzig-Südfriedhof (Bellintani, P and Residori 2000) and the Alpine mining-smelting site Mauk A (AT) (Schibler *et al.* 2011). However, settlement finds are not recorded from northern Germany or southern Scandinavia/Denmark, where inclusion in burials is the dominant practice. This may reflect the retention of some commodity value in the *Pfahlbauperlen* in the near Alpine regions, where the connection to, and knowledge of, their source may have been stronger in the communities, creating a mixed foreign/local and commodity/gift identity that could result in their either structured or unstructured social deposition (cf. Figure 13). Further away from the Alps, knowledge of the source location would have been more limited, and the beads retained a 'foreign' nature imbued with quasi 'local' value through the exchange networks they followed, probably as gifts, to reach their destination.

At Hauterive-Champréveyres a collection of *Pfahlbauperlen* were found in a small area, which also contained phalerae, jewellery items and tools; it is possible that these objects were intentionally deposited as in intra-settlement mixed hoard (Rychner-Faraggi 1993: 16). In hoards further north of the Alps, for instance, at Allendorf (D) *Pfahlbauperlen* were included with several forms of tools, and other jewellery items (including amber and jet beads (Uenze, O 1949/50)), while in the Neustrelitz (D) hoard they were associated with a number of other forms of glass bead, tools, jewellery, and many bronze 'knobs' (Jantzen and Schmidt 1999). Clearly the *Pfahlbauperlen* retained their jewellery identification in these hoards, given their occurrence with other jewellery pieces, but also high status/prestigious associations due to the presence of supposed prestige objects, e.g. phalerae and amber beads. Why they were deposited in hoards and not in burials is difficult to establish; they do not appear to have been included as a rejection of 'foreign' identity because many 'local' objects were also present, and – unlike bronze work – they do not have a recyclable value. These depositions, consisting of a range of objects, and frequently lots of jewellery, may represent the votive deposition of objects, or the deposition of the attire of an individual(s) or social entity(ies) (cf. Fredengren 2011).

The combination of jet with *Pfahlbauperlen*, and the possible emulation of *Pfahlbauperlen* in jet (see Section 5.2.4) suggests that communities in the northern Alpine forelands were utilising a local-foreign object as a way of introducing jet to the local material culture, for example at Hagnau-Burg (mid-11th to mid-9th century BC (Schöbel 1996)) and Ürschhausen-Horn (mid-9th century BC (Nagy 1999)), at a time when the supply of these glass beads from the Po Plain was drawing to a close, as the manufacturing centres (e.g. Frattesina) slowly declined during the late 10th and early 9th centuries BC (Bietti Sestieri 1984; Salzani and Colonna 2010). The glass beads thus became a prototype for new artefacts, but also increased the acceptability and relevance of the new material (jet) through physical association in jewellery objects.

Multiple Correspondence Analysis of the finds associated with *Pfahlbauperlen*, in burials and hoards, shows a clustering of sites/burials based around the inclusion of ceramic vessels, fasteners (needles and fibula), and other jewellery objects (see Chart 3). The assemblages Le Boiron (supplementary CH) and Vidy-Chavannes (CH,

[36] Other than organic objects which do not survive the cremation/burial process.

lower left quadrant) lie towards the outer edge of the main cluster, indicating their some similarities to other LBA assemblages. Burials with *Pfahlbauperlen* at Innsbruck-Mühlau (AT) and Flintsbach (D) show similarity in the associated goods (lower right and lower left quadrants). This may be expected given their relatively close proximity to each other. It is interesting to note that burials from Innsbruck-Mühlau and Flintsbach both show some spread in their associations, suggesting that, in contrast to burials as Osteria dell'Osa (IT) and Haunstetten (D) (upper left), social differentiation is expressed in the burials with *Pfahlbauperlen*, particularly with the examples separated from the main distribution by the presence of bronze bars and gold objects. Other outliers include assemblage from Hauterive-Champréveyres (Chart 3 – CH, top right), the Late Bronze Age burial from Acholshausen (D, top right), and the early Iron Age burial from Ins (CH, centre right), separated by their inclusion of horse and wagon equipment. Overall, the MCA of assemblages including *Pfahlbauperlen* suggests relatively stable associations of the beads from Italy to Austria and southern Germany, with changing associations as they were circulated further north through Europe, through the exclusion of utensils and domestic objects.

If it is accepted that a decline in accessibility to the *Pfahlbauperlen* occurred in conjunction with the decline of Frattesina during the $10^{th}/9^{th}$ century BC, and recognising the time difference between some of the depositions in the nCA, e.g. Hauterive-Champréveyres[37], Hagnau-Burg[38], Ürschhausen-Horn[39], Réallon (FR)[40] and even the possible inclusion of a single bead in an early Iron Age burial at Ins (grave 1908 IV (Drack 1958)), then the possibility of the curation of these beads over extended periods of time must be considered. Studies based on wear and damage, form, and style have suggested how Neolithic and Bronze Age jet necklaces in the United Kingdom were fragmented and circulated over extended periods of time (Frieman 2012; Sheridan and Davis 1998, 2002). Such practices are more difficult to identify with these glass beads as they do not wear/abrade as readily, and they follow a generally standardized shape, making the reconstruction of necklace form difficult. However, the deliberate fragmentation and recirculation of beads over extended periods of time may be a method to explain their decreasing numbers not only with distance from the Alps, but also with time, and also their recombination with other forms of bead – such as amber and jet – in order to make larger pieces of jewellery. Such fragmentation would have extended the biography of these objects to new generations, and they may have been circulated as 'heirlooms' – resulting the Ins burial deposition – or as gift objects with beads being retained by multiple persons.

During the earlier Iron Age, glass beads, such as the *Hagenauer* type (Haevernick 1975) and beads with spiral and eye decoration (Frey and Roth 1983; Frey *et al.* 1987), were utilized in burial practices of the northern Alpine region – typically with female associations. The more limited distribution of the *Hagenauer* type beads suggests a possible manufacture north of the Alps (see Section 5.2.2), while the spiral and eye decoration beads show wider links to the Italian peninsula and the Balkan region (Frey *et al.* 1987: Map 1). Thus, the *Hagenauer* glass beads were a locally manufactured object for use in local burial practices. It is difficult to establish whether the gender association of glass beads in the nCA changed between the LBA and EIA as many of the *Pfahlbauperlen* were not included in burials, and when they are included in burials north of the Alps, gender information is not available for many of the examples. Some of the burials do however contain artefacts that may suggest a male identity in the burials, for example at Friedrichsruhe (D; spear), Acholshausen (D; dagger), Vidy-Chavannes (CH; osteological analysis) and the EIA burial at Ins (CH; dagger). It is possible that the decline of the *Pfahlbauperlen* occurred at the same time as changes in social genderization of glass beads towards more female associated artefacts.

The stratified eye beads of the La Tène period, common across much of central Europe, including Switzerland, are assumed to be imported from the Balkan region (Venclová 1983), and are essentially a manufacturing development of the Late Bronze Age *Noppenperlen*, and an elaboration of the early Iron Age eye beads, to create the circular eye design. These beads are typically found in burials and in association with other glass and amber beads, and fibulae. The occurrence of the beads in burials in the nCA suggests a complete re-organization of the association of glass beads to female jewellery objects by the later Iron Age.

7.3: Razors

The social function of razors in the northern Circum-Alpine region has been alluded to previously, and is based upon their rates of decoration and significant deposition in the nCA compared to other regions of Europe, particularly southern Scandinavia/Denmark and Italy (see Sub-section SYMBOLISM AND USE in Section 5.4.2.1). The style of razors used in both Denmark and Italy is considerably different to those found in the northern Circum-Alpine region and neighbouring areas (France, Austria, Germany) allowing imported objects to be easily recognized, e.g. *Villanovan* razors in Switzerland and eastern France. Distribution of these *Villanovan* type razors in northern Italy indicates a

[37] 1050-1030 BC.
[38] broadly 1050-850 BC.
[39] 870/850-800 BC.
[40] 9^{th}-8^{th} century BC.

pattern similar to that seen for the *Pfahlbauperlen* (see above), with considerable quantities observed in the eastern Po Plain, but an apparent absence in the western Po Plain (Bianco Peroni 1979: Figs. 112-18). Yet, the occurrence of these razors in western Switzerland and eastern France (Map 52) creates a transport and exchange problem similar to that detailed above (see Section 7.2) for the *Pfahlbauperlen*; their locations indicate that a route travelling across the western Alps, and incorporating the Rhône valley might have been utilized (particularly the *Herrnbaumgarten* razor at Chelin/Lens (CH)) and further into the western Alps and beyond.

Only one of the *Villanovan* style razors recorded from outside of the Italian peninsula (Beaufort-en-Vallée (FR)) has any associated artefacts, in this instance as part of a hoard. It is possible that this razor is of the *Grotta Gramiccia* form (Bianco Peroni 1979: 123-36), primarily distributed in the Po Plain and central Italy, and mainly found within burial contexts (78 of 102 instances), but very infrequently recorded from hoards (7 in the large hoard at Bologna-San Francesco). Associated materials show a male tendency, with weapons and serpentine fibula, although female associations are also possible (Bianco Peroni 1979: 177-84). The hoard at San Francesco contained over 14,000 metal objects (weighing over 1400 kilograms) including over 40 razors, two swords, multiple axes, sickles, horse gear, fibula, needles, arm-/leg-rings, daggers, spearheads, and other small objects (Bianco Peroni 1979: no. 443). Clearly this is an exceptional hoard, and it is very hard to compare it with hoard from Beaufort-en-Vallée, consisting of a fibula, stilus, profiled knob, needle, small rings, a large arm-ring, a belt plate, and the handle of a bronze vessel, variously dating to between the Iron Age and the mid first millennium AD (Jockenhövel 1980: 561).

The majority of the other razor variants discussed in this study are primarily distributed in the lake-dwellings of the northern Circum-Alpine region (see Section 5.4.2.1), though some of them travelled considerable distances away from their core distribution. Given their apparent low symbolic status, the occurrence of *Bodman* and *Genf* type razors in Poland, northern Germany, and western France, *Allendorf* razors in south-east Germany, northern Germany and the Netherlands, and *Mörigen* and *Auvernier* types in eastern and central Germany, Austria, Poland, the Netherlands, and even the United Kingdom, indicates that they travelled surprisingly great distances from their area of manufacture. Comparison of the find contexts, for all time periods, by region (Map 156) illustrates three main factors:

- The majority of razors in this study are recorded from the nCA, though there are collections of up to 35 razors in regions from eastern France to the Carpathian Basin, with fewer instances recorded in western France, northern Europe, and the United Kingdom. Therefore, a general central-eastern orientation for the movement and exchange of razors can be observed.
- From the nCA, eastern France, and southern Germany, razors from lake-dwelling contexts account for the largest proportion of the finds. Razors without associated context information account for a lower proportion of finds from other regions is the case with other forms of material culture, such as knives (see below).
- Outside of the nCA, these razors are more frequently included in burial assemblages, while settlement finds account for a smaller section of the assemblage. Razors from hoards are less common in eastern Europe than in western France, though they are more nummerous than settlement finds in northern Germany. The small quantity of these razor types from western France disguises a pattern of deposition in hoards, burials and settlements (cf. Jockenhövel 1980: 6), while in eastern France razors are well attested in burial contexts of the early and middle Urnfield period (cf. Jockenhövel 1980: 7).

Considering the deposition of razors over time, the nCA shows a constant deposition in settlements (lake and terrestrial) throughout the Late Bronze Age, with a minority component found in burials during the HaB3 period (Chart 4). This trend changes dramatically, with all of the recorded razors known from burial contexts, during the Iron Age. Of the limited finds dating to the early stages of the Late Bronze Age in eastern France, deposition in caves, in rivers, and in burials is attested, while for the HaB3 phase the majority are known from lake-settlements. Iron Age finds from the region are predominantly from burials. In western France all of the HaB razors are recorded from hoards, while those from the early Iron Age are recorded in hoards and wetland contexts, with an increasing occurrence in burials. Throughout the Urnfield period in southern Germany, these razors can be found in burial assemblages, with a significant proportion in settlement contexts during HaB3 (Chart 5). The only recorded example from the early Iron Age is from a burial context. Deposition practices in northern Germany, the Czech Republic, and the Carpathian Basin show a tendency towards inclusion in burials, with an increasing deposition in hoards during the final stages of the LBA.

If it is accepted that the main distribution area of the razors reflects their manufacturing region (i.e. the lake-dwelling area of the nCA for many of the razors considered here) it is evident that the values associated to the razors changed as they travelled to new regions were incorporated into local depositional practices. While the predominant finding of razors from settlement contexts in the nCA (and neighbouring regions) suggests that they were not utilized in practices of social identity

creation and maintenance, their inclusion in hoards and burials in other areas of Europe shows that they were used for these purposes. One exception to this trend is the *Herrnbaumgarten* type (see Sub-section HERRNBAUMGARTEN in Section 5.4.2.1), more common to eastern central Europe than in the nCA. An example of this razor type included in burial from Chelin/Lens (CH) has been interpreted as the possession of a 'foreigner' (cf. Nicolas 2003: 283). Multiple Correspondence Analysis of the assemblages including *Herrnbaumgarten* knives suggests that, based upon the inclusion of ring jewellery and needles and absence of weapons, there may be some similarities between the burial at Chelin (NCA, lower left quadrant) and some in the Carpathian Basin (Chart 6).

Looking in a southerly direction, the razors from the southern Circum-Alpine region and Italy are primarily from burial contexts of the Late Bronze Age and early Iron Age. However, this does not include all of the possible '*Villanovan*' type razors detailed by Bianco Peroni (1979), which are predominantly from burial contexts (see above); in fact, burials account for in excess of 70% of the razors from these regions. Burial deposition was also the dominant practice for razors during the LBA for razors in the Balkan region. Of the *Villanovan* razors recorded from outside the Italian peninsula, i.e. the nCA, only one example is recorded from a secure context (i.e. Beaufort-en-Vallée; see above), making consideration of the transfer of razor associations between the two regions difficult. The *Fontanella* (F) type razors show some similarities to the *Oblekovice* (O) type from central and eastern Europe, and MCA analysis of the assemblages with these two razor types suggests that they were included in similar burial assemblages (Chart 7). Several outlying assemblages also indicate that there may be internal stratification in the burials with these razors.

The Multiple Correspondence Analysis of different types of Late Bronze Age razors from various regions of Europe has, therefore, demonstrated that in addition to the lack of value association transfer of razors manufactured in the nCA and circulated to other areas of Europe, occasionally the value and associations of razors travelled with the object as they were moved to new regions. During the Iron Age the collection of recorded razors from the nCA are from burial contexts (Map 157), similar to the occurrence of Iron Age razors in France (Jockenhövel 1980: 193-97). The abrupt change from settlement deposition to burial deposition reflects increasing concern with the burial of individuals during the Iron Age in the nCA, and an increasing use of razors as items of identification. However, the razors were not necessarily an indication of status, and were in fact frequently included as the only burial good in cremations of early Iron Age Etruria (Iaia 2013: 106). Performing MCA on the dataset of Iron Age razors from the nCA, France, and Late Bronze Age to early Iron Age razor types from other regions of Europe (Chart 8) suggests that there was no clear transfer of value associations into the nCA. With the exception of a few outliers, the Iron Age type razors show distinct clustering (centre region, upper half) away from the LBA razors, demonstrating both spatial differentiation (as most of the LBA-EIA razors with contextual associations are from outside of the nCA) and temporal separation.

7.4: Knives

The study of several Late Bronze Age knife types from the northern Circum-Alpine region has illustrated numerous lines of exchange and communication running through the Alps and across central Europe. While regional varieties of general knife forms, such as the *Baumgarten* and *Pfatten* types, suggest the inter-regional circulation of styles, the distribution of specific forms, such as the *Matrei* or *Matrei-Mühlau* type, indicates intra-regional exchange and circulation practices (see Section 5.4.2.2). Moulds and frequency of distribution can also provide indications of 'core' areas for certain knife types, for example the socketed (*Tüllen*) and solid handle (*Phantasiegriff*) varieties, which appear to be particularly prevalent in the northern Circum-Alpine region lake-dwellings, and also in northern Germany (Map 158; Map 159). Although the actual routes along which these objects were circulated, and the method of circulation (e.g. gift or commodity exchange) is unclear, a regional comparison of deposition contexts will permit an insight into the changing associations of knives, as a material culture group (not type basis) as they travelled between regions.

Excluding regions with low numbers of recorded socketed knives, such as Austria and Denmark/southern Scandinavia, there are clear differences in the contexts of recovery in different areas of Europe (Map 160). In the northern Circum-Alpine area, the majority of finds are known from Lake-Dwelling contexts, while some are recorded only from a lake region – most likely reflecting unstructured recovery from lake-settlements – which also accounts for the majority of finds recorded from eastern France (especially Lake Bourget). Deposition within hoards accounts for an increasing number of the socketed knives as they were moved further away from the presumed manufacturing zone around Lake Neuchâtel and in eastern France, with large proportions of the collections from southern Germany and western France found in such contexts. Moving further north through Europe, and into a possible second manufacturing zone in northern Germany, hoard deposition accounts for a lower percentage of the socketed knives, with an increasing number deposited in burials. Unfortunately contextual information is not available for roughly 25% of the socketed knives from northern Germany and northern Europe, which may

provide a skew on the context proportion, but it is evident that settlement finds account for a minority of socketed knives in northern Germany. If it is assumed that the high number of socketed knives in northern Germany indicates the local manufacture of these objects, then their biographical potential differs significantly from those manufactured within the north-western Circum-Alpine area. While acknowledging the tenuous descriptive potential of 'lake-dwelling' as a recovery context (see Section 1.5 (cf. Fischer, V 2011, 2012)), there is an apparent deposition of these socketed knives within settlement locations in their manufacturing zone, with little apparent social significance. As these objects were travelled further from their centre of manufacture, into western France and southern Germany, a dual value developed as their social significance increased; they signified social relationships and identities leading to inclusion in burials, but were also treated as metal 'stock' and were increasingly deposited in hoards. Although these objects may have held some significance, they may not have been novel or 'foreign' enough to be included in burials consistently. In northern Germany, whether or not they were imported or locally manufactured, inclusion in burials becomes the main biographical termination for the socketed knives, attesting to an increased utilisation of the knives in social identity construction.

For the analysis of *Socketed* knives, 37 assemblages, from various regions, were compared – though none were included from the nCA due to lack of associated goods with knives from this region. The MCA chart (Chart 9) shows that the knives from northern Germany, in a variety of deposition contexts, are spread widely across the chart, suggesting a range of associations, while the examples from Poland and southern Germany show more clustering, indicating a more consistent deposition practice. When the context of deposition is considered, then a clear clustering of hoards and burials is evident in the chart, regardless of which region they are from, largely segregated by the occurrence of ceramics (upper right) to metal vessels and weapons (upper left). Although deposited in different regions, material associations of socketed knives when included in burials apparently remained stable, as did the associated objects in hoards. While the *Phantasie* handle knives form a loose group on their own (Chart 10), cross comparison of the two forms suggests that the knives were used in relatively similar assemblages, though the difference in numbers hinders interpretation (Chart 11).

Returning to the more limited distribution of *Matrei* type knives, a more consistent practice of deposition can be seen across the different regions from where they have been recorded – with the exception of the northern Circum-Alpine region (Map 161). Deposition in burials is the most common practice in all of the regions, again indicating a distinct social role for these objects. In the nCA, burials with these objects are not recorded, instead they are mostly known from lake-settlements. Multiple Correspondence Analysis on the recorded assemblages with *Matrei* knives (Chart 12) shows no clear pattern of deposition, with each of the different regions included showing a variety of depositional associations. This may be an indication of somewhat similar deposition practices, though internally varied, in each of the regions.

Expanding the spatial and temporal focus of consideration to include the entire study region (with the exception of areas with insufficient data set) and all of the Late Bronze Age and early Iron Age, it is possible to observe the changing utilization of knives through both regions and epochs (with the limitation of broad typological dating classes). Unsurprisingly, lake-dwelling contexts dominate the findings from the northern Circum-Alpine region, eastern France and southern Germany (Map 162). As for the *Socketed* knives, which constitute a sub-group of this distribution, increasing occurrence of knives in hoards is observed with greater distance from the nCA to the west (France), and north-west (northern Europe) (Map 160). Moving northwards through Germany, eastwards to Austria and Poland, and across the Alps to the southern Circum-Alpine region and the Po Plain, an increasing preference for deposition in burial contexts is observed. It is striking that outside of the nCA lake-dwelling region very few knives are recorded from settlement contexts, with only small percentages in Austria and Germany. Whether imported to, or exported from the nCA, a clear change in cultural association occurs with regard to the biographical possibilities and social functions of knives. While some knives are known from burials in the nCA (mainly relating to the MBA (cf. Fischer, C 1997)), during the Late Bronze Age, burial associations were lost while domestic (settlement) associations increased. Such an occurrence would appear to be at odds with the relatively ornate decoration which is present on many of the so-called *Palafittique* or *Pfahlbau* knives (see Sub-section KNIFE GROUPS OF SWITZERLAND in Section 5.4.2.2), but may represent a decrease of symbolic association due to local manufacture, or practices of single or hoard deposition within settlement contexts which were not recognized in the archaeological record at the time of recovery (cf. Fischer, V 2012: 115).

From a temporal perspective, it is possible to observe changes within specific regions, by dividing knife types into broad temporal categories dependent upon their typological-chronological attribution (Chart 13). Within the nCA, lake-dwellings remains a stable majority of all finds throughout the whole of the Late Bronze Age, while two knives relating to HaB3/HaC are recorded from inland settlements. In southern Germany a clear decrease in the percentage of knives deposited in burials occurs between HaA and HaB, with a corresponding

increase in the number of knives from lake-settlements. Deposition in hoards is an insignificant occurrence until the final phases of the LBA, when the biography of circa 10% of the knives was terminated in this way. Further east, in Austria, deposition in burials was the typical biographical termination for the majority of knives (over 80%) throughout the Bronze Age. Progressing north through the Czech Republic, Poland and northern Germany, burials account for a gradually increasing percentage from HaA to HaB (summing HaB values), while an increase of hoard deposition occurred during the final stages of the LBA in Poland and the Czech Republic. Hoard deposition was also practiced, at a low rate, in northern Germany during HaA, which may be a reflection of influence from the communities of southern Scandinavia/Denmark and eastern/northern France. The limited Bronze Age knives (of the types discussed here) from the southern Circum-Alpine region and the Po Plain were mainly deposited in burials, as single objects or in hoards during HaA, while hoards and single finds decreased during the HaB period.

The early Iron Age (HaC) heralded a reorganisation of knife deposition practices in the nCA, with incorporation in burials becoming the defining culmination of their biography. Such practices conform to those of the surrounding regions north of the Alps, although a limited number of objects from those areas hinder interpretation. The southern Circum-Alpine region shows similar dominance of knives in burials during the early Iron Age, while practices became more varied during the later Iron Age. The change to deposition in burials in the nCA during the Iron Age is a reflection of changing cultural contexts and the development and influence of the Hallstatt culture in central Europe. This new cultural milieu changed the potential biography of knives from locally manufactured and richly decorated objects with domestic associations deposited within settlement boundaries (either structured, un-structured or as 'isolated depositions' (Fischer, V 2012: 115), to locally manufactured objects intertwined with the biographies of individuals and deposited in burials as part of an identity creating assemblage. While the majority of knives discussed here are simply recorded as being recovered from lake-settlements, there is some evidence that they may have been included within structured depositions within settlement contexts, for example two un-typed type knives from Greifensee-Böschen were recovered from a small collection including an axe, a small chisel, and a hammer (Eberschweiler *et al.* 2007: 252; Fischer, V 2012: 118). This assemblage would suggest associations with metal working and not individuals, as demonstrated by their inclusion in burials elsewhere.

7.5: Swords

A significant number of the many varieties of central European Late Bronze Age swords are known from the northern Circum-Alpine region, with several forms likely being produced in the area (see Sub-section SWORD TYPES in Section 5.4.1.1). The changing nature of sword deposition during the Bronze Age and Iron Age has already been discussed (see Sub-section DEPOSITION TRENDS in Section 5.4.1.1), with fragmentary deposition in burials or intact deposition in wetland contexts during the Late Bronze Age being replaced by primarily intact burial deposition during the Iron Age. This change in practice represents a re-organisation of the social use of swords as creators and symbols of identity; instead of weapons being in a broken state when identified with an individual, or as effectively un-owned isolated depositions in watery contexts (possibly as votive offerings), they were strictly identified as the possessions of specific individuals and emphasized their status as warriors and/or leaders in the community. This is another facet of the increasing concern with the elaboration and celebration of the individual rather than the community during the Iron Age (Wells 1998).

The distribution the many of the LBA swords, such as *Mörigen* (Map 163), *Auvernier* (Map 164), *Tachlovice* (Map 165), *and* Antenna (grouped *Tarquinia, Weltenburg, Corcelettes, Zürich* types) (Map 166) show concentrations in the lake-dwelling region of western Switzerland, and also in the Rhine Valley, suggesting that the Rhine was used as a communication, exchange, and transport route. It is interesting that, similar to the *Pfahlbauperlen*, the swords with finds in both Italy and north of the Alps, the *Tachlovice*, *Tarquinia* and *Weltenburg*, are not common in the western Po Plain, region, but are found from the eastern Po Plain and alpine valleys leading towards eastern Switzerland and Austria. Finds of these swords in the Alpine Rhône valley hoard at Bex (CH) provide indications of a western route across the Alps, though there are no corresponding finds to such a route in northern Italy. The *Mörigen* and *Tachlovice* swords also show a distribution extending into the lower Rhône valley (Map 163; Map 165), which may be a precursor to the networks used to circulate the early Iron Age *Gündlingen* and iron *Hallstatt* swords from central Europe to south-eastern France (Map 33; Map 38). Distribution density mapping of the Late Bronze Age sword types clearly indicates the nCA lake-dwelling region as a significant centre, and also illustrates the Rhine valley as a region of dense distribution. Other areas which stand out as being of higher density distribution are southern Germany and northern eastern Germany around the Elbe and Oder rivers. Densities of Iron Age sword types, particularly the HaC period *Gündlingen* and *Mindelheim* types (Map 167), show a general exclusion of Switzerland from the circulation of these weapons, with only two *Gündlingen* swords

occurring as isolated finds (Font and Sion). While the *Mindelheim* swords are distributed in a general south-east to north-west Europe alignment, the *Gündlingen* type shows a broader distribution extending in an arc around the former lake-dwelling region and connecting southern Germany to the lower Rhône valley via the Middle Rhine Valley, mirroring the distribution of *Mörigen* swords with the exception of the Lake Neuchâtel region (compare Map 163 and Map 167). However, non-specific sword types of the Iron Age, typically termed *Hallstatt* (or simply mentioned as iron) swords, should also be considered in this pattern (Map 38). While several of such swords are present in Switzerland, they largely complement the distribution seen for *Gündlingen* and *Mindelheim* swords, with high distribution in southern Germany and the eastern French Jura region.

Moving through the Iron Age to the later Hallstatt period (HaD) the occurrence and density of Iron Age daggers and short swords suggest that the former lake-dwelling regions of Switzerland are re-integrated to the exchange and communication networks with southern Germany (Map 39; Map 40). Such distribution is likely linked to the emergence of *Fürstensitze* at Châtillon-sur-Glâne (CH) and Üetliberg (CH) respectively reflecting the densities around Lake Neuchâtel and Lake Zurich. A single dagger is again known from the Alpine Rhône valley, at Sitten/Sion, indicating a possible route across the Alps into northern Italy.

While a large proportion of the Late Bronze Age swords are recorded as isolated finds lacking associated objects, almost 90 swords (of the *Mörigen*, *Tachlovice*, *Weltenburg*, *Tarquinia*, *Zürich*, and *Auvernier* types) are known from hoard or burial contexts, of which circa 50% are associated with more than one other category of object (see Table 47), show no clear clustering based around sword type (Chart 14): evidently the sword was not a significant factor in determining which objects would be deposited with it. When single items, or single categories of items, are recorded with swords (e.g. Şimleu Silvaniei (RO) and Bothenheilingen (D)) these objects are primarily swords, or occasionally large ring jewellery (e.g. Niederurnen (CH)). Of the swords with greater numbers of associated objects, a clear distinction is evident between those which were deposited in hoard assemblages, and those that were included in burials (Chart 15). This difference is based around the inclusion of ceramic vessels; such variance should be expected as ceramic vessels were rarely included in hoard assemblages of the period. The swords deposited in hoards were associated with a wide range of objects, including large and small jewellery objects, weapons, tools and utilities. Iron Age swords and daggers, predominantly from central Europe and eastern France, form a defined cluster and relatively dispersed assemblage group, based around the inclusion of weapons, ceramics, small jewellery and fibulas/needles (Chart 16, Chart 17, and Chart 18). There appears to be some segmentation between *Gündlingen* and *Mindelheim* type swords (Chart 19), not only through the inclusion of horse and wagon gear – as might be expected if they were different swords used by horse riders and warriors (see Sub-sections GÜNDLINGEN and MINDELHEIM in Section 5.4.1.1), but through the inclusion of prestige items, such as bronze vessels, which suggests a high(er) status – low(er) status division amongst elite classes. The *Mindelheim* swords also appear to show some separation by country, with examples from Austria confined to the upper left of the chart, with other regions dispersed throughout the plot area. It has to be pointed out that there are only three examples from Austria, and so this clustering should be treated with caution.

Comparing all of the Late Bronze Age and Iron Age hoards and burials (Chart 20), it is clear that the assemblage of LBA burials are generally comparable to the IA burial depositions, as are several of the LBA hoard assemblages (except ceramics). Continuation of value association and appropriate deposition practice occurred with the deposition of swords in burials between the Late Bronze Age and the Iron Age, while their deposition in hoards during the Bronze Age clearly fulfilled more symbolic than practical functions – particularly in the small assemblages (e.g. Wierzchowo (PL), Kehmstedt (D) or Bex (CH)).

From a biographical perspective it is certainly evident that there was a general standardized treatment of swords (and daggers) across both space and time. Swords were consistently used as indicators of social status and identity in burials by a minority of the population (Sperber 1996), regardless of their potential journey from locations of manufacture to locations of deposition. Yet, the biographies of swords may have included more than simply the expression of power and prestige through their physical form and the symbolism of warfare which they embodied (Kristiansen 1999: 198). The method through which swords were circulated is unknown, and it is possible that they may have served as a way of identification between spatially separated elites (Kristiansen and Larsson 2005b: 31). It is also possible that during the Late Bronze Age, when swords may have been less strictly identified with individuals (see above), swords travelled as gifts between elite members of society, and their cultural biography incorporated multiple identities through the exchange process. Furthermore, swords were decorated with other objects, such as amber, ivory, and different colour metals (e.g. iron, copper, gold), along their hilt. This would have aided in the individualisation of swords, enabling them to be identified as specific objects with their own identity. However, they also represented and symbolized the exchange networks which were co-ordinated and

utilized to gather the materials – for example amber from the north and ivory from Africa. Thus, many of the Late Bronze Age and Iron Age swords can be seen as containing multiple biographies, while possessing a well-defined pattern of use-life and terminal deposition in burials, in hoards, or as isolated 'votive' depositions.

7.6: Ring Jewellery

Many of the arm- and leg-ring jewellery types considered in this study are primarily distributed in the northern Circum-Alpine region, with evidence of local manufacture in the lake-dwelling settlements (see Section 5.4.2.4). Distribution of the nCA type ring jewellery in other regions of Europe indicates their circulation through exchange practices, while the presence of some 'foreign' type rings, such as the *Vénat* and potentially the *Homburg* and *Balingen* types, in the contexts from the northern Alpine region suggests the import of ring jewellery to this area. While the focus on objects from the northern Circum-Alpine region has ensured that a large proportion of the ring jewellery studied is from this region (though assemblages are recorded from other areas, e.g. France and Germany), it is also evident that the lake-dwellings were manufacturing centres for these objects (creating such a high density in the nCA) and were responsible for their distribution throughout Europe. As with other types of material culture, the vast majority of arm-/leg-rings from the nCA are known from lake-settlements or within the vicinity of a lake (Map 168), though a number are also known from hoards within lake-dwelling areas, such as at Auvernier-Nord (see Fischer, V 2012: 58-60), and inland hoards, for example at Basel-Elisabethenschanze (Primas 1977). There are also several instances of Late Bronze Age ring-jewellery from the region recorded in burial contexts, for example Vidy-Chavannes (Kaenel and Klausener 1990; Moinat and David-Elbiali 2003) and Le Boiron (Beeching 1977), making the deposition of this object class more diverse than other objects studied (e.g. knives and razors), but settlement finds are still the most numerous, accounting for over 60% of all rings (Pászthory 1985: 253).

The vast majority of rings considered from western France and northern Germany are recorded from hoards, with fewer examples from rivers and as single finds (Map 168). In these areas burial deposition for the types of rings considered is not particularly represented, though other forms of 'local' rings were included in burials during, for example, the early Urnfield period in central Germany (Richter 1970 types *Framersheim* and *Hanau*). Finds from lake-settlement and lake areas (without further context information) account for a large proportion of the ring finds in southern Germany and eastern France, with only a minority occurring in burials and as single finds. In both of these regions a significant proportion of the rings are known from hoards, including a lake-dwelling hoard at Wasserburg-Buchau (Kimmig, W 1992).

The associated goods deposited with ring types that travelled the greatest distances – *Homburg, Balingen, Corcelettes,* and *Vénat* – illustrates a possible circulation of ring value association. All of the *Vénat* type rings from France have been recorded from hoard contexts, while the few known from the nCA are from settlement locations, indicating that these rings were deposited in 'local', rather than 'imported', practices. *Corcelettes* type rings outside of the nCA are mainly recorded from hoard contexts, while inside the nCA and eastern France they are recorded from hoards and burials in addition to lake-settlements (Map 171). This may suggest that the *Corcelettes* rings were deliberately excluded from burial contexts in southern and northern Germany, where other 'local' types of rings were frequently included in burials (e.g. Richter 1970). Possibly imported, but possibly locally manufactured, *Balingen* and *Homburg* rings in the nCA were deposited in hoards and occasionally in burials, as they were in southern Germany, while in other regions they were primarily placed in hoards (Map 169, Map 170). This suggests that rings were utilized in local deposition practices regardless of their 'foreign' nature.

Multiple Correspondence Analyses of the *Homburg*, *Balingen*, *Mörigen*, and *Corcelettes* type rings suggests that they were deposited in similar assemblages despite differences in their style (Chart 21). Comparing the plot with origin (Chart 22), it is also clear that there is no particular differentiation based on the region in which the rings were deposited – with the exception of two outliers from Switzerland and one from Germany. These three items are recorded from burial contexts, and a different assemblage composition should be expected for objects in burials and hoards (Chart 23). Examining the ring types independently, there appears to be some segregation between hoards from France and Germany containing *Corcelettes* type rings (Chart 24), based around the inclusion of small jewellery objects. The chart for *Balingen* type rings suggests a separation around the co-deposition of metal vessels (Chart 25), while the *Homburg* type rings show similar assemblages across all regions, with several outliers from Germany (Chart 26). Thus, it is evident that the value of arm-and leg-ring jewellery was not constant as they travelled around Europe, but was re-constituted for use in regional practices, though these practices were relatively similar across regions.

Examining the deposition context of arm-rings by time period from eastern France (Chart 27) and the nCA (Chart 28) [41] indicates that the dominant deposition location across all periods was within lake-settlements,

[41] The two regions with sufficient subdivision of data.

with a minor component in hoards during the HaB phase. It is possible that many of the pieces of ring jewellery recovered from lake-dwellings in antiquity represent hoards (see Section 1.5 (Fischer, V 2011, 2012)), though it is difficult to estimate how large a percentage this would account for. Deposition in burials formed a minor practice during the final stages of the Late Bronze Age, before becoming the main form of deposition during the early Iron Age. The find contexts of arm-/leg-rings from eastern France show a predominance for placement in hoards during HaA, a practice which continued throughout the HaB period in this region.

Although temporally limited and confined to the *Zerba* type (see Sub-section ZERBA & POURRIÈRES in Section 5.4.2.4), the rings recorded from the Italian peninsula are mainly recorded from hoard contexts, while those from the southern Circum-Alpine region are primarily known from burials (Chart 29 (cf. Pearce 1994; Paltineri and Rubat Borel 2008)). Clearly some regional differentiation of valuation of the *Zerba* type rings occurs between these two regions. Examples of the *Zerba* type ring occur in eastern France, and several of these are found in hoard contexts, while the *Pourrières* type ring shows some similarities to the *Zerba* type, and are known from lake-dwelling contexts around Lake Geneva and in the Lake Neuchâtel region, or deposited as multipart hoards (Chart 29). In this deposition pattern the *Pourrières* type rings were utilized and disposed of as 'local' objects, even though they demonstrate some 'foreign' influence.

The dominant deposition of large ring jewellery in burials during the Iron Age attests to their social function as objects of identity creation, possibly used at different stages of life and social status in combination with belt jewellery (Schmid-Sikimić 1996: 5-8). Combinations with other jewellery, and avoidance of utilities and weapons are clearly defined in the MCA plot of the Iron Age rings detailed in this study (Chart 30) – possibly representing increased female associations. Some outliers occur based on the inclusion of weapons and more functional objects – such as the LBA hoard at Vénat-Saint Yrieix, which includes rings similar to the *Valangin* type (Schmid-Sikimić 1996: 47), and a fragment of *Lausanne* type ring from a tumulus at Hemishofen, which may have been associated with a fragmentary fibula (Schmid-Sikimić 1996: 58-59). The assemblage with *Schötz* rings from Unterlunkhofen (Schmid-Sikimić 1996: no.41) is unusual through the inclusion of a razor, which separates this burial another outlier, Schötz (*Schötz* ring (Schmid-Sikimić 1996: no.32)) containing only a ceramic vessel.

Distribution of Iron Age type arm rings within the nCA illustrates that the former lake-dwelling areas were not totally abandoned, with communities occupying the same regions (e.g. Lake Neuchâtel and Lake Geneva foreland) and utilising, the same areas as the Late Bronze Age lake-dwelling communities (Map 116; Map 117), but not settling the lake shores. The Iron Age ring jewellery also shows continuation and elaboration of Late Bronze Age designs, with a retention of ribbed and grooved decoration on the *Schötz* type similar to that of the *Homburg* and *Balingen* types, and the *Gorgier* and *Subingen* types retaining circular eyes and triangular designs similar to the *Boiron* and *Corcelettes* types (compare Figure 53 and Figure 54). Furthermore, many of the broad arm-rings, in both clay and metal, show rich decoration incorporating circular eyes, dogtooth and triangular designs (e.g. Schmid-Sikimić 1996 types Prattlen and Ins), similar to many of the LBA knife and arm-ring decoration schemes.

Comparing the MCA distribution of Iron Age and Bronze Age ring depositions (Chart 31), some differentiation occurs between the objects based around the inclusion of other jewellery items. The burials from Vidy-Chavannes, including small gold spiral rolls, and a grinding stone (Kaenel and Klausener 1990; Moinat and David-Elbiali 2003), and Saint-Prex En Coulet (Pászthory 1985: no.1408-1409), containing two large rings, are exceptions to this trend (labelled BB, lower left quadrant). However, a general continuation of association can be observed in the deposition or large ring jewellery in burials between the LBA and EIA, even though the quantity and forms of associated goods changed over time (e.g. compare burials at Vidy-Chavannes and Le Boiron to those from Lyssach). Both the Iron Age burials and the Late Bronze Age hoards are clustered to the left of the graph, based around the inclusion of small jewellery objects, with some vertical differentiation based upon the inclusion of weapons and utilities in the hoards, and their absence in burials.

7.7: Bronze Vessels

Various types of Late Bronze Age and Iron Age metal vessels (e.g. cups, beakers, buckets) are known from the northern Circum-Alpine region, with some being imported from other parts of Europe, such as Late Bronze Age *Hajdúböszörmény* type buckets and Iron Age *Schnabelkannen*, and others may have been manufactured locally, for example *Jenišovice* cups (see Section 5.4.2.6). The find contexts of many of the Late Bronze Age vessels (mainly in lake-settlements) makes comparative deposition studies difficult, as these objects have no identifiable associated finds as would be expected from hoards or burials. It has been suggested that some of the metal vessels – such as the fragmentary pieces from Zurich-Wollishofen-Haumesser – travelled not as intact prestige objects, but as commoditized fragmented scrap bronze for recycling (Primas 1990b: 87).

A two-zone hanging beaker (*Zweizonenbecher*) from a hoard at Grandson-Corcelettes provides a rare opportunity to analyse the find associations of an imported vessel in the lake-dwelling communities. The main distribution area of these vessels is in northern Germany, Denmark and Scandinavia (Map 175), where they are predominantly found in hoard assemblages (Sprockhoff and Höckmann 1979). Multiple Correspondence Analysis of the depositions including these forms of vessels (and also three zone and multiple zone vessels) suggests that the depositions from all of the regions form a relatively coherent group based around the inclusion of large and small jewellery objects, and weapons (primarily axes and spears), with a small cluster separated by the inclusion of metal working remains (Chart 32). The example from Grandson-Corcelettes lies towards the outer limits of this cluster (nCA top of plot), based upon the inclusion of horse gear and two spindle whorls (domestic objects), and is rather separated from other examples in southern Germany (Hödingen, Neulingen, Kaiserslautern), based on the occurrence of metal working remains and absence of domestic equipment, fasteners and small jewellery objects. The presence of this Nordic style vessel, in a hoard which is not significantly dissimilar to deposition compositions from northern Europe while being somewhat unlike more local depositions (if domestic remains are excluded), and the nearby finding of a northern European *Platten* fibula (see Section 5.4.2.5) and *West Baltic* type spearhead (see Sub-section WEST BALTIC in Section 5.4.1.2), suggest that the equipment may have been deposited by a migrant from the north. Alternatively, if these northern objects do not represent the deposition of a 'foreign' individual's equipment, they show retention of value association as they travelled from northern Europe to the northern Alpine region, with deposition in assemblages similar to those of their native region, without recycling conversion of the object into a local object form.

Other Late Bronze Age vessels from the nCA, for example *Jenišovice* cups, are recorded as single objects from within lake-dwelling settlements (Map 176). Such deposition practices are unusual compared to other regions of Europe, where multiple vessels were often deposited together in hoard or burial assemblages, but rarely within settlements (cf. Martin 2009; Gedl 2001). It has been suggested that the assemblages of multiple vessels may represent specific communal events and social practices of drinking and consumption with vessels too valuable for everyday use (e.g. Martin 2009: 136-43). Where included in burials, such as the 'Kings grave' from Seddin, the vessels may have represented the power and status of individuals and their ability to host and control such consumption events; while the presence of single 'foreign' vessels may have been the result of presenting participants at such events with gifts (Martin 2009: 140). From the surviving material it is difficult to see either of these practices occurring within the lake-dwelling communities north of the Alps. It is possible that the *Jenišovice* vessels known from this region were manufactured locally, and their isolated findings (not in hoards) do not suggest communal deposition as part of ceremonial practices. While the absence of such vessels from burials in the nCA suggests that they were not strictly associated with individuals, it must be stressed that the burial practices of the lake-dwelling communities remain largely unknown. No apparent patterns are visible in the assemblages containing *Jenišovice cups,* with depositions from different regions spreading across the plot, though there appears to be some seperation between burial and hoard assemblages (Chart 33).

During the Iron Age, many *Schnabelkannen* travelled over the Alps from their native manufacturing zone in northern and central Italy (see Section 5.4.2.6). Many of these vessels are known from wagon burials and burials including rich assemblages of gold jewellery objects (Vorlauf 1997). Multiple Correspondence Analysis suggests that many of the *Schnabelkannen* depositions are to some extent similar, due to the presence of gold and jewellery objects, with some differentiation based around the inclusion of large ring jewellery (Chart 34). It is relatively evident that the deposition of *Schnabelkannen* north of the Alps formed part of prestige burial practices, while the few examples with recorded associated objects from the southern Alpine region show some dissimilarity in assemblage associations, with fewer gold objects incorporated, suggesting that the prestige value of these vessels increased with their journey across the Alps. The dominant practice of including metal vessels in burials during the Iron Age suggests a re-organisation of values from the potential celebration of communal events to the celebration of the individual and their ability to control and host such events.

The distribution of Iron Age bronze vessels, such as the *Schnabelkannen* and *Rheinischen situla*, are found in great numbers along the Rhine valley, while Bronze Age vessels, such as the *Jenišovice* cups (of types detailed here) and hanging vessels are found in fewer numbers from the region (compare Map 131 and Map 132 to Map 175 and Map 176). This distribution of objects travelling from the south northwards, and vice-versa, indicates the importance that the Rhine Valley played in transport routes during both of these time periods.

7.8: Fibulae

Fibulae of the Late Bronze Age are a relatively uncommon occurrence in the northern Circum-Alpine region, and the majority of those are from lake-settlements (see Section 5.4.2.5). The fibulae which are recorded attest to exchange links looking both

northwards (*Platten* fibula) and southwards across the Alps to northern Italy (*Mörigen* and assorted *Bogen* types). The low numbers of these types indicates sporadic or intermittent interaction events rather than intense levels of exchange. Iron Age fibulae are more common in the Circum-Alpine region and continue to show links with northern Italy, and suggest routes along which they may have crossed the Alps (Map 124 and Map 125 (cf. Della Casa 2002: 70-71; Primas 1970).

Platten fibula are commonly found in northern Germany, Poland, and Denmark; a few examples, however, can be found in central Germany and the Middle Rhine Valley (Map 177), some of which have been considered as 'imitations' of original Nordic fibula (Hansen 1991). The majority of this fibula type is recorded from hoard contexts, with few examples from burials. Unfortunately the find contexts of the *Platten* fibula from Grandson-Corcelettes are somewhat confused, with some suggestions at the time of recovery in the 19th century that it was associated with up to 25 objects including sword fragments and arm-rings (Betzler 1974: no. 134; but cf. Fischer, V 2005). Multiple Correspondence Analysis of the assemblages including *Platten* fibula (Chart 35) suggests that distinct clustering occurs around a combination of large and small jewellery objects, weapons, horse gear, and fasteners, while some separation occurs depending upon the inclusion of bronze vessels, ceramics, and domestic objects (spinning whorls). The assemblages from the Middle Rhine Valley show similar composition to those from northern Germany and Poland, suggesting similar concepts of appropriate disposal for these fibulae. The hoards of Nächstenbach-Weinheim, Haimbach, and Schwachenwalde (Chłopowo (PL)) are relatively similar in composition and occupy the same area in the MCA space. The *Platten* fibula from Grandson-Corcelettes (labelled NCA) lies well outside of the main concentration of associated objects, though this position – and objects deemed to be associated with this fibula – must be treated with caution given the uncertain circumstances of the find. However, considering the other Nordic style finds from Grandson-Corcelettes (spearhead and hanging vessel) it is possible that this object represents the equipment of a migrant from the north, bringing with them concepts for the correct deposition of objects, while the objects from the MRV, consistent with assemblages from the north, may represent migrants to that region, or local awareness of the correct deposition for imported objects from their (not-too-distant) area of production, rather than locally manufactured emulative objects.

While most of the fibulae recorded from the northern Circum-Alpine region are not found with any associated objects, a single example of a *Torsion Bogen* fibula is recorded from a small assemblage at the lake-settlement Zug-Sumpf, and a *Valais Bogen* fibula from a burial at Sitten/Sion (see Sub-section VALAIS in Section 5.4.2.5). MCA of these two examples with assemblages including LBA fibula from northern Italy (e.g. *False Torsion* and *Arco Semplice*), indicates that the fibula from Sion (NCAV) correlates to assemblages from northern Italy, with the inclusion of large and small jewellery objects and fasteners (Chart 36). In contrast, the fibula from Zug-Sumpf is clearly separated from the main cluster of assemblages based upon the presence of utilities and metal working remains (nCAT bottom). When compared to the *Platten* fibula, these assemblages from northern Italy/sCA are clearly separated by the inclusion of weapons and bronze vessels in the depositions (Chart 37). Given the predominance of jewellery objects and absence of weapons or utilities in the assemblages from the sCA, it may be suggested that these represent female orientated burials. In contrast, the occurrence of weapons and tools/utilities in the assemblages from northern Europe may suggest that the *Platten* fibula were frequently associated with male identity assemblages or multiple identities where both male and female associated objects are recognized. While the female burial from Sion tallies with this supposition (Betzler 1974: no.156), the broken fibula from Zug-Sumpf does not; instead it forms part of a small hoard assemblage, possibly a metalworkers deposition (Bauer, I *et al.* 2004: 96). On some occasions, as objects travelled across the Alps they retained their value associations and were utilized in similar practices in both the northern and southern areas, such as the example from Sion. Travelling further away from the Alps caused a decline in practice transfer, as may be seen from the examples of fibula recorded from lake-settlements, and the fibula from Zug-Sumpf.

Iron Age fibula types in the nCA are recorded from both settlements (e.g. Üetliberg, Châtillon-sur-Glâne) and burials (e.g. Subingen), similar to deposition patterns seen in the southern Alpine region and the Italian peninsula (Eles Masi 1986; Primas 1970). Objects found in the burial assemblage with fibulae include small jewellery, ceramics, and frequently further fibula, indicating their role in the creation and maintenance of social identities. Between the Late Bronze Age and Iron Age, with the increasing occurrence of fibulae in communities north of the Alps a heightened association between fibulae and social identity developed, resulting in more frequent deposition of these objects in burials.

7.9: Spearheads

One of the most widely discussed objects from the lake-dwelling communities and which travelled to more northerly areas of Europe are the so called '*Pfahlbaulanzen*' (Kristiansen 1998: 161-66; Jacob-Friesen 1967), with a distribution extending from the nCA to Scandinavia (see Sub-section PFAHLBAU in Section 5.4.1.2). These final Urnfield period spears break from

the earlier tradition of richly inscribed decoration combining half circles, triangles and dogs tooth patterns, instead utilizing simple ribbed and grooved bands around the socket (see Tarot 2000). This evolution of decoration mirrors, to some extent, that seen on many other material culture groups, such as knives and arm-/leg-rings (see Sections 5.4.2.2 and 5.4.2.4). However, there is some difference in the decoration applied to spearheads when compared to these other objects: many of the knives include ribbed/grooved decoration on the handle while retaining incized decoration on the blade faces (for example from Zurich-Alpenquai (Mäder 2001a)), while arm-/leg-rings may combine both forms of decoration (e.g. *Mörigen* type) or extensive use of ribs and grooves (e.g. *Balingen* and *Homburg* types), with an increase in rich inscribed decoration during the Iron Age (see Schmid-Sikimić 1996). This change in decoration may reflect a reduced need, or desire, to individualize spearheads with elaborate decoration as an attempt to emphasize their identity, the identity of their wielder, or the social function which they fulfilled, at the expense of simpler decoration as they became increasingly identified with warrior identities and as a portion of warrior equipment (Tarot 2000: 40-48).

The *Pfahlbaulanzen*, as expected for an object manufactured locally in the nCA, show a high distribution density in this region, especially in the Lake Neuchâtel region (Map 178). The lake-settlement regions of eastern Switzerland and southern Germany also show high distribution density, though not as high as that in the west. Moving northwards an area of high density again occurs in the Middle Rhine Valley, in the region between Strasbourg and Frankfurt, while some isolated find locations are in central France, as seen for other objects (e.g. such as knives, swords and horse gear). Between Frankfurt and Denmark a diversification of distribution is evident, possibly representing a range of regional exchange and communication routes running through the area and spreading across northern Germany. The distribution of these spearheads then funnels into Denmark and southern Scandinavia, with a particularly high density on Funen Island (DK). When considering *Pfahlbau* type spearheads, it has been common to also consider the distribution of *West Baltic* type, relatively similar in form and including ribs or grooves around the base of the shaft (cf. Jacob-Friesen 1967), with distribution primarily in Denmark, northern Germany and Poland (Map 43). Funen Island also shows a high density of these spearheads (Map 179), with other hotspots occurring along the river Oder, in south-eastern Germany (four *Pfahlbau* or *West Baltic* type [42] – examples from Künzing, 2 from Straubing-Sand, 1 from Teugn). Examples lying significantly outside of the main area of distribution include five possible examples from the large hoard at Petit Villatte (FR), and a single example from Grandson-Corcelettes (CH). The examples from Petit Villatte form a small portion of a large founders hoard, and thus have lost their social function and biography by travelling away from their native region, and gained a new value as metal stock. In contrast, the example from Grandson-Corcelettes found as an intact object, and in the same settlement as other objects of northern European origin (*Platten* fibula and hanging vessel), may have retained its original biographic trajectory.

However, it is not only the *Pfahlbaulanzen* which show connections between the nCA and central/northern European type spears; decorative motifs [43] on late Urnfield (HaB1) period *Wellendekor* spearheads shows similarities across Europe from the Czech Republic (Říhovský 1996: no.64, Napajedla) to Denmark and France (see Figure 42). Subtle mutations in decoration occurred, making the decoration more relevant in local regions; for example, the triangle being transformed into, or replaced by, a folded boat on examples from Denmark (Kaul 1998: 168-69). Though as Kaul (1998: 169-70) suggests, the triangular heart shaped motifs in southern regions, e.g. at Zurich-Wollishofen (Tarot 2000: no.662), may represent degraded and translated versions of the ship symbols. However, such motives in the nCA and surrounding regions may also represent a concatenation of a triangle with semi-circles and the exclusion of horizontal bands. It is not clear whether these *Wellendekor* style motifs originated in northern Europe and were mutated on their journey south, or vice-versa.

Multiple correspondence analysis of the *Pfahlbau* and *West Baltic* spearheads – where listed with associated finds – suggests that there may be some differentiation between the spear varieties based upon the inclusion of ceramics, small jewellery, and horse gear (Chart 38). As many of these objects occur within the same region, it is possible that these differences are between manufactured 'local' and imported 'foreign' weapons, deposited with different assemblages in hoards (Chart 39). There also appears to be segregation based upon the region in which the depositions occur – with those from Poland, northern Germany and Scandinavia occupying somewhat different positions of Chart 40. It is unfortunate that the *West Baltic* spear from Grandson-Corcelettes does not have any associated objects, as it would be interesting to see how its deposition compared to other *West Baltic* spears, particularly as the possible

[42] Defined in the literature as being of either *Pfahlbau* or *West Baltic* type. Hereafter sites with spears identified as either *Pfahlbau* **or** *West Baltic* type are marked with *.

[43] Consisting of opposed concentric semi-circles seperated by dividing lines around the shaft, with a triangle on pointing towards the blade tip from where the blade begins – *Wellendekor* in terms of (Tarot 2000: 13)

spearheads from Straubing-Sand (D) would fit with the pattern for those deposited in the northern regions. Objects associated with *West Baltic* type spearheads in their native regions include *Platten* fibula (e.g. Poznań-Wielka Starołęka (PL), Szczecin-Klęskowo (PL)) and bronze hanging vessels (e.g. Stora Köpinge (SE), Grönhult (SE)), and it is worth reiterating that both a hanging vessel and a *Platten* fibula are known from Grandson-Corcelettes. Why these objects were not deposited together, with the spearhead in an isolated location, while the hanging vessel was deposited in an assemblage with a local *Pfahlbau* type spear is unknown. Such a substitution is not without precedent, as can be seen in the inclusion of *Pfahlbau* spears with *Platten* fibula in hoards at Gambach-Friedberg ((D) a large founders hoard), Pederstrup* (DK), and with hanging vessels at Nya Åsle (SE), Hyldtoft* (DK), Kjertinge* (SE). It is evident that the two spear types were to some extent interchangeable in their deposition, with greater concern placed on the presence of spears in deposition rather than the presence of specific forms of spear. The presence of a *West Baltic* spear and other Nordic objects at Grandson-Corcelettes, provides greater support to the supposition of a migrant from the north residing in (or visiting) the community and bringing with them personal equipment.

The Iron Age (HaC-HaD) spearhead finds recorded from Switzerland, although relatively limited in spatial extent (Map 46), clearly illustrate a change in deposition practices within the region. Instead of being deposited in hoards or as single objects, they were incorporated into burials including large and small jewellery objects and knives. The association with other weapons appears largely to have been lost; for example only 11 *Gündlingen* swords are recorded as being associated with spear heads. Therefore, while spears became objects associated with specific individuals, they appear to have signified slightly different identities to those identified through *Mindelheim*, *Gündlingen* and *Hallstatt* type swords. Combinations of daggers and spears were popular in burials in central Europe (for example repeatedly at Hallstatt), suggesting a warrior equipment set, but such associations are not particularly evident in Switzerland (cf. Sievers 1982). How far Iron Age spears travelled is more difficult to assess than for those of the Bronze Age, as they are difficult to classify into typological groupings, and many of them are recovered in highly fragmented and corroded conditions (see Sub-section IRON AGE in Section 5.4.1.2).

Between the Bronze Age and Iron Age cultural attitudes towards spearheads within the northern Circum-Alpine region changed from identification of individual weapons with deposition in communal practices and events to deposition in specific burials as a section of the entombed persons' identity. For those spearheads manufactured in the lake-dwelling region and circulated to the north, the spears were utilized in local practices and were even substituted for local spearheads in some hoard depositions.

7.10: Horse Gear

Horse harness equipment from the northern Circum-Alpine region can be divided into two simple categories; equipment made from organic material (antler) and those of bronze (see Section 5.4.2.7). Organic equipment is more common from the region, with numerous finds from lake-settlements (e.g. Mörigen and Grandson-Corcelettes), but not from burials or hoards. In contrast, bronze bridal gear is more frequently recorded from burials (e.g. Saint-Sulpice) or within structured deposits within lake-dwellings (e.g. Zurich-Alpenquai, Grandson-Corcelettes bit piece (cf. Fischer, V 2012: 60-61)). This organic = settlement : bronze = burial/hoard deposition division is observed elsewhere in Europe (e.g. Hüttel 1981: 123), and may represent a transfer of object value between possible equipment sources in eastern Europe and use locations in central Europe. Such valuations were not only confined to objects imported to the nCA, for example angled bronze cheek pieces, but also pieces manufactured locally, for example the *Mörigen* type antler cheek pieces, and exported to other areas of central Europe (Map 133).

The early Urnfield period *Mengen-Kaisten* type horse gear recorded from burial contexts in Switzerland and southern Germany are frequently associated with weapons and other objects of horse gear (cf. Hüttel 1981), creating two sets of bridal equipment and, therefore, indicating the use of two horses to draw wagons (e.g. Saint-Sulpice (CH), Mengen (D)). Late Urnfield type horse gear, particularly of the angled form, indicate a communication and exchange route between the nCA and the Carpathian Basin and beyond (Map 138), and demonstrate similar associations to those observed for the early Urnfield types, with weapons, wagon elements, and multiple pieces of horse equipment occurring in burials (e.g. Frög (AT), Seržen'-Jurt (RU) Černogorovka (UA)). Two interesting deposits are small hoard collections from Zurich-Alpenquai (consisting of a chisel, gouge, knife, winged axe and arm-ring fragment), and Haslau-Regelsbrunn (D) containing a *Jenišovice* cup, 4 spiral fibula, 4 socketed axes, 3 sickles, 2 cross bits, and a knife. When combined with the bit piece from the Grandson-Corcelettes hoard (Fischer, V 2012: 60-61), these three assemblages show different associations to the horse gear deposited in burials; they have working equipment, tools, and bronze vessels, but few weapons. This may suggest associations with artisans, possibly metal workers, or traders with 'foreign' connections.

The horse shaped cheek piece from Zurich-Alpenquai is an unusual find north of the Alps, while such pieces are

relatively common in central Italy (Map 135). It has been suggested earlier (see Sub-section SYMBOLISM in Section 5.4.2.7) that the functional use of horse iconography on horse gear effectively creates redundant symbolism, as the status of individuals as horse owners/riders is demonstrated through their presence with/on a horse; the use of horse-shaped bridal pieces would not have added to the perceived status. Objects associated with these horse-shaped bridal pieces in burials from central Italy include weapons (swords, spears), personal equipment (e.g. razors, knives), jewellery, and often equipment for a single horse (cf. Von Hase 1969). This equipment is associated with warrior identities, and the use of horse-shaped bridal gear in burial contexts may be the symbolic presencing of horses in the burial equipment (see Sub-section SYMBOLISM in Section 5.4.2.7). Alternatively, these stylistically equine shaped pieces may be referencing ideal aspects of horses, imbuing the horses on which they were used with specific 'magical' properties, as suggested by the combination of water-birds and horses on some types of bridal gear (Figure 59). The lack of associated objects with the cheek piece from Zurich-Alpenquai make it difficult to interpret how this object was valued in the lake-dwelling community, though the fact that there is only a single example and no bit piece indicates that (assuming the item had been used) the bridal assemblage was deliberately dismantled prior to deposition.

8: Routes of Trade, Communication and Interaction

In previous studies the occurrence of jewellery objects outside of their main centres of production and distribution have been used to suggest individual, particularly female, mobility during the Middle Bronze Age (e.g. Jockenhövel 1991). Jockenhövel (1991: 54-60) proposed that such mobility may have been voluntary or forced, but appears to have been limited to cultural regions directly neighbouring each other, with transport of objects over longer distance occurring through 'down-the-line' exchange systems. Many of the object types, such as needles, neck collars, and bronze spirals, discussed by Jockenhövel show primary distribution within an area of 25km radius, occasionally extending up to 100km, while those depositions related to 'migrant' or 'relocated' individuals may be up to 250/300km from the main object distribution. Of course, this does not indicate a specific location from where objects originated (and is primarily concerned with artefacts originating from a cultural region, rather than within communities), nor the routes along which objects, and people, may have travelled. Combining the distribution densities of the object categories discussed previously (see Chapter 7) will provide indications of the routes that objects travelled, with the occurrence of multiple categories within a set proximity suggesting communities which were involved in the circulation of those materials over longer distances.

The distribution densities of the three main types of large-ring jewellery found inside and outside of the nCA (*Corcelettes*, *Balingen*, *Homburg*) shows high density around Lake Neuchâtel, with overlapping points of *Balingen*, *Corcelettes* and *Homburg* types at Aigle and Ollon (CH), Petit Villatte (FR), Mauves-sur-Loire (FR), and several occurrences around Rüdesheim, Wiesbaden, Weisenau, and Mannheim (D) in the Middle Rhine Valley (MRV). The instances of *Corcelettes* rings in the Middle Rhine Valley occur in excess of 350km from their main distribution on Lake Neuchâtel. The *Homburg* rings show a more gradual dispersion across southern Germany, the high density in the MRV is also over 350km from their greatest density on Lake Neuchâtel. As these rings travelled further from their main distribution, the distances between their locations of deposition increased, with a separation of over 250km between sites in central Germany (e.g. Kuckenburg) and north-eastern Germany/Poland (e.g. Wendorf), but a small cluster is found within northern Germany with three locations within 65km. Although the *Corcelettes* rings are not recorded from the east of Switzerland, high levels of *Balingen* and *Homburg* rings found in both the western and eastern sectors suggests a degree of interaction between the two regions. While the majority of central Europe north of the Alps can be seen as a part of the Urnfield culture during the Late Bronze Age, regional differences in material culture and practices are evident. The west and east of Switzerland formed different sections of the Rhine-Swiss-East-France group (Rychner 1998), while the region around Mainz, Wiesbaden, and Frankfurt has been attributed to the Lower Main-Swabian group (Jockenhövel and Kubach 1994). Evidently, inter-group exchange of the arm-/leg-ring jewellery was occurring over great distances between Urnfield groups.

Adding other jewellery objects, i.e. the *Pfahlbauperlen*, *Platten* fibula, and amber beads, demonstrates even further this inter-cultural exchange – not only from the Italian peninsula to north of the Alps, but also between LBA communities in Switzerland, France, and Germany. With the exception of the lake-dwelling settlements of western and eastern Switzerland, there are few locations where the distribution of *Pfahlbauperlen* and ring jewellery of the above types overlaps. Instances where such overlap is present occur in the Rhine Valley at Burkheim (D) and Frankfurt (D), and also in the large hoard at Augsburg-Haunstetten (D). A small cluster, with up to 45km between sites, of low numbers of *Pfahlbauperlen* occurs within the vicinity of Kelheim in south-eastern Germany. Otherwize it is quite evident that the *Pfahlbauperlen* travelled far greater distances than the *Corcelettes*, *Homburg*, or *Balingen* rings, and did not use the same exchange and communication routes.

The southwards flow of amber shows several areas of overlap with *Pfahlbauperlen* in northern Germany, for example around Friedrichsruhe, Uelsby, and Wensin, but then a large gap of roughly 350km to the next area of cluster overlap, around Reundorf-Grundfeld (D) and Frankfurt. Progressing southwards from this point the distances between areas of overlapping distribution decreases to between roughly 200km (Petterweil ↔ Strasbourg) [44] and 100km (Grundfeld ↔ Abenberg-Pippenhof), with multiple areas along the Rhine valley and in the lake-dwelling areas of Switzerland and southern Germany reducing distances of separation even further. The overlap of *Pfahlbauperlen,* amber beads of both northern and southern European types, and *Corcelettes* rings at Montlingerberg (CH) suggests that this settlement was involved in both intra and inter-regional exchange patterns. The small cluster of amber and *Pfahlbauperlen* around Innsbruck (AT) provide further indications of the use of the Inn valley as routes of exchange and communication.

The most southerly *Platten* fibula occurs at Grandson-Corcelettes, over 600km away from their main region of distribution in northern Germany and Denmark (Map 177), and still 350km away from the small clusters at

[44] ↔ denotes between.

Nächstenbach-Weinheim and Framersheim. These small clusters are connected by steps of circa 100km to the main distribution in northern Germany, with isolated objects at Gambach, Haimbach and Rosdorf. The combination of *Platten* fibula and *Homburg* type rings at Wendorf (D), roughly 30km away from *Pfahlbauperlen* and amber at Neustrelitz and Wesenberg, and in the proximity of *Pfahlbauperlen* and *Platten* fibula around Emmendorf and Ripdorf-Molzen indicate an exchange and communication point in this region.

Socketed (*Tüllen*) and *Phantasie* handle knives link the nCA to northern Europe, but show contrasting distribution patterns (see Section 7.4). High concentrations of *Tüllenmesser* are recorded from around Lake Neuchâtel, overlapping with the ring jewellery, *Pfahlbauperlen*, and amber distribution as described above. Overlaps of *Pfahlbauperlen* and *Tüllenmesser* also occur at Réallon (FR), around Lake Bourget (FR) and Château-Gaillard/Ambérieu (FR), and Han-sur-Lesse (BE), while clustering with *Platten* fibula and *Pfahlbauperlen* is evident around Nierstein, Bad Homburg, and Framersheim (D). Circulation of *Tüllenmesser* occurred over shorter distances than other objects, with frequently less than 50km separating depositions. Three quite clear groups can be seen when considering the route from the nCA to northern Europe:

1) Around the lake-settlements of western Switzerland, separated by circa 250km from
2) A concentration in the Rhine valley, which in turn is some 100 to 150km from the distribution in
3) Northern Germany.

Such separation could be explained by regional variations in the style of knife (see Section 5.4.2.2), though their similar distribution to other exchange items indicates that they were also circulated over larger distances.

The distribution of *Phantasie* knives shows greater presence in eastern central Europe, with overlaps occurring with *Pfahlbauperlen*, amber, and Homburg rings around Schmon (D), Klein-Saubernitz (PL), and around the lake-settlements of the nCA. A small cluster of *Pfahlbauperlen*, amber, *Homburg* rings, socketed knives and Phantasie knives occurs within a distance of 50km in south-eastern Germany, focussed around Tacherting and Chieming. Several instance of *Phantasiemesser* are recorded from hoards within France, in association with *Corcelettes* and *Homburg* type rings, suggests these objects may have come from the lake-dwelling region of western Switzerland. It is striking that the distribution of the these knives are, with the exception of the lake-dwelling areas and in Poland, significantly more dispersed than that of the socketed knives, with typically 50 to 100km between sites.

The distribution density of *Jenišovice* cups shows clear concentrations in the northern Circum-Alpine region, the Carpathian Basin, and in Denmark (see Section 7.7). Some of this distribution will be influenced by regional manufacture of specific variant forms (cf. Thrane 1975). Outside of the nCA small clusters of *Jenišovice* cups with the above discussed material objects are seen around Innsbruck (AT), over 300km from the main distribution around Lake Neuchâtel, and over 200km from finds at Zurich-Alpenquai. Within a distance of less than 50km a cluster of multiple objects groups also occurs around Strasbourg, from assemblages at Strasbourg-Lingolsheim, Birklach-Drachshubel, and Roeschwoog, all in excess of 150km from Lake Neuchâtel. Other dispersed instances occur in France and the Netherlands, nearly 400km from the Lake Neuchâtel concentration, but in association with *Pfahlbauperlen* and socketed knives (Han-sur-Lesse; BE), *Homburg* and *Balingen* rings, and socketed knives (Choisy-le-Roi; FR), and within 15km of *Homburg* type rings (Marnay and Évans; FR). These cups outside of the nCA may suggest exchange and communication points. *Jenišovice* cups from northern and central Germany may have travelled from either the nCA or Denmark, though many of them are found within close proximity to sites with *Homburg* rings (e.g. Allendorf ↔ Marburg @ < 17km; Wernigerode ↔ Thale and Quedlinberg @ < 25km; Wendorf ↔ Dahmen and Basedow @ < 20km) suggesting either transportation with these rings, or involvement in networks flowing to both the south and north. However, it is also evident that there is relatively little overlap between the distribution of *Jenišovice* cups and *Pfahlbauperlen* in a south-north axis, while greater overlap occurs on a west-east basis, with close proximity at Schreckenstein/Střekov (CZ), Křenůvky (CZ), and between Nicholsburg (CZ) and Poysdorf (AT).

The final objects with a clear north-south and south-north distributions are the *Pfahlbau* and *West Baltic* spears. Centres of distribution for these objects are, respectively, in the lake-dwelling communities of the nCA (particularly western Switzerland), and the western Baltic. Distribution of the *West Baltic* spears is more restricted, with the largest concentration in the Danish islands, northern Germany and Poland. The example from Grandson-Corcelettes occurs over 800km from this main distribution, though only 500km from a small cluster of spearheads around Peising (D), within close proximity of *Pfahlbauperlen* and *Homburg* type rings. There is a general absence of overlap with *Pfahlbauperlen* in the more northerly regions or within central Germany where *West Baltic* spears are uncommon. In contrast, the *Pfahlbau* spears show co-occurence with many forms of material culture in the lake-dwelling regions, as to be expected, but also occur with those same objects in the Middle Rhine Valley, particularly around Frankfurt and in the large hoard at Nächstenbach-Weinheim, where *Platten* fibula are also

present. Aside from these overlap points it is again evident that, similar to the *West Baltic* spears, little co-occurrence of *Pfahlbauperlen* with the *Pfahlbau* spears takes place in central Germany or northern Europe. In southern Germany some overlap with *Pfahlbauperlen* and *Homburg* rings occurs between Ingolstadt-Zuchering and Pinkhofen (@ > 70km), at roughly 400km from the main distribution around Lake Neuchâtel. In combination with the general absence of *Pfahlbauperlen* overlap, it is noticeable that there is little overlap between the *Pfahlbau* spears and *Homburg* rings, *Jenišovice* cups, hanging vessels (with the exception of Beetzendorf and Dareskau ↔ Mehrin @ c. 15km), or *Platten* fibula. In fact, the *Pfahlbau* spears are, similar to socketed knives, largely confined to western Germany on their route to the north, while these other objects follow a central/eastern Germany distribution. Once outside of the nCA the *Pfahlbau* spears travelled over greater distances between use and deposition, with separation of between 100 and 200km between small clusters of spearheads separated only short distances apart (e.g. at Hamm and Werne, Vechta and Cloppenburg, and at Hannover).

The distribution of different razor forms indicates that typically these objects did not travel great distances, with predominantly local/regional distribution of specific variants (see Section 5.4.2.1 (Hennig 1986:Fig. 12)). However, some examples of razors which travelled greater distances are observed in the northern Circum-Alpine region, such as the *Herrnbaumgarten* razor included in a burial at Chelin/Lens, and *Oblekovice* razors from lake-dwellings around Lake Neuchâtel. The occurrence of these razors at distances of over 500km from their main distribution in eastern Europe may indicate individual mobility (see Section 7.3), whereas a 'down-the-line' exchange circulation would be expected to produce a more gradual spread away from the main distribution area. Similarly, the *Villanovan* type razors north of the Alps, occurring between 200 and 400km (and even further for those in central France) from the main distribution of similar forms in northern Italy (Map 52) may be indications of individual mobility. Even though Italian form razors appear to have been more socially symbolic than their counterparts in the northern Alpine region (through decoration and inclusion in burials), the distribution of variants indicates that they were not exchanged over great distances (cf. Bianco Peroni 1979). Where razors are found outside of their main region of distribution they are more likely to indicate the relocation, displacement, or mobility of individuals on a permanent (e.g. marriage) or temporary (e.g. trading), basis rather than the exchange of razors as objects.

Late Bronze Age swords form one of the largest combined categories mapped, even though some of the varieties are represented by very few instances, or are primarily confined to the northern Circum-Alpine region (see Section 5.4.1.1). For this reason, only the larger groups, i.e. *Mörigen*, *Auvernier*, *Tachlovice*, and 'Antenna' (grouped *Tarquinia*, *Weltenburg* and *Zürich* types), have been considered in the density map. It is clear from the distribution of these swords that they travelled great distances, extending from central Italy to Denmark and central France to Ukraine (Map 163 - Map 166), though strong clusters are evident, particularly around Lake Neuchâtel, in the Rhine Valley between Mannheim and Mainz, around Günserode and Mohrungen in central Germany, and around the Lower Oder Valley (see Section 7.5). However, clearly different levels of separation occur between the various types:

- *Tachlovice* swords are relatively dispersed, with high density around Lake Neuchâtel and in the western Czech Republic, with other instances, frequently several within less than 50km (e.g. the Rhône valley, Rhine valley) separated by 100 to 200km (Map 165).
- *Auvernier* swords, while being somewhat opposed to the distribution of *Tachlovice* swords (see Sub-section AUVERNIER in Section 5.4.1.1) also have a high density in the lake region of western Switzerland. Outside of the nCA high density points occur at Obereßlingen ↔ Wendlingen-Unterboihingen ↔ Neuhausen-Fildern and Preinersdorf ↔ Gstadt-Chiemsee in southern Germany, and in northern Germany around Kambs ↔ Karbow ↔ Klenau. In general the separation of the *Auvernier* swords can be seen in several bands moving northwards from Lake Neuchâtel, at > 200km, > 500km, and > 700km (Map 164).
- Antenna form swords show extensive distribution in the Italian peninsula, with separation between deposition sites less than 100km, and frequently less than 50km. To the north of the Alps regions of high density occur around Lake Neuchâtel and in central Germany around Günserode. However, north of the Alps the separation between sites becomes greater: between 50 and 100km, and occasionally 100 - 150km. Although less pronounced than with the *Auvernier* type, some banding does occur, with groups between 50-250; 250-450; and >450km from Lake Neuchâtel, or < 200; 200-450; 450-700; and > 700km from the high concentration point in Bologna (Map 166).
- *Mörigen* swords show the most progressive dispersal of the sword types discussed, and although high density points occur at Lake Neuchâtel, in the Rhine valley, central Germany around Kehmstedt, and northern Germany in the Lower Oder Valley, separated by between 250 and 350km, there is an almost continual occurrence of the swords separated by less than 50km between western Switzerland and northern Germany and Poland, with occasional gaps of up to 150km (Map 163).

With regards to coincidence with other material groups, it is evident that the greatest overlap occurs in the Middle Rhine Valley (Mainz region) and around the lake-settlements of Switzerland. *Homburg* type rings appear to have a relatively similar distribution pattern to the sword types, running diagonally from the MRV to north-east Germany, though they are not found in the same sites, but usually within 50 – 100km. Socketed knives are relatively excluded from any overlap with the sword forms, other than in the MRV, while the *Phantasie* handle knives do not overlap with the sword distribution they are within the same pattern and dispersed between sites of sword deposition. The primary distribution of *Jenišovice* cups in the Carpathian Basin and their uncommon occurrence in southern Germany precludes them from overlap in these areas, though some coincidence within less than 50km is seen around Velké and Tachlovice (CZ). In this case, the slightly earlier (HaA2-HaB3) use of *Jenišovice* cups than the swords (HaB2-HaB3), and the general tendency of not including swords in LBA burials (see Sub-section DEPOSITION TRENDS in Section 5.4.1.1), may explain the low level of overlap. However, there also appears to be no significant overlap between the hanging vessels and swords; even when they are found in southern Germany (such as at Neulingen and Kaiserslautern) they fall outside of the distribution of any of the above sword types.

While the distribution of the *Pfahlbauperlen* shows some overlap with the distribution of swords in the nCA and southern Germany, moving further to the north this co-occurrence decreases, with few areas of overlap or within 50km evident, though some occurs around Auleben ↔ Mohrungen ↔ Günserode (< 25km) and Waldau ↔ Vollmarshausen (c. 5km). The movement of amber to the south was apparently unconnected to the distribution of these sword types, with few areas of overlap or close proximity occurring in northern Germany, though some are evident towards southern Germany (for example in the Rhine valley and around Unterkrumbach). Finally, it is perhaps surprising that the distribution of the *Pfahlbau* spears does not significantly overlap with the distribution of any of the sword types; the spearheads follow a route along the Rhine valley then continue along the western side of Germany, while the swords follow the Rhine valley before breaking across central and eastern Germany. However, small regions of overlap occur within 20km of Meseberg and Arneburg, and also within 20km from Kuckenburg and Halle.

It is clear that different value regimes were held by certain objects given their distribution. Some object may have travelled in the possession of migrant individuals, for example the Nordic style objects from Grandson-Corcelettes and unique objects such as 'foreign' horse gear from various settlements, such as Zurich-Alpenquai. Other objects may have moved on a commodity basis over shorter, but still inter-regional, distances – for example *Homburg*, *Balingen*, and *Corcelettes* type ring jewellery – along 'down-the-line' exchange systems (see Section 2.6.1). Regionally specific objects, such as knives and sickles, may have circulated over intra-regional networks, again on a commodity basis. Contrastingly, the distribution of *Pfahlbauperlen*, occurring in ever fewer numbers with increasing distance from the Circum-Alpine region, and perpetuation across several centuries, suggests that they may have circulated on a gift basis, or as the possessions of migrant individuals. The occurrence of balance bars and weights in several of the lake-dwelling trade centres (see Section 5.5) suggests an increasing exchange of objects on a commodity, rather than gift, basis during the Late Bronze Age.

8.1: Nodal points

Combining all of these elements can provide indications of 'nodal' points and communities in the Late Bronze Age exchange networks flowing between northern and southern Europe (Map 180). Frattesina, in the Po Plain, is widely recognized as an important manufacturing and exchange centre during the Late Bronze Age and early Iron Age, linking the Mediterranean world with northern Europe. North of the Alps, however, Late Bronze Age sites displaying such rich inter-regional connections and intensive manufacturing activities are uncommon, and few 'nodal' locations have been proposed.

From the northern Circum-Alpine region, Lake Neuchâtel clearly stands out as a nodal zone, with significant communities at Auvernier, Hauterive-Champréveyres, Mörigen, and Grandson-Corcelettes. Given the dendro-dating available from Hauterive-Champréveyres and Auvernier-Nord, and typological dating from Mörigen and Grandson-Corcelettes, it is possible that development and decline of significant trading stations can be seen over time (Figure 67). Initially Hauterive-Champréveyres flourishes as a regional trading centre during the middle and late Urnfield period, as indicated by the occurrence of amber and glass beads imported from distant locations, while metal vessels, knives, and a quantity of moulds demonstrate the settlements importance in local exchange networks. During the early 9th century BC, the settlement at Auvernier-Nord developed into a large centre, less than 10km from Hauterive, and shows many regional connections through ring jewellery, knives, amber and glass beads, and multiple swords – including the Italian *Tarquinia* type. Furthermore, the regional significance of Auvernier is illustrated by sickles apparently cast in the same mould found at Auvernier, Gletterens, and Cortaillod Est (sites within 10km of each other); it is possible that these were made at Auvernier and circulated out from there (Map 100). During the second half of the 9th century BC two lake-settlements come to prominence in the Lake Neuchâtel/Three Lakes region: Grandson-Corcelettes at

the south-western end of Lake Neuchâtel, and Mörigen on the north-eastern side of Lake Biel, separated by over 50km. Each of these sites shows inter-regional contacts, with the Nordic style hanging beaker, *Platten* fibula and *West Baltic* spear from Grandson-Corcelettes, indicating contact with the north of Europe; while a *Villanovan* type razor, southern French style ceramics, horse gear, and fibulae from Mörigen, suggest contacts towards southern Europe. At a regional scale, both sites show significant importance with relatively similar numbers of swords, knives, spears, horse-gear, and razors recorded, although Grandson-Corcelettes has significantly more items of large-ring jewellery. Both sites also show intra-regional contacts through sickles made in the same mould, with Mörigen linked to Nidau and Twann-Petersinsel, and Grandson-Corcelettes to Cortaillod-Est (Map 100). Artefacts manufactured from the same ingot have been found at Hauterive-Champréveyres and Mörigen (Rychner and Kläntschi 1995: 64-66), suggesting either a short period of overlap between the two settlements and mobility (of people and/or objects) between the two sites (Map 181).

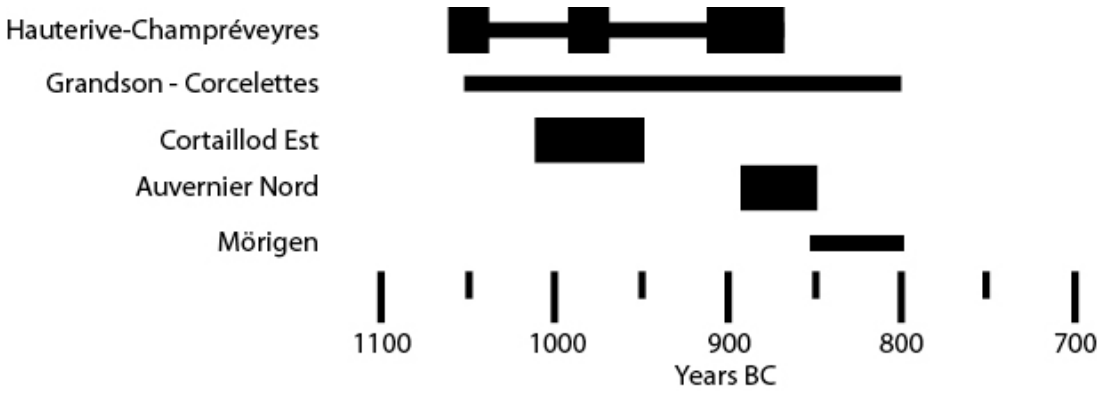

Figure 67: Chronological comparison between Hauterive-Champréveyres, Auvernier Nord, Grandson-Corcelettes, Cortaillod-Est, and Mörigen. Thick line = dendrochronological dates; thin line = typological dating (see also Figure 7).

Outside of the Lake Neuchâtel region, intermediary sites or regional satellites occur between northern Italy and the north Alpine foreland, for example Zug-Sumpf and Ürschhausen-Horn on smaller pre-Alpine lakes, Bex and Sion in the Rhône Valley, and Flums-Gräpplang and Montlingerberg in the Rhine valley. Montlingerberg is often seen as a significant site on the route between northern Italy and the northern Alps, being on a prominent position along a valley route (Steinhauser-Zimmermann 2002), though the generally low occurrence of metalwork objects (e.g. swords, arm-rings) suggests that this was more of an intermediary rather than a nodal settlement. Further north from Montlingerberg, the cluster of lake-settlements at the northern edge of Lake Zurich may have formed regional nodal communities, particularly Zurich-Wollishofen-Haumesser and -Alpenquai.

Again, these settlements may have developed sequentially, with Wollishofen-Haumesser likely waning, while Alpenquai grew during the 10th century BC, before Alpenquai became dominant during the 9th century BC. Objects likely manufactured from the same metal ingot, found at Wollishofen and Nidau in western Switzerland (over 100km separation), indicate intra-regional connections (Map 181). Fragments of a *Hajdúböszörmény* type bucket suggest longer systems of exchange reaching Wollishofen, while the occurrence of *Pfahlbauperlen* and eastern European horse gear at Alpenquai demonstrates connections held by that community. Similar quantities of arm-/leg-rings, knives, sickles, and razors at the two settlements suggest that they may have been of similar local importance during different time periods.

The occurrence of weights, of the *terramare* and *Pfahlbau* systems (Pare 1996), at the lake-settlement nodal points proposed (Alpenquai, Wollishofen-Haumesser, Mörigen, Grandson-Corcelettes, Auvernier (see Section 5.5) provides further support to the supposition that these settlements were intra- and inter-regionally significant sites, involved with long-distance exchange routes to communities in northern Italy.

Moving further north, the greatest concentration of objects occurs in the Rhine valley, particularly around Mannheim, Otterstadt and Worms, where *Pfahlbauperlen*, swords, and ring jewellery occur within 50km of each other. Many of the swords in this region were recovered through dredging of the Rhine, and thus represent symbolic wetland deposition, while the arm-rings are recorded from hoards on the valley periphery at Nächstenbach-Weinheim and Hochstadt, along with many knives and swords of inter-regional varieties, and a *Platten* fibula at the former. Which settlements and communities were responsible for these depositions is

difficult to establish as they may have travelled some distance to do so, but it is unlikely that the same community was responsible for both the Nächstenbach-Weinheim and Hochstadt hoards, as they are further than 50km apart. Given the occurrence of a *Platten* fibula at Nächstenbach and *Corcelettes* rings and *Pfahlbau* spears at Hochstadt it is possible that they were communities with different cultural outlooks – one to the north and the other to the south – while participating in the same broad exchange network.

Between 50 and 100km north of Nächstenbach another cluster (focussed around a 25-50km radius of Frankfurt) of objects is observed, with *Pfahlbauperlen*, *Homburg* and *Corcelettes* type rings, multiple sword types and *Pfahlbau* spears known, particularly from a large hoard at Hanau. Again, it is difficult to say which communities were responsible for these depositions, but it is relatively clear that there was a nodal exchange point in this region, and the Late Bronze Age fortified 'highland'[45] settlement at Bad Homburg (D) may have housed one of these communities. The emergence of Glauberg as a *Fürstensitz* (within 50km of the object cluster) demonstrates the continued significance of the region into the Iron Age.

To the north-east of Lake Constance, at a distance of 75 to 125km, a small cluster of objects occurs between the 'highland' settlements Gomadingen-Hackberg (LBA) and Hohenasperg (IA). The concentration of Late Bronze Age 'highland' settlements in this region (Jockenhövel 1974b: Fig. 3), may have been intended to control trade routes flowing through the area, and while not necessarily forming nodal points themselves, they would have been able to direct goods to central communities. Further to the east of this region a cluster of objects occurs along the upper Danube valley, with a series of *Pfahlbauperlen* found between burials at Ingolstadt-Zuchering (D) and Künzing (D) (c. 125km apart). The occurrence of *Phantasie* handle knives in burials at Ittling, *Homburg* rings at Kelheim, possible *West Baltic* spearheads in burials at Künzing, Teugn, and Straubing-Sand, and *Tarquinia-Weltenburg* type sword at Weltenburg indicate nodal communities within the region, possibly based at the Frauenberg and/or Straubing settlements.
A further cluster of objects occurs to the south of the Danube valley, and to the east of Lake Constance, along the Austria-Germany border, between the Bronze Age 'highland' settlements at Rachelburg-Flintsbach (AT) and Salzburg-Rainberg (AT), and a hoard at Tacherting (D), within 75km. The two settlements appear to define the southern edge of the nodal region. Deposition of objects in wetland contexts formed the core of the concentration at Preinersdorf (D) and Wald an der Alz (D). These depositions reflect a traditional use of (possibly) imported *Mörigen* swords, and the collection of *Homburg* rings in the Tacherting hoard also shows use of 'foreign' objects in local practices.

Moving northwards through Europe the distances between the objects discussed generally increases, with fewer clusters. An exception to this occurs around multiple hoards in central Germany, particularly those at Kuckenburg, Schmon, Griefstedt, Günserode, Deersheim, Wernigerode, Thale, Quedlingenberg, Schadeleben, and Göllingen, and burials within the same region at Auleben and Sophienhof. These sites occur in a radius of c. 50km, based around the hilly region of Harz. The 'highland' settlement Bösenburg (Jockenhövel 1974b) to the east of this cluster may have formed a communication waypoint, but it is clear that the nodal point occurred within this region. This is the last prominent nodal area observable, as the distribution of objects in more northerly regions spreads to different directions, with the *Balingen* rings travelling north-eastwards, while the *Pfahlbauperlen* mainly head north *or* east, but not into the north-east. The *Tarquinia-Weltenburg* swords flow in the same direction as the *Homburg* rings, suggesting a possible connection between these objects during circulation.

8.2: Trade as influence for Cultural Change in the northern Circum-Alpine region?

Clearly, some of the lake-dwelling communities of the northern Circum-Alpine region were incorporated in exchange and communication networks that extended across central Europe and northern Italy. It is also evident that those communities were primarily involved in the manufacture and export of objects to regional settlements and beyond. In contrast, the quantity of imported objects found within lake-settlements is relatively low, with the *Pfahlbauperlen* and *Allumiere* beads from Hauterive-Champréveyres representing one of the largest concentration of artefacts from south of the Alps in the nCA lake-dwellings. In addition to the many examples of 'foreign' objects detailed through Chapter 5, some needles also show connections between lake-dwellings and other regions of Europe. For example, some needles from Zurich-Alpenquai and Hauterive-Champréveyres are similar to items found in the Middle Rhine Valley, the Carpathian Basin, and northern Italy (Mäder 2001a: 26-28; Kubach 1973; Rychner-Faraggi 1993: 47; Říhovský 1979: 158, 81-82). However, these objects account for only a minority of the assemblage at these sites: c. 6% at Alpenquai (Mäder 2001a: 26-28). Combining all of the evidence for 'foreign' objects in the lake-dwelling, and other contexts, of the northern Circum-Alpine region (see Chapter 5), it is clear that relatively few items were imported to, and utilized by, communities of nCA. Where such objects do occur, it

[45] By 'highland' is meant settlement elevated on visible hills in the landscape, and not mountainous areas.

appears that they were deposited in 'local' practices, indicating that value associations did not necessarily travel with the object. Exceptions to this pattern may indicate instances of individual mobility, for example the *Herrnbaumgarten* razor from Chelin/Lens, and the Nordic style objects from Grandson-Corcelettes.

The general rejection of foreign objects, and lack of value transfer, suggests that the primary involvement of the lake-dwelling communities in European long-distance (and short-distance) trade and communication networks was on a production and export basis, as opposed to an importing objects. In this respect the continuation and development of regional decorative styles throughout the Late Bronze Age and into the early Iron Age (Vogt 1952; Ruoff 1974; Dunning and Rychner 1992), and the continued establishment of lake-settlements during the Late Bronze Age can be interpreted as (conscious/active or un-conscious/passive) practices designed to maintain the cultural identity of the lake-dwelling communities. However, it is clear that the trade and communication routes also included some elements of acceptance and incorporation – for example with the glass beads, which became widely circulated throughout central Europe and cannot be seen as spread purely through individual mobility. In this instance the lake-dwelling communities may have acted as 'barrier' or 'translation' regions, converting the beads from a foreign, Proto-Villanovan object, to a culturally acceptable item to Urnfield societies north of the Alps. Such a role could also have been performed by communities in the region of Innsbruck.

However, it is also clear that cultural changes were occurring in the lake-dwelling communities during the Late Bronze Age as a direct result of their involvement in, and possible control of, far reaching exchange and communication networks. The presence of weights at numerous lake-settlements corresponding to systems used in northern Italy during the Middle and Late Bronze Age (see Section 5.5) is a direct reference to changing social attitudes towards the circulation of materials in the northern Circum-Alpine region. Whilst it is possible that scales could have been used for symbolic purposes, their occurrence in different regions suggests the emergence of commodity exchange systems linking those regions and communities. The appearance of such commodity systems in the nCA at the end of the Bronze Age marks a break with previous patterns of gift exchange and social enchainment that may have dominated the limited inter-regional exchange networks with which the communities were involved, and which resulted in the distribution of, for example, *Brotlaibidole* around Lake Constance (Köninger and Schlichtherle 2001), *Allumiere* beads at Hauterive-Champréveyres and Montlingerberg, and *Pfahlbauperlen* throughout northern Europe. How prevalent commodity exchange practices were is difficult to estimate, though the relative scarcity of weights suggests that they were utilized by a small section of society, possibly retained by specific members of society involved in trade systems. In conjunction with weights and scales, the occurrence of sickle fragments as a 'proto-currency' (Primas 1986: 37-41; Sommerfeld 1994) should also be considered. The circulation of sickle fragments of relatively regularized mass could have been used to 'purchase' other items on a commodity basis, or to circulate refined metal stock as ingots and fragments thereof.

Furthermore, social changes during the Late Bronze Age can also be observed through the occurrence of new objects in the lake-dwelling communities of the nCA, specifically keys. Whether these objects were connected to exchange and communication routes is unknown as few Late Bronze Age precedents occur in Europe, though some 'key'-like features can be seen in 'ring grip bars' from Austria (Grossweikersdorf; Schönberg (cf. Říhovský 1979: no.1781-83)); and Iron Age examples are recorded from northern Italy (see Section 5.4.2.8). The occurrence of keys in a variety of sized settlements, from the small population Greifensee-Böschen to the large settlements at Estavayer-le-Lac, Zurich-Alpenquai and Wasserburg-Buchau, suggests their use was not strictly related to population and settlement size. It is notable that they also occur at settlements interpreted as significant positions on trade routes – such as Mörigen and Montlingerberg; does this represent a desire to secure valuable imported goods, or the symbolic ability to control access to specific buildings?

Water-bird decoration on several of the lake-dwelling keys has been used to support their function as 'ritual' objects (see Van Willigen 2011), but such decoration only occurs on two of the examples, and symbolic decoration does not necessarily signify 'ritual' use. However, the low quantity of keys recovered from the Late Bronze Age, and the range of settlement sizes from where they are known, suggest that they were used by a minority (elite or 'ritual'?) section of society, and that access to certain areas of communities was becoming more rigidly controlled. Societies and communities, even small ones, were becoming more stratified and controlled, with divisions based around the (in)ability to access specific areas and structures within the village community.

The introduction and early adoption of iron as a decorative (Stage 1 use, after Snodgrass 1980: 336-37), and occasional functional material at several of the lake-dwelling communities (see Section 5.4.3) is also indicative of increasing social stratification. Even with objects that were utilized by small section of society, such as swords and horse gear, iron was used as a decorative material in practices of object singularization between elites. The occurrence of iron inlay on more

widely spread items, such as arm-/leg-rings and needles, would have symbolized the elevated status of both the object and wearer, while the use of functional solid iron objects, such as a knife or spear, would have marked individuals (and objects) as significantly different from the rest of the community. The occurrence of many iron objects in lake-dwellings and assemblages in the nCA from the Late Bronze Age indicates that these communities were pioneer adopters of the techniques and practices of iron metallurgy in the region. The new routes along which iron travelled, and techniques required to produce functional iron objects during the EIA, may have threatened the position of the lake-dwellings as regional centres of bronze work production.

During the early Iron Age a reduction, either voluntary or forced, in the level of involvement in inter-regional exchange networks is visible in both the quantity and variety of imported materials found in the northern Circum-Alpine region, and the quantity of locally manufactured materials exported to other areas of Europe. The question here is whether the lake-dwellings were abandoned before the trade routes shifted, i.e. abandonment caused the movement of exchange networks, or occurred after the trade route shift, i.e. abandonment was influenced by the variation. In this respect erosion of some upper settlement layers (Wiemann *et al.* 2012), and early excavations of some settlements the 19th century (e.g. Mörigen) hinder interpretation. It is clear, however, that the involvement of lake-dwelling communities in inter-regional trade survived some settlement relocations – for example during the Late Bronze Age the flourishing and decline of Hauterive-Champréveyres between 1050 and 870 BC (Figure 67).

The distribution of *Gündlingen* type swords, circulated for a relatively short period of time during the late 9th and early 8th centuries BC, indicates that the former lake-dwelling communities of Switzerland were largely excluded from participation in the use and movement of these weapons, though those in eastern France, around Lake Chalain (FR), may have been involved in the transport routes (Map 33; Map 167). The *Gündlingen* swords recorded from Switzerland, at Font and Sion, show a significant reduction in the quantity of swords recorded from the area over the short time period from the circulation of *Mörigen* swords during the Late Bronze Age (HaB2-HaB3) to the utilisation of *Gündlingen* swords during the early Iron Age. Even the inclusion of HaC and HaD period iron swords – of undefined or '*Hallstatt*' type (Map 38) – does not significantly increase the quantity of swords known from the nCA, and retains the image of relative disassociation from the use, exchange, and circulation of these objects.

The circulation of early Iron Age ring jewellery and razors provides further indications of limited, primarily regional, exchange and circulation patterns. With specific regard to razors, some more widespread connections are demonstrated by the distribution of *Cordast* type razors, linking the nCA to the southern France, though as has been seen for the Late Bronze Age, generally, razors did not travel large distances. The ring jewellery types show a significantly more regional, and 'local', distribution than their Late Bronze Age predecessors (see Schmid-Sikimić 1996) with little sign of the far-reaching inter-regional circulation that can be observed, for example, in the distribution of *Homburg* and *Corcelettes* type rings.

Social changes are evident in the newly emphasized concern with status and celebration of the individual through burial practices. While the funerary activities of the lake-dwelling communities of the Late Bronze Age are largely unknown, those employed by the subsequent Iron Age communities are more identifiable – partly through a return to utilisation of burial mounds instead of flat urn burials (cf. Lüscher and Müller 1999). An increase of tumulus size can be observed between the early and later Iron Age, for example from four metres in diameter at Unterlunkhofen (CH), to 20 metres at Thunstetten (CH) (Lüscher and Müller 1999: 250). The use of tumuli instead of flat burials created a visible and perpetual link between communities and their environment and location, while also permitting expression of status and prestige through their physical size. Objects included in burials, as in earlier periods, were utilized to show both the identity of the entombed individual and display their power and status. For example, the later Iron Age *Schnabelkannen* demonstrated the ability of the individuals to control and access trade routes linking Europe north of the Alps to the Italian peninsula (Map 131).

Settlement sizes also provide indications of cultural change. From the relatively high population density lake-settlements of the Late Bronze Age, a degradation towards small dispersed communities occurred during the early Iron Age. A true comparison of settlement size is difficult, because relatively few HaC period settlements are known when compared to number of LBA lake-dwellings, but the quantity of burials indicates that communities were still occupying the former lake-dwelling areas: although they had abandoned the lake-settlements they did not totally leave the area (cf. Boisaubert *et al.* 2008; Bauer, I 1993). If the communities had moved to single, large settlements of similar size to those which they abandoned (e.g. Estavayer-le-Lac Pianta (c.30,000 m^2)[46], Mörigen (c. 11,000 m^2), or Zurich-Alpenquai (c. 28,000 m^2)) it would be reasonable to expect that some archaeological evidence of these

[46] Settlement size information taken from the database of the Palafitte UNESCO World Heritage Status application (Palafittes 2009).

settlements would have been recovered. This, however, is not the case. Instead, current evidence suggests relatively small and loosely arranged settlements existing in the lake hinterland, such as Frasses-Praz au Doux, extending over an area of up to 10,000 m^2, with potentially 12 dwelling structures (Mauvilly *et al.* 1997; Mauvilly and Ruffieux 2008a). The current, admittedly sparse, evidence suggests that communities in the lake-dwelling regions abandoned an experiment with 'proto-urbanism' (Arnold 1990a) in favour of a loosely organized small settlements, forms of which can be seen in other regions, e.g. Brig-Glis Waldmatte in the Alpine Rhône valley (Curdy *et al.* 1993). Such a transition to small open settlements is even observed during the occupation of lake-dwellings, for example Conjux-Le Port, in the region of Lake Bourget (FR) (Billaud 2008).

In other areas of the nCA, away from the lake margins but still on transport routes linking the regions north and south of the Alps, settlements were occupied between the LBA and EIA without apparent decrease in size, for example Montlingerberg (Steinhauser-Zimmermann 1989), or were newly established small villages, e.g. Brig-Glis Waldmatte, at up to 2000 m^2 (Curdy *et al.* 1993). Both of these settlements show connections to communities north and south of the Alps, particularly in the range of ceramics utilized in the settlements.

The use of hill top settlements, such as Wittnauer Horn and Baarburg, and later *Fürstensitze*, such as the Üetliberg and Châtillon-sur-Glâne, may have provided larger settlements with higher population density than the surrounding low lying villages, and also acted as regional trade and manufacturing centres. The *Fürstensitze* in particular were significant in the control and manipulation of wide ranging exchange and communication networks, as evidenced by the recurrent findings of imported Attic ceramics, wheel thrown pottery, and objects of Etruscan origin. Contemporary with the habitation of 'highland' settlements and development of *Fürstensitze*, isolated re-occupation of lakes is seen at Ürschhausen-Horn (Lake Nussbaum, CH) and Oggelshausen-Bruckgraben (Lake Feder, D).

However, the occupation of these lakes between the late 8^{th} and late 7^{th} century BC[47] was not for settlement (especially at Oggelshausen), but resource exploitation – as methods to intensively extract fish on a seasonal basis[48]. These small resource access points were, in a similar manner to Alpine mines (Schibler *et al.* 2011), likely supported/temporarily occupied by communities some distance from the lake, possibly up to 20km away in the case of Oggelshausen (Köninger, In Preparation). A clear change of social attitude towards the lake environment occurred between the Late Bronze Age settlement abandonment and Iron Age re-occupation: from potential dwelling zone to non-residential resource extraction environment. Such a change of association, and population/support of these 'fishing' stations by distant communities may also reflect concepts of 'ownership' of the lakes – with only certain members of society permitted to 'exploit' the lake.

Combining all of the evidence of trade and exchange relationships, settlement movement and relocation, social changes, and artefact distribution, it is possible to suggest a sequence of events relating to the abandonment of lake-settlements at the end of the Late Bronze Age and limited re-occupation during the early Iron Age:

1) Cyclical movement of settlements as some wax and others wane.
2) Climatic change influencing lake-levels and directly affecting some settlements.
3) Dispersal of lake-dwelling centres of trade and manufacture, and abandonment of 'proto-urbanism' experiment.
4) Establishment of small, self-sufficient settlements with limited inter-regional exchange contacts, and de-centralized production of goods.
5) Replacement of north-south exchange route flowing along the riverine-lacustrine system, with an arcing route from southern and central Germany to the Rhône valley and southern France.
6) Increased social expression of individual identity and status, and increased concern with visibility in the environment.
7) Establishment of 'highland' settlements as new centres of population density, exchange and manufacture
8) Re-integration of the northern Circum-Alpine region to inter-regional exchange systems
9) Exploitation of lake-resources by centres of population and manufacture.

<u>1) Cyclical settlement movement</u>

As previously detailed under the proposal of settlement biography (see Section 4.5.3 (cf. Jennings 2012b), lake-settlements underwent various stages of waxing and waning, dependent upon social events and life-cycles. This may have accounted for the growth and decline of centres of trade, such as Hauterive-Champréveyres and Mörigen, and Zurich-Wollishofen-Haumesser and -

[47] Ürschhausen, c. 660-635 BC (Billamboz and Gollnisch 1998); Oggelshausen-Bruckgraben, c.730-620 BC (Köninger 2001/2002: 51)

[48] This is certainly identified at Oggelshausen-Bruckgraben, but only postulated for Ürschhausen-Horn, where limited excavation of the Iron Age structures occurred and occupation of the site as a village/settlement is possible (Gollnisch-Moos 1999: 155-57).

Alpenquai (see Section 8.1). The role of individual members ('leaders'; 'chiefs'; 'merchants'; 'translators') in the growth, decline, and movement of trade centres could have been highly significant, with those individuals skilled in the politics of exchange able to create a greater role for themselves in the system (cf. the Kula Ring system).

2) Climatic Change

Climatic change and lake-level rise during the Late Bronze Age is well documented (see Section 1.1.3.1), though there are some doubts as to the synchronicity and ubiquity of these lake-level rises (Bleicher 2013). Such lake-level rises may have directly influenced some of the lake-dwellings, leading to attempts to combat rising humidity (e.g. Ürschhausen-Horn), but in other cases direct influence is not readily discernible, e.g. Zurich-Alpenquai (Wiemann *et al.* 2012).

3) Dispersal of population, trade, and manufacturing centres and 4) Establishment of small communities

Due to climatic influence directly influencing settlements or adversely affecting economic productivity, or the beginnings of trade-route circumvention, lake-dwellings were abandoned at the end of the 9th century BC, and the communities dispersed into the lake hinterland – either joining existing settlements or establishing new ones. Through either a lack of strong social leadership or insufficient economic productivity in the hinterland, the high-density settlements capable of supporting a high level of manufacturing output and manipulation of inter-regional exchange routes dissolved. In their place arose small communities, largely self-sufficient, with limited regional exchange and circulation of material culture, as typified by the widespread LBA distribution of ring jewellery compared to small scale distribution in the early Iron Age.

5) Replacement of trade routes

The distribution of early Iron Age swords, particularly the *Gündlingen* type, indicates that a re-organisation of trade routes flowing through the northern Circum-Alpine region was contemporary with the decline of the lake-dwelling manufacturing centres. Instead of the region, particularly the Lake Neuchâtel/Lake Biel/Lake Murten region, being a leading European manufacturing centre through which multiple exchange routes flowed, the area was now on the periphery of an exchange route linking central Europe to southern France via the Rhône, Doubs, and Middle Rhine Valley. This route did not develop during the Iron Age after the decline of the lake-dwellings, but was actually one of the routes in which the lake-dwelling communities were involved during the Late Bronze Age, as exemplified by the distribution of *Mörigen* swords.

6) Increased status of the individual

A renewed emphasis on the individual during the Iron Age is evident through the change in burial practices, with burial under tumuli rather than flat burials becoming dominant. The beginnings of increased emphasis of identity and status can be seen in the Late Bronze Age lake-dwellings with the occurrence of keys in communities, privileging some and constraining others, and the occurrence of iron decoration on objects as a method of demonstrating status. The increased placement of objects (e.g. swords) in burials, as opposed to in wetland contexts or hoards, which began in the final stages of the LBA and continued through the EIA, reflects an emphasis on deposition for the individual person rather than the collective community. The increased emphasis of the individual rather than the community may also partly explain the abandonment of the 'proto-urban' experiment, with agglomerate communities fracturing to form multiple small communities with local elite groups.

7) Establishment of 'highland' settlements

In addition to the increased emphasis of individual visibility, it became important for settlements to be noticeable, influencing the use of 'highland' settlements with significantly greater presence in the landscape than LBA lake-dwellings (see Section 4.6), and culminating in the overtly visible and high status *Fürstensitze*. These 'highland' settlements acted as regional manufacturing and trade centres, as indicated by the occurrence of, for example, wheel thrown pottery and fibulae at many of the sites, and amber shards at Glauberg (see Section 5.1). Such high status materials indicate that the 'highland' settlements formed the centre of regional social systems, with community elites residing there.

8) Re-integration in exchange networks

During the latter HaC and HaD period the former lake-dwelling regions of the nCA were re-incorporated to the inter-regional exchange systems, as can be seen in the distribution of ring jewellery and daggers. New nodal regions and points on this exchange system occurred at Hallstatt (AT), and in the Middle Rhine Valley around Breisach (D). The occurrence of *Rheinisch* type situla in burials within the region of the Üetliberg and Châtillon-sur-Glâne *Fürstensitze* indicate these areas were connected to the MRV and southern Germany (Map 132). During the late-early Iron Age, the status and role of these 'highland' settlements in inter-regional exchange is less clear; imported Etruscan *Schnabelkannen* are unknown from the northern Alpine foreland, but occur in large quantities in the Middle Rhine Valley (Map 131), while imported Attic ceramics are known from both of sites (Guggisberg 1991), indicating their re-connection, but possibly at the peripherary, of the Rhône-Doubs-Rhine route that began to emerge during the Late Bronze Age (see 5 above).

9) Exploitation of lacustrine resources

Material culture remains from the limited re-occupation of the lake during the Iron Age for resource exploitation at Oggelshausen-Bruckgraben shows links to the settlements in the region of the Heuneburg (D) (see section 4.3.4). The intensive seasonal exploitation indicated by the fish traps suggests that the resource was being utilized to support a larger population, as potentially vast quantities of fish could be caught within a short period of time. Control of the lake by larger, elite, populations is a likely explanation for this site. This does not preclude smaller communities along the lake-hinterland from utilising the lake, but in such settlements it would be plausible to expect that the lake resources were exploited on a smaller scale, continual basis. The small re-occupation at Ürschhausen-Horn may represent just such a small community. Larger re-occupation of the lake did not occur due to irrevocably changed social and economic circumstances: the trade routes which had been controlled by the lake-dwelling manufacturing centres had shifted, and new 'highland' settlements emerged to fill the void left when the lake-settlements were abandoned, while increased concern with overt display of individual status and prestige required greater permanence and presence in the landscape, which was not compatible with the former lake-dwelling system of periodically mobile settlements.

9: Final Reflections: Cultural vs. Environmental Change in the Lake-Dwelling Abandonment?

The central theme to this study of material culture objects from the northern Circum-Alpine region (nCA) and beyond – *'Did cultural events influence the abandonment of the lake-dwelling tradition in addition to climatic deterioration?'* – has led to an extensive comparative study of material from the lake-dwellings of the northern Alpine forelands, central Europe, and the Italian peninsula. The consideration of the well documented climatic deterioration and its impact upon lake-dwelling communities of the Neolithic and Middle Bronze Age (see Section 1.1) demonstrated how vulnerable these settlements were to climatic variations. However, a review of some Late Bronze Age settlement evidence has indicated that communities did not leave settlements directly in the face of climatic decline, but took measures to ensure that they could continue inhabiting the lake-shore (e.g. Section 4.3.1). A subsidiary question was also proposed based upon the apparent increase in lake-settlements in the eastern Baltic region as those in the nCA were being abandoned during the early Iron Age (see Section 1.3): *is it possible to observe a cultural connection between the lake-dwellings of the eastern Baltic and those of the Circum-Alpine region*? In order to assess the possibility of such a link, settlements were treated as a form of 'immobile' or 'permanent' material culture and analysed between the two regions (see Chapter 4).

A combination of Relational Theory (see Section 2.3) and the Biography of Objects (see Section 2.4) was applied to various categories of 'mobile' or 'portable' material culture as a method of understanding changing value associations between the different regions to infer cultural connections. Distribution patterns and Multiple Correspondence Analysis were also applied to specific categories of material culture to provide further indications of such cultural communication and trade links between the areas (see Chapters 5 and 7). The study of material culture from the lake-dwellings of the nCA also highlighted the possibility of fragmentation (see Section 2.4) being a deliberate practice during the Late Bronze Age, suggesting possible directions for future research.

9.1: Cultural connection between the nCA and eastern Baltic lake-dwellings?

A comparison of lake-settlements from the eastern Baltic region and those of the northern Circum-Alpine region suggests that there was not a similar concept of dwellings in the two regions (see Section 4.4). The majority of the Baltic lake-settlements appear to have been constructed as multiple structures on single platforms, or as loose clusters of buildings with few surviving remains. A limited number of publications and excavations undoubtedly hinder such a comparison, but it is clear that there are few comparable structures in the lake-dwellings of the nCA. It was previously argued that the large fortified Lusatian settlement at Biskupin shows some influence from the Mediterranean region based upon its dense and regularized layout (e.g. Niesiołowska-Wędzka 1989; 1991). However, settlement arrangement is not a sufficient indication of cultural connection, particularly given that regular and dense arrangements occur in other regions – including the nCA lake-settlements (see Section 4.5.1.5 (cf. Arnold 1990a)) – and are most probably a result of specific socio-cultural conditions (Barfield 1994; Herbich and Dietler 2007). Just as settlement form is not enough to postulate a connection between the Mediterranean and Biskupin, a tendency to occupy wetland environments is not enough to suppose a link between Alpine region lake-dwellings and those in the eastern Baltic. If there were some similarities in construction method, as seen between the northern and southern Alpine regions (e.g. Köninger and Schlichtherle 2001), a link may have been more likely, but instead the West Baltic Barrow Culture lake-dwellings shows more similarities to eastern Europe (see Section 1.3).

From all of the Circum-Alpine region material culture groups analysed very few are represented in the Baltic region. Exceptions to this are knives, hanging vessels, *Platten* fibula, *West Baltic* spearheads, and varieties of swords. Of these groups the *Platten* fibula, *West Baltic* spears, and hanging vessels are more commonly found in northern Europe and Scandinavia, with very few in the northern Alpine region, representing either imported objects or the personal equipment of migrant/travelling individuals. The routes along which these objects, or their owners, travelled to the lake-dwellings were most likely via the Middle Rhine Valley (see Chapter 8). Although several knife types are found in the eastern Baltic region and the nCA, they are typically classified into a regional variant system, suggesting that while incorporated into the general use zone of specific forms, communities were producing and utilising their own specific variants (see Section 7.4). Both *Mörigen* and Antenna form swords found in the region are not located near the lake-settlements of later periods, and few *Gündlingen* type swords are recorded from the eastern Baltic/Poland (see Section 5.4.1.1). In fact, there is very little evidence to suggest any form of trade, exchange, and communication network linking the Circum-Alpine to the central/eastern Baltic regions, with even the wide-ranging *Pfahlbauperlen* failing to reach the area, even though they reached southern Scandinavia and northern Germany. The inferred trade connections flowed between the northern Circum-Alpine region and northern Germany/Denmark, but, while it is possible

that some redirection of material occurred from these areas to the eastern Baltic area, this would have been the secondary export of already translated objects. Based upon Multiple Correspondence Analysis there also appears to be some value differences between West Baltic spearheads in contexts from Poland, and those from northern Germany, suggesting localized practices with few cross-cultural similarities (see Section 7.9).

Lake-settlements of the eastern Baltic region/Poland actually appear to be quite poor in their material assemblage, with very few bronze objects recovered during the limited excavations. For example they contain very few bronze, but numerous antler or bone spearheads (cf. Gedl 2009). Some of these Baltic lake-dwellings may not have fulfilled the role of manufacturing centre that many of the Circum-Alpine ones played, but it is also worth noting that some of the nCA settlements had very few metalwork objects (e.g. Ürschhausen-Horn), and the low quantity of such items may also represent deliberate abandonment processes (see Section 4.3.1).

Combining the multiple strands of evidence from settlement form, construction methods, and material culture distribution, it appears that there was not a provable connection (either cultural or economic) between the lake-dwellings of the eastern Baltic region and those of the Circum-Alpine area. Local conditions and social developments should instead be sought for driving factors in this region (cf. Harding and Locker 2004).

9.2: Cultural influence in the LBA lake-dwelling abandonment?

The apparent abandonment of the lake-shore during the Late Bronze Age and early Iron Age transition brought an end to a tradition of lake-settlement/pile-dwelling occupation in the northern Circum-Alpine region, spanning more than 3500 years. Traditional interpretations for this abandonment have focussed on the role of climatic decline in forcing people to relocate to regions away from the lake-shore (e.g. Magny 2004b), either through direct inundation or economic degradation, but the region-wide synchronicity that has been proposed by some authors has recently been questioned (Bleicher 2013). Correlations between cultural and environmental change should not be inferred as, or confused for, causality factors (cf. Grattan 2010), as has been suggested elsewhere, for example:

> *phases of higher lake-level coincided with an increase in annual precipitation, a decrease in summer temperature and a shortening of the growing season. […] It is noteworthy that changes of culture within the Neolithic and Bronze Age periods mostly occurred during phases of higher lake level, i.e. cooler and wetter climatic conditions, probably inducing a destabilization of the former socio-economic equilibrium.*
> (Magny 2004b: 75)

Combining the principles of object biographies and the available dating evidence from lake-dwellings, an idealized biography of lake-settlements was proposed (see Section 4.5.3) as a method of combining social influences for the decision to relocate settlements (cf. Jennings 2012a). Although the influences proposed are, admittedly, rather vague conceptions (it is after all difficult to observe the death of elite individuals in communities where little burial evidence survives, or to measure the agency and charisma of individuals and their ability to attract and direct both people and goods), the apparent cyclical re-occupation, renovation, or movement of some settlements (e.g. Wasserburg-Buchau, or around Lake Neuchâtel and Lake Biel; Figure 67, see also Section 4.5.1) indicates that factors other than purely climate dictated the mobility of communities and individuals.

Clearly a fundamental problem exists in trying to interpret cultural change leading to the abandonment of the lake-dwellings, as there are no lake-dwellings recorded from the Iron Age, limiting a direct comparison between the settlement assemblages of the periods (LBA and IA). However, viewing lake-dwelling occupation in a normative manner (i.e. lake-dwelling occupation was the standard practice in communities, ignoring previous periods of non-occupation), and therefore the abandonment as a novel event, it is possible to observe influences for cultural change in the Late Bronze Age material culture, and compare the contexts from which objects are known during both the LBA and the EIA. A range of Late Bronze Age material culture groups (see Chapter 5) suggest that the lake-dwelling communities of the northern Alpine forelands were important regional and inter-regional manufacturing centres, exporting goods, such as ring jewellery, swords, spears and knives, to communities in the north of Europe, but rarely to regions south of the Alps. It appears that minimal value associations travelled with the objects, and they were re-constituted into local assemblages and deposition practices as they circulated throughout Europe.

In opposition to the large number of objects manufactured by the LBA lake-dwelling communities and exported to other regions of Europe, there are apparently limited instances of 'imported' objects in these settlements. Some of the 'foreign' objects, such as needles, bronze vessels and axes (e.g. from Zurich-Alpenquai (Mäder 2001a) and Hauterive-Champréveyres (Rychner-Faraggi 1993)) indicate links to central Germany and central/eastern Europe, while others, such as glass beads (*Pfahlbauperlen*), amber beads, and razors

(e.g. Hauterive-Champréveyres (Rychner-Faraggi 1993) and Mörigen (Bernatzky-Goetze 1987)) demonstrate links to the southern Circum-Alpine region and the Po Plain. It is also evident that some of these objects travelled as the personal equipment of travelling individuals, for example the *Herrnbaumgarten* razor at Chelin/Lens, and the collection of Nordic objects at Grandson-Corcelettes.

Some objects of unusual or 'ritual' nature suggest that the northern Circum-Alpine lake-dwellings were similar-but-different to their neighbouring Urnfield culture communities, and that they imported some ideological references, for example the *Stangentrichter,* 'moon-idols'/fire-dogs and bird-shaped vessels, indicating links to southern Germany and the Carpathian Basin. However, the sun-bird-ship symbolism appears as an uncommon aspect of the lake-dwelling/nCA communities, despite its apparent widespread occurrence across Europe. This may be a result of the lake-dwelling communities position as regional centres, and therefore 'translator' communities (see Section 2.6.1), who rejected some of the symbolism due to their close connection to the wetland/lake/water environment. Furthermore, the lake-dwelling communities differ from many other Urnfield societies in that there is currently little evidence for their funerary practices (see Section 6.1), but some evidence suggests that they were utilising inland cemeteries and burial places (e.g. Le Boiron; Vidy-Chavannes) detached from the actual location of settlement. However, such evidence accounts for a minority of the potential population residing in the lake-settlements.

The early Iron Age evidence is in contrast to that of the Late Bronze Age; a significant proportion of the material assemblage from the northern Circum-Alpine region is known from burial contexts, while very little is from settlements. Evidence of settlements is, with the exception of some 'highland' and fortified sites, very sparse, but cemeteries indicate that the former lake-dwelling regions were still being utilized for social practices (see Section 4.5.2) and material culture decoration, form, and deposition associations, e.g. ceramics, arm-/leg-rings, show continuation between the two periods (LBA-EIA). Furthermore, instead of being at the centre of exchange networks spreading across central Europe, the region was left at the periphery of the main distribution of swords (cf. Map 167) and arm-rings (see Section 5.4.2.4). While it is possible that the lack of catalogue publication for Iron Age metal objects (in contrast to their Bronze Age counterparts – typically in the Prähistorische Bronzefunde series) has contributed to this apparent exclusion, the occurrence of few *Gündlingen* type swords in the region compared to their LBA predecessors (see Section 5.4.1.1) suggests that the exclusion is not simply a synthetic observation resulting from publication or excavation rates. That the exclusion from inter-regional circulation routes occurred is further suggested by the apparent re-integration to wider circulation routes during the latter stage of the early Iron Age (late HaC, HaD), with daggers and ring-jewellery found in burials of the nCA similar to types in Austria and Germany. In contrast to the periphery position of the northern Alpine forelands, the southern Alpine valleys were, judging by the evidence of imported fibula types, still connected to northern Italian communities (Map 124; Map 125).

With re-integration to the long-distance exchange networks the lake-shores were again (e.g. at Ürschhausen-Horn and Oggelshausen-Bruckgraben) temporarily re-occupied. However, this re-occupation of the lakes did not last for long, or mark a widespread re-settlement trend. Instead, at least at Oggelshausen, the motivation was for extensive exploitation of lake resources – in this case fish – by communities living further afield (see Section 4.3.4). This does not exclude the possibility of small communities occupying the lake-shore, such as that at Ürschhausen-Horn, but such villages were apparently neither common nor long-lived.

A proposed sequence for the abandonment of the lake-shores in the northern Circum-Alpine region at the end of the Late Bronze Age (see Section 8.2) shifts the focus of research from climatically driven models to incorporate social aspects, specifically the transformation of burial practices and settlement systems during the early Iron Age, and the influence that this may have had on the decline of the lake-dwelling tradition. Whether climatic decline or cultural change (as a result of shifting trade networks) was the driving factor is unclear. Given the low time resolution of typological-chronologies and dating of lake-sediments it is unlikely that a definite answer will ever be found, particularly as many of the high lake-water events are interpreted through the absence of lake-settlements on lake shores (Magny 2004b; cf. Bleicher 2013). However, it is evident that lake shorelines would always be suitable for settlement construction if communities were inclined to do so. Therefore, assuming a normative practice of lake-dwelling, it would be expected that the Late Bronze Age communities would simply shift their settlement within the lake-margin correlating to the raising/lowering of the lake-level, as can be seen on Lake Chalain – see Section 4.5.1.4 – if climatic change forced them. It is clear though, that both climatic decline and the loss of inter-regional exchange contacts would have impacted upon the economic productivity of settlements, agrarian production in the former and circulation of bronze work and possible consumables in the latter, resulting in an inability to support large centralized populations and a dispersal of communities into the wider environment.

The cultural changes occurring in the final stages of the Late Bronze Age and beginning of the Iron Age primarily

heightened the concern with the celebration of the individual rather than the community, as demonstrated by the increased deposition of objects in burials rather than in hoards (see Section 5.4.4). At the same time, a greater concern with visual consumption in both burial (see Section 6.1) and settlement practices (see Section 4.6), created a cultural setting in which lake-dwellings were no longer a viable or desirable option. This reduction in the desire to reside in wetland environments may relate to their unsuitability as high status settlements through their relative impermanence, requiring frequent renovation and rebuilding (Bleicher 2009; Ebersbach 2009) and environmental 'invisibility', reducing the potential for practices of overt visual consumption (of materials and labour) when compared to 'highland' settlements. Such aspects were not relevant to the Late Bronze Age communities, who favoured the lake as their position of dominance of trade and exchange routes running through the region. Certain objects – i.e. keys (see Section 5.4.2.8) – from some of the lastly occupied lake-dwellings attest to changing social structures within the settlements, and a division of the community along the principles of those with (and those without) access to structures or areas, and the ability to control the access of others. The use of iron to adorn a number of objects found within the lake-settlements, and further into Europe (see Section 5.4.3.2), shows a developing segregation of society through the display of this novel material on weapons, tools, utensils, and jewellery. This segregation can be seen as another facet of the developing concern with celebration of identity and emphasis of the individual rather than the community during the Iron Age.

Furthermore, the former lake-dwelling communities had little visual connection to their environment setting; other than possible pile remains in the lake, and social memory (see Section 4.5.3), there would have been little to indicate that former settlements had resided in the area; a factor amplified by the general absence of cemeteries in their vicinity. This is in contrast to a return to tumuli burials during the early Iron Age, which can be seen as a method of legitimizing and supporting settlement in specific regions. Thus, the former lake-dwelling zones, showing no signs of previous occupation, were not legitimate settlement areas, and the lake resources may have been controlled by individuals residing in elite settlements and utilizing such legitimizing practices further afield. The wetland environments did, however, remain socially significant places during the Iron Age, as exemplified by the deposition of metal work at, for example, La Tène in the later Iron Age.

Whether the lake-dwelling communities were aware that their movement away from the lake-shore would bring a tradition of occupation (which had endured for many centuries) to an end is unclear, but they would certainly have recognized that they were breaking away from their recent pattern of settlement and occupation (see Section 2.2). It is however clear that their decision to move away from the lake was a deliberate action, not solely a passive response to climatic decline. Due to their new emphasis on individual visibility, identity and status, the social changes occurring in the community made a full return to lake-dwelling an unlikely occurrence.

9.3: Future research directions

Through an examination of material culture groups from the lake-dwellings of the northern Circum-Alpine region possible indications of practices of deliberate objects fragmentation – particularly concerning arm- and leg-ring jewellery (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1), the *Pfahlbauperlen* throughout Europe (Section 7.2), and possibly also ceramics at Ürschhausen-Horn (Section 4.3.1) – have been identified. Deliberate object fragmentation has been well discussed as methods of enchainment and presencing absent identities (e.g. Chapman 2000; Chapman and Gaydarska 2007; Frieman 2012). While such practices with conversion of the parent arm-/leg-rings to offspring objects in the northern Alpine forelands are relatively uncommon (e.g. three razors (see Sub-section RE-MANUFACTURED RAZORS in Section 5.4.2.1); and a dagger from Zug-Sumpf (Bauer, I *et al.* 2004: 96)), there are numerous arm-rings which show defined fragmentation through cutting off a portion, as opposed to accidental breakage. Future research should attempt to identify instances of deliberate fragmentation of arm-rings, utilising archaeometric analysis if necessary.

A further area of fragmentation studies which would benefit from archaeometric analysis is the study of sickle division and their circulation as 'proto-currency' (cf. Primas 1986; Sommerfeld 1994). The circulation of such fragments and their deposition in hoards has been seen as both the movement of metal stock and the use of semi-regular pieces of metal in exchange practices (see Sub-section SYMBOLISM AND USE in Section 5.4.2.3). However, few studies have been specifically aimed at identifying how far such fragments travelled. The distribution of sickle forms is largely on a regional basis, particularly in the northern Circum-Alpine region, with few instances of 'foreign' sickles in the region (see Sub-section IMPORTED TYPES in Section 5.4.2.3). Visual observation of sickle fragments from different regions may indicate possible connections between individual fragments, and therefore the extent of their circulation and communication between communities and regions. Archaeometric analysis could confirm the occurrence of fragments from the same sickle postulated through visual analysis, where the metal was of sufficient similarity, or suggest sickles manufactured from the same ingot in different regions (cf. Rychner and Kläntschi 1995).

The evidence of 'sibling' sickles from the northern Circum-Alpine region (Map 100) suggests either exchange systems linking various communities in the region, the mobility of metalworkers creating sickles from the same mould in various settlements, or the mobility of individuals/households between settlements. A thorough review of dating evidence and associated materials at the various settlements where sibling sickles are found has been planned under a future SNF project (PP00P1_146325/1), with the intention of supporting the proposals of settlement biographies discussed earlier (see Section 4.5.3). While the material and dating evidence will not be able to identify causes for foundation/abandonment of settlements, it will provide indications of the contemporaneous occupation of settlements.

Models of cultural variability in the French Jura region (Vital 1993: 174-78, 1991) have suggested that societies changed from having areas of communal space and communal organisation during the Final Bronze Age II (HaA-HaB1) and an increased hierarchy in the Final Bronze Age III (HaB1-B3), to a strictly hierarchical society with burial practices and control of exchange routes used as legitimizing techniques during the early Iron Age (HaC). Such practices required a re-organisation to concepts of inheritance and legitimacy, not only with reference to material objects but also to house plots, burial locations, and possibly even trade and exchange contacts (cf. Blanco-González 2011; González-Ruibal 2006). If the rights to dwell in specific areas were lost with the death of individuals, then possible influences for the movement of settlements and deliberate vacation of building plots may be identified. Future research should attempt to recognize principles of inheritance in the lake-dwelling communities to achieve an understanding of how the societies reproduced themselves across generations and identify possible influences in the movement of settlements. How the ability to trade with specific communities was regulated and perpetuated remains unknown, and will be difficult to identify from the archaeological record, but it should be anticipated that as individuals died then specific trade contacts were lost as the relationships in which they participated died with them. However, such decline of specific relationships should be expected over time, and the loss of individual connections would not have impacted significantly upon the general movement of objects, as other relationships would have flourished to fill the void, though not necessarily between the same communities/settlements.

The distribution density of various types of Late Bronze Age full grip swords has suggested different regimes of circulation, with the *Mörigen* swords showing a relatively consistent spread from the northern Alpine region to northern Europe (Map 163), while the *Auvernier* and Antenna type swords show distinct banding in their distribution with increasing distance from the Alps/Lake Neuchâtel region (Map 164; Map 166). Although the banding of *Auvernier* and Antenna swords may be a result of their apparent relationship of exclusion (see Sub-section AUVERNIER in Section 5.4.1.1), it is also the manifestation of cultural attitudes and practices. These practices may have involved different valuation levels for specific sword forms, as has been proposed for the early Iron Age *Gündlingen* and *Mindelheim* types (e.g. Cowen 1968). It is possible that the *Mörigen* swords were used by a level of lower elites, while the Antenna form and *Auvernier* swords were used by an upper tier. It is also possible that the swords were utilized by different identities in society (cf. Kristiansen 2002), with the *Mörigen* type representing 'local' Urnfield identities, while the antenna form represented an influence from the Italian peninsula. Alternatively, this pattern may suggest the method of circulation of swords: either as trade commodity or as gift objects. The locally manufactured *Mörigen* type, with relatively consistent distribution, may have travelled as exchange 'commodities', in contrast to the infrequent *Auvernier* and Antenna swords, which may have travelled as 'gifts' between elite members at nodal regions on the long-distance exchange routes as symbols of their ability to participate in such practices or as objects presented at the beginning or conclusion of exchange events. Further study of other sword forms occurring in the northern Circum-Alpine region dating to the entire Bronze Age, and particularly Late Bronze Age composite handle swords (*Griffplatten*, *Griffangel*, *and Griffzunge*), their associated distribution in Europe, and patterns of separation between sites, may suggest further forms of valuation schemes relating to these objects. Such valuation regimes would provide an indication of the social structure in communities, and may provide suggestions of varying levels of a hierarchical organisation or social identities incorporating the use of specific swords (cf. Kristiansen 1999).

Other areas of research interest should focus on the influences and social choices which led communities to settle in specific locations of the environment, both wetland and inland. It is well recognized in other areas of Europe that landscape features, both natural and built, played a significant role in the placement and alignment of settlements and other structures. The prevalence of 'moon idols' in the northern Circum-Alpine region suggests the possible social significance of marking calendar events or calculating lunar/solar positions, which could have been used to align buildings or other structures. Furthermore, the influence of inheritance practices and social 'rights' to settle or occupy specific areas during not only the Bronze Age and Iron Age, but also the Neolithic, should be addressed, particularly given the well discussed *Hausplatz* and *Siedlungsplatz* concepts (see Section 4.5). An understanding of such practices may be highlighted through a study of the

location of lake-settlements, and also inland settlements, in relation to earlier human landscape features – particularly burials and cemeteries. Studies of Neolithic and Bronze Age ceramics have often proposed small-scale household production of pottery and have even identified individual potter's work (e.g. Greifensee-Böschen and Zug-Sumpf), but few inter-site comparative studies have been undertaken. Although time consuming, an examination of the ceramic assemblage from several contemporary or sequential lake-dwellings from the same region (e.g. Lake Feder (see Section 4.5.1.1)) may identify the same pottery producers at several sites. If household rather than specialized pottery production and exchange/trade of ceramics is accepted, then this would confirm suggestions of household mobility and the possible identification of individuals acting in several settlements.

The study of many types of material culture from the northern Circum-Alpine region relating to the Late Bronze Age and early Iron Age has demonstrated a continuation of form and decorative styles between the time periods, despite the terminal decline of a long-established lake-dwelling tradition. Although material culture groups show continuation of style between the two periods, the social practices of their use and deposition show a defined re-organization between the Late Bronze Age and early Iron Age; deposition of objects in hoards was common in the former, while burial deposition became the norm in the latter. This change in deposition practice is a direct reflection of socio-cultural changes related to the emphasis of individuality and status at the expense of communal and collective identities. Changes to the inter-regional exchange and communication networks, roughly contemporaneous with these social developments, resulted in the (former) lake-dwelling region being marginalized and caused a diminution of the role of the area as an important manufacturing and exchange node linking northern Europe to the central Mediterranean. Without entirely discounting the possible influence of climatic change on the lake-dwelling communities, it is clear that significant social and cultural changes were occurring at the same time as the lake-settlements were being abandoned.

These cultural changes were so fundamental and significant to the composition of society that a full return to occupation of the lake-shore became impossible, even during periods of 'favorable' climatic conditions. While climatic change should not be discarded as an influencing factor for the cessation of the lake-dwelling tradition during the Late Bronze Age and early Iron Age, this study has clearly shown that climatically deterministic models are no longer viable and do not reflect the whole situation. Although climate may sometimes be the trigger, it is however a series of cultural variables that determine people’s final decision.

Bibliography

AESCHIMANN, D. & GUISAN, A. (1995) Introduction to the Alps, in A. GUISAN, J. I. HOLTEN, R. SPICHIGER & L. TESSIER (Eds.) *Potential ecological impacts of climate change in the Alps and Fennoscandian mountains***,** Genève, Conservatoire et Jardin botaniques. 81-85.

AGBE-DAVIES, A. S. & BAUER, A. A. (2010) Rethinking Trade as a Social Activity: An Introduction, in A. A. BAUER & A. S. AGBE-DAVIES (Eds.) *Social Archaeologies of Trade and Exchange: Exploring Relationships among People, Places, and Things***,** California, West Coast Press. 13-28.

ALBORE LIVADIE, C., BARTOLI, C., BOENZI, G., CICIRELLI, C. & GUZZO, P. G. (2005) The Poggiomarino river settlement in the Longola area, in P. A. J. ATTEMA, A. NIJBOER & A. ZIFFERERO (Eds.) *Papers in Italian archaeology VI : communities and settlements from the Neolithic to the early Medieval period***,** Oxford, Archaeopress. 699-705.

ALBORE LIVADIE, C. & CICIRELLI, C. (2003) L'insediamento Protostorico in Località Longola di Poggiomarino: nota preliminare, *La Parola Del Passato: rivista di studi antichi,* 58, 88-128.

ALTORFER, K. (2004a) Die Pfahlbauten — Ein neues Fenster in die Vergangenheit, in ANTIQUARISCHE GESELLSCHAFT IN ZÜRICH (Ed.) *Pfahlbaufieber: Von Antiquaren, Pfahlbaufischern, Altertümerhändlern und Pfahlbaumythen***,** Zürich, Chronos Verlag. 60-90.

ALTORFER, K. (2004b) Pfahlbautourismus und Pfahlbauentdeckungen im Ausland, in ANTIQUARISCHE GESELLSCHAFT IN ZÜRICH (Ed.) *Pfahlbaufieber: Von Antiquaren, Pfahlbaufischern, Altertümerhändlern und Pfahlbaumythen***,** Zürich, Chronos Verlag. 91-101.

ALTORFER, K. (2010) *Die prähistorischen Feuchtbodensiedlungen am Südrand des Pfäffikersees : Eine archäologische Bestandesaufnahme der Stationen Wetzikon-Robenhausen und Wetzikon-Himmerich*, Monographien der Kantonsarchäologie Zürich 41, Zürich, FO-Fotorotar.

AMBROSE, W., ALLEN, C., O'CONNOR, S., SPRIGGS, M., OLIVEIRA, N. V. & REEPMEYER, C. (2009) Possible obsidian sources for artifacts from Timor: narrowing the options using chemical data, *Journal of Archaeological Science,* 36 (3), 607-15.

AMT FÜR ARCHÄOLOGIE THURGAU (2010) *Archäologie im Thurgau,* Frauenfeld, Huber.

ANATI, E. (1960) *La civilisation du Val Camonica,* Grenoble, Arthaud.

ANATI, E. (1994) *Valcamonica rock art : a new history for Europe*, Studi Camuni 13, Capo di Ponte, Edizioni del Centro.

ANDREY, S. (2006) Les ossements humains épars des stations littorales de la région des Trois-Lacs, *Cahiers d'Archéologie Fribourgeoise,* 8, 146-61.

ANGELINI, I. (2011) Archaeometry of Bronze Age and Early Iron Age Italian Vitreous Materials: A Review, in I. TURBANTI-MEMMI (Ed.) *Proceedings of the 37th International Symposium on Archaeometry*, Berlin, Springer. 17-23.

ANGELINI, I., ARTIOLI, G., BELLINTANI, P., DIELLA, V., GEMMI, M., POLLA, A. & ROSSI, A. (2004) Chemical analyses of Bronze Age glasses from Frattesina di Rovigo, Northern Italy, *Journal of Archaeological Science,* 31 (8), 1175-84.

ANGELINI, I., ARTIOLI, G., BELLINTANI, P. & POLLA, A. (2005) Protohistoric Vitreous Material of Italy: from Early Faience to Final Bronze Age Glasses, in ASSOCIATION INTERNATIONALE POUR L'HISTOIRE DU VERRE (Ed.) *16e Congrès de l'Association Internationale pour l'Histoire du Verre*, Nottingham, AIHV. 32-36.

ANGELINI, I. & BELLINTANI, P. (2006) Archeometria delle ambre protostoriche: dati acquisiti e problemu aperti, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1477-93.

ANGELINI, I. & BELLINTANI, P. (2005) Archaeological ambers from Northern Italy: An FTIR-Drift study of provenance by comparison with the Geological Amber Database, *Archaeometry,* 47 (2), 441-54.

ANGELINI, I., NICOLA, C., ARTIOLI, G., DE MARINIS, R. C., RAPI, M. & UBOLDI, M. (2011) Chemical, Mineralogical and Textural Characterisation of Early Iron Age Vitreous Materials from the Golasecca Culture (Northern Italy), in I. TURBANTI-MEMMI (Ed.) *Proceedings of the 37th International Symposium on Archaeometry*, Berlin, Springer. 25-32.

ANGELINI, I., POLLA, A., GIUSSANI, B., BELLINTANI, P. & ARTIOLI, G. (2009) Final Bronze-Age glass in Northern and Central Italy: is Frattesina the only glass production centre?, in J.-F. MOREAU, R. AUGER, J. CHABOT & A. HERZOG (Eds.) *Proceedings of the 36th International Symposium on Archaeometry*, Quebec, CELAT. 329-37.

APALS, J. (2004/05) Carl Georg Graf Sievers und die Inselsiedlungen Lettlands, *Plattform,* 13/14, 46-56.

APPADURAI, A. (1986) Introduction: Commodities and the politics of value, in A. APPADURAI (Ed.) *The social life of things : commodities in cultural perspective***,** Cambridge, Cambridge University Press. 3-63.

ARBOGAST, R.-M., JACOMET, S., MAGNY, M. & SCHIBLER, J. (2006) The significance of climate fluctuations for lake level changes and shifts in subsistence economy during the late Neolithic (4300–2400 B.C.) in central Europe, *Vegetation History and Archaeobotany,* 15 (4), 403-18.

ARENSTAM GIBBONS, S. J. & NICHOLLS, R. J. (2006) Island abandonment and sea-level rise: An historical analog from the Chesapeake Bay, USA, *Global Environmental Change,* 16 (1), 40-47.

ARLETTI, R., MAIORANO, C., FERRARI, D., VEZZALINI, G. & QUARTIERI, S. (2010) The first archaeometric data on polychrome Iron Age glass from sites located in northern Italy, *Journal of Archaeological Science,* 37 (4), 703-12.

ARMIT, I. (1996) *The archaeology of Skye and the Western Isles,* Edinburgh, Edinburgh University Press.

ARNOLD, B. (1983) Les 24 maisons d' Auvernier-Nord (Bronze final), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte,* 66, 87-104.

ARNOLD, B. (1986) *Fouille subaquatique et photographie aérienne,* Saint-Blaise, Editions du Ruau.

ARNOLD, B. (1990a) Cortaillod-Est et les villages du lac de Neuchâtel au Bronze final : structure de l'habitat et proto-urbanisme, Saint-Blaise, Editions du Ruau.

ARNOLD, B. (1990b) Villages du Bronze Final sur les rives du lac de Neuchâtel, in C. MORDANT & A. RICHARD (Eds.) *L'habitat et l'occupation du sol à l'âge du bronze en Europe***,** Paris, Editions du Comité des travaux historiques et scientifiques. 303-12.

ARNOLD, B. (1995) *Pirogues monoxyles d'Europe centrale : construction, typologie, évolution*, Neuchâtel, Musée cantonal d'archéologie.

ARNOLD, B. (2002) A Landscape of Ancestors: The Space and Place of Death in Iron Age West-Central Europe, in H. SILVERMAN & D. B. SMALL (Eds.) *The Space and Place of Death***,** Arlington, Archaeological Papers of the American Anthropological Association. 129-43.

ARNOLD, B. (2004) The Heuneburg, in P. I. BOGUCKI & P. J. CRABTREE (Eds.) *Ancient Europe 8000 B.C.-A.D. 1000 : encyclopedia of the Barbarian world, Volume II***,** New York ; London, Charles Scribner's Sons. 249-52.

ARNOLD, B. (2010) Eventful Archaeology, the Heuneburg Mudbrick Wall, and the Early Iron Age of Southwest Germany, in D. J. BOLENDER (Ed.) *Eventful archaeologies : new approaches to social transformation in the archaeological record***,** Albany, State University of New York Press. 100-14.

ARNOLD, B., HAFNER, A., WOLF, M. M., MAUVILLY, M., WINIGER, A. & WOLF, C. (2004) Die Region der drei Seen - im Grenzraum zwischen Romandie und Deutschschweiz, *Archäologie der Schweiz,* 27 (2), 42-52.

ARNOLDUSSEN, S. (2013) Life history approaches and wetland habitation: a later prehistoric case study from the Dutch delta, in F. MENOTTI & A. O'SULLIVAN (Eds.) *The Oxford Handbook of Wetland Archaeology***,** Oxford, Oxford University Press. 733-48.

ARTURSSON, M. & NICOLIS, F. (2007) Cultural relations between the Mediterranean and the Baltic Seas during the Bronze Age? The evidence from northern Italy and southern Scandinavia, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 331-42.

ASLAN, C. (2006) Individual, Household, and Community Space in Early Bronze Age Western Anatolia and the Nearby Islands, in E. C. ROBERTSON, J. D. SEIBERT, D. C. FERNANDEZ & M. U. ZENDER (Eds.) *Space and spatial analysis in archaeology*, Calgary, University of Calgary Press. 133-40.

ASPES, A., FASANI, L. & MARZATICO, F. (1995) The Pile Dwellings of Northern Italy, in A. ASPES (Ed.) *Settlement Patterns: between the Alps and the Black Sea 5th to 2nd Millenium B.C.*, Museo Civico di Storia Naturale - Verona. 295-307.

BABIĆ, S. (2007) "Translation Zones" or gateway communities revisited: the case of Trebenište and Sindos, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 57-61.

BABIŃSKI, L., FEJFER, M. & PRĄDZYŃSKI, W. (2007) Environmental monitoring at the Lusatian culture settlement in Biskupin, Poland, *Journal of Wetland Archaeology,* 7, 51-72.

BADER, T. (1983) *Die Fibeln in Rumänien*, Prähistorische Bronzefunde 14 / 6, München, C. H. Beck.

BADER, T. (1990) Bemerkungen über die ägäischen einflüsse auf die alt- und mittelbronzezeitliche entwicklung im Donau-Karpatenraum, in T. BADER (Ed.) *Orientalisch-ägäische Einflüsse in der europäischen Bronzezeit*, Bonn, Rudolf Habelt. 181-205.

BĄK, U. (1992) Bronzezeitliche geweiknebel in südpolen, *Archäologisches Korrespondenzblatt,* 22 (2), 201-08.

BALASSONE, G., BONI, M., DI MAIO, G. & VILLA, I. M. (2009) Characterization of metallic artefacts from the Iron Age culture in Campania (Italy): a multi-analytical study., *Periodico di Mineralogia,* 78 (1), 45-63.

BALISTA, C. & BELLINTANI, P. (Eds.) (1998) *Canàr di San Pietro Polesine. Ricerche archeo-ambientali sul sito palafitticolo***,** Rovigo, Padusa.

BALISTA, C., BONDAVALLI, F., CARDARELLI, A., LABATE, D., MAZZONI, C. & STEFFÉ, G. (2009) Dati preliminari sullo scavo della Terramara di Gaggio di Castelfranco Emilia (Modena): scavi 2001-2004, in M. A. BERNABÒ BREA & R. VALLONI (Eds.) *Archeologia ad alta velocità in emilia. Indagini geologiche e archeologiche lungo il tracciato ferroviario.*, Firenze, Quaderni di Archeologia dell'Emilia Romagna. 113-38.

BALISTA, C. & LEONARDI, G. (2003) Le strategie d'insediamento tra II e inizio I millennio A.C. in Italia settentrionale centro - orientale, in ISTITUTO ITALIANO DI PREISTORIA E PROTOSTORIA (Ed.) *Atti della XXXV riunione scientifica : le comunità della preistoria italiana : studi e ricerche sul neolitico e le età dei metalli*, Istituto Italiano di Preistoria e Protostoria. 159-72.

BALLMER, A. (2010) Measuring the Mental - A Quantitative Approach to Mental Landscape Concepts in Prehistory, in UNIVERSITÄT KIEL. GRADUIERTENSCHULE "HUMAN DEVELOPMENT IN LANDSCAPES" (Ed.) *Landscapes and human development: the contribution of European archaeology : proceedings of the International Workshop "Socio-Environmental Dynamics over the Last 12'000 Years: The Creation of Landscapes (1st-4th April)"*, Bonn, Dr. Rudolf Habelt. 193-202.

BALLMER, A. (2010) Zur Topologie des bronzezeitlichen Deponierens Von der Handlungstheorie zur Raumanalyse, *Prähistorische Zeitschrift,* 85, 120-31.

BALZER, I. (2009) Chronologisch-chorologische Untersuchung des späthallstatt- und frühlatènezeitlichen "Fürstensitzes" auf dem Münsterberg von Breisach (Grabungen 1980-1986), Stuttgart, Konrad Theiss Verlag.

BANDI, G. (1974) Über den Usprung und die historische Beziehungen der Tonstempel der bronzezeitlichen Gruppen: Madarovče und Polada, *Preistoria Alpina,* 10, 237-52.

BARBARIĆ, V. (2010) Late Bronze Age in Dalmatia: state of research, in P. C. GUIDA & E. BORGNA (Eds.) *From the Aegean to the Adriatic: Social Organizations, modes of Exchange and Interaction in the Post-palatial Period (12th-11th BC)*, Roma, Quasar. 311-23.

BARFIELD, L. H. (1991) Wessex with and without Mycenae: new evidence from Switzerland, *Antiquity,* 65 (246), 102-07.

BARFIELD, L. H. (1994) The Bronze Age of Northern Italy: Recent Work and Social Interpretation, in S. STODDART & C. MATHERS (Eds.) *Development and decline in the Mediterranean Bronze Age***,** Sheffield, J. R. Collis Publications. 129-44.

BARON, J. & LASAK, I. (Eds.) (2007) *Long Distance Trade in the Bronze Age and Early Iron Age***,** Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego.

BARRETT, J. C. (2000) A thesis on agency, in M.-A. DOBRES & J. E. ROBB (Eds.) *Agency in archaeology***,** London, Routledge. 61-68.

BARTOLONI, G., DELPINO, F., MORIGI GOVI, C. & SASSATELLI, G. (2000) *Principi etruschi tra Mediterraneo ed Europa,* Venezia, Marsilio.

BAUDOU, E. (1960) *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im nordischen Kreis*, Stockholm, Almqvist and Wiksell.

BAUER, A. A. (2008) Import, Imitation, or Communication? Pottery style, technology, and coastal contact in the Early Bronze Age Black Sea, in P. F. BIEHL & Y. Y. RASSAMAKIN (Eds.) *Import and imitation in archaeology***,** Langenweissbach, Beier & Beran. 89-104.

BAUER, I. (1985) Neolithische und bronzezeitliche Befunde am Rietspitz bei Fällanden, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 68, 41-64.

BAUER, I. (1991) Hallstattzeitliche Keramik aus fundstellen im Kanton Zug, *Tugium,* 7, 85-122.

BAUER, I. (1992) Frühe scheibengedrehte Keramik von der Baarburg, Kanton Zug, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 75, 155-63.

BAUER, I. (1993) Ein hallstattzeitlicher Fundkomplex aus der Zuger Altstadt, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 76, 93-112.

BAUER, I. (1994) Von der Spätbronze- zur Hallstattzeit: Die Nordostschweiz, in SCHWEIZERISCHEN AKADEMIE DER GEISTES- UND SOZIALWISSENSCHAFTEN (Ed.) *Keramik zwischen den Epochen : Funktion - Formenwandel - Technik*, Bern, NIKE - Nationale Informationsstelle für Kulturgüter-Erhaltung. 21-31.

BAUER, I., FORT-LINKSFEILER, D., RUCKSTUHL, B., HASENFRATZ, A., HAUSER, C. & MATTER, A. (1992)

Bronzezeitliche Landsiedlungen und Gräber, Egg, Komm. Fotorotar.

BAUER, I., FRASCOLI, L., PANTLI, H., SIEGFRIED, A., WEIDMANN, T. & WINDLER, R. (1991) *Üetliberg, Uto-Kulm : Ausgrabungen 1980-1989,* Zürich, Komm. Orell Füssli.

BAUER, I. & GROSS-KLEE, E. (1994) Tradition und Formenwandel von Keramik (6. bis 1. Jahrtausend v. Chr.), in SCHWEIZERISCHEN AKADEMIE DER GEISTES- UND SOZIALWISSENSCHAFTEN (Ed.) *Keramik zwischen den Epochen : Funktion - Formenwandel - Technik*, Bern, NIKE - Nationale Informationsstelle für Kulturgüter-Erhaltung. 13-20.

BAUER, I. & NORTHOVER, J. P. (1998) Zug-Sumpf: an extensive approach to the analysis of a single site and the development of samping strategies for other sites, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". I : Production, circulation et consomation du bronze*, Paris, Editions du Comité des Travaux Historiques et Scientifiques. 175-89.

BAUER, I. & NORTHOVER, P. (2004) *Bronzegiesser und Bronzeschmiede am Zugersee,* Zug, Kantonales Museum für Urgeschichte.

BAUER, I., RUCKSTUHL, B. & SPECK, J. (2004) *Zug-Sumpf: Die Funde der Grabungen 1923-37,* Zug, Kantonales Museum für Urgeschichte.

BAUER, S. (2002) Verloren, verwahrt oder geweiht? Nadeln aus Pfahlbauten des Zürichsees, in L. ZEMMER-PLANK (Ed.) *Kult der Vorzeit in den Alpen : Opfergaben - Opferplätze - Opferbrauchtum***,** Bozen, Athesia. 1047-85.

BAUMEISTER, R. (Ed.) (2009) *Mord im Moor?***,** Bad Schussenried, Federsee Museum Bad Buchau.

BÉARAT, H. & BAUER, I. (1994) Früheisenzeitliche Keramik von Baarburg ZG und Üetliberg ZH: Eine mineralogisch-petrographische und chemische Untersuchung zur Frage der Herstellundsorte scheibengedrehter Keramik in der ausgehenden Hallstattzeit, *Germania,* 72 (1), 67-93.

BECH, J.-H. (1997) Bronze Age settlements on raised sea-beds at Bjerre, Thy, NW-Jutland, in J. J. ASSENDORP (Ed.) *Forschungen zur bronzezeitlichen Besiedlung in Nord- und Mitteleuropa***,** Espelkamp, Verlag Marie Leidorf. 3-15.

BECH, J.-H. (2003) The Thy Archaeological Project - Results and Reflections from a Mutlinational Archaeological Project, in H. THRANE (Ed.) *Diachronic settlement studies in the metal ages : report on the ESF workshop, Moesgård, Denmark, 14-18 october 2000***,** Højbjerg, Jutland Archaeological Society. 45-60.

BECK, C. W. & HARTNETT, H. E. (1993) Sicilian Amber, in C. W. BECK, J. BOUZEK & D. DRESLEROVÁ (Eds.) *Amber in archaeology : proceedings of the Second International Conference on Amber in Archaeology, Liblice 1990***,** Praha, Czech Republic, Institute of Archaeology, Czech Academy of Sciences. 36-47.

BECK, C. W. & SHENNAN, S. J. (1991) *Amber in prehistoric Britain,* Oxford, Oxbow Monograph.

BECK, C. W. & STOUT, E. C. (2000) The Origin of the Prehistoric Amber Finds in Southern Switzerland, in R. C. DE MARINIS & S. B. SIMONA (Eds.) *I Leponti tra mito e realtà : raccolta di saggi in occasione della mostra*, Vol. 2**,** Locarno, Armando Dadò Editore. 41-61.

BEECHING, A. (1977) *Le Boiron : une nécropole du bronze final près de Morges (Vaud, Suisse)*, Lausanne, Musée d'archéologie et d'histoire.

BELL, T., WILSON, A. & WICKHAM, A. (2002) Tracking the Samnites: Landscape and Communications Routes in the Sangro Valley, Italy, *American Journal of Archaeology,* 106 (2), 169-86.

BELLATO, F. & BELLINTANI, G. F. (1984) Dati per uno studio della technologia e tipologia dei manufatti in corno ed osso nell'abitato protostorico di Frattesina di Fratta Polesine, *Padusa,* 20, 223-60.

BELLINTANI, G. F. & PERETTO, R. (1984) Il ripostiglio di Frattesina ed altri manufatti enei raccolti in superficie. Notizie preliminari, *Padusa,* 20, 55-72.

BELLINTANI, P. (1997) Frattesina: l'ambra e la produzione vitrea nel contesto delle relazioni transalpina, in L. ENDRIZZI & F. MARZATICO (Eds.) *Ori delle Alpi***,** Trento, Servizio beni culturali Provinica autonoma di Trento. 117-29.

BELLINTANI, P. (2002) Bernsteinstraßen, Glasstraßen, in G. SCHNEKENBURGER (Ed.) *Über die Alpen : Menschen - Wege - Waren***,** Stuttgart, Theiss. 39-48.

BELLINTANI, P. (2004) Ambre del II millennio a.C. in Italia, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 200-07.

BELLINTANI, P. (2011) Prima dei Fenici. Perle in faience, glassy faience e vetro in Italia nel II millennio a.C, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra*

*Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 160-71.

BELLINTANI, P. (2013) Long-distance trade routes linked to wetland settlements, in F. MENOTTI & A. O'SULLIVAN (Eds.) *The Oxford Handbook of Wetland Archaeology***,** Oxford, Oxford University Press. 779-94.

BELLINTANI, P. & RESIDORI, G. (2003) Quali e quante conterie: perle ed altri materiali vetrosi edll'italia settentrionale nel quadro dell'età del bronzo europea, in I. I. D. P. E. PROTOSTORIA (Ed.) *Atti Della XXXV Riunione Scientifica*, Firenze, Istituto Italiano di Preistoria e Protostoria. 483-98.

BELLINTANI, P. & STEFAN, L. (2009) Nuovi dati sul primo vetro Europeo: il caso di Frattesina, in A. MAGNA (Ed.) *Atti del primo convegino interdiciplinare sul vetro nei beni culturali e nell'arte di ieri e di oggi*, Parma, 71-86.

BENDER, B. (2002) Time and Landscape, *Current Anthropology,* 43 (s4), S103-S12.

BENJAMIN, W. (1999) *The Work of Art in the Age of Mechanical Reproduction*, London, Pimlico.

BENKERT, A., CARAZZETTI, R., GOLLNISCH, H., RAGETH, J. & SEIFERT, M. (1998) Siedlungswesen, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 193-229.

BENTLEY, R. A., HAHN, M. W. & SHENNAN, S. J. (2004) Random drift and culture change, *Proceedings of the Royal Society of London. Series B: Biological Sciences,* 271 (1547), 1443-50.

BERGER, D. (2011) *Bronzezeitliche Färbetechniken an Metallobjekten nördlich der Alpen*, unpublished thesis for Doktor des Naturwissenschaften, (Eberhard-Karls-Universität Tübingen).

BERGER, D. & PERNICKA, E. (2009) Archäolometallurgische Untersuchungen zur Metalleinlegetechnik einiger Auvernierschwerter, *Restaurierung und Archäologie,* 2, 1-17.

BERGER, L. & BROGLI, W. (1980) *Wittnauer Horn und Umgebung,* Basel, Schweiz Gesellschaft für Ur- und Frühgeschichte.

BERGER, L. & SCHINDLER, M. P. (1999) Kunst und Kunstgewerbe, in F. MÜLLER, G. KAENEL & G. LÜSCHER (Eds.) *Eisenzeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 229-42.

BERGONZI, G. (1997) L'ambra delle terramare nel contesto italiano ed europeo, in M. A. BERNABÒ BREA, A. CARDARELLI & M. CREMASCHI (Eds.) *La terramare : la piu antica civiltà padana*, Milano, Electa. 602-09.

BERNATZKY-GOETZE, M. (1987) *Mörigen : die spätbronzezeitlichen Funde,* Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

BERSU, G. (1945) *Das Wittnauer Horn im Kanton Aargau : seine ur- und frühgeschichtlichen Befestigungsanlagen*, Basel, Verlag Birkhäuser & CIE.

BERTONE, A., CARANZANO, S. & ROSSI, P. (2004) Dalla Pietra ai Metalli, in A. BERTONE & S. CARANZANO (Eds.) *La civiltà di Viverone : la conquista di una nuova frontiera nell'Europa del II Millennio a.C***,** Biella, Eventi & Progetti. 53-69.

BETTELLI, M. & VAGNETTI, L. (1997) Aspetti delle relazioni fra l'area egeo-micenea e l'Italia settentrionale, in M. A. BERNABÒ BREA, A. CARDARELLI & M. CREMASCHI (Eds.) *La terramare : la piu antica civiltà padana***,** Modena Foro Boario, Electa. 614-20.

BETZLER, P. (1974) *Die Fibeln in Süddeutschland, Österreich und der Schweiz I : (urnenfelderzeitliche Typen)*, Prähistorische Bronzefunde 14 / 3, München, Beck.

BIANCO PERONI, V. (1970) *Die Schwerter in Italien*, Prähistorische Bronzefunde 4 / 1, München, Beck.

BIANCO PERONI, V. (1976) *Die Messer in Italien*, Prähistorische Bronzefunde 7 / 2, München, Beck.

BIANCO PERONI, V. (1979) *I rasoi nell'Italia continentale*, Prähistorische Bronzefunde 8 / 2, München, Beck.

BIEHL, P. F. & RASSAMAKIN, Y. Y. (Eds.) (2008) *Import and imitation in archaeology***,** Langenweissbach, Beier & Beran.

BIETTI SESTIERI, A. M. (1981) Economy and Society in Italy between the late Bronze Age and early Iron Age, in G. BARKER & R. HODGES (Eds.) *Archaeology and Italian Society : prehistoric, Roman and medieval studies***,** Oxford, British Archaeological Reports. 133-55.

BIETTI SESTIERI, A. M. (1984) L'abitato di Frattesina, *Padusa,* 20, 413-27.

BIETTI SESTIERI, A. M. (1988) The 'Mycenean connection' and its impact on the central Mediterranean societies, *Dialoghi di Archeologia (series 3),* 6 (1), 23-51.

BIETTI SESTIERI, A. M. (1997) Italy in Europe in the Early Iron Age, *Proceedings of the Prehistoric Society,* 63, 371-402.

BIETTI SESTIERI, A. M. & MACNAMARA, E. (2007) *Prehistoric Metal Artefacts from Italy (3500-720BC) in the British Museum,* London, The British Museum.

BIGLER, B. (2005) Der Rhinsberg bei Eglisau, Kanton Zürich, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 88, 169-200.

BILLAMBOZ, A. (1998) Zur dendrochronologischen Datierung der Bohlenwege an der Wuhrstraße westlich von Bad Buchau, Kreis Biberach, *Archäologische Ausgrabungen in Baden-Württemberg,* 1997, 50-52.

BILLAMBOZ, A. (2003) Tree rings and wetland occupation in Southwest Germany between 2000 and 500 BC: dendroarchaeology beyond dating in tribute to F. H. Schweingruber, *Tree-ring Research,* 59 (1), 37-49.

BILLAMBOZ, A. (2006a) Dendroarchäologische Untersuchungen in den neolithischen Ufersiedlungen von Hornstaadt-Hörnle, in LANDESAMT FÜR DENKMALPFLEGE (Ed.) *Siedlungsarchäologie im Alpenvorland IX. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 98***,** Stuttgart, Konrad Theiss Verlag. 297-414.

BILLAMBOZ, A. (2006b) Die Wasserburg Buchau im Jahrringkalender, *Plattform,* 13/14, 97-105.

BILLAMBOZ, A. (2009) The absolute dating of Wasserburg-Buchau, in S. W. MANNING & M. J. BRUCE (Eds.) *Tree-rings, kings and old world archaeology and environment papers presented in honor of Peter Ian Kuniholm***,** Oxford, Oxbow Books. 33-40.

BILLAMBOZ, A. & GOLLNISCH, H. (1998) Die Dendrodatierung der Siedlungsphasen von Uerschhausen-Horn (CH Thurgau) in der Spätbronzezeit und frühen Eisenzeit, *Plattform,* 5/6, 102-03.

BILLAMBOZ, A. & KÖNINGER, J. (2008) Dendroarchäologische Untersuchungen zur Besiedlungs- und Landschaftsentwicklung im Neolithikum des westlichen Bodenseegebietes, in W. DÖRFLER & J. MÜLLER (Eds.) *Umwelt - Wirtschaft - Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Südskandinaviens*, Neumünster, Wachholtz. 317-34.

BILLAUD, Y. (2006a) L'organisation architecturale des stations Bronze final du lac du Bourget (Savoie): résultats récents à Conjux/le Port 3, *Bulletin de la Société préhistorique française,* 103 (1), 167-71.

BILLAUD, Y. (2008) Les stations littorales de l'âge du Bronze final: Perception et évaluation d'un patrimoine subaquatique, in S. JACOMET, I. DOMAIZON, J. POULENARD & F. ARNAUD (Eds.) *Autour du Lac du Bourget. Actes du colloque pluridisiplinaire*, Thonon-les-Bains, Les Editions de la Page Blanche. 49-54.

BILLAUD, Y. (2011) Récupération de bois d'œuvre et réemploi sur une station littorale de la fin du Bronze final: Conjux / Le Port 3, lac du Bourget, Savoie, in I. SÉNÉPART, T. PERRIN, É. THIRAULT & S. BONNARDIN (Eds.) *Marges, frontières et transgressions. Actualité de la recherche.*, Toulouse, Archives d'Écologie Préhistorique. 475-80.

BILLAUD, Y. & MARGUET, A. (2005) Habitats lacustres du Néolithique et de l'âge du Bronze dans les lacs alpins français: bilan des connaissances et perspectives, in P. DELLA CASA & M. TRACHSEL (Eds.) *WES'04 - Wetland Economies and Societies*, Zurich, Chronos. 169-78.

BILLAUD, Y., MARGUET, A. & SIMONIN, O. (1992) Chindrieux, Châtillon (Lac du Bourget, Savoie) Ultime Occupation des Lacs Alpins Français à l'âge du Bronze?, in COMITÉ DES TRAVAUX HISTORIQUES ET SCIENTIFIQUES (Ed.) *Archéologie et environnements des milieux aquatiques: actes du 116e congrès national des sociétés savantes*, Paris, Editions du Comité des travaux historiques et scientifiques. 277-310.

BINGGELI, M. (2011) Spearheads and Swords - the making of bronze objects, in M. UCKELMANN & M. MÖDLINGER (Eds.) *Bronze age warfare : manufacture and use of weaponry***,** Oxford, Archaeopress. 11-21.

BINTLIFF, J. L. (1998) A siege mentality at Lampeter? Let Ludwig in - He's a friend, *Archaeological dialogues : Dutch perspectives on current issues in archaeology,* 5.1, 37-43.

BLANCO-GONZÁLEZ, A. (2011) From Huts to 'The House': the shift in perceiving home between the Bronze Age and the Early Iron Age in Central Iberia (Spain), *Oxford Journal of Archaeology,* 30 (4), 393-410.

BŁASZKIEWICZ, M. (1995) Uwagi o genezie i holoceńskiej historii jeziora arklickiego (woj. olsztyn), *Acta Universitatis Nicolai Copernici Archaeologia,* 24 (287), 47-51.

BLEICHER, N. (2009) *Altes Holz in neuem Licht: Archäologische und dendrochronologische Untersuchungen an spätneolithischen Feuchtbodensiedlungen in Oberschwaben*, Stuttgart, Konrad Theiss Verlag.

BLEICHER, N. (2013) Summed radiocarbon probability density functions cannot prove solar forcing of Central

European lake-level changes, *The Holocene,* 23 (5), 755-65.

BLEICHER, N., MÄDER, A., MOTSCHI, A., RIETHMANN, P. & SCHWÖRER, P. (2011) Die Rettungsgrabung Parkhaus Opéra, *Archäologie Schweiz,* 34 (3), 16-23.

BOAS, F. (1982) The Aims of Ethnology, in F. BOAS *Race language and culture*, Chicago, University of Chicago Press. 626-38.

BOAST, R. (2009) The formative century, 1860-1960, in B. W. CUNLIFFE, C. GOSDEN & R. A. JOYCE (Eds.) *The Oxford handbook of archaeology***,** Oxford, Oxford University Press. 47-70.

BOISAUBERT, J.-L. & BUGNON, D. (2008) Morat/Löwenberg, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 64-79.

BOISAUBERT, J.-L., BUGNON, D. & MAUVILLY, M. (2008) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)*, Fribourg, Service archéologique de l'Etat de Fribourg.

BOLLIGER SCHREYER, S. (2001) *Zürich Wollishofen-Haumesser: spätbronzezeitliche Keramik : Tauchsondierungen 1964-1970,* Zürich, Baudirektion Kanton Zürich, Hochbauamt, Kantonsarchäologie.

BÖNISCH, E. (2005) Begrabene Häuser? Brandschutt mit bronzezeitlichem Hausinventar, in B. HÄNSEL & B. HOREJS (Eds.) *Interpretationsraum Bronzezeit : Bernhard Hänsel von seinen Schülern gewidmet***,** Bonn, Rudolf Habelt. 445-62.

BONOGOFSKY, M. (2003) Neolithic Plastered Skulls and Railroading Epistemologies, *Bulletin of the American Schools of Oriental Research,* (331), 1-10.

BONZON, J. (2004) Die spätbronzezeitlichen Lanzenspitzen-Gussformen von Zug-Sumpf - eine petrographische Studie, in I. BAUER, B. RUCKSTUHL & J. SPECK *Zug-Sumpf: Die Funde der Grabungen 1923-37*, Zug, Kantonales Museum für Urgeschichte. 144-49.

BORGNA, E. (1999) The North Adriatic Regions Between Europe and The Aegean World (12th-8th CA.): Social Strategies and Symbols of Power in the Long-Distance Exchange, in R.-G. Z. M. KOLLOQUIUM (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 151-83.

BORIĆ, D. (Ed.) (2009) *Archaeology and memory***,** Oxford, Oxbow.

BORRELLO, M. A. (1992*) Hauterive-Champréveyres, 6. La céramique du Bronze final : zones D et E*, Saint-Blaise, Editions du Ruau.

BORRELLO, M. A. (1993) Hauterive-Champréveyres, 7. La céramique du Bronze final : zones A et B, Neuchâtel, Musée cantonal d'archéologie.

BOULUD-GAZO, S. (2011) The discovery of a new Tachlovice sword at Pont-sur-Seine, Aube, France, in M. UCKELMANN & M. MÖDLINGER (Eds.) *Bronze age warfare : manufacture and use of weaponry***,** Oxford, Archaeopress. 133-52.

BOUYER, M. & BOISAUBERT, J.-L. (1992) La nécropole de l'âge du Bronze de Murten/Löwenberg, *Archäologie der Schweiz,* 15 (2), 68-73.

BOUZEK, J. (1993) The shifts of the amber route, in C. W. BECK, J. BOUZEK & D. DRESLEROVÁ (Eds.) *Amber in archaeology : proceedings of the Second International Conference on Amber in Archaeology, Liblice 1990***,** Praha, Czech Republic, Institute of Archaeology, Czech Academy of Sciences. 141-46.

BOUZEK, J. (1994) Late Bronze Age Greece and the Balkans: a review of the present picture, *The Annual of the British School at Athens,* 89, 217-34.

BOUZEK, J. (1997) *Greece, Anatolia and Europe: cultural interrelations during the Early Iron Age*, Jonsered, Paul Åströms Förlag.

BOUZEK, J. (2007) The amber route, Apollo and the Hyperboreans, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 357-62.

BOWSER, B. J. (2004) Prologue: Toward an Archaeology of Place, *Journal of Archaeological Method and Theory,* 11 (1), 1-3.

BOYD, R. & RICHERSON, P. J. (2005) *The origin and evolution of cultures,* Oxford, Oxford University Press.

BRADLEY, R. (1990) *The passage of arms : an archaeological analysis of prehistoric hoards and votive deposits*, Cambridge, Cambridge University Press.

BRADLEY, R. (2002) Death and the regeneration of life: a new interpretation of house urns in Northern Europe, *Antiquity,* 76, 372-77.

BRADLEY, R. (2005) *Ritual and domestic life in prehistoric Europe*, London, Routledge.

BRADLEY, R. & SMITH, A. C. (2007) Questions of Context: A Greek Cup from the River Thames, in C. GOSDEN, H. HAMEROW, P. DE JERSEY & G. LOCK (Eds.) *Communities and connections : essays in honour of Barry Cunliffe***,** Oxford, Oxford University Press. 30-42.

BRADLEY, R. & WILLIAMS, H. (Eds.) (1998) The Past in the Past: the re-use of ancient monuments, *World archaeology*, 30 (1).

BREM, H., BOLLIGER, S. & PRIMAS, M. (1987) *Die römische und spätbronzezeitliche Besiedlung*, Eschenz, Insel Werd 3, Zürich, Abt. Ur- und Frühgeschichte der Universität Zürich.

BRESTRICH, W. & WAHL, J. (1998) *Die mittel- und spätbronzezeitlichen Grabfunde auf der Nordstadtterrasse von Singen am Hohentwiel*, Stuttgart, Komm. Konrad Theiss Verlag.

BRILL, R. H. (1992) Chemical Analyses of some Glasses from Frattesina, *Journal of Glass Studies,* 34, 11-22.

BROODBANK, C. (1993) Ulysses without Sails: Trade, Distance, Knowledge and Power in the Early Cyclades, *World archaeology,* 24 (3), 315-31.

BROSSEDER, U. (2002) Ornamentik als Hinweis auf Kontakte während der Hallstattzeit, in A. LANG & V. SALAČ (Eds.) *Fernkontakte in der Eisenzeit*, Praha, Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik. 304-08.

BROWN, E. J. (1995) *Traditional metalworking in Kenya,* Oxford, Oxbow.

BRÜCK, J. (1999) Houses, lifecycles and deposition on Middle Bronze Age settlements in southern England, *Proceedings of the Prehistoric Society,* 65, 145-66.

BRÜCK, J. (2006) Death, Exchange and Reproduction in the British Bronze Age, *European Journal of Archaeology,* 9 (1), 73-101.

BRUN, P. (1992) La place du Jura franco-suisse dans l'économie-monde méditerranéenne au Premier âge du Fer: essai de modélisation, in G. KAENEL & P. CURDY (Eds.) *L'âge du Fer dans le Jura : actes du 15e colloque de l'Association française pour l'étude sur l'âge du Fer, Pontarlier (France) et Yverdon-les-Bains (Suisse), 9-12 mai 1991***,** Lausanne, Bibliothèque historique vaudoise. 189-205.

BRZEZIŃSKI, W. (1992) Recent developments in wetland archaeology in Poland, in B. COLES (Ed.) *The Wetland revolution in prehistory*, Exeter, Department of History and Archaeology University of Exeter. 73-79.

BUCHLI, V. A. (2000) Interpreting Material Culture: The Trouble With Text, in J. THOMAS (Ed.) *Interpretive archaeology : a reader***,** London, Leicester University Press. 363-76.

BUCHLI, V. A. (2004) Material Culture: Current Problems, in L. MESKELL & R. W. PREUCEL (Eds.) *A companion to social archaeology***,** Oxford, Blackwell. 179-94.

BUGAJ, E. (2007) Etruscan systems of a goods exchange and communication routes including regions located north of the Alps: outline of the issue, in J. BARON & I. LASAK (Eds.) *Long Distance Trade in the Bronze Age and Early Iron Age***,** Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego. 293-314.

BUKOWSKI, Z. (1982) Osiedle otwarte kultury łużyckiej w Grzybianych, woj. Legnicjie w świetle dotychczasowych badań. Open settlement of the Lusatian Culture in the light of recent excavation., *Pamiętnik Muzeum Miedzi,* 1, 13-29.

BUKOWSKI, Z. (1988) Critically about the so-called Amber Route in the Odra and Vistula river basins in the Early Iron Age, *Archaeologia Polona,* 28, 71-122.

BUKOWSKI, Z. (2002) Znaleziska bursztynu w zespołach z epoki brązu i z wczesnej epokie żelaza z dorzecza Odry oraz Wisły, Warszawa, Wydawnictwo Instytutu Archeologii i Etnologii PAN.

BURGA, C. A. (1988) Swiss Vegetation History during the Last 18 000 Years, *New Phytologist,* 110 (4), 581-602.

BURGA, C. A. (1991) Palynologische Hinweise zu nacheiszeitlichen Klimaschwankungen in den Zentralalpen: das mittelholozäne Wärmeoptimum, *Geographica Helvetica,* 46 (4), 178-82.

BÜRGI, Z. (1982) Die prähistorische Besiedlung von Toos-Waldi, *Archäologie der Schweiz,* 5 (2), 82-88.

BURŠIČ-MATIJAŠIĆ, K. (1998) The Monkodonja hillfort : a typological and statistical analysis of pottery finds from the middle Bronze age hillfort of Monkodonja near Rovinj, Pula, Arheološki muzej Istre.

BURZIGOTTI, R., DRAGONI, W., EVANGELISTI, C. & GERVASI, L. (2003) *The Role of Lake Trasimeno (central Italy) in the History of Hydrology and Water Management* Conference paper presented at International Water History Association 3rd International Conference, 11th-14th December, held at Alexandria.

BUSBY, C. (1997) Permeable and Partible Persons: a comparative analysis of gender and body in South India and Melanesia, *Journal of the Royal Anthropological Institute,* 3 (2), 261-78.

BUTRIMAS, A. (1998) Birzulio baseino ir Zemai i auk tumos akmens amziaus tyrin jim apzvalga, *Lietuvos archeologija,* 15, 107-31.

BUTRIMAS, A. (Ed.) (2001) *Baltic Amber***,** Vilnius, Vilnius Academy of Fine Arts.

CAMPBELL, S. F. (1983a) Attaining rank: a classification of kula shell valuables, in J. W. LEACH & E. LEACH (Eds.) *The Kula : new perspectives on Massim exchange***,** Cambridge, Cambridge University Press. 229-48.

CAMPBELL, S. F. (1983b) Kula in Vakuta: the mechanics of keda, in J. W. LEACH & E. LEACH (Eds.) *The Kula : new perspectives on Massim exchange***,** Cambridge, Cambridge University Press. 201-27.

CARDARELLI, A. & ACCORSI, C. A. (Eds.) (2004) *Parco archeologico e museo all'aperto della Terramara di Montale***,** Modena, Museo civico archeologico etnologico.

CARDARELLI, A., PACCIARELLI, M. & PALLANTE, P. (1997) Pesi da bilancia dell'età del bronzo?, in M. A. BERNABÒ BREA, A. CARDARELLI & M. CREMASCHI (Eds.) *La terramare : la piu antica civiltà padana***,** Modena Foro Boario, Electa. 629-42.

CAVERS, G. (2006) Late Bronze Age and Iron Age lake settlement in Scotland and Ireland: the development of the 'Crannog' in the North and West, *Oxford Journal of Archaeology,* 25 (4), 389-412.

CAVERS, G. (2007) The complexity of crannog taphonomy: old and new evidence, in SWAP (Ed.) *Archaeology from the wetlands : recent perspectives : proceedings of the 11th WARP conference, Edinburgh 2005***,** Edinburgh, Society of Antiquaries of Scotland. 243-52.

CHAPMAN, J. (1998) Ojectification, embodiment and the value of places and things, in D. W. BAILEY (Ed.) *The archaeology of value : essays on prestige and the processes of valuation***,** Oxford, Hedges. 106-30.

CHAPMAN, J. (2000) *Fragmentation in archaeology : people, places and broken objects in the prehistory of South Eastern Europe*, London, Routledge.

CHAPMAN, J. (2008) Approaches to Trade and Exchange in Earlier Prehistory (Late Mesolithic-Early Bronze Age), in A. JONES (Ed.) *Prehistoric Europe : theory and practice***,** Chichester, Wiley-Blackwell. 333-55.

CHAPMAN, J. & GAYDARSKA, B. (2007) *Parts and wholes : fragmentation in prehistoric context,* Oxford, Oxbow Books.

CHESSON, M. S. (2003) Households, Houses, Neighbourhoods and Corporate Villages: Modeling the Early Bronze Age as a House Society, *Journal of Mediterranean Archaeology,* 16 (1), 79-102.

CHILDE, V. G. (1925) *The dawn of European civilization,* London, Kegan Paul.

CHILDE, V. G. (2003) *Man makes himself,* London, Spokesman.

CHILDS, S. T. & KILLICK, D. (1993) Indigenous African Metallurgy: Nature and Culture, *Annual Review of Anthropology,* 22, 317-37.

CHOCHOROWSKI, J. (1993) *Ekspansja kimmeryjska na tereny europy strodkowej,* Krakow, Universytet Jagiellonski.

CHOCHOROWSKI, J., JANIAK, R. & KOVALJUKH, N. (2000) Dating of great fortified settlements in the basin of the Upper Warta and Prosna rivers, *Geochronometria,* 19, 47-52.

CICIRELLI, C. & ALBORE LIVADIE, C. (2008) Stato delle ricerche a Longola di Poggiomarino: quadro insediamentale e problematiche, in P. G. GUZZO (Ed.) *Nuove ricerche archeologiche nell'area vesuviana (scavi 2003-2006) : atti del convegno internazionale, 1-3 febbraio 2007*, Roma, L'Erma di Bretschneider. 473-87.

CICIRELLI, C. & ALBORE LIVADIE, C. (Eds.) (2012) *L'abitato protostorico di Poggiomarino : località Longola, campagne di scavo 2000-2004***,** Roma, "L'Erma" di Bretschneider.

CICIRELLI, C., ALBORE LIVADIE, C., COSTANTINI, L. & DELLE DONNE, M. (2008) La vite a Poggiomarino, Longola: un contesto di vinificazione dell'Età del Ferro, in P. G. GUZZO (Ed.) *Nuove ricerche archeologiche nell'area vesuviana (scavi 2003-2006) : atti del convegno internazionale, 1-3 febbraio 2007*, Roma, L'Erma di Bretschneider. 574-75.

CLELAND, H. F. (1927) Commerce and Trade Routes in Prehistoric Europe, *Economic Geography,* 3 (2), 232-38.

CLINE, E. H. (1994) *Sailing the wine-dark sea : international trade and the Late Bronze Age Aegean, Oxford*, Tempus Reparatum.

COFFYN, A., GOMEZ, J. & MOHEN, J.-P. (1981) *L'apogée du bronze atlantique : le dépôt de Vénat,* Paris, Picard.

COLES, B. & COLES, J. (1992) The wetland revolution: a natural event, in B. COLES (Ed.) *The Wetland revolution*

*in prehistory***,** Exeter, Department of History and Archaeology University of Exeter. 147-53.

COLES, J. & MINNITT, S. (1995) *'Industrious and fairly civilized' : the Glastonbury Lake Village,* (Repr. [with minor corr.] edition), Somerset, Somerset Levels Project.

COLES, J. M. & HARDING, A. F. (1979) *The Bronze Age in Europe: an introduction to the prehistory of Europe c. 2000-700 BC*, London, Methuen & Co.

COLLIS, J. (1997) *The European Iron age,* London, Routledge.

COLOMB, A. & MUYDEN, B. V. (1896) *Antiquités lacustres : album,* Lausanne, G. Bridel.

CONNERTON, P. (1989) *How societies remember,* Cambridge, Cambridge University Press.

CONOLLY, J. & LANE, M. (2006) *Geographical information systems in archaeology,* (Reprinted edition), Cambridge, Cambridge University Press.

CONSCIENCE, A.-C. (2001) Frühbronzezeitliche Uferdörfer aus Zürich-Mozartstrasse - eine folgenreiche Neudatierung., *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte,* 84, 147-57.

CORDIER, G. (2002) Le dépôt de l'âge du Bronze final des Châtelliers à Amboise (Indre-et Loire) / The late Bronze Age deposit "Les Châtelliers" at Amboise (Indre-et-Loire), *Revue Archeologique du Centre de la France*, 5-34.

CORDIER, G. & BOURHIS, J. R. (1996) *Le dépôt de l'âge du bronze final du Petit-Villatte à Neuvy-sur-Barangeon (Cher) et son contexte régional*, Joué-les-Tours, G. Cordier.

CORNAGGIA CASTIGLIONI, O. (1976) I "talismani a tavoletta" del Bronzo europeo. Esegesi della problematica ed inventario dei repertie italiani, *Natura,* 67 (3-4), 135-70.

COURTOIS, J.-C. (1968) *Découvertes archéologiques de l'âge du bronze et de l'âge du fer dans les Hautes-Alpes, 1955-1967*, Gap, A. Vollaire.

COWEN, J. D. (1968) The Hallstatt Sword of Bronze: on the Continent and in Britain, *Proceedings of the Prehistoric Society,* 33 (1967), 377-454.

CREMASCHI, M., PIZZI, C. & VALSECCHI, V. (2006) Water management and land use in the terramare and a possible climatic co-factor in their abandonment: The case study of the terramara of Poviglio Santa Rosa (northern Italy), *Quaternary International,* 151 (1), 87-98.

CREWE, L. (2007) *Early Enkomi : regionalism, trade and society at the beginning of the Late Bronze Age on Cyprus*, Oxford, Archaeopress.

CRIELAARD, J. P. (1999) Production, circulation and consumption of Early Iron Age Greek pottery (eleventh to seventh centuries BC), in J. P. CRIELAARD, V. STISSI & G. J. VAN WIJNGAARDEN (Eds.) *The complex past of pottery : production, circulation and consumption of Mycenaen and Greek pottery (sixteenth to early fifth centuries BC) : proceedings of the ARCHON international conference*, Amsterdam, J. C. Gieben. 49-81.

CULTRARO, M. (2006) I vaghi di ambra del tipo Tirinto nella protostoria italiana: nuovi dati dell'area Egeo-Balcanica, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1533-53.

CULTRARO, M. (2007) Evidence of amber in Bronze Age Sicily: local sources and the Balkan-Mycenaean connection, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 377-89.

CUNLIFFE, B. W. (1988) *Greeks, romans and barbarians : spheres of interaction*, New York, Methuen.

CUNLIFFE, B. W. (2001) *Facing the ocean : the Atlantic and its peoples, 8000 BC-1500 AD*, Oxford, Oxford University Press.

CUNLIFFE, B. W. (2008) *Europe between the oceans : themes and variations: 9000 BC-AD 1000*, New Haven, Yale University Press.

CURDY, P. (2008) La réduction du minerai de fer, in A. GALLAY (Ed.) *Des Alpes au Léman : images de la préhistoire***,** Gollion, Infolio. 302.

CURDY, P., MANUEL MOTTET, NICOUD, C., BAUDAIS, D., LUNDSTRÖM-BAUDAIS, K. & MOULIN, B. (1993) Brig-Glis/Waldmatte, un habitat alpin de l'âge du Fer Fouills archéologiques N9 en Valais, *Archäologie Schweiz,* 16 (4), 138-51.

CZEBRESZUK, J. (2007) Amber between the Baltic and the Aegean in the third and second millenia BC (an outline of major issues), in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 363-69.

DAMON, F. H. (1983) What moves the kula: opening and closing gifts on Woodlark Island, in J. W. LEACH & E.

LEACH (Eds.) *The Kula : new perspectives on Massim exchange***,** Cambridge, Cambridge University Press. 309-42.

DAVID-ELBIALI, M. & MOINAT, P. (2005) Saint-Prex (Vaud) à l'âge du Bronze: le cas d'une commune lémanique, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 88, 119-68.

DE CAPITANI, A., DESCHLER-ERB, S., LEUZINGER, U., MARTI-GRÄDEL, E. & SCHIBLER, J. (Eds.) (2002) *Die jungsteinzeitliche Seeufersiedlung Arbon, Bleiche 3 : Funde***,** Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau, Amt für Archäologie.

DE GUIO, A. (1991) Alla ricerca del potere: alcune prospettive italiane, in E. HERRING, R. WHITEHOUSE & J. WILKINS (Eds.) *The Archaeology of Power: Papers of the fourth Conference of Italian Archaeology*, London, Accordia Research Centre. 153-92.

DE MARINIS, R. C. (1999) Towards a Relative and Absolute Chronology of the Bronze Age in Northern Italy, *Notizie archeologiche bergomensi,* 7, 23 - 100.

DE MARINIS, R. C. (2000) Il museo civico archeologico Giovanni Rambotti di Desenzano del Garda : una introduzione alla preistoria del lago die Garda, Desenzano del Garda, Città die Desenzano del Garda.

DE MARINIS, R. C. (2009) Continuity and discontinuity in Northen Italy from the Recent to the Final Bronze Age: a view from North-Western Italy, in A. CARDARELLI, A. CAZZELLA, M. FRANGIPANE & R. PERONI (Eds.) *Scienze dell'Antichità 15: Atti del convegno internazionale "Le ragioni del cambiamento/Reasons for change***,** Rome, Edizioni Quasar. 535-45.

DE NAVARRO, J. M. (1925) Prehistoric Routes between Northern Europe and Italy Defined by the Amber Trade, *The Geographical Journal,* 66 (6), 481-503.

DEAL, M. (1985) Household Pottery Disposal in the Maya Highlands: An Ethnoarchaeological Interpretation, *Journal of Anthropological Archaeology,* 4, 243-91.

DELLA CASA, P. (2000) Mesolcina præhistorica : Mensch und Naturraum in einem Bündner Südalpental vom Mesolithikum bis in römische Zeit / Presenza umana ed ambiente naturale in una vallata sudalpina dei Grigioni dal mesolitico all'epoca romana, Bonn, Rudolf Habelt.

DELLA CASA, P. (2001) Natural and cultural landscapes: models of utilization of the Alpine area in the Non Valley (I), Mittelbünden (CH) and Maurienne (F), *Preistoria Alpina,* 35, 125-40.

DELLA CASA, P. (2002) *Landschaften, Siedlungen, Ressourcen : Langzeitszenarien menschlicher Aktivität in ausgewählten alpinen Gebieten der Schweiz, Italiens und Frankreichs*, Montagnac, Monique Mergoil.

DELLA CASA, P. (2007) Transalpine pass routes in the Swiss Central Alps and the strategic use of topographic resources, *Preistoria Alpina,* 42, 109-18.

DELLA CASA, P., BASS, B. & FEDELE, F. (1999) The Grisons Alpine Valleys survey 1995-97: Methods, results and prospects of an interdisciplinary research program, in P. DELLA CASA (Ed.) *Prehistoric alpine environment, society, and economy*, Universitätsforschungen zur prähistorischen Archäologie. 151-72.

DEREVENSKI, J. S. (2000) Rings of life: the role of early metalwork in mediating the gendered life course, *World archaeology,* 31 (3), 389 - 406.

DIETLER, M. (1997) The Iron Age in Mediterranean France: Colonial Encounters, Entanglements, and Transformations, *Journal of World Prehistory,* 11 (3), 269-358.

DIETLER, M. (2005) *Consumption and colonial encounters in the Rhône Basin of France : a study of early Iron Age political economy,* Lattes, Edition de l'Association pour le développement de l'archéologie en Languedoc-Roussillon.

DIETZ, U. L. (1998) *Spätbronze- und früheisenzeitliche Trensen im Nordschwarzmeergebiet und im Nordkaukasus*, Prähistorische Bronzefunde 16 / 2, Stuttgart, Franz Steiner Verlag.

DIXON, N. (2004) *The crannogs of Scotland,* Stroud, Tempus.

DIXON, N. (2007) Crannog structure and dating in Perthshire with particular reference to Loch Tay, in SWAP (Ed.) *Archaeology from the wetlands : recent perspectives : proceedings of the 11th WARP conference, Edinburgh 2005***,** Edinburgh, Society of Antiquaries of Scotland. 253-65.

DOBRES, M.-A. (1999) Technology's links and *Chaînes:* The Processual Unfolding of Technique and Technician, in M.-A. DOBRES & C. R. HOFFMAN (Eds.) *The social dynamics of technology practice, politics, and world views***,** Washington, Smithsonian Institution Press. 124-46.

DOBRES, M.-A. & ROBB, J. E. (2000) Agency in archaeology: paradigm or platitude?, in M.-A. DOBRES & J. E. ROBB (Eds.) *Agency in archaeology***,** London, Routledge.

DOONAN, O. P. & BAUER, A. A. (2010) Buying a Table in Erfelek: socialities of contact and community in the Black Sea region, in A. A. BAUER & A. S. AGBE-DAVIES (Eds.) *Social Archaeologies of Trade and Exchange: Exploring Relationships among People, Places, and Things***,** California, West Cost Press. 183-206.

DOPPLER, T., PILCHER, S., JACOMET, S., SCHIBLER, J. & RÖDER, B. (2010) Archäobiologie als sozialgeschichtliche Informationsquelle : ein bislang vernachlässigtes Forschungspotential, in E. CLAßEN, T. DOPPLER & B. RAMMINGER (Eds.) *Familie - Verwandtschaft - Sozialstrukturen: Sozialarchäologische Forschungen zu neolithischen Befund***,** Kerpen-Loogh, Welt und Erde. 119-39.

DORE, A. (2004) Coppia di morsi con montanti a cavallino, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 604.

DRACK, W. (1958) *Aeltere Eisenzeit der Schweiz : Kanton Bern*, Basel, Birkhäuser.

DRACK, W. (1973) Waffen und messer der hallstattzeit aus dem Schweizerischen mitteland und Jura, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 57, 119-68.

DRACK, W. (1977) Die Bronzegefässe der Hallstattzeit aus dem schweizerischen Mittelland und Jura, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 60, 103-20.

DU GARDIN, C. (1986) La parure d'ambre à l'âge du Bronze en France, *Bulletin de la Société préhistorique française*, 546-88.

DU GARDIN, C. (1996) L'Ambre en France au Bronze Ancien: données nouvelles, in C. MORDANT & O. GAIFFE (Eds.) *Cultures et Sociétées du Bronze Ancien en Europe*, Éditions du Comité des Travaux historiques et scientifiques. 189-95.

DU GARDIN, C. (1993) The Circulation of Amber in Prehistoric Europe, in C. SCARRE & F. HEALY (Eds.) *Trade and exchange in Prehistoric Europe : proceedings of a conference held at the University of Bristol, April 1992***,** Oxford, Oxbow Books in association with the Prehistoric Society and the Société Préhistorique Française. 131-33.

DU GARDIN, C. (2002) L'ambre et sa circulation dans L'Europe protohistorique, in J. GUILAINE (Ed.) *Matériaux, productions, circulations du Néolithique à l'Âge du Bronze***,** Paris, Errance. 213-35.

DULAR, J. (1999) Höhensiedlungen in Zentralslowenien von der Kupfer- bis zur Eisenzeit - Bericht über ein Forschungsprojekt, *Praehistorische Zeitschrift,* 74, 129-153.

DUNNING, C. & RYCHNER, V. (1994) Archäologische Untersuchungen zum Übergand von der Bronze- zur Eisenzeit in der Westschweiz, in P. SCHAUER (Ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus*, Bonn, Universitätsverlag Regensburg / Rudolf Habelt. 63-97.

DURCZEWSKI, D. (1960) Grodzisko kultury łużyckiej w Smuszewie, *Z Otchłani Wieków,* 26, 218-24.

DURCZEWSKI, D. (1985) *Gród ludności kultury łużyckiej z okresu halsztackiego w Smuszewie, woj. pilskie*, Poznań, Muzeum Archeologiczne.

EARLE, T. K. (2002) The Bronze Age Economy of Thy: Finance in a Networked Chiefdom, in T. K. EARLE *Bronze Age economics : the first political economies*, Boulder (Colorado), Westview. 293-324.

EARLE, T. K. (2010) Exchange Systems in Prehistory, in C. D. DILLIAN & C. L. WHITE (Eds.) *Trade and Exchange: archaeological studies from History and Prehistory***,** New York, Springer. 205-17.

EARLE, T. K., BECH, J.-H., KRISTIANSEN, K., APERLO, P., KELERTAS, K. & STEINBERG, J. (1998) The Political Economy of Late Neolithic and Early Bronze Age Society: the Thy Archaeological Project, *Norwegian archaeological review,* 31 (1), 1-28.

EARLE, T. K. & KRISTIANSEN, K. (Eds.) (2010) Organizing Bronze age societies : the Mediterranean, Central Europe, and Scandinavia compared**,** Cambridge, Cambridge University Press.

EBERLI, U. (2010) *Die horgenzeitliche Siedlung Pfäffikon-Burg,* Zürich, Baudirektion Kanton Zürich.

EBERSBACH, R. (2009) Gachnang-Niederwil TG-Egelsee: Neuinterpretation der Baubefunde, *Jahrbuch der Archäologie Schweiz,* 92, 97-116.

EBERSBACH, R. (2010) Vom Entstehen und Vergehen. Überlegungen zur Dynamik von Feuchtbodenhäusern un -siedlungen, in H. SCHLICHTHERLE & I. MATUSCHIK (Eds.) *Vernetzungen : Aspekte siedlungsarchäologischer Forschung : Festschrift für Helmut Schlichtherle zum 60. Geburtstag***,** Freiburg im Breisgau, Lavori. 41-50.

EBERSBACH, R. (2013) Houses, households and settlements: architecture and living spaces, in F. MENOTTI & A. O'SULLIVAN (Eds.) *The Oxford Handbook*

*of Wetland Archaeology***,** Oxford, Oxford University Press. 283-301.

EBERSCHWEILER, B. (1990a) Blockbauten im späbronzeitlichen Dorf von Greifensee-Böschen, in M. HÖNEISEN (Ed.) *Die ersten Bauern : Pfahlbaufunde Europas*, Vol. 1**,** Zürich, Schweizerisches Landesmuseum. 193-200.

EBERSCHWEILER, B. (1990b) Die Türe von Robenhausen, in M. HÖNEISEN (Ed.) *Die ersten Bauern : Pfahlbaufunde Europas*, Vol. 1**,** Zürich, Schweizerisches Landesmuseum. 191-92.

EBERSCHWEILER, B. (2004) *Bronzezeitliches Schwemmgut vom "Chollerpark" in Steinhausen (Kanton Zug) : bemerkenswerte Holzfunde vom nördlichen Zugersee sowie weitere bronzezeitliche Hölzer von Fundplätzen an Gewässern der Zentral- und Ostschweiz*, Basel, Schweizerische Gesellschaft für Ur- und Frühgeschichte.

EBERSCHWEILER, B., HAFNER, A. & WOLF, C. (2006) Unterwasserarchäologie in der Schweiz. Bilanz und Perspektive aus den letzten 25 Jahren, in A. HAFNER, U. NIFFELER & U. RUOFF (Eds.) *Die neue Sicht : Unterwasserarchäologie und Geschichtsbild : Akten des 2. Internationalen Kongresses für Unterwasserarchäologie*, Basel, Archäologie Schweiz. 24-46.

EBERSCHWEILER, B., RIETHMANN, P. & RUOFF, U. (1987) Greifensee-Böschen ZH: Ein spätbronzezeitliches Dorf. Ein Vorbericht, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 70, 77-100.

EBERSCHWEILER, B., RIETHMANN, P. & RUOFF, U. (2007) *Das spätbronzezeitliche Dorf von Greifensee-Böschen : Dorfgeschichte, Hausstrukturen und Fundmaterial*, Zürich, Neue Medien.

EGGERT, M. K. H. (1988) Riesentumuli un Sozialorganisation. Vergleichende Betrachtungen zu den sogennanten "Fürstenhügeln" der späten Hallstattzeit, *Archäologisches Korrespondenzblatt,* 18 (3), 263-74.

EIBNER, C. (1973) Die urnenfelderzeitlichen Sauggefässe. Ein Beitrag zur morphologischen und ergologischen Umschreibung, *Prähistorische Zeitschrift,* 48, 144-99.

EIBNER, C. (1985) Die urnenfelderzeitliche Wallburg und das Gräberfeld ("In der Gans" / Burenberg), in H. WINDL (Ed.) *Ausgrabungen in Stillfried : Stratigraphie von der Eiszeit bis zur Gegenwart***,** Wien, Nö Landesmuseum. 31-37.

EIBNER, C. (1999) Some experiments with a replica of an Urnfield Culture bronze razor of Herrnbaumgarten Type, in E. JEREM & I. POROSZLAI (Eds.) *Archaeology of the bronze and iron age : experimental archaeology, environmental archaeology, archaeological parks*, Budapest, Archaeolingua. 265-66.

ELES MASI, P. V. (1986) *Le fibule dell'Italia settentrionale*, Prähistorische Bronzefunde 14 / 5, München, C. H. Beck.

EVANS, J. A., CHENERY, C. A. & FITZPATRICK, A. P. (2006) Bronze Age childhood migration of individuals near Stonehenge, revealed by strontium and oxygen isotope tooth enamel analysis, *Archaeometry,* 48 (2), 309-21.

FALKENSTEIN, F. (2005) Zu den Gewässerfunden der älteren Urnenfelderzeit in Süddeutschland, in B. HÄNSEL & B. HOREJS (Eds.) *Interpretationsraum Bronzezeit : Bernhard Hänsel von seinen Schülern gewidmet***,** Bonn, Rudolf Habelt. 491-504.

FALKENSTEIN, F. (2011) Zu Struktur und Deutung älterurnenfelderzeitlicher Hortfunde im nordalpinen Raum, in U. L. DIETZ & A. JOCKENHÖVEL (Eds.) *Bronzen im Spannungsfeld zwischen praktischer Nutzung und symbolischer Bedeutung : Beiträge zum internationalen Kolloquium am 9. und 10. Oktober 2008 in Münster***,** Stuttgart, Steiner. 71-105.

FISCHER, C. (1993) Zinnachweis auf Keramik der Spätbronzezeit, *Archäologie der Schweiz,* 16 (1), 17-24.

FISCHER, C. (1997) *Innovation und Tradition in der Mittel- und Spätbronzezeit : Gräber und Siedlungen in Neftenbach, Fällanden, Dietikon, Pfäffikon und Erlenbach*, Zürich, Fotorotar AG/Druck Kommunikation Verlag.

FISCHER, C. (1998) Symbolische Handlungen und Bestattungsbräuche in der Bronzezeit, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 309-25.

FISCHER, C. & KAUFMANN, B. (1994) *Bronze, Bernstein und Keramik : Urnengräber der Spätbronzezeit in Reinach BL,* Liestal, Amt für Museen und Archäologie BL..

FISCHER, V. (2005) La Station de Grandson-Corcelettes a l'Age du Bronze Final, *Revue historique vadoise,* 113, 153-67.

FISCHER, V. (2011) The deposition of bronzes at Swiss lakeshore settlements: new investigations, *Antiquity,* 85 (330), 1298-311.

FISCHER, V. (2012) *Les bronzes en contexte palafittique sur les rives du Léman et des Trois-Lacs (Suisse*

occidentale), Lausanne, Musée cantonal d'archéologie et d'histoire.

FISHER, P., FARRELLY, C., MADDOCKS, A. & RUGGLES, C. (1997) Spatial Analysis of Visible Areas from the Bronze Age Cairns of Mull, *Journal of Archaeological Science,* 24 (7), 581-92.

FITZPATRICK, A. (2009) In his hands and in his head: The Amesbury Archer as a metalworker, in P. CLARK (Ed.) *Bronze Age connections : cultural contact in prehistoric Europe*, Oxford, Oxbow Books. 176-88.

FLETCHER, R. N. (2007) *Patterns of imports in Iron Age Italy,* Oxford, British Archaeological Reports.

FOGEL, J. & LANGER, J. L. (1999) Europejskie "Idole chlebkowate" z wczesnej epoki brązu. Próba nowej interpretacji trésci metodami matematycznymi, *Folia Praehistorica Posnaniensia,* 9, 79-133.

FONTIJN, D. R. (2002) *Sacrificial landscapes : cultural biographies of persons, objects and 'natural' places in the Bronze Age of the southern Netherlands, c. 2300-600 B.C.*, Leiden, University of Leiden.

FONTIJN, D. R. (2009) Land at the other end of the sea? Metalwork circulation, geographical knowledge and the significance of British/Irish imports in the Bronze Age of the Low Countries, in P. CLARK (Ed.) *Bronze Age connections : cultural contact in prehistoric Europe*, Oxford, Oxbow Books. 129-48.

FONTIJN, D. R. (2007) The significance of 'invisible' places, *World archaeology,* 39 (1), 70-83.

FONTIJN, D. R. (2010) *Living near the dead : the barrow excavations of Rhenen-Elst: two millennia of burial and habitation on the Utrechtse Heuvelrug*, Leiden, Sidestone.

FORD, D., GOODWIN, J., BOOTHROYD, N., ABBY, R., COOK, B. & YOUNGS, S. (1998) A prehistoric Excalibur and other artefacts of diverse dates: a catalogue of selected finds from Staffordshire recovered through metal detecting, *West Midlands Archaeology,* 41, 36-48.

FORENBAHER, S. (1995) Trade and Exchange in Late Bronze and Early Iron Age Croatia, in B. HÄNSEL (Ed.) *Handel, Tausch und Verkehr im bronze- und früheisenzeitlichen Südosteuropa*, München, Südosteuropa-Gesellschaft. 269-82.

FOSTER, G. M. (1960) Life-Expectancy of Utilitarian Pottery in Tzintzuntzan, Michoacan, Mexico, *American Antiquity,* 25 (4), 606-09.

FOWLER, C. (2004) *The archaeology of personhood : an anthropological approach*, London, Routledge.

FREDENGREN, C. (2002) *Crannnogs: A Study of People's Interaction with Lakes, with Particular Reference to Lough Gara in the North-west of Ireland*, Dublin, Wordwell.

FREDENGREN, C. (2011) Where Wandering Water Gushes - the Depositional Landscape of the Mälaren Valley in the Late Bronze Age and Earliest Iron Age of Scandinavia, *Journal of Wetland Archaeology,* 10, 109-35.

FREESTONE, I. C. (2001) Post-Depositional Changes in Archaeological Ceramics and Glasses, in D. R. BROTHWELL & A. M. POLLARD (Eds.) *Handbook of archaeological sciences***,** Chichester, John Wiley. 615-25.

FREI, B. (1955) Zur Datierung der Melauner Keramik, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 15, 129-73.

FREI, K. M., FREI, R., MANNERING, U., GLEBA, M., NOSCH, M. L. & LYNGSTRØM, H. (2009) Provenance of ancient textiles - a pilot study evaluating the strontium isotope system in wool, *Archaeometry,* 51 (2), 252-76.

FREY, O.-H. (1991) I primi principi Celti nel VI secolo a.C., in S. MOSCATI, O.-H. FREY, V. KRUTA, B. RAFTERY & M. SZABÓ (Eds.) *I Celti***,** Milano, Bompiani. 75-92.

FREY, O.-H. & ROTH, H. (Eds.) (1983) *Glasperlen der vorrömischen Eisenzeit I***,** Mainz am Rhein, Philipp von Zabern.

FREY, O.-H., ROTH, H. & DOBIAT, C. (Eds.) (1987) *Glasperlen der vorrömischen Eisenzeit II: Ringaugenperlen und verwandte Perlengruppen*, Mainz am Rhein, Philipp von Zabern.

FRIEMAN, C. J. (2010) Imitation, identity and communication: The presence and problems of skeuomorphs in the Metal Ages, in B. V. ERIKSEN (Ed.) *Lithic technology in metal using societies*, Højbjerg, Jutland Archaeological Society. 33-44.

FRIEMAN, C. J. (2012) Going to pieces at the funeral: Completeness and complexity in early Bronze Age jet 'necklace' assemblages, *Journal of Social Archaeology,* 12 (3), 334-55.

GACKOWSKI, J. (1993a) Historia i stan badań osad "palowych" na pomorzu, *Acta Universitatis Nicolai Copernici Archaeologia,* 21 (249), 69-85.

GACKOWSKI, J. (1993b) O potrzebie przeproawzenia systematycznych badań archeologicznych na osiedlach

nawodnych w północno-wschodniej polsce, *Acta Universitatis Nicolai Copernici Archaeologia,* 21 (249), 51-67.

GACKOWSKI, J. (1995) Relikty zabudowy mieszkalno-obronnej osiedla nawodnego kultury kurhanów zachodniobałtyjskich w mołtajnach, woj. Olsztyn (Stan 1.): charakterystyka planigraficzno-stratygraficzna zalegania struktur drewnianych i próba ich rekonstrukcji, *Acta Universitatis Nicolai Copernici Archaeologia,* 24 (287), 7-46.

GACKOWSKI, J. (2000) On the Dating and Cultural Ascpects of the West Baltic Barrow Culture Lake Dwellings, in A. KOLA (Ed.) *Studies in lake dwellings of the west baltic barrow culture***,** Toruń, Wydawnictwo Uniwersytetu Mikołaja Kopernika. 9-63.

GACKOWSKI, J. & JABŁOŃSKI, Z. (1993) Sprawozdanie z badań archeologicznych przeprowadzonych w 1987 roku na wczesnośredniowiecznej osadzie "palowej" w parsęcku, GM. szczecinek (stanowisko 2), *Acta Universitatis Nicolai Copernici Archaeologia,* 21 (249), 115-34.

GALANAKI, I., TOMAS, H., GALANAKIS, Y. & LAFFINEUR, R. (Eds.) (2007) *Between the Aegean and Baltic seas : prehistory across borders : proceedings of the International Conference "Bronze and early iron age interconnections and contemporary developments between the Aegean and the regions of the Balkan Peninsula, Central and Northern Europe"*, University of Zagreb, 11-14 April 2005**,** Liège, Université de Liège.

GAMBARI, F. M. (2004) I signori del commercio sulle vie d'acqua. Il ruolo degli scambi nella cultura di Golasecca, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 304-13.

GAMPER, M. (1981) Heutige Solifluktionsbeträge von Erdströmen und klimamorphologische Interpretation fossiler Böden, *Ergebnisse der wissenschaftlichen Untersuchungen im Schweizerischen Nationalpark*, Zürich, Geographisches Institut. 355-443.

GAUTHIER, E. (2003) Étude de la variabilité de la composition des dépôts de bronzes, en france orientale, aux Xe et IXe siècles avant notre ère, *Revue archéologique de l'Est,* 52, 19-44.

GEDL, M. (1981) *Die Rasiermesser in Polen*, Prähistorische Bronzefunde 8 / 4, München, C. H. Beck.

GEDL, M. (1984) *Die Messer in Polen*, Prähistorische Bronzefunde 7 / 4, München, C. H. Beck.

GEDL, M. (1991) *Die Hallstatteinflüsse auf den polnischen Gebieten in der Früheisenzeit,* Warszawa, Universytet Jagiellonski Panstwowe Wydawnictwo Naukowe.

GEDL, M. (1995) *Die Sicheln in Polen*, Prähistorische Bronzefunde 18 / 4, Stuttgart, Franz Steiner Verlag.

GEDL, M. (2001) *Die Bronzegefässe in Polen*, Prähistorische Bronzefunde 2 / 15, Stuttgart, Franz Steiner Verlag.

GEDL, M. (2009) *Die Lanzenspitzen in Polen*, Prähistorische Bronzefunde 5 / 3, Stuttgart, Franz Steiner.

GELL, A. (1998) *Art and agency : an anthropological theory*, Oxford, Clarendon Press.

GENTILI, G. V. (2003) *Verucchio villanoviana : il sepolcreto in località le pegge e la necropoli al piede della Rocca Malatestiana*, Roma, Giorgio Bretschneider.

GEORGIADIS, M. & GALLOU, C. (Eds.) (2009) *The past in the past : the significance of memory and tradition in the transmission of culture*, Oxford, Archaeopress.

GERDSEN, H. (1986) *Studien zu den Schwertgräbern der älteren Hallstattzeit,* Mainz am Rhein, Philipp von Zabern.

GERLOFF, S. (1975) *The early Bronze Age daggers in Great Britain and a reconsideration of the Wessex culture*, Prähistorische Bronzefunde 6 / 2, München, Beck.

GERRITSEN, F. (1999) To Build and to Abandon. The Cultural Biography of Late Prehistoric Houses and Farmsteads in the Southern Netherlands, *Archaeological dialogues : Dutch perspectives on current issues in archaeology,* 6 (2), 78-114.

GERRITSEN, F. (2003) Local identities : landscape and community in the late prehistoric Meuse-Demer-Scheldt region, *Amsterdam archaeological studies 9*, Amsterdam, Amsterdam University Press.

GERRITSEN, F. (2008) Domestic Times: Houses and Temporalities in Late Prehistoric Europe, in A. JONES (Ed.) *Prehistoric Europe : theory and practice***,** Chichester, Wiley-Blackwell. 143-61.

GERSBACH, E. (1995) *Baubefunde der Perioden IVc-IVa der Heuneburg : Text und Tafeln*, Mainz am Rhein, Verlag Philipp von Zabern.

GERSBACH, E. & BOOM, H. V. D. (1996) *Baubefunde der Perioden IIIb-Ia der Heuneburg,* Mainz am Rhein, Verlag Philipp von Zabern.

GIRAUDI, C., MAGNY, M., ZANCHETTA, G. & DRYSDALE, R. N. (2011) The Holocene climatic evolution of Mediterranean Italy: A review of the continental geological data, *The Holocene,* 21 (1), 105-15.

GNEPF HORISBERGER, U. (2003) Die bronze- und hallstattzeitliche Fundstelle Baar ZG-Martinspark, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 86, 55-113.

GOLLNISCH-MOOS, H. (1999) *Haus- und Siedlungsstrukturen der spätestbronzezeitlichen Siedlung,* Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

GONZÁLEZ-RUIBAL, A. (2006) House societies vs. kinship-based societies: An archaeological case from Iron Age Europe, *Journal of Anthropological Archaeology,* 25 (1), 144-73.

GÖRMER, G. (2006) Bronzezeitliche Depots in Mitteleuropa und ihre Deutung, *Ethnographisch-Archäologische Zeitschrift,* 47 (3), 289-98.

GÓRSKI, J. & MAKAROWICZ, P. (2007) Reception of Transcarpathian influence in Trzciniec cultural circle as a sign of long-distance exchange contacts, in J. BARON & I. LASAK (Eds.) *Lond Distance Trade in the Bronze Age and Early Iron Age*, Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego. 101-16.

GOSDEN, C. (1985) Gifts and Kin in Early Iron Age Europe, *Man,* 20 (3), 475-93.

GOSDEN, C. (2005) What Do Objects Want?, *Journal of Archaeological Method and Theory,* 12 (3), 193-211.

GOSDEN, C. & LOCK, G. (1998) Prehistoric Histories, *World archaeology,* 30 (1), 2-12.

GOSDEN, C. & MARSHALL, Y. (1999) The cultural biography of objects, in C. GOSDEN & Y. MARSHALL (Eds.) *The Cultural Biography of Objects*, Vol. 31.2**,** London, Routledge. 169-78.

GOSLAR, T. (2000) Absolute Radiocarbon Dating of the Lake Dwelling from Bogaczewo (Varmian-Masurian Voivodeship), in A. KOLA (Ed.) *Studies in lake dwellings of the west baltic barrow culture***,** Toruń, Wydawnictwo Uniwersytetu Mikołaja Kopernika. 81-88.

GRATTAN, J. P. (2010) Testing Eventful Archaeologies: Eventful Archaeology and Volcanic "Disasters", in D. J. BOLENDER (Ed.) *Eventful archaeologies : new approaches to social transformation in the archaeological record***,** Albany, State University of New York Press. 179-88.

GREEN, D., HASELGROVE, C. & SPRIGGS, M. (1978) *Social organisation and settlement : contributions from anthropology, archaeology and geography*, Oxford, British Archaeological Reports.

GRICIUVIENĖ, E. (2000) *Prehistoric Lithuania: archaeology exposition guide,* Vilnius, National Museum of Lithuania.

GROSS-KLEE, E. & SCHIBLER, J. (1995) Fäll- und Behaubeile, in W. E. STÖCKLI, U. NIFFELER & E. GROSS-KLEE (Eds.) *Die Schweiz vom Paläolithikum bis zum frühen Mittelalter : vom Neandertaler zu Karl dem Grossen***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 159-68.

GROSS, E., BROMBACHER, C., DICK, M., DIGGELMANN, K., HARDMEYER, B., JAGHER, R., RITZMANN, C., RUCKSTUHL, B., RUOFF, U., SCHIBLER, J., VAUGHAN, P. C. & WYPRÄCHTIGER, K. (1987) *Zürich "Mozartstrasse" : neolithische und bronzezeitliche Ufersiedlungen,* Zürich, Orell Füssli.

GROSS, E. & RITZMANN, C. (1990) Die neolithischen und bronzezeitlichen Siedlungen im Zürcher Seefeld, in M. HÖNEISEN (Ed.) *Die ersten Bauern : Pfahlbaufunde Europas*, Vol. 1**,** Zürich, Schweizerisches Landesmuseum. 161-76.

GUGGISBERG, M. (1991) Die Kontakte zwischen der frühkeltischen Schweiz und dem Süden: Eine Bestandesaufnahme, *Archäologie der Schweiz,* 14 (1), 75-88.

GUGGISBERG, M. (2011) La ceramica greca a nord delle Alpi. Contesto e fuzione, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 227-28.

GUREVICH, A. Y. (1968) Wealth and Gift-Bestowal among the Ancient Scandinavians, *Scandinavica : an international journal of Scandinavian studies,* 7, 126-38.

GUŠTIN, M. (2010) The Eastern Traces on the Slopes of the Eastern Alps: some examples of Iron Age contacts along the Danube and Sava Rivers, in S. BERECKI (Ed.) *Iron age communities in the Carpathian Basin*, Cluj-Napoca, Editura Mega. 9-14.

HAEVERNICK, T. E. (1975) Hallstatt Glasringe und Hagenauer Perlen, *Trierer Zeitschrift,* 38, 63-73.

HAEVERNICK, T. E. (1978) Urnenfelderzeitliche Glasperlen, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 35, 145-57.

HAFNER, A. & SUTER, P. J. (2000) *3400 : die Entwicklung der Bauerngesellschaften im 4. Jahrtausend v.Chr. am Bielersee aufgrund der Rettungsgrabungen von Nidau und Sutz-Lattrigen*, Bern, Berner Lehrmittel- und Medienverlag.

HAFNER, A. & SUTER, P. J. (2004) *5000 Jahre abgetaucht - aufgetaucht 1984-2004,* Bern, Archäologischer Dienst des Kantons Bern.

HAGL, M. (2008) *Ein urnenfelderzeitlicher Depotfund vom Bullenheimer Berg in Franken (Hort F)*, München, Verlag C.H. Beck.

HAHNEKAMP, C. (2012) Schwerter Datenbank. Bronze- und urnenfelderzeitliche Schwerter; available online at *http://chc.sbg.ac.at/schwerter/map.php*. [accessed 9 April, 2012].

HALLOWELL, A. I. (1955) *Culture and experience,* Philadelphia, University of Pennsylvania Press.

HAMILAKIS, Y. (1999) Stories from Exile: Fragments from the Cultural Biography of the Parthenon (or 'Elgin' Marbles), in C. GOSDEN & Y. MARSHALL (Eds.) *The cultural biography of objects*, Vol. 31.2**,** London, Routledge. 303-20.

HANDBERG, S. & JACOBSEN, J. K. (2011) Greek or Indigenous? From Potsherd to Identity in Early Colonial Encounters, in M. GLEBA & H. W. HORSNMUS (Eds.) *Communicating Identity in Italic Iron Age Communities***,** Oxford, Oxbow Books. 177-96.

HANNESTAD, L. (1999) The reception of Attic pottery by the indigenous peoples of Italy: the evidence from funerary contexts, in J. P. CRIELAARD, V. STISSI & G. J. VAN WIJNGAARDEN (Eds.) *The complex past of pottery : production, circulation and consumption of Mycenaen and Greek pottery (sixteenth to early fifth centuries BC) : proceedings of the ARCHON international conference*, Amsterdam, J. C. Gieben. 303-18.

HÄNSEL, B. (2007) Ägäische siedlungsstrukturen in Monkodonja/Istrien?, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 149-55.

HÄNSEL, B., MATOŠEVIC, D., MIHOVILIC, K., TERŽAN, P. & TERŽAN, B. (2009) Zur Sozialarchäologie der befestigten Siedlung von Monkodonja (Istrien) und ihrer Gräber am Tor, *Prähistorische Zeitschrift,* 84 (2), 151-80.

HÄNSEL, B. & TERŽAN, B. (2000) Ein bronzezeitliches Kuppelgrab ausserhalb der mykenischen Welt im Norden der Adria, *Praehistorische Zeitschrift,* 75 (2), 161-83.

HANSEN, S. (1991) *Studien zu den Metalldeponierungen während der Urnenfelderzeit im Rhein-Main-Gebiet*, Bonn, Rudolf Habelt.

HAPKA, R. (1995) Deux tombes à incinération du Bronze final à Cortaillod NE-Aux Murgiers, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 78, 160-62.

HARDING, A. F. (1971) The Earliest Glass in Europe, *Archeologické rozhledy,* 23 (2), 188-200.

HARDING, A. F. (1984) *The Mycenaeans and Europe,* London, Academic Press.

HARDING, A. F. (2000) *European societies in the Bronze Age,* Cambridge, Cambridge University Press.

HARDING, A. F. (2007) Interconnections between the Aegean and continental Europe in the Bronze and early Iron Ages: moving beyond scepticism, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 47-55.

HARDING, A. F. (2006) Enclosing and excluding in Bronze Age Europe, in A. F. HARDING, S. SIEVERS & N. VENCLOVÁ (Eds.) *Enclosing the past: inside and outside in prehistory***,** Sheffield, J.R. Collis. 97-115.

HARDING, A. F. (2008) Razors and male identity in the Bronze Age, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 191-95.

HARDING, A. F. (2011) Prestige Swords of the Bronze Age, in A. VIANELLO (Ed.) *Exotica in the Prehistoric Mediterranean***,** Oxford, Oxbow Books. 194-98.

HARDING, A. F. & HUGHES-BROCK, H. (1974) Amber in the Mycenaean World, *The Annual of the British School at Athens,* 69, 145-72.

HARDING, A. F. & LOCKER, A. (2004) *Sobiejuchy : a fortified site of the Early Iron Age in Poland,* Warsaw, Institute of Archaeology and Ethnology, Polish Academy of Science.

HARDING, A. F. & RĄCZKOWSKI, W. (2010) Living on the lake in the Iron Age: new results from aerial photographs, geophysical survey and dendrochronology on sites of Biskupin type, *Antiquity,* 84 (324), 386-404.

HÄRKE, H. (1979) *Settlement types and settlement patterns in the West Hallstatt province : an evaluation of evidence from excavated sites*, Oxford, British Archaeological Reports.

HÄRKE, H. (1989) Transformation or Collapse? Bronze Age to Iron Age Settlement in West Central Europe, in M. L. S. SØRENSEN & R. THOMAS (Eds.) *The Bronze Age-Iron Age transition in Europe : aspects of continuity and change in European societies, c. 1200 to 500 B.C*, Vol. 1**,** Oxford, B.A.R. 184-203.

HARRIS, O. J. T. (2013) Relational communities in prehistoric Britain, in C. WATTS (Ed.) *Relation Archaeologies: humans, animals, things***,** Abingdon, Routledge. 173-89.

HARTMANN, G., KAPPEL, I., GROTE, K. & ARNDT, B. (1997) Chemistry and Technology of Prehistoric Glass from Lower Saxony and Hesse, *Journal of Archaeological Science,* 24 (6), 547-59.

HASENFRATZ, A. & CASPARIE, W. A. (2006) *Niederwil, eine Siedlung der Pfyner Kultur: anorganische Funde, Palynologie, und Synthese,* Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

HASENFRATZ, A. & SCHNYDER, M. (1998) *Das Seebachtal : eine archäologische und paläoökologische Bestandesaufnahme,* Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

HASTORF, C. A. & JOHANNESSEN, S. (1991) Understanding Changing People/Plant Relationships in the Prehispanic Andes, in R. W. PREUCEL (Ed.) *Processual and postprocessual archaeologies : multiple ways of knowing the past***,** Carbondale, Center for Archaeological Investigations. 140-55.

HAUGHEY, F. (2007) Glimpsing the water, in SWAP (Ed.) *Archaeology from the wetlands : recent perspectives : proceedings of the 11th WARP conference, Edinburgh 2005***,** Edinburgh, Society of Antiquaries of Scotland. 119-25.

HAUGHEY, F. (2013) Rivers and lakes: a network of wetland highways, in F. MENOTTI & A. O'SULLIVAN (Eds.) *The Oxford Handbook of Wetland Archaeology***,** Oxford, Oxford University Press. 385-97.

HAWKES, C. (1954) Wenner-Gren Foundation Supper Conference: Archeological Theory and Method: Some Suggestions from the Old World, *American Anthropologist,* 56 (2), 155-68.

HAYDEN, B. & CANNON, A. (1983) Where the Garbage Goes: Refuse Disposal in the Maya Highlands, *Journal of Anthropological Archaeology,* 2, 117-63.

HEEB, J. (2009) Thinking Through Technology - an experimental approach to the copper axes from southeastern Europe, in T. L. KIENLIN & B. ROBERTS (Eds.) *Metals and societies : studies in honour of Barbara S. Ottaway***,** Bonn, Habelt. 415-20.

HEIERLI, J. (1886) Der Pfahlbau Wollishofen, *Mitteilungen der Antiquarischen Gesellschaft in Zürich,* 22 (1), 1-32.

HEIERLI, J. (1888*) Pfahlbauten, neunter Bericht*, Leipzig.

HELMS, M. W. (1988) *Ulysses' sail : an ethnographic odyssey of power, knowledge, and geographical distance*, Princeton, Princeton University Press.

HENDERSON, J. (1988a) Electron probe microanalysis of mixed-alkali glasses, *Archaeometry,* 30 (1), 77-91.

HENDERSON, J. (1988b) Glass production and Bronze Age Europe, *Antiquity,* 62 (236), 435-51.

HENDERSON, J. (1993) Chemical analyses of the glass and faience from Hauterive-Champréveyres, Switzerland, in A.-M. RYCHNER-FARAGGI (Ed.) *Hauterive-Champréveyres 9: Métal et parure au Bronze final***,** Neuchâtel, Musée cantonal d'archéologie : Service cantonal de la conservation des monuments et des sites. 111-17.

HENDERSON, J. (2000) *The science and archaeology of materials : an investigation of inorganic materials*, London, Routledge.

HENDERSON, J. C. (1998) Islets through Time: The Definition, Dating and Distribution of Scottish Crannogs, *Oxford Journal of Archaeology,* 17 (2), 227-44.

HENNIG, H. (1986) Einige bemerkungen zu den Urnenfeldern im Regensburger raum, *Archäologisches Korrespondenzblatt,* 16 (3), 289-301.

HERBICH, I. & DIETLER, M. (2009) Domestic Space, Social Life and Settlement Biography: Theoretical Reflections from the Ethnography of a Rural African Landscape, in M. C. BELARTE (Ed.) *L'espai domèstic i l'organizaticó de la societat a la protohistòria de la Mediterrània occidental (ler mil.lenni aC). Actes de la IV Reunió Internacional d'Arqueologia de Calafell*, Barcelona, Institut Català d'Arqueologia Clàssica. 11-23.

HERING, J. (1866) Die Pfahlbauten, *Baltische Studien,* 21, 9-20.

HERRMANN, F.-R. (1966) *Die Funde der Urnenfeldkultur in Mittel- und Südhessen*, Berlin, De Gruyter.

HERRMANN, F.-R. (2008) Zur Urnenfelderzeitlichen Befestigung des Glaubergs in der Wetterau, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 197-99.

HESKE, I. (2009) Siedlung, Waren und Wege - Eine Fallstudie aus dem östlichen Braunschweiger Land, in M. BARTELHEIM & H. STÄUBLE (Eds.) *Die wirtschaftlichen Grundlagen der Bronzezeit Europas***,** Rahden/Westf., Verlag Marie Leidorf GmbH. 321-37.

HEYDECK, J. (1888) Der Pfahlbau im Kownatken-See, *Sitzungsberichte der Alterumsgesellschaft Prussia,* 13, 72-74.

HEYDECK, J. (1889) Die Pfahlbauten im Szonstag- und Tulewo-See, *Sitzungsberichte der Alterumsgesellschaft Prussia,* 14, 127-37.

HEYDECK, J. (1909) Pfahlbauten in Ostpreßen, *Sitzungsberichte der Alterumsgesellschaft Prussia,* 22, 194-202.

HINGLEY, R. (1997) Iron, ironworking and regeneration: a study of the symbolic meaning of metalworking in Iron Age Britain, in A. GWILT & C. HASELGROVE (Eds.) *Reconstructing Iron Age Societies: new approaches to the British Iron Age***,** Oxford, Oxbow Books. 9-18.

HINGLEY, R. (2006) Defining community: iron, boundaries and transformation in later prehistoric Britain, in A. F. HARDING, S. SIEVERS & N. VENCLOVÁ (Eds.) *Enclosing the past: inside and outside in prehistory***,** Sheffield, J.R. Collis. 116-25.

HINGLEY, R. (2009) Esoteric Knowledge? Ancient Bronze Artefacts from Iron Age Contexts, *Proceedings of the Prehistoric Society,* 75, 143-65.

HJELMROOS-ERICSSON, M. (1981) *Holocene development of Lake Wielkie Gacno area, north-western Poland*, unpublished thesis for Doctor of Philosophy, (Univeristy of Lund).

HOCHULI, S. (1991) Eine spätbronzezeitliche Messerklinge aus Arbon TG, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 74, 202-03.

HOCHULI, S. (1994) *Arbon-Bleiche : die neolithischen und bronzezeitlichen Seeufersiedlungen : Ausgrabungen 1885-1991*, Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

HOCHULI, S. & MAISE, C. (1998) Verkehr und Transport, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 299-306.

HOCHULI, S. & RYCHNER, V. (1998) Diverse Materialien, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 291-98.

HODDER, I. (1982a) *Symbols in action : ethnoarchaeological studies of material culture*, Cambridge, Cambridge University Press.

HODDER, I. (1982b) Theoretical Archaeology: A Reactionary View, in I. HODDER (Ed.) *Symbolic and Structural Archaeology***,** Cambridge, Cambridge University Press. 1-16.

HODDER, I. (1984) Archaeology in 1984, *Antiquity,* 58 (222), 25-32.

HODDER, I. (1985) Postprocessual Archaeology, in M. B. SCHIFFER (Ed.) *Advances in Archaeological Method and Theory*, Vol. 8**,** New York, Academic Press. 1-26.

HODDER, I. (1986) *Reading the past : current approaches to interpretation in archaeology*, Cambridge, Cambridge University Press.

HODDER, I. (Ed.) (1987a) *The archaeology of contextual meanings***,** Cambridge, Cambridge University Press.

HODDER, I. (1987b) The contribution of the long term, in I. HODDER (Ed.) *Archaeology as long-term history***,** Cambridge, Cambridge University Press. 1-8.

HODDER, I. (1989) This is not an article about material culture as text, *Journal of Anthropological Archaeology,* 8 (3), 250-69.

HODDER, I. (1991a) Interpretive Archaeology and Its Role, *American Antiquity,* 56 (1), 7-18.

HODDER, I. (1991b) *Reading the past : current approaches to interpretation in archaeology,* (2nd edition edition), Cambridge, Cambridge University Press.

HODDER, I. (1992a) Burials, Houses, Women and Men in the European Neolithic, in I. HODDER *Theory and Practice in Archaeology*, London, Routledge. 45-80.

HODDER, I. (1992b) Material Practice, Symbolism and Ideology, in I. HODDER *Theory and Practice in Archaeology*, London, Routledge. 201-12.

HODDER, I. (2000) Agency and individuals in long-term processes, in M.-A. DOBRES & J. E. ROBB (Eds.) *Agency in Archaeology***,** London, Routledge. 21-33.

HODDER, I. & LANE, P. (1982) A Contextual Examination of Neolithic Axe Distribution in Britain, in J. E. ERICSON & T. K. EARLE (Eds.) *Contexts for prehistoric exchange***,** New York, Academic Press. 213-35.

HODDER, I. & ORTON, C. (1976) *Spatial analysis in archaeology,* Cambridge, Cambridge University Press.

HOFMANN, P. (1991) Le Landeron NE, Les Carougets, Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte, 74, 240-41.

HOFMANN ROGNON, P. & DOSWALD, C. (2005) *Le Landeron - Les Carougets : vestiges protohistoriques, villa romaine, tombes et habitat médiévaux,* Hauterive, Service et musée cantonal d'archéologie de Neuchâtel.

HOHLBEIN, M. (2008a) *Die spätbronze- und urnenfelderzeitlichen Bronzemesser im mittleren und südlichen Westedutschland I*, unpublished thesis for Doctor of Philosophy, (Westfälischen Wilhelms-Universität zu Münster (Westf.)).

HOHLBEIN, M. (2008b) Urnenfelderzeitlichen vollgriffmesser der griffschemata Aub/Mirebeau-sur-Bèze und Ehingen/Bruchköbel, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 201-09.

HOLDERMANN, C.-S. & TROMMER, F. (2011) Organisation, Verfahrenstechniken und Arbeitsaufwand im spätbronzezeitlichen Metallhandwerk, in U. L. DIETZ & A. JOCKENHÖVEL (Eds.) *Bronzen im Spannungsfeld zwischen praktischer Nutzung und symbolischer Bedeutung : Beiträge zum internationalen Kolloquium am 9. und 10. Oktober 2008 in Münster***,** Stuttgart, Steiner. 117-29.

HOLE, F., FLANNERY, K. V. & NEELY, J. A. (1969) *Prehistory and human ecology of the Deh Luran plain : an early village sequence form Khuzistan, Iran,* Ann Arbor, University of Michigan Museum of Anthropology.

HOLSTEIN, D. (2003) *Der Kestenberg bei Möriken (AG) : Auswertung der Ausgrabungen 1950-1953 in der bronze- und eisenzeitlichen Höhensiedlung*, Basel, D. Holstein.

HOLZHAUSER, H., MAGNY, M. & ZUMBUÜHL, H. J. (2005) Glacier and lake-level variations in west-central Europe over the last 3500 years, *The Holocene,* 15 (6), 789-801.

HOOPER, B. & O'CONNOR, B. (1976) A Bronze Spearhead and its Shaft from the River Thames at Hammersmith, *Archaeological Journal,* 133, 33-37.

HOPERT, S. (1996) Frühe schiebengedrehte Keramik aus Südwestdeutschland und der Schweiz, *Archäologie der Schweiz,* 19 (1), 18-27.

HORMES, A., MÜLLER, B. U. & SCHLÜCHTER, C. (2001) The Alps with little ice: evidence for eight Holocene phases of reduced glacier extent in the Central Swiss Alps, *The Holocene,* 11 (3), 255-65.

HOSKINS, J. (1998) *Biographical objects : how things tell the stories of people's lives*, New York, Routledge.

HUGHES-BROCK, H. (1999) Mycenaean Beads: Gender and Social Contexts, *Oxford Journal of Archaeology,* 18 (3), 277-96.

HUGHES-BROCK, H. (2005) Amber and some other travellers in the Bronze Age Aegean and Europe, in A. DAKOURI-HILD & S. SHERRATT (Eds.) *Autochthon : papers presented to O.T.P.K. Dickinson on the occasion of his retirement***,** Oxford, Archaeopress. 301-16.

HUNDT, H.-J. (1978) Die Rohstoffquellen des europäischen Nordens und ihr Einfluss auf die Entwicklung des nordischen Stils, *Bonner Jahrbücher,* 178, 125-62.

HURCOMBE, L. (2008) Organics from inorganics: using experimental archaeology as a research tool for studying perishable material culture, *World archaeology,* 40 (1), 83-115.

HUTCHINSON, R. W. & BOARDMAN, J. (1954) The Khaniale Tekke Tombs, *The Annual of the British School at Athens,* 49, 215-28.

HÜTTEL, H.-G. (1981) *Bronzezeitliche Trensen in Mittel- und Osteuropa : Grundzüge ihrer Entwicklung*, Prähistorische Bronzefunde 16 / 2, München, C. H. Beck.

IACONO, F. (2013) Westernizing Aegean of LH III C, in M. E. ALBERTI & S. SABATINI (Eds.) *Exchange Networks and Local Transformations***,** Oxford, Oxbow Books. 60-79.

IAIA, C. (2013) Metalwork, rituals and the making of elite identity in central Italy at the Bronze Age-Iron Age transition, in M. E. ALBERTI & S. SABATINI (Eds.) *Exchange networks and local transformations***,** Oxford, Oxbow. 102-16.

ISMAIL-MEYER, K. & RENTZEL, P. (2004) Mikromorphologische Untersuchung der Schichtabfolge, in S. JACOMET, U. LEUZINGER, J. SCHIBLER & F. BOUCHET *Die jungsteinzeitliche Seeufersiedlung Arbon, Bleiche 3 :*

Umwelt und Wirtschaft, Frauenfeld, Amt für Archäologie. 66-80.

JACKSON, C. M. & NICHOLSON, P. T. (2010) The provenance of some glass ingots from the Uluburun shipwreck, *Journal of Archaeological Science,* 37 (2), 295-301.

JACOB-FRIESEN, G. (1967) Bronzezeitliche Lanzenspitzen Norddeutschlands und Skandinaviens, Hildesheim, August Lax.

JACOB, C. (1995) *Metallgefässe der Bronze- und Hallstattzeit in Nordwest-, West- und Süddeutschland*, Prähistorische Bronzefunde 2 / 9, Stuttgart, Franz Steiner Verlag,.

JACOMET, S., LEUZINGER, U., SCHIBLER, J. & BOUCHET, F. (2004) *Die jungsteinzeitliche Seeufersiedlung Arbon, Bleiche 3 : Umwelt und Wirtschaft,* Frauenfeld, Amt für Archäologie.

JANITS, L. (1959) Poselenija epochi neolita i rannego metala v priustje r. Emaigi**,** Tallinn, Akademija Nauk Estonskoj SSR.

JANTZEN, D. J. & SCHMIDT, J. P. (1999) Ein Hortfund der Periode III aus Neustrelitz, Lkr. Mecklenburg-Strelitz, *Bodendenkmalpflege in Mecklenburg-Vorpommern,* 47, 7-127.

JENNINGS, B. (2012a) Settling and moving: a biographical approach to interpreting patterns of occupation in LBA Circum-Alpine lake-dwellings, *Journal of Wetland Archaeology,* 12, 1-21.

JENNINGS, B. (2012b) When the Going Gets Tough...? Climatic or Cultural Influences for the LBA Abandonment of Circum-Alpine Lake-Dwellings, in J. KNIESEL, W. KIRLEIS, M. DAL CORSO, N. TAYLOR & V. TIEDTKE (Eds.) *Collapse or Continuity? Environment and Development of Bronze Age Human Landscapes. Proceedings of the International Workshop "Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes II"***,** Kiel, Rudolf Habelt. 85-99.

JENNINGS, B. (in print) Repair, Recycle or Re-use? Creating mnemonic devices through the modification of object biographies, *Cambridge Archaeological Journal,* 24 (1)

JIRÁŇ, L. (2002) *Die Messer in Böhmen*, Prähistorische Bronzefunde 7 / 5, Stuttgart, Franz Steiner Verlag.

JOCKENHÖVEL, A. (1971) *Die Rasiermesser in Mitteleuropa (Süddeutschland, Tschechoslowakei, Österreich, Schweiz)*, Prähistorische Bronzefunde 8 / 1, München, C. H. Beck'sche Verlagsbuchhandlung.

JOCKENHÖVEL, A. (1974a) Eine Bronzeamphore des 8. Jahrhunderts v. Chr. von Gevelinghausen, Kr. Meschede (Sauerland), *Germania,* (52), 16-54.

JOCKENHÖVEL, A. (1974b) Zu befestigten Siedlungen der Urnenfelderzeit aus Süddeutschland, *Fundberichte aus Hessen,* 14, 19-62.

JOCKENHÖVEL, A. (1980) Die Rasiermesser in Westeuropa (Westdeutschland, Niederlande, Belgien, Luxemburg, Frankreich, Grossbritannien und Irland), Prähistorische Bronzefunde 8 / 3, München, C. H. Beck.

JOCKENHÖVEL, A. (1986) Struktur und Organisation der Metallverarbeitung in urnenfelderzeitlichen Siedlungen Süddeutschlands, in D.-W. R. BUCK & B. GRAMSCH (Eds.) *Siedlung, Wirtschaft und Gesellschaft während der jüngeren Bronze- und Hallstattzeit in Mitteleuropa : internationales Symposium Potsdam April 1983*, Berlin, VEB Deutscher Verlag der Wissenschaft. 213-34.

JOCKENHÖVEL, A. (1990) Bronzezeitlicher Burgenbau in Mitteleuropa Untersuchungen zur Struktur frühmetallzeitlicher Gesellschaften, in T. BADER (Ed.) *Orientalisch-ägäische Einflüsse in der europäischen Bronzezeit*, Bonn, Rudolf Habelt. 209-28.

JOCKENHÖVEL, A. (1991) Räumliche Mobilität von Personon in der mittleren Bronzezeit des weslichen Mitteleuropa, *Germania,* 69 (1), 49-62.

JOCKENHÖVEL, A. & KUBACH, W. (1994) *Bronzezeit in Deutschland,* Stuttgart, Konrad Theiss.

JOCKENHÖVEL, A. & SMOLLA, G. (1975) Le dépôt de Juvincourt-Damary (Aisne), *Gallia Préhistoire,* 18, 290-313.

JOCKENHÖVEL, A. & WOLF, G. (1988) Paläometallurgische untersuchungen zur Bronze- und Eisenzeit im gebiet zwischen Mosel und Werra, *Jahrbuch des Römisch-Germanisches Zentralmuseum,* 35, 536-50.

JOHANSEN, K. L., LAURSEN, S. T. & HOLST, M. K. (2004) Spatial patterns of social organization in the Early Bronze Age of South Scandinavia, *Journal of Anthropological Archaeology,* 23 (1), 33-55.

JOHNSEN, H. & OLSEN, B. (1992) Hermeneutics and Archaeology: On the Philosophy of Contextual Archaeology, *American Antiquity,* 57 (3), 419-36.

JOHNSON, M. (1989) Conceptions of agency in archaeological interpretation, *Journal of Anthropological Archaeology,* 8 (2), 189-211.

JOHNSON, M. (1999) *Archaeological theory : an introduction*, Oxford, Blackwell.

JOHNSON, M. (2009) The Theoretical Scene, 1960-2000, in B. W. CUNLIFFE, C. GOSDEN & R. A. JOYCE (Eds.) *The Oxford handbook of archaeology***,** Oxford, Oxford University Press. 71-88.

JONES, A. (2002) *Archaeological theory and scientific practice,* Cambridge, Cambridge University Press.

JONES, A. (2007) *Memory and material culture,* Cambridge, Cambridge University Press.

JONES, A. (2010) Layers of meaning: Concealment, containment, memory and secrecy in the British Early Bronze Age, in D. BORIĆ (Ed.) *Archaeology and Memory***,** Oxford, Oxbow Books. 105-20.

JONES, M. R. (2007) *Oxhide ingots, copper production, and the Mediterranean trade in copper and other metals in the Bronze Age*, unpublished thesis for Master of Arts, (Texas A&M).

JONES, R. E., LEVI, S. T. & BETTELLI, M. (2005) Mycenaean Pottery in the Central Mediterranean: imports, imitations and derivatives, in R. LAFFINEUR & E. GRECO (Eds.) *Emporia : Aegeans in the Central and Eastern Mediterranean*, Liège, Université de Liège. 539-45.

JONES, R. E., LEVI, S. T. & VAGNETTI, L. (2002) Connections between the Aegean and Italy in the Later Bronze Age: the ceramic evidence, in V. KILIKOGLOU, A. HEIN & Y. MANIATIS (Eds.) *Modern trends in scientific studies on ancient ceramics : papers presented at the 5th European Meeting on Ancient Ceramics*, Oxford, Archaeopress. 171-84.

JOY, J. (2010) *Iron age mirrors : a biographical approach*, Oxford, Archaeopress.

JUNG, R. & MARASZEK, R. (2005) The European Bronze Age from a Greek perspective?, in R. LAFFINEUR (Ed.) *L'âge du bronze en Europe et en Méditerranée : sessions générales et posters / The bronze age in Europe and the Mediterranean : general sessions and posters*. Actes du XIVème Congrès UISPP, Oxford, Archaeopress. 115-18.

JURIŠIĆ, M. (2000) *Ancient shipwrecks of the Adriatic : maritime transport during the first and second centuries AD*, Oxford, Archaeopress.

KADROW, S. (2007) North of the Carpathians - the outskirts of the Aegean world?, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 323-29.

KAENEL, G. (2005) "Fürstensitze" und andere Siedlungszentren des 6. und 5. Jhs. v. Chr. in der Schweiz, in J. BIEL & D. KRAUSSE (Eds.) *Frühkeltische Fürstensitze : älteste Städte und Herrschaftszentren nördlich der Alpen : internationaler workshop zur keltischen Archäologie in Eberdingen-Hochdorf, 12. und 13. September 2003***,** Esslingen, folio-Verlag Dr. G. Wesselkamp. 48-56.

KAENEL, G. & KLAUSENER, M. (1990) Quelques tombes à incinération du Bronze final (Xe siècle av. J.-C.) à Vidy (Lausanne VD), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte,* 73 (51-82).

KAHANE, A. & MUELLER, M. (No Date) The Chicago Homer, Northwestern University. Available online at *http://digital.library.northwestern.edu/homer/html/application.html*. [accessed 17 October 2011].

KASISKI, F. W. (1869) Die Pfahlbauten in den ehemaligen Parsanzig-See bei Neustettin, *Baltische Studien,* 23, 77-102.

KASSEROLER, A. (1959) *Das Urnenfeld von Volders,* Innsbruck, Universitätsverlag Wagner.

KAUL, F. (1998) *Ships on bronzes : a study in bronze age religion and iconography*, Copenhagen, National Museum.

KAUL, F. (2004) Social and religious perceptions of the ship in Bronze Age Northern Europe, in P. CLARK (Ed.) *The Dover Bronze Age Boat in Context: Society and water transport in Prehistoric Europe***,** Oxford, Oxbow Books. 122-37.

KELLER, F. (1854) Die keltische Pfahlbauten in den Schweizerseen, *Mitteilungen der Antiquarischen Gesellschaft in Zürich,* 1, 65-100.

KELLER, F. (1866) *Pfahlbauten. Sechster Bericht*, Mitteilungen der Antiquarischen Gesellschaft in Zürich 15(2), Zürich.

KELLY, K. G. (2010) Arenas of Action: Trade as Power, Trade as Identity, in A. A. BAUER & A. S. AGBE-DAVIES (Eds.) *Social Archaeologies of Trade and Exchange: Exploring Relationships among People, Places, and Things***,** California, West Cost Press. 99-117.

KENT, S. (1984) *Analyzing activity areas : an ethnoarchaeological study of the use of space,* (1st edition), Albuquerque, University of New Mexico Press.

KERNER, M. (2001) Mondhörner. Urgeschichtliche Messgeräte, *Helvetia Archaeologica,* 32 (127/128), 82-136.

KERNER, M. (2004) Frühe astro-geodätische Messgeräte (II), *Geomatik Schweiz,* 2004 (2), 67-75.

KERNER, M. (2007) Das Mondorn vom Alpenquai Zürich, *Geomatik Schweiz,* 2007 (2), 65-69.

KEROUANTON, I. (1998) La production métallique des stations littorales immergées de Lac du Bourget (Savoie) à l'âge du Bronze Final, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". III : Production, circulation et consomation du bronze*, Paris, Editions du Comité des Travaux Historiques et Scientifiques. 87-102.

KEROUANTON, I. (2002) Le lac du Bourget (Savoie) à l'Âge du Bronze final : les groupes culturels et la question du groupe du Bourget, *Bulletin de la Société préhistorique française,* 99 (3), 521-61.

KESWANI, P. F. S. (2004) *Mortuary ritual and social hierarchy in Bronze Age Cyprus*, London, Equinox.

KIMMIG, P. (1975) Early Celts on the upper Danube: the excavations at the Heuneburg, in R. L. S. BRUCE-MITFORD (Ed.) *Recent archaeological excavations in Europe***,** London, Routledge & Kegan Paul. 32-64.

KIMMIG, W. (1981) Ein Grabfund der jüngeren Urnfelderzeit (Hallstatt B3) mit Eisenschwert von Singen am Hohentwiel, in R. PLEINER, H. HAEFNER & W. U. GUYAN (Eds.) *Frühes Eisen in Europa*, Schaffhausen, Peter Meili. 37-43.

KIMMIG, W. (1981) Ein Grabfund der jüngeren Urnenfelderzeit mit eisenschwert von Singen am Hohentwiel, *Fundberichte aus Baden-Württemberg,* 6, 93-119.

KIMMIG, W. (1983) Die greichische Kolonisation im westlichen Mittelmeergebiet und ihre Wirkung auf die Landschaften des westlichen Mitteleuropa, *Jahrbuch des Römisch-Germanisches Zentralmuseum,* 30, 5-78.

KIMMIG, W. (1988) *Das Kleinaspergle : Studien zu einem Fürstengrabhügel der frühen Latènezeit bei Stuttgart*, Stuttgart, Konrad Theiss.

KIMMIG, W. (1992) *Die "Wasserburg Buchau" : eine spätbronzezeitliche Siedlung*, Stuttgart, Konrad Theiss.

KIMMIG, W. (2000) *Die "Wasserburg Buchau" : Keramikfunde,* Stuttgart, K. Theiss.

KIMMIG, W. & BÖHR, E. (2000) *Importe und mediterrane Einflüsse auf der Heuneburg,* Mainz am Rhein, Philipp von Zabern.

KLUG-TREPPE, J. (2008) Verzierte Bronzemesser der Urnenfelderkultur im Oberrheingebiet, *Archäologische Nachrichten aus Baden,* 76/77, 22-23.

KLUGE, J. (1986) Ein Thrako-Kimmerischer Trensenknebel vom Rundem Berg bei Urach, Kreis Reutlingen, *Archäologisches Korrespondenzblatt,* 16, 413-17.

KNAPPETT, C. (2002) Photographs, Skeuomorphs and Marionettes, *Journal of Material Culture,* 7 (1), 97-117.

KNAPPETT, C., MALAFOURIS, L. & TOMKINS, P. (2010) Ceramics (as containers), in D. HICKS & M. C. BEAUDRY (Eds.) *The Oxford handbook of material culture studies***,** Oxford, Oxford University Press. 588-612.

KNIESEL, J. (2013) Long and close distance trade and exchange beyond the Baltic coast during the Early Iron Age, in M. E. ALBERTI & S. SABATINI (Eds.) *Exchange networks and local transformations***,** Oxford, Oxbow. 156-68.

KOHL, P. L. (1981) Materialist Approaches in Prehistory, *Annual Review of Anthropology,* 10 (1), 89-118.

KOLA, A. (Ed.) (2000) *Studies in lake dwellings of the west baltic barrow culture***,** Toruń, Wydawnictwo Uniwersytetu Mikołaja Kopernika.

KOLLING, A. (1968) *Späte Bronzezeit an Saar und Mosel,* Bonn, Rudolf Habelt.

KÖNINGER, J. (1997) Gemusterte Tonobjekte aus der Ufersiedlung Bodman-Schachen I - Zur Verbreitung und Chronologie der sogenannten "Oggetti enigmatici", in B. FRITSCH (Ed.) *Tradition und Innovation : prähistorische Archäologie als historische Wissenschaft : Festschrift für Christian Strahm***,** Rahden/Westf., Verlag Marie Leidorf. 429-68.

KÖNINGER, J. (1998) Oggelshausen "Bruckgraben" - Eine hallstattzeitliche Siedlung im südlichen Federseemoor, Gemeinde Oggelshausen, Kreis Biberach, *Archäologische Ausgrabungen in Baden-Württemberg,* 1997, 59-61.

KÖNINGER, J. (1999) Zum Fortgang der Untersuchungen in den hallstattzeitlichen Fundstellen im "Bruckgraben", Gemeinde Oggelshausen, Kreis Biberach, im südlichen Federseeried, *Archäologische Ausgrabungen in Baden-Württemberg,* 1998, 95-99.

KÖNINGER, J. (2000) Von Fischen, Fallen und Faschinen. Neues aus den hallstattzeitlichen Fundstellen von Oggelshausen-Bruckgraben, Kreis Biberach, *Archäologische Ausgrabungen in Baden-Württemberg,* 1999, 59-64.

KÖNINGER, J. (2001) Zum vorläufigen Abschluss der Sondagen in der eisenzeitlichen Fischfanganlage bei Oggelshausen-Bruckgraben, Kreis Biberach, *Archäologische Ausgrabungen in Baden-Württemberg,* 2000, 59-62.

KÖNINGER, J. (2001/2002) Oggelshausen-Bruckgraben - Fund und Befunde aus einer eisenzeitlichen Fischfanganlage im südlichen Federseeried, Gde. Oggelshausen, Krs Biberach, *Heimat- und Altertumsverein Heidenheim an der Brenz e.V.,* 2001/2002, 34-56.

KÖNINGER, J. (2006) *Die frühbronzezeitlichen Ufersiedlungen von Bodman-Schachen I : Befunde und Funde aus den Tauchsondagen 1982-1984 und 1986*, Stuttgart, Konrad Theiss.

KÖNINGER, J. (In Preparation) *Oggelshausen-Bruckgraben,* Freiburg, Janus Verlag.

KÖNINGER, J. & SCHLICHTHERLE, H. (2001) Foreign Elements in South-West German Lake Dwellings: transalpine Relations in the Late Neolithic and Early Bronze Ages, *Preistoria Alpina,* 35 (1999), 43-53.

KOPYTOFF, I. (1986) The Cultural biography of things: commoditization as process, in A. APPADURAI (Ed.) *The social life of things : commodities in cultural perspective***,** Cambridge, Cambridge University Press. 64-91.

KOROLEC, H. (1968) *Procesy brzegowe i zmiany linii brzegowej jeziora Mikołajskiego*, Warszawa, Prace Geograficzne Instiytutu Geografia PAN*,* 73.

KOSSACK, G. (1954) Pferdegeschirr aus Gräbern der älteren Hallstattzeit Bayerns, *Jahrbuch des Römisch-Germanisches Zentralmuseum,* 1954 (1), 111-78.

KOSSACK, G. (1959) *Südbayern während der Hallstattzeit,* Berlin, de Gruyter.

KOSTRZEWSKI, J. (1936) *Osada bagienna w Biskupinie w pow. żnińskim*, Poznań, 1-20.

KOSTRZEWSKI, J. (1938) Biskupin: an early Iron Age village in Western Poland, *Antiquity,* 12 (47), 311-17.

KOSTRZEWSKI, J. (Ed.) (1950) *III sprawozdanie z prac wykopaliskowych : w grodzie kultury łużyckiej w Biskupinie w Powiecie Żnińskim, za lata 1938-1939 i 1946-1948*, Poznań, Polskiego towarzystwa prehistorycznego.

KOTTAK, C. P. (2009) *Window on humanity : a concise introduction to anthropology*, New York, McGraw Hill.

KRÄMER, W. (1985) *Die Vollgriffschwerter in Österreich und der Schweiz*, Prähistorische Bronzefunde 4 / 10, München, C. H. Beck.

KRĄPIEC, M. (2000) Dendrochronological Analysis of Wood from Selected Lake Dwellings of the West Baltic Barrow Culture, in A. KOLA (Ed.) *Studies in lake dwellings of the west baltic barrow culture***,** Toruń, Wydawnictwo Uniwersytetu Mikołaja Kopernika. 65-78.

KRAUSE, R. (2005) Bronzezeitliche Burgen in den Alpen. Befestigte Siedlungen der frühen bis mittleren Bronzezeit, in B. HÄNSEL & B. HOREJS (Eds.) *Interpretationsraum Bronzezeit : Bernhard Hänsel von seinen Schülern gewidmet***,** Bonn, Rudolf Habelt. 389-413.

KRAUSE, R., EULER, D. & FUHRMANN, K. (2008) Der frühkeltische Fürstensitz auf dem Ipf bei Bopfingen im Nördlinger Ries (Ostalbkreis, Baden-Württemberg), in D. KRAUSSE (Ed.) *Frühe Zentralisierungs- und Urbanisierungsprozesse : zur Genese und Entwicklung frühkeltischer Fürstensitze und ihres territorialen Umlandes*, Stuttgart, Kommissionsverlag - Konrad Theiss Verlag. 249-79.

KREUZ, A. & SCHÄFER, E. (2008) Archäobotanische Ergebnisse zur Bronze- und Eisenzeit in Hessen, in D. KRAUSSE (Ed.) *Frühe Zentralisierungs- und Urbanisierungsprozesse : zur Genese und Entwicklung frühkeltischer Fürstensitze und ihres territorialen Umlandes. Kolloquium des DFG-Schwerpunktprogramms 1171*, Stuttgart, Kommissionsverlag - Konrad Theiss Verlag. 115-41.

KRISTIANSEN, K. (1993) From Villanova to Seddin. The Reconstruction of an Elite Exchange Network during the Eighth Century BC, in C. SCARRE & F. HEALY (Eds.) *Trade and exchange in Prehistoric Europe : proceedings of a conference held at the University of Bristol, April 1992***,** Oxford, Oxbow Books in association with the Prehistoric Society and the Société Préhistorique Française. 143-51.

KRISTIANSEN, K. (1998) A theoretical strategy for the interpretation of exchange and interaction, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". III : Production, circulation et consomation du bronze*, Paris, Comité des Travaux Historiques et Scientifiques. 333-43.

KRISTIANSEN, K. (1998) *Europe before history, Cambridge*, Cambridge University Press.

KRISTIANSEN, K. (1999) The Emergence of Warrior Aristocracies in Later European Prehistory and their Long-term History, in J. CARMAN & A. F. HARDING (Eds.)

*Ancient warfare : archaeological perspectives***,** Stroud, Sutton. 175-89.

KRISTIANSEN, K. (2002) The tale of the sword - swords and swordfighters in Bronze Age Europe, *Oxford Journal of Archaeology,* 21 (4), 319-32.

KRISTIANSEN, K. (2011) Constructing Social and Cultural Identities in the Bronze Age, in B. W. ROBERTS & M. VANDER LINDEN (Eds.) *Investigating Archaeological Cultures: Material Culture, Variability, and Transmission***,** New York, Springer. 201-10.

KRISTIANSEN, K. & LARSSON, T. B. (2007) Contacts and travels during the 2nd Millenium BC. Warriors on the move, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 25-33.

KRISTIANSEN, K. & LARSSON, T. B. (2005b) *The rise of Bronze Age society : travels, transmissions, and transformations,* Cambridge, Cambridge University Press.

KROMER, K. (1956) Ein Bronzemesser aus Hallstatt in Oberösterreich, *Mitteilungen der Anthropologischen Gesellschaft in Wien,* 86, 64-70.

KRUSZYNSKI, M. (1991) Recent research on horse-harness of the Bronze and Early Iron Ages in Poland, *Papers from the Institute of Archaeology*, 8-16.

KUBACH, W. (1973) *Die Nadeln in Hessen und Rheinhessen*, Prähistorische Bronzefunde 13 / 3, München, Beck.

KUBACH, W. (1994) Vergraben, versenkt, verbrannt - Opferfunde und Kultplätze, in A. JOCKENHÖVEL & W. KUBACH (Eds.) *Bronzezeit in Deutschland***,** Stuttgart, Konrad Theiss. 65-74.

KUCHLER, S. (1987) Malangan: Art and Memory in a Melanesian Society, *Man,* 22 (2), 238-55.

KÜCHLER, S. (1993) Landscape as Memory: The Mapping of Process and its Representation in a Melanesian Society, in B. BENDER (Ed.) *Landscape: politics and perspectives***,** Providence, Berg. 85-106.

KUHLMANN, N. & SEGSCHNEIDER, M. (2004) Häuser, Gehöfte und Siedlungen der Bronzezeit, in T. LEHMANN, H. VON SCHMETTOW & J. P. SCHMIDT (Eds.) *Mythos und Magie: Archäologische Schätze der Bronzezeit aus Mecklenburg-Vorpommern***,** Lübstorf, Archäologisches Landesmuseum und Landesamt für Bodendenkmalpflege Mecklenburg-Vorpommern. 68-73.

KUIJPERS, M. H. G. (2012) Towards a Deeper Understanding of Metalworking Technology, in T. L. KIENLIN & A. ZIMMERMANN (Eds.) *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations. (October 22-24).* Bonn, Rudolf Habelt. 413-21.

KUNTER, K. (1997) Frühlatènzeitliche Schichtaugenperlen in der Schweiz? Überlegungen zu einer Fundlücke im westlichen Mitteleuropa, in U. VON FREEDEN & A. WIECZOREK (Eds.) *Perlen: Archäologie, Techniken, Analysen*, Bonn, Dr. Rudolf Habelt. 43-53.

KUNTER, K. & HAEVERNICK, T. E. (1995) *Schichtaugenperlen*, Glasperlen der vorrömischen Eisenseit 4, Espekamp, Verlag Marie Leidorf.

KURZ, S. (2000) *Die Heuneburg-Aussensiedlung : Befunde und Funde*, Stuttgart, Konrad Theiss.

KYTLICOVÁ, O. (1991) *Die Bronzegefässe in Böhmen*, Prähistorische Bronzefunde 2 / 12, Stuttgart, Franz Steiner.

LAFFINEUR, R. & GRECO, E. (Eds.) (2005) *Emporia : Aegeans in the Central and Eastern Mediterranean* : proceedings of the 10th International Aegean Conference: Athens, Italian School of Archaeology, 14-18 April 2004**,** Liège, Université de Liège.

LAMOTTA, V. M. & SCHIFFER, M. B. (2001) Behavioural Archaeology: towards a new synthesis, in I. HODDER (Ed.) *Archaeological Theory Today***,** Cambridge, Polity. 14-64.

LANG, A. & SALAČ, V. (Eds.) (2002) *Fernkontakte in der Eisenzeit***,** Praha, Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik.

LANZREIN, A. N. (2009) *Die befestigte Höhensiedlung Toos-Waldi: von der Frühbronzezeit dis in die Spätantike*, Thurgau, Amtes für Archäologie des Kantons Thurgau.

ŁAPO, J. M. & OSSOWSKI, W. (1995) Prace inwentaryzacyjne na osadzie z wczesnych okresów epoki żelaza w bogaczewie, stan. 2, woj. suwałki. metoda i wyniki, in A. CHOINSKI (Ed.) *Archaeologia podwodna jezior Nizu Polskiego: Materialyz konferencji Podwodne Archeologiczne Zdj e cie Polski Niżowych Stref Pojeziernych*, Torun, Uniwersytet Kopernika W Toruniu Mikołaja. 43-52.

LARSSON, L. (2001) South Scandinavian wetland sites and finds from the Mesolithic and the Neolithic, in B. A. PURDY (Ed.) *Enduring records: The environmental and cultural heritage of wetlands***,** Oxford, Oxbow Books. 158-71.

LASAK, I. (2007) Glass beads from the cemetery in Miłosławice in Silesia: possible interpretaions, in J. BARON & I. LASAK (Eds.) *Long Distance Trade in the Bronze Age and Early Iron Age***,** Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego. 141-57.

LATOUR, B. (1999) *Pandora's hope : essays on the reality of science studies,* Cambridge (Mass.), Harvard University Press.

LAUX, F. (1973) *Die Fibeln in Niedersachsen*, Prähistorische Bronzefunde 14 / 1, München, Beck.

LAUX, F. (2009) *Die Schwerter in Niedersachsen*, Prähistorische Bronzefunde 4 / 17, Stuttgart, Franz Steiner.

LEARY, J. (2009) Perceptions of and responses to the Holocene flooding of the North sea lowlands, *Oxford Journal of Archaeology,* 28 (3), 227-37.

LEEMANN, A. & NIESSEN, F. (1994) Holocene glacial activity and climatic variations in the Swiss Alps: reconstructing a continuous record from proglacial lake sediments, *The Holocene,* 4 (3), 259-68.

LEUZINGER, U. (2000) *Die jungsteinzeitliche Seeufersiedlung Arbon-Bleiche 3. Befunde,* Frauenfeld, Department für Erziehung und Kultur des Kantons Thurgau.

LEUZINGER, U. (2001) Seesicht, verbaut... Leben im Pfahlbaudorf Arbon-Bleiche 3 vor 5400 Jahren, *Plattform,* 9-10, 94-96.

LEUZINGER, U. (2010) Jungsteinzeit, in AMT FÜR ARCHÄOLOGIE THURGAU (Ed.) *Archäologie im Thurgau***,** Frauenfeld, Huber. 85-105.

LÉVI-STRAUSS, C. (1989) *The savage mind,* (5th impression edition), London, Weidenfeld & Nicolson.

LEWIS, H. (2007) Pile Dwellings, Changing Lake Conditions and Sediment Deposition: Preliminary soil micromorphology study of cultural depositis from underwater sites at Lake Luokesas, Molėtai Region, Lithuania, *Journal of Wetland Archaeology,* 7, 33-50.

LI PUMA, E. (1998) Modernity and forms of personhood in Melanesia, in M. LAMBEK & A. STRATHERN (Eds.) *Bodies and persons : comparative perspectives from Africa and Melanesia***,** Cambridge, Cambridge University Press. 53-79.

LIDDIARD, R. (2005) *Castles in context : power, symbolism and landscape, 1066-1500*, Macclesfield, Windgather Press.

LILLIOS, K. T. (1999) Objects of Memory: The Ethnography and Archaeology of Heirlooms, *Journal of Archaeological Method and Theory,* 6 (3), 235-62.

LILLIOS, K. T. & TSAMIS, V. (Eds.) (2010) *Material Mnemonics: everyday memory in Prehistoric Europe***,** Oxford, Oxbow Books.

LLOBERA, M. (2001) Building Past Landscape Perception With GIS: Understanding Topographic Prominence, *Journal of Archaeological Science,* 28 (9), 1005-14.

LORENZ, A. (2006) *Der spätbronzezeitliche Hortfund von Stadtallendorf unter besonderer Berücksichtigung seiner Gläser*, Bonn, Habelt.

LOZE, I. (1988) *Poselenija kamennovo veka Lubanskoj niziny. Mezolit, ranij i srednij neolit*, Riga.

LUNZ, R. (1974) *Studien zur End-Bronzezeit und älteren Eisenzeit im Südalpenraum*, Firenze, Sansoni.

LÜSCHER, G. (1991) Frühkeltische "Fürstensitze" in der Schweiz, *Archäologie der Schweiz,* 14 (1), 68-74.

LÜSCHER, G. (1993) *Unterlunkhofen und die hallstattzeitliche Grabkeramik in der Schweiz,* Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

LÜSCHER, G. & MÜLLER, F. (1999) Gräber und Kult, in F. MÜLLER, G. KAENEL & G. LÜSCHER (Eds.) *Eisenzeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 249-82.

LÜSCHER, G. & RAST-EICHER, A. (1999) Verschiedene Materialien, in F. MÜLLER, G. KAENEL & G. LÜSCHER (Eds.) *Eisenzeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 196-208.

MACIEJEWSKI, F. (1950) Paciorki z grodu "kultury łużyckiej" w Biskupinie, in J. KOSTRZEWSKI (Ed.) *III sprawozdanie z prac wykopaliskowych : w grodzie kultury łużyckiej w Biskupinie w Powiecie Żnińskim, za lata 1938-1939 i 1946-1948*, Poznań, Polskiego towarzystwa prehistorycznego. 111-13.

MADDIN, R., MUHLY, J. D. & WHEELER, T. S. (1977) How the Iron Age began, *Scientific American,* 237 (4), 122-31.

MÄDER, A. (1996) Pfanzliche Applikationen an spätbronzezeitlicher Keramik, *Archäologie der Schweiz,* 19 (1), 9-17.

MÄDER, A. (2001a) *Die spätbronzezeitliche Seeufersiedlung Zürich-Alpenquai 1: Die Metallfunde :*

Baggerungen von 1916-1919, Zürich, Baudirektion Kanton Zürich, Hochbauamt, Kantonsarchäologie.

MÄDER, A. (2001b) *Zürich-Alpenquai 2: Die Schultergefässe und Kugelbecher : Baggerungen von 1916 und 1919*, Zürich, Baudirektion Kanton Zürich, Hochbauamt.

MAGGETTI, M. & GALETTI, G. (1987) Hallstattzeitliche Keramik von Châtillon-s-Glâne und der Heuneburg - ein naturwissenschaftlicher Vergleich, *Freiburger Archäologie,* 1984, 96-106.

MAGNY, M. (1992) Holocene lake-level fluctuations in Jura and the northern subalpine ranges, France: regional pattern and climatic implications, *Boreas,* 21 (4), 319-34.

MAGNY, M. (1995) *Une histoire du climat, des derniers mammouths au siècle de l'automobile*, Paris, Editions Errance.

MAGNY, M. (2004a) The contribution of palaeoclimatology to the lake-dwellings, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 132-43.

MAGNY, M. (2004b) Holocene climate variability as reflected by mid-European lake-level fluctuations and its probable impact on prehistoric human settlements, *Quaternary International,* 113 (1), 65-79.

MAGNY, M., DE BEAULIEU, J.-L., DRESCHER-SCHNEIDER, R., VANNIÈRE, B., WALTER-SIMONNET, A.-V., MIRAS, Y., MILLET, L., BOSSUET, G., PEYRON, O., BRUGIAPAGLIA, E. & LEROUX, A. (2007) Holocene climate changes in the central Mediterranean as recorded by lake-level fluctuations at Lake Accesa (Tuscany, Italy), *Quaternary Science Reviews,* 26 (13), 1736-58.

MAGNY, M., GALOP, D., BELLINTANI, P., DESMET, M., DIDIER, J., HAAS, J. N., MARTINELLI, N., PEDROTTI, A., SCANDOLARI, R., STOCK, A. & VANNIERE, B. (2009a) Late-Holocene climatic variability south of the Alps as recorded by lake-level fluctuations at Lake Ledro, Trentino, Italy, *The Holocene,* 19 (4), 575-89.

MAGNY, M., MAISE, C., JACOMET, S. & BURGA, C. A. (1998) Klimaschwankungen im Verlauf der Bronzezeit, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *SPM III Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 135-40.

MAGNY, M., PEYRON, O., GAUTHIER, É., ROUÈCHE, Y., BORDON, A., BILLAUD, Y., CHAPRON, E., MARGUET, A., PÉTREQUIN, P. & VANNIÈRE, B. (2009b) Quantitative reconstruction of climatic variations during the Bronze and early Iron ages based on pollen and lake-level data in the NW Alps, France, *Quaternary International,* 200 (1-2), 102-10.

MAINBERGER, M. & MAINBERGER, C. (2010) Grenzland? Zum Naturraum und zu den Anfängen bäuerlicher Kultur zwischen Argen und Bodensee, in I. MATUSCHIK & C. STRAHM (Eds.) *Vernetzungen : Aspekte siedlungsarchäologischer Forschung : Festschrift für Helmut Schlichtherle zum 60. Geburtstag***,** Freiburg im Breisgau, Lavori. 331-44.

MAISE, C. (1999) Klima, Umwelt, Landwirtschaft und Ernährung, in F. MÜLLER, G. KAENEL & G. LÜSCHER (Eds.) *SPM IV Eisenzeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 93-97.

MALINOWSKI, B. (1922) *Argonauts of the Western Pacific,* London, George Routledge.

MALINOWSKI, T. (1958) Osadnictwo kultury łużyckiej wczesnej epoki żelaznej w Słupcy, *Fontes Archaeologisi Posnanienses,* VII - IX, 1-97.

MALINOWSKI, T. (1971) Über den Bernsteinhandel zwischen den südöstlichen baltischen Ufergebieten und dem Süden Europas in der frühen Eisenzeit, *Praehistorische Zeitschrift,* 46 (1), 102-10.

MALINOWSKI, T. (1974) An Amber Trading-Post in Early Iron Age Poland, *Archaeology,* 27 (3), 195-200.

MALINOWSKI, T. (2007) The Lusatian Culture Fortified Site in Komorowo, District of Szamotuły - a supposed amber factory in the Early Iron Age, in J. BARON & I. LASAK (Eds.) *Lond Distance Trade in the Bronze Age and Early Iron Age*, Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego. 223-35.

MALNATI, L. (2004) Il ruolo dell'aristocrazia nell'affermazione del dominio Etrusco in val padana tra il IX e la fine del VII secolo A.C., in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 248-57.

MARAN, J. (2013) Bright as the sun: The appropriation of amber objects in Mycenaean Greece, in H. P. HAHN & H. WEISS (Eds.) *Mobility, Meaning & Transformations of Things: shifting contexts of material culture through time and space***,** Oxford, Oxbow Books. 147-69.

MARAZZI, M. (2003) The Mycenaeans in the Western Mediterranean (17th - 13th c. BC), in N. C. STAMPOLIDIS (Ed.) *Sea routes ... from Sidon to Huelva : interconnections in the Mediterranean 16th - 6th c. BC***,** Athens, Museum of Cycladic Art. 108-15.

MARCINIAK, B. (1998) The diatom record of Holocene lake-level changes in the central part of the Polish Lowland, in S. P. HARRISON, B. FRENZEL, U. HUCKRIEDE & M. M. WEIß (Eds.) *Palaeohydrology as reflected in lake-level changes as climatic evidence for Holocene times***,** Stuttgart, Gustav Fischer Verlag. 53-66.

MARCUS, J. (2000) Toward an archaeology of communities, in M. A. CANUTO & J. YAEGER (Eds.) *The Archaeology of communities : a new world perspective***,** London, Routledge. 231-42.

MARSHALL, Y. (2000) Transformations of Nuu-chah-nulth Houses, in R. A. JOYCE & S. D. GILLESPIE (Eds.) *Beyond kinship : social and material reproduction in house societies***,** Philadelphia, University of Pennsylvania Press. 73-102.

MARTIN, J. (2009) *Die Bronzegefässe in Mecklenburg-Vorpommern, Brandenburg, Berlin, Sachsen-Anhalt, Thüringen und Sachsen*, Prähistorische Bronzefunde 2 / 16, Stuttgart, Franz Steiner.

MARZATICO, F. (2004) 150 years of lake-dwelling research in Northern Italy, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 83-97.

MARZATICO, F. (2009) Le basi economiche dell'etá del Bronzo in Italia settentrionale, in M. BARTELHEIM & H. STÄUBLE (Eds.) *Die wirtschaftlichen Grundlagen der Bronzezeit Europas***,** Rahden/Westf., Verlag Marie Leidorf GmbH. 213-52.

MARZOLI, D. (2004) 6.10. Sfinge, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 648.

MAUVILLY, M. (2008) L'âge du Bronze, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 347-70.

MAUVILLY, M., ANTENEN, I., BROMBACHER, C., GASSMANN, P., GUÉLAT, M., MORINA-CURTY, L., OLIVE, C., PILLONEL, D., RICHOZ, I. & STUDER, J. (1997) Frasses "Praz au Doux" (FR), un site du Hallstatt ancien en bordure de rivière, *Archäologie Schweiz,* 20 (3), 112-25.

MAUVILLY, M. & RUFFIEUX, M. (2008a) Frasses/Praz au Doux, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 204-11.

MAUVILLY, M. & RUFFIEUX, M. (2008b) Sévaz/Tudinges 1+3 et Condémine, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 218-25.

MAYEWSKI, P. A., ROHLING, E. E., CURT STAGER, J., KARLÉN, W., MAASCH, K. A., DAVID MEEKER, L., MEYERSON, E. A., GASSE, F., VAN KREVELD, S., HOLMGREN, K., LEE-THORP, J., ROSQVIST, G., RACK, F., STAUBWASSER, M., SCHNEIDER, R. R. & STEIG, E. J. (2004) Holocene climate variability, *Quaternary Research,* 62 (3), 243-55.

MELLER, H. (2004a) Die Himmelsscheibe von Nebra, in H. MELLER (Ed.) *Der geschmiedete Himmel : die weite Welt im Herzen Europas vor 3600 Jahren***,** Stuttgart, Konrad Theiss Verlag. 22-31.

MELLER, H. (2004b) Star Search, *National Geographic*, Washington, D.C., National Geographic Society. 76-87.

MENOTTI, F. (1999) The Abandonment of the ZH-Mozartstrasse Early Bronze Age Lake-settlement. GIS Computer Simulation of the Lake-level Fluctuation Hypothesis, *Oxford Journal of Archaeology,* 18 (2), 143-55.

MENOTTI, F. (2001a) *"The missing period" : Middle Bronze Age lake-dwellings in the Alps*, Oxford, Archaeopress.

MENOTTI, F. (2001b) The *Pfahlbauproblem* and the History of Lake-Dwelling Research in the Alps, *Oxford Journal of Archaeology,* 20 (4), 319-28.

MENOTTI, F. (2003) Cultural response to environmental change in the Alpine lacustrine regions: the displacement model, *Oxford Journal of Archaeology,* 22 (4), 375-96.

MENOTTI, F. (2004a) Displacement, readaptation, and cultural continuity, a lake-dwelling perspective, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 207-17.

MENOTTI, F. (2004b) Introduction: the lake-dwelling phenomenon and wetland archaeology, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 1-6.

MENOTTI, F. (Ed.) (2004c) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research*, London, Routledge.

MENOTTI, F. (2009) Climate variations in the Circum-Alpine region and their influence on Neolithic-Bronze Age lacustrine communities: displacement and/or cultural adaptation, in M. BUDJA (Ed.) *Documenta Praehistorica XXXVI***,** Ljubljana, Faculty of Art, Univeristy of Ljubljana. 61-66.

MENOTTI, F. (2012) *Wetland Archaeology and Beyond: Theory and Practice,* Oxford, Oxford University Press.

MENOTTI, F., BAUBONIS, Z., BRAZAITIS, D., HIGHAM, T., KVEDARAVICIUS, M., LEWIS, H., MOTUZAITE, G. & PRANCKĖNAITĖ, E. (2005) The first Lake-Dwellers of Lithuania: Late Bronze Age pile settlements on Lake Luokesas, *Oxford Journal of Archaeology,* 24 (4), 381-403.

MENOTTI, F. & PRANCKĖNAITĖ, E. (2008) Lake-dwelling building techniques in prehistory: driving wooden piles into lacustrine sediments, *euroREA,* 5, 3-7.

MERCURI, A., ACCORSI, C., MAZZANTI, M., BOSI, G., CARDARELLI, A., LABATE, D., MARCHESINI, M. & GRANDI, G. (2006) Economy and environment of Bronze Age settlements – Terramaras – on the Po Plain (Northern Italy): first results from the archaeobotanical research at the Terramara di Montale, *Vegetation History and Archaeobotany,* 16 (1), 43-60.

MERHART, G. V. (1952) *Studien über einige Gattungen von Bronzegefässen, Festschrift des Römisch-Germanischen Zentralmuseums in Mainz zur Feier seines hundertjährigen Bestehens 1952*, Vol. 2**,** Mainz, 1-71.

MERHART, G. V. (1969) Studien über einige gattungen von bronzegefässen, in G. KOSSACK & G. V. MERHART (Eds.) *Hallstatt und Italien : gesammelte Aufsätze zur frühen Eisenzeit in Italien und Mitteleuropa***,** Mainz, Römisch-Germanischen Zentralmuseums Mainz. 280-379.

MERRIMAN, N. (1987) Value and motivation in pre-history: the evidence for 'Celtic spirit', in I. HODDER (Ed.) *The Archaeology of contextual meanings***,** Cambridge, Cambridge University Press. 111-16.

METZNER-NEBELSICK, C. (1994) Die früheisenzeitliche Trensenentwicklung zwischen Kaukasus und Mitteleuropa, in P. SCHAUER (Ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus*, Bonn, Universitätsverlag Regensburg / Rudolf Habelt. 383-447.

METZNER-NEBELSICK, C. (2005) Das bronzezeitliche Gräberfeld von Hordeevka am Südlichen Bug im Spannungsfeld seiner auswärtigen Bezüge, in B. HÄNSEL & B. HOREJS (Eds.) *Interpretationsraum Bronzezeit : Bernhard Hänsel von seinen Schülern gewidmet***,** Bonn, Rudolf Habelt. 293-315.

MICHNIK, M. (2007) Imported objects at the cemetery in Świbie, district of Gliwice, in J. BARON & I. LASAK (Eds.) *Long Distance Trade in the Bronze Age and Early Iron Age***,** Wrocław, Wydawnictwo Uniwersytetu Wrocławskiego. 159-77.

MILDNER, S. (2008) *Bronzezeitliche Glasperlen in Deutschland - Eine Bestandsaufnahme*, unpublished thesis for Master of Archaeology, (Otto-Freidrich-Universität Bamberg).

MILDNER, S., FALKENSTEIN, F., SCHMIDT, J. P. & SCHÜSSLER, U. (2010) Materialanalytische Untersuchungen an ausgewählten Glasperlen des bronzezeitlichen Hortfundes von Neustrelitz, Lkr. Mecklenburg-Strelitz, *Bodendenkmalpflege in Mecklenburg-Vorpommern,* 57, 43-63.

MILLER, D. (1982) Structures and strategies: an aspect of the relationship between social hierarchy and cultural change, in I. HODDER (Ed.) *Symbolic and structural archaeology***,** Cambridge, Cambridge University Press. 89-98.

MILLER, D. (Ed.) (1998) *Material cultures: why some things matter***,** London, UCL Press.

MILLOTTE, J.-P.-E. (1963) *Le Jura et les Plaines de Saône aux âges des métaux,* Paris, Les Belles Letrres.

MÖDLINGER, M. (2011a) *Herstellung und Verwendung bronzezeitlicher Schwerter Mitteleuropas : eine vertiefende Studie zur mittelbronze- und urnenfelderzeitlichen Bewaffnung und Sozialstruktur*, Bonn, Rudolf Habelt.

MÖDLINGER, M. (2011b) Ritual Object or Powerful Weapon - The Usage of Central Europe Bronze Age Swords, in M. UCKELMANN & M. MÖDLINGER (Eds.) *Bronze Age Warfare: Manufacture and Use of Weaponry***,** Oxford, Archaeopress. 153-66.

MOHEN, J.-P. (1988) Métallurgie, in ASSOCIATION ABBAYE DE DOUALAS (Ed.) *Avant les celtes. L'Europe à l'age du bronze, 2500-800 avant J.C. Abbaye de Daoulas, Musée départemental breton*, 14 mai - 31 août 1988**,** Daoulas, Association Abbaye de Daoulas. 30-37.

MOINAT, P. & DAVID-ELBIALI, M. (2003) *Défunts, bûchers et céramiques : la nécropole de Lausanne-Vidy (VD) et les pratiques funéraires sur le Plateau suisse du XIe au VIIIe s.av.J.-C*, Lausanne, Cahiers d'archéologie romande.

MONAGHAN, J. (1998) The Person, Destiny, and the Construction of Difference in Mesoamerica, *RES: Anthropology and Aesthetics,* 33, 137-46.

MOORE, H. (1987) Problems in the analysis of social change: an example from the Marakwet, in I. HODDER (Ed.) *Archaeology as long-term history***,** Cambridge, Cambridge University Press. 85-104.

MOORE, T. (2007) Percieving Communities: ecxhange, landscapes and social networks in the later Iron Age of western Britain, *Oxford Journal of Archaeology,* 26 (1), 79-102.

MOOSAUER, M. & BACHMAIER, T. (2005) *Bernstorf - das Geheimnis der Bronzezeit,* Stuttgart, Theiss.

MORAN, E. F. (2000) *Human adaptability: An introduction to ecological anthropology*, Boulder, Westview.

MORGENROTH, U. (1999) Southern Iberia and the Mediterranean Trade-routes, *Oxford Journal of Archaeology,* 18 (4), 395-401.

MOSELLO, R., ARISCI, S. & BRUNI, P. (2004) Lake Bolsena (Central Italy): an updating study on its water chemistry, *Journal of Limnology*, 63 (1), 1-12.

MÖSLEIN, S. (1998/99) Siedlung, Depotfund und Gräberfeld der Urnenfelderzeit auf der Innterrasse am Fusse der Rachelburg bei Flintsbach a. Inn, LKR Rosenheim, *Bericht der Bayerischen Bodendenkmalpflege,* 39/40, 331-48.

MÜLLER-KARPE, H. (1949/50) Grünwalder Gräber, *Praehistorische Zeitschrift,* 34/35 (1), 313-25.

MÜLLER-KARPE, H. (1959) *Beiträge zur Chronologie der Urnenfelderzeit nördlich und südlich der Alpen*, Berlin, De Gruyter.

MÜLLER-KARPE, H. (1961) *Die Vollgriffschwerter der Urnenfelderzeit aus Bayern*, München, Beck.

MÜLLER-KARPE, H. (1962) Zur spätbronzezeitlichen Bewaffnung in Mitteleuropa und Greichland, *Germania,* 40, 255-87.

MÜLLER, F. (1993) Argumente zu einer Deutung von "Pfahlbaubronzen", *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 76, 71-92.

MÜLLER, R. (2002) Vom Balkan bis nach Skandinavien - Fernkontakte bei Haus- und Gesichtsurnen?, in A. LANG & V. SALAČ (Eds.) *Fernkontakte in der Eisenzeit*, Praha, Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik. 230-38.

MULLIN, D. (2012) The river has never divided us: Bronze Age metalwork deposition in western Britain, *Oxford Journal of Archaeology,* 31 (1), 47-57.

MUNN, N. D. (1983) Gawan kula: spatiotemporal control and the symbolism of influence, in J. W. LEACH & E. LEACH (Eds.) *The Kula : new perspectives on Massim exchange***,** Cambridge, Cambridge University Press. 277-308.

MUNN, N. D. (1986) *The fame of Gawa : a symbolic study of value transformation in a Massim (Papua New Guinea) society*, Cambridge, Cambridge University Press.

MURILLO-BARROSO, M. & MARTINÓN-TORRES, M. (2012) Amber Sources and Trade in the Prehistory of the Iberian Peninsula, *European Journal of Archaeology,* 15 (2), 187-216.

MURRAY, P. (1980) Discard Location: The Ethnographic Data, *American Antiquity,* 45 (3), 490-502.

NAGLER-ZANIER, C. (1999) *Die hallstattzeitliche Siedlung mit Grabenanlage von Geiselhöring, Niederbayern*, Büchenbach, Verlag Dr. Faustus.

NAGLER-ZANIER, C. (2005) *Ringschmuck der Hallstattzeit aus Bayern (Arm- und Fussringe, Halsringe, Ohrringe, Fingerringe, Hohlwulstringe)*, Prähistorische Bronzefunde 10 / 7, Stuttgart, Franz Steiner.

NAGY, G. (1999) *Keramik und Kleinfunde der spätestbronzezeitlichen Siedlung,* Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

NASH BRIGGS, D. (2003) Metals, Salt, and Slaves: Economic Links Between Gaul and Italy From the Eighth to the Late Sixth Centuries BC, *Oxford Journal of Archaeology,* 22 (3), 243-59.

NASH BRIGGS, D. (2007) Home Truths from Travellers' Tales: On the Transmission of Culture in the European Iron Age, in C. GOSDEN, H. HAMEROW, P. DE JERSEY & G. LOCK (Eds.) *Communities and connections : essays in honour of Barry Cunliffe***,** Oxford, Oxford University Press. 15-29.

NAVA, M. L. (2011) La tradizione millenaria dell'ambra, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 159-67.

NEBELSICK, L. (2000) Rent asunder: ritual violence in Late Bronze Age hoards, in C. F. E. PARE (Ed.) *Metals make*

the world go round : the supply and circulation of metals in Bronze Age Europe, Oxford, Oxbow Books. 160-75.

NEEDHAM, S. P. (1998) Modelling the flow of metal in the Bronze Age, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". III : Production, circulation et consomation du bronze*, Paris, Comité des Travaux Historiques et Scientifiques. 285-307.

NEEDHAM, S. P. (2007) 800 B.C, The Great Divide, in C. HASELGROVE & R. POPE (Eds.) *The earlier Iron Age in Britain and the near continent***,** Oxford, Oxbow Books. 39-63.

NEEDHAM, S. P., PARFITT, K. & VARNDELL, G. (2006) *The Ringlemere Cup. Precious Cups and the Beginning of the Channel Bronze Age*, Oxbow Books, Oxford.

NEGRONI CATACCHIO, N. (1985) La problematica dell'ambra nella protostoria italiana: le ambre intagliate di Fratta Polesine e le rotte mercantili nell'Alto Adriatico, *Padusa,* 20, 73-90.

NEGRONI CATACCHIO, N. (1993) The production of amber figurines in Italy from the 8th to the 4th centuries BC, in C. W. BECK, J. BOUZEK & D. DRESLEROVÁ (Eds.) *Amber in archaeology : proceedings of the Second International Conference on Amber in Archaeology, Liblice 1990***,** Praha, Czech Republic, Institute of Archaeology, Czech Academy of Sciences. 191-202.

NEGRONI CATACCHIO, N. (1999) Produzione e commercio dei vaghi d'ambra tipo Tirinto e tipo Allumiere alla luce delle recenti scoperte, in O. PAOLETTI (Ed.) *Protostoria e Storia del 'Venetorum Angulus' Atti del XX Convegno di Studi Etruschi ed Italici*, Pisa, Instituti editoriali e poligrafici internazionali. 241-65.

NEGRONI CATACCHIO, N. (2011) Amber and the Warrior Princes of the Orientalising Period in Italy, in A. VIANELLO (Ed.) *Exotica in the Prehistoric Mediterranean***,** Oxford, Oxbow Books. 63-95.

NEGRONI CATACCHIO, N., MASSARI, A. & RAPOSSO, B. (2006) L'ambra come idicatore di scambi nell'Italia pre e protostorica, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1439-75.

NEUBAUER, W. (1994) *Flums-Gräpplang : eine spätbronzezeitliche Siedlung in der Schweiz*, Buchs, BuchsDruck und Verlag.

NEUSTUPNÝ, E. (1998) Strucutres and events: the theoretical basis of spatial archaeology, in E. NEUSTUPNÝ (Ed.) *Space in prehistoric Bohemia***,** Praha, Institute of Archaeology, Academyof Sciences of the Czech Republic. 9-44.

NICOLAS, I. (2003) Au fil du rasoir: étude des rasoirs métalliques de l'âge du Bronze jusq'au haut Moyen Age en Suisse, in M. BESSE, L.-I. STAHL GRETSCH & P. CURDY (Eds.) *ConstellaSion. Hommage à Alain Gallay***,** Lausanne, Cahiers d'archéologie romande. 273-89.

NICOSIA, C., BALISTA, C., CUPITÒ, M., ERTANI, A., LEONARDI, G., NARDI, S. & VIDALE, M. (2011) Anthropogenic deposits from the Bronze Age site of Fondo Paviani (Verona, Italy): Pedochemical and micropedological characteristics, *Quaternary International,* 243 (2), 280-92.

NIESIOŁOWSKA-WĘDZKA, A. (1989) *Procesy urbanizacyjne w kulturze Łużyckiej w świetle oddziaływań kultur południowych*, Wroclaw, Polska Akademia Nauk.

NIESIOŁOWSKA-WĘDZKA, A. (1991) Procesy urbanizacyjne w kulturze Łużyckiej, in J. JASKANIS (Ed.) *Prahistoryczny gród w Biskupinie. Problematyka osiedli obronnych na początku epoki żelaza***,** Warsaw, Państwowe Muzeum Archeologiczne. 57-80.

NIEWIAROWSKI, W. (1976) Problem genezy i funkcji frodów "typu biskupińskiego" w świetle oddziaływań kultur poludniowych, *Slavia Antiqua,* 23, 17-38.

NIEWIAROWSKI, W., NORYŚKIEWICZ, B., PIOTROWSKI, W. & SINKIEWICZ, M. (1995) An Outline of Natural and Anthropogenic Changes of Geographical and Environment in the Biskupin Area During the Last 7000 Years, *Quaternary Studies in Poland,* 13, 77-88.

NIEWIAROWSKI, W., NORYŚKIEWICZ, B., PIOTROWSKI, W. & ZAJĄCKOWSKI, W. (1992) Biskupin fortified settlement and its environment in the light of new environmental and archaeological studies, in B. COLES (Ed.) *The Wetland revolution in prehistory*, Exeter, Department of History and Archaeology University of Exeter. 81-92.

NIGHTINGALE, G. (2007) Lefkandi. An important node in the international exchange network of jewellery and personal adornment, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 421-29.

NIKITA, K. & HENDERSON, J. (2006) Glass Analyses from Mycenaean Thebes and Elateia: Compositional Evidence for a Mycenaean Glass Industry, *Journal of Glass Studies,* 48, 71-120.

NIKITA, K., HENDERSON, J. & NIGHTINGALE, G. (2009) An Archaeological and Scientific Study of Mycenaean Glass from Elateia-Alonaki, Greece, in K. JANSSENS, P. DEGRYSE, P. COSYNS, J. CAEN & L. VAN'T DACK (Eds.) *Annales of the 17th Congress of the International Association for the History of Glass*, Antwerp, University Press Antwerp. 39-46.

NORTHOVER, J. P. (1982) The exploration of the long-distance movement of bronze in Bronze and Early Iron Age Europe, *Bulletin of the Institute of Archaeology, University of London,* 19, 45-72.

NOVÁK, P. (1975) *Die Schwerter in der Tschechoslowakei I*, Prähistorische Bronzefunde 4 / 4, München, Beck.

NOVOTNÁ, M. (1991) *Die Bronzegefässe in der Slowakei*, Prähistorische Bronzefunde 2 / 11, Stuttgart, Franz Steiner.

NOVOTNÁ, M. (2001) *Die Fibeln in der Slowakei*, Prähistorische Bronzefunde 14 / 11, Stuttgart, Franz Steiner.

NOWACZYK, B., OSTOJA-ZAGÓRSKI, J., PAZDUROWA, A. & ROMANOWSKA-GRABOWSKA, O. (1982) Zmiany poziomu wód w Jeziorze Wolskim w świetle badań archeologicznych i datowań C-14, *Badania Fizjograficzne nad Polską Zachodnią,* 24, 141-6.

NYMOEN, P. (2008) Boats for Rivers and Mountains: Sources for New Narratives about River Travel?, *International Journal of Nautical Archaeology,* 37 (1), 3-16.

O'SULLIVAN, A. (1998) *The Archaeology of Lake Settlement in Ireland,* Dublin, Royal Irish Academy.

ODNER, K. (1983) Reflection or Autonomy. Thoughts on European Cultural Development, *Norwegian archaeological review,* 16, 1-13.

ODOJ, R. (1962) Podwodne badania archaeologiczne w Rybnie, pow Mrągowo, *Komunikaty Mazursko-Warmińskie,* 3, 712-22.

OELZE, V. M., NEHLICH, O. & RICHARDS, M. P. (2012) 'There's no place like home' - no isotopic evidence for mobility at the Early Bronze Age cemetery of Singen, Germany, *Archaeometry*, 54 (4), .752-778.

OKA, R. & KUSIMBA, C. (2008) The Archaeology of Trading Systems, Part 1: Towards a New Trade Synthesis, *Journal of Archaeological Research,* 16 (4), 339-95.

OSSOWSKI, W. & ŁAPO, J. M. (2006) The flooded land. Underwater excavations in lakes of north-eastern Poland, in A. HAFNER, U. NIFFELER & U. RUOFF (Eds.) *Die neue Sicht : Unterwasserarchäologie und Geschichtsbild : Akten des 2. Internationalen Kongresses für Unterwasserarchäologie*, Basel, Archäologie Schweiz. 47-55.

OSTOJA-ZAGÓRSKI, J. (1978) *Gród halsztacki w Jankowie nad Jeziorem Pakoskim*, Wrocław, Ossolineum.

OSTOJA-ZAGÓRSKI, J. & STRZAŁKO, J. (1984) Biologic-Cultural changes in the Hallstatt period in the Microregion of Sobiejuchy near Żinn, Bydgoszcz Voivodship, *Archaeologia Polona,* 23, 23-48.

PABST, S. (2011) Die grossräumige Ausbreitung der Brillenfibeln am Übergang von der Bronze- zur Eisenzeit - Kommunikastionswege und soziale Hintergründe, in U. L. DIETZ & A. JOCKENHÖVEL (Eds.) *Bronzen im Spannungsfeld zwischen praktischer Nutzung und symbolischer Bedeutung : Beiträge zum internationalen Kolloquium am 9. und 10. Oktober 2008 in Münster***,** Stuttgart, Steiner. 199-234.

PAHLOW, M. (2006) *Gold der Bronzezeit in Schleswig-Holstein*, Bonn, Habelt.

PALAFITTES (2009) Palafittes_v3, in PALAFITTES *Prehistoric Pile Dwellings around the Alps*, Neuchâtel, Office et Musee d'archeologie Neuchâtel.

PALAVESTRA, A. (1993) *Praistorijski ćilibar na centralnom i zapadnom Balkanu,* Beograd, AIZ Dosije : Srpska akademija nauka i umetnosti.

PALAVESTRA, A. (2007) Was there an amber route?, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 349-56.

PALINCAŞ, N. (2007) Contacts with the Aegean and their social impact in the late Bronze Age in the Lower Danube, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 231-37.

PALTINERI, S. & RUBAT BOREL, F. (2010) Le armille tipo Zerba: un riesame della questione, in N. NEGRONI CATACCHIO (Ed.) *Preistoria e protostoria in Etruria. L'alba dell'Etruria Fenomeni di continuità e trasformazione nei secoli XII-VIII a.C. Ricerche e scavi*. Atti del Nono Incontro di Studi (12-14 Settembre), Milano, Centro studi di preistoria e archaeologia. 609-21.

PAPADOPOULOS, A. (2011) Business as Usual: Cypriot Demand for Aegean Pottery during the Late Bronze Age, in A. BRYSBAERT (Ed.) *Tracing prehistoric social networks through technology : a diachronic perspective on the aegean***,** New York, Routledge. 167-82.

PAPE, J. (2000) Die attische Keramik der Heuneburg und der keramische Südimport in der Zone nördlich der Alpen während der Hallstattzeit, in W. KIMMIG & E. BÖHR (Eds.) *Importe und mediterrane Einflüsse auf der Heuneburg***,** Mainz am Rhein, Philipp von Zabern. 71-175.

PARE, C. F. E. (1991) *Swords, wagon-graves, and the beginning of the early iron age in central Europe*, Marburg, Philipps-Universität.

PARE, C. F. E. (1992) *Wagons and wagon-graves of the Early Iron Age in Central Europe,* Oxford, Oxford University Committee for Archaeology.

PARE, C. F. E. (1999) Weights and Weighing in Bronze Age Central Europe, in R.-G. Z. M. KOLLOQUIUM (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 421-514.

PARET, O. (1926-28) Neue Funde im Steinhauser Ried bei Schussenried, *Fundberichte aus Schwaben. Neue Folge,* 4, 52-58.

PARET, O. (1942) Die Pfahlbauten. Ein Nachruf, *Schriften des Verein für Geschichte des Bodensees,* 68, 75-84.

PARKER PEARSON, M. (1999) *The archaeology of death and burial,* Thrupp Stroud, Sutton Publishing.

PARZINGER, H. (1995) The Beginning of La Tène Culture in Central Europe, in J. D. HILL & C. G. CUMBERPATCH (Eds.) *Different Iron Ages : studies on the Iron Age in temperate Europe***,** Oxford, Tempvs Reparatvm. 95-110.

PASSARD, M., PINIGRE, J.-F. & HURTELLE, J. (1984) Un dépôt de l'Age du Bronze Final à Bouclans (Doubs), *Revue Archéologique de l'Est et du Centre-Est Dijon,* 32, 85-111.

PÁSZTHORY, K. (1985) *Der bronzezeitliche Arm- und Beinschmuck in der Schweiz*, Prähistorische Bronzefunde 10 / 3, München, C. H. Beck.

PATAY, P. & PETRES, É. F. (1990) *Die Bronzegefässe in Ungarn*, Prähistorische Bronzefunde 2 / 10, München, C. H. Beck.

PATZEL, G. (1977) Der zeitliche Ablauf und das Ausmass postglazialer Klimaschwankungen in der Alpen, *Erdwissenschaftliche Forschung,* 13, 248-59.

PAULI, J. (1994) *Die urgeschichtliche Besiedlung des Runden Bergs bei Urach*, Sigmaringen, Jan Thorbecke.

PAULI, L. (1971) Die Golasecca-Kultur und Mitteleuropa : ein Beitrag zur Geschichte des Handels über die Alpen, *Hamburger Beiträge zur Archäologie,* 1 (1), 1-84.

PAWLIKOWSKI, M., RALSKA-JASIEWICZOWA, M., SCHÖNBORN, W., STUPNICKA, E. & SZEROCZYŃSKA, K. (1982) Woryty near Gietrzwałd, Olsztyn Lake District, NE Poland - vegetational history and lake development during the last 12 000 years, *Acta Palaeobotanica,* 22 (1), 85-116.

PAYNE, A., CORNEY, M., BURTON, N. & CUNLIFFE, B. W. (2006) *The Wessex hillforts project : extensive survey of hillfort interiors in central southern England*, London, English Heritage.

PEAKE, R., ALLENET, G., AUXIETTE, G., BOISSEAU, F., CHAUSSÉ, C., COUBRAY, S., LEROYER, C., PAUTRET-HOMERVILLE, C., PERRIÈRE, J. & TOULEMONDE, F. Villiers-sur-Seine, Le Gros Buisson : un habitat arisocratique de la fin de l'âge du bronze et du début du premier âge dur fer, in M.-J. ROULIÈRE-LAMBERT, A. DAUBIGNEY, P.-Y. MILCENT, M. TALON & J. VITAL (Eds.) *De l'Âge du Bronze à l'Âge du Fer en France et en Europe occidentale (Xe - VIIe siècle av. J.-C.) ; la moyenne vallée du Rhône aux âges du Fer, Actes du XXXème colloque international de l'AFEAF, co organisé avec l'APRAB, 26-28 mai*, Revue Archéologique de l'Est.

PEAKE, R. & SÉGUIER, J.-M. (2000) Balances en os de l'Age du Bronze dans le Sud-Est du Bassin parisien, *Archéopages,* 1, 20-29.

PEARCE, M. (1994) *Il territorio di Milano e Pavia tra mesolitico e prima età del ferro : dalla carta archeologica alla ricostruzione del paesaggio*, Firenze, La Nuova Italia editrice.

PEARCE, M. (1995) Exchange Northwards from Peninsular Italy in the First Millenium BC: the Western Po Plain and the Alpine Passes, in J. SWADDLING, P. ROBERTS & S. WALKER (Eds.) *Italy in Europe: economic relations 700 BC - AD 50***,** London, British Museum. Department of Greek and Roman Antiquities. 145-57.

PEARCE, M. (2000) Metals make the world go round: the copper supply for Frattesina, in C. F. E. PARE (Ed.) *Metals make the world go round : the supply and circulation of metals in Bronze Age Europe*, Oxford, Oxbow Books. 108-15.

PEARCE, M. (1998) New research on the *terramare* of nothern Italy, *Antiquity,* 72 (278), 743-46.

PEARCE, M. (2007) *Bright blades and red metal : essays on north Italian prehistoric metalwork,* London, Accordia Research Institute, University of London.

PEARCE, M. & DE GUIO, A. (1999) Between the mountains and the plain: an intergrated metals production and circulation system in Later Bronze Age North-Eastern Italy, in P. DELLA CASA (Ed.) *Prehistoric*

alpine environment, society, and economy, Universitätsforschungen zur prähistorischen Archäologie. 289-93.

PEERS, L. (1999) 'Many Tender Ties': The Shifting Contexts and Meanings of the S BLACK Bag, in C. GOSDEN & Y. MARSHALL (Eds.) *The cultural biography of objects*, Vol. 31.2**,** London, Routledge. 288-302.

PERNET, L. & SCHMID-SIKIMIĆ, B. (2008) Les fers de lances à douilles facettées de la fin de l'age du Brandopferplatz de Wartau-Ochsenberg (Cant. Saint-Gall, Suisse), *Archäologisches Korrespondenzblatt,* 38 (3), 365-77.

PERONI, R. (1979) *From Bronze Age to Iron Age: Economic, Historical and Social Considerations*. London, Academic Press.

PERONI, R. (1997) Il potere e i suoi simboli, in M. A. BERNABÒ BREA, A. CARDARELLI & M. CREMASCHI (Eds.) *La terramare : la piu antica civiltà padana***,** Modena Foro Boario, Electa. 661-73.

PERONI, R. (2004) Culti, comunità tribali e gentilizie, caste guerriere e figure di eroi e principi nel secondo millennio in italia tra europa centrale ed egeo, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 161-73.

PÉTREQUIN, P. (1984) *Gens de l'eau, gens de la terre : ethno-archéologie des communautés lacustres*, Paris, Librairie Hachette.

PÉTREQUIN, P. (2011) La circolazione delle grandi asce in pietra verde delle Alpi, nell'Europa tra il VI e il IV millennio a.C., in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 79-81.

PÉTREQUIN, P. (2013) Lake-dwellings in the Alpine region, in F. MENOTTI & A. O'SULLIVAN (Eds.) *The Oxford Handbook of Wetland Archaeology***,** Oxford, Oxford University Press. 253-67.

PÉTREQUIN, P. & BAILLY, M. (2004) Lake-dwelling research in France: from climate to demography, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 36-49.

PÉTREQUIN, P., MAGNY, M. & BAILLY, M. (2005) Habitat lacustre, densité de population et climat - L'example du Jura français, in P. DELLA CASA & M. TRACHSEL (Eds.) *WES'04 - Wetland Economies and Societies*, Zurich, Chronos. 143-68.

PETRESCU-DÂMBOVIŢA, M. (1998) *Der Arm- und Beinschmuck in Rumänien*, Prähistorische Bronzefunde 10 / 4, Stuttgart, Franz Steiner Verlag.

PETRESCU-DÎMBOVIŢA, M. (1978) *Die Sicheln in Rumänien mit Corpus der jung- und spätbronzezeitlichen Horte Rumäniens*, Prähistorische Bronzefunde 18 / 1, München, Beck.

PFAUTH, U. (1998) *Beiträge zur Urnenfelderzeit in Niederbayern*, Bonn, Rudolf Habelt.

PICCOLI, A. & PERONI, R. (1992) Per una ricostruzione della sequenza cronologica dell'isolone del mincio nell'ambito dell'età del bronzo padana, in G. BARTOLI, M. BARTOLI, P. CAVICCHI, F. FEDELI, A. GALIBERTI, S. GELICHI, L. GIANNONI, P. GORINI & M. RICCI (Eds.) *Rassegna di Archaeologia (10): L'Età del Bronzo in Italia nei secoli dal XVI al XIV a.c.*, Firenze, All'Insegna Del Giglio. 295-317.

PICCOLI, A. & ZANINI, A. (2005) Italian Bronze Age impressed tablets. Proposals for a new analysis method and new acquisitions, in R. LAFFINEUR (Ed.) *L'âge du bronze en Europe et en Méditerranée : sessions générales et posters / The bronze age in Europe and the Mediterranean : general sessions and posters. Actes du XIVème Congrès UISPP*, Oxford, Archaeopress. 83-90.

PILLONEL, D. (2007) *Hauterives-Champréveyres 14: Technologie et usage du bois au Bronze final,* Neuchâtel, Office et musée cantonal d'archéologie de Neuchâtel.

PLEINER, R. (1981) Die Wege des Eisens nach Europa, in R. PLEINER, H. HAEFNER & W. U. GUYAN (Eds.) *Frühes Eisen in Europa*, Schaffhausen, Peter Meili. 115-28.

POLIN, S. V. (1984) Grave of the Scythian warrior near the village of Krasnyi Podol in Khersonskaya oblast [English translation of Russian title], in E. V. CHERNENKO (Ed.) *Armor of the Scythians and Sarmatians***,** Kyiv, Naukova Dumka. 103-19.

POLLA, A., ANGELINI, I., ARTIOLI, G., BELLINTANI, P. & DORE, A. (2011) Archaeometric Investigation of Early Iron Age Glasses from Bologna, in I. TURBANTI-MEMMI (Ed.) *Proceedings of the 37th International Symposium on Archaeometry*, Berlin, Springer. 139-44.

POTREBICA, H. (2008) Contacts between Greece and Pannonia in the Early Iron Age - with special concern to the area of Thessalonica, in P. F. BIEHL & Y. Y. RASSAMAKIN (Eds.) *Import and imitation in archaeology***,** Langenweissbach, Beier & Beran. 187-212.

POUSAZ, N., ELYAQTINE, M., GUÉLAT, M. & MARCHAND, K. (2000) Delémont JU-En La Pran. De l'âge du Bronze au Moyen Age. Une nécropole du Bronze final dans son environnement archéologique et sédimentaire, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 83, 79-94.

PRANCKĖNAITĖ, E. (Ed.) (2011) *Wetland Settlements of the Baltic***,** Vilnius, Centre of Underwater Archaeology.

PREUCEL, R. W. (1991) The Philosophy of Archaeology, in R. W. PREUCEL (Ed.) *Processual and postprocessual archaeologies : multiple ways of knowing the past***,** Carbondale, Center for Archaeological Investigations. 17-29.

PREUCEL, R. W. (2010) *Archaeological semiotics,* Malden, Mass. ; Oxford, Wiley-Blackwell.

PREUCEL, R. W. & BAUER, A. A. (2001) Archaeological Pragmatics, *Norwegian archaeological review,* 34 (2), 85 - 96.

PRIMAS, M. (1970) *Die südschweizerischen Grabfunde der älteren Eisenzeit und ihre Chronologie*, Basel, Birkhäuser.

PRIMAS, M. (1977) Beobachtungen zu den spätbronzezeitlichen Siedlungs- und Depotfunden der Schweiz, in K. STÜBER & A. ZÜRCHER (Eds.) *Festschrift Walter Drack zu seinem 60. Geburtstag***,** Zürich, Th. Gut & Co. . 44-55.

PRIMAS, M. (1986) *Die Sicheln in Mitteleuropa I (Österreich, Schweiz, Süddeutschland)*, Prähistorische Bronzefunde 18 / 2, München, C. H. Beck.

PRIMAS, M. (1995) Stand und Aufgaben Der Urnenfelderforschung in der Schweiz, in R.-G. Z. MAINZ (Ed.) *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*, Bonn, Rudolf Habelt. 201-23.

PRIMAS, M. (1990b) Verkehr und Innovation, *Archäologie der Schweiz,* 13 (2), 80-88.

PRIMAS, M. (1997) Bronze Age Economy and Ideology: Central Europe in Focus, *Journal of European Archaeology,* 5 (1), 115-30.

PRIMAS, M. (2004) Wirtschaft und Gessellschaft urnenfelderzeitlicher Seeufersiedlungen - eine Aktualisierung, in B. HÄNSEL (Ed.) *Parerga Praehistorica : Jubiläumsschrift zur Prähistorischen Archäologie : 15 Jahre UPA***,** Bonn, R. Habelt. 113-33.

PRIMAS, M. (2008) *Bronzezeit zwischen Elbe und Po : Strukturwandel in Zentraleuropa 2200-800 v. Chr*, Bonn, Verlag Habelt.

PRIMAS, M. (2012) Networks and Hierarchy in Bronze Age Contexts, in T. L. KIENLIN & A. ZIMMERMANN (Eds.) *Beyond Elites. Alternatives to Hierarchical Systems in Modelling Social Formations. (October 22-24).* Bonn, Rudolf Habelt. 369-79.

PRIMAS, M., DELLA CASA, P. & SCHMID-SIKIMIĆ, B. (1992) *Archäologie zwischen Vierwaldstättersee und Gotthard : Siedlungen und Funde der ur- und frühgeschichtlichen Epochen*, Bonn, Rudolf Habelt.

PRIMAS, M. & PERNICKA, E. (1998) Der Depotfund von Oberwilflingen, *Germania,* 76 (1), 25-65.

PRIMAS, M. & RUOFF, U. (1981) Die urnenfelderzeitliche Inselsiedlung "Grosser Hafner" im Zürichsee (Schweiz) Tauchausgrabung 1978-1979, *Germania,* 59 (1)

PRIMAS, M. & SCHMID-SIKIMIĆ, B. (1997) Interaction Across the Alps, in ISTITUTO ITALIANO DI PREISTORIA E PROTOSTORIA (Ed.) *La Valle D'Aosta nel quadro della preistoria e protostoria dell'arco alpino centro-occidentale*, Firenze, Istituto Italiano di Preistoria e Protostoria.

PRIMAS, M., TAROT, J., MEIER, W., SCHMID-SIKIMIĆ, B. & FANKHAUSER, C. (1989) *Die Keramik der Spätbronzezeit*, Eschenz, Insel Werd 4, Zürich, Abt. Ur- und Frühgeschichte der Universität Zürich.

PROCTOR, D. (1971) *Hannibal's march in history,* Oxford, Clarendon Press.

PRÜSSING, G. (1991) *Die Bronzegefässe in Österreich*, Prähistorische Bronzefunde 2 / 5, Stuttgart, Franz Steiner.

PRÜSSING, P. (1982) *Die Messer im nördlichen Westdeutschland (Schleswig-Holstein, Hamburg und Niedersachsen)*, Prähistorische Bronzefunde 7 / 3, München, C. H. Beck.

PUGIN, C., CORBOUD, P. & CASTELLA, A.-C. (1988) Une roue du Bronze final sur la station littorale de Corcelletes (Grandson VD), *Archäologie der Schweiz,* 11 (4), 146-54.

PULAK, C. (1998) The Uluburun shipwreck: an overview, *International Journal of Nautical Archaeology,* 27 (3), 188-224.

PUTZ, U. (2011) Vorgeschichtliche Importfunde aus der Mittelmeerwelt nördlich der Alpen, in P. HERZ, P. SCHMID & O. STOLL (Eds.) *Handel, Kultur und Militär : die Wirtschaft des Alpen-Donau-Adria-Raumes***,** Berlin, Frank & Timme. 157-80.

PYDYN, A. (1998) Universal or relative? Social, economic and symbolic values in central Europe in the transition from the Bronze Age to the Iron Age, in D. W. BAILEY (Ed.) *The archaeology of value: essays on prestige and the processes of valuation***,** Oxford, Hedges. 97-105.

PYDYN, A. (1999) *Exchange and cultural interactions : a study of long-distance trade and cross-cultural contacts in the Late Bronze Age and Early Iron Age in Central and Eastern Europe*, Oxford, Archaeopress.

PYDYN, A. (2005) Wyniki systematycnych penetracji podwodnych w rejonie Jeziora Powidzkiego (województwo wielkopolskie), *Fontes Archaeologisi Posnanienses,* 41, 317-30.

PYDYN, A. (2007) The lake-dwellings and lakeside settlements of Poland, in SWAP (Ed.) *Archaeology from the wetlands : recent perspectives : proceedings of the 11th WARP conference, Edinburgh 2005***,** Edinburgh, Society of Antiquaries of Scotland. 323-31.

PYDYN, A. (Ed.) (2010a) *Archeologia Jeziora Powidzkiego***,** Toruń, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika.

PYDYN, A. (2010b) Archeologiczne penetracje podwodne strefy przybrżnej Jeziora Powidzkiego, in A. PYDYN (Ed.) *Archeologia Jeziora Powidzkiego***,** Toruń, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika. 15-39.

PYDYN, A. & GACKOWSKI, J. (2011) Wetland archaeology of the Late Bronze Age and the Early Iron Age settlements from Poland, in E. PRANCKĖNAITĖ (Ed.) *Wetland settlements of the Baltic. A prehistoric perspective***,** Vilnius, Centre of Underwater Archaeology. 123-39.

PYDYN, A. & HENDERSON, J. C. (2010) Zastosowanie tachimetru w badaniach i interpretacji archaeologicznych stanowisk podwodnych, na przykładzie stanowiska 12 w Polanowie, in A. PYDYN (Ed.) *Archeologia Jeziora Powidzkiego***,** Toruń, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika. 259-69.

PYDYN, A. & REMBISZ, A. (2010) Osadnictwo ludności łużyckich pól popeilnicowych w strefi brzegowej Jeziora Powidzkiego, in A. PYDYN (Ed.) *Archeologia Jeziora Powidzkiego***,** Toruń, Wydawnictwo Naukowe Uniwersytetu Mikołaja Kopernika. 99-130.

QUILLFELDT, I. V. (1995) *Die Vollgriffschwerter in Süddeutschland*, Prähistorische Bronzefunde 4 / 11, Stuttgart, Franz Steiner.

RAGETH, J. (1976) Die bronzezeitliche Siedlung auf dem Padnal bei Savognin (Oberhalbstein GR), Grabungen 1971 und 1972, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 59, 123-79.

RAGETH, J. (1986) Die wichtigsten Resultate der Ausgrabungen in der bronzezeitlichen Siedlung auf dem Padnal bei Savognin (Oberhalbstein GR), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 69, 63-104.

RAJEWSKI, Z. (1963) Über befestige Siedlungen der Lausitzer Kultur aus der Hallstatt-Periode im Gebiet Polens, *Arbeits- und Forschungsberichte zur sächsischen Bodendenkmalpflege,* 11-12, 483-510.

RALSTON, I. (1995) Fortifications and Defence, in M. J. GREEN (Ed.) *The Celtic World***,** London, Routledge. 59-81.

RANDSBORG (1999) Into the Iron Age: A discourse on War and Society, in J. CARMAN & A. F. HARDING (Eds.) *Ancient warfare : archaeological perspectives***,** Stroud, Sutton. 191-202.

REDFIELD, R., LINTON, R. & HERSKOVITS, M. J. (1936) Memorandum for the study of acculturation, *American Anthropologist,* 38 (1), 149-52.

REDKNAP, M. (2006) Lake dwellings in Wales: reflections on legends, historical events and archaeology, in A. HAFNER, U. NIFFELER & U. RUOFF (Eds.) *Die neue Sicht : Unterwasserarchäologie und Geschichtsbild : Akten des 2. Internationalen Kongresses für Unterwasserarchäologie*, Basel, Archäologie Schweiz. 88-91.

REINERTH, H. (1928) *Die Wasserburg Buchau : eine befestigte Inselsiedlung aus der Zeit 100-800 v. Chr*, Augsburg, Benno Filser.

REINERTH, H. (1932) *Das Pfahlbaudorf Sipplingen am Bodensee,* Leipzig, Rosch Verlag.

RENFREW, C. (Ed.) (1973) *The explanation of culture change : models in prehistory*, London, Duckworth.

RENFREW, C. (1975) Trade as Action at a Distance: Questions of Integration and Communication, in J. A. SABLOFF & C. C. LAMBERG-KARLOVSKY (Eds.) *Ancient civilization and trade***,** Albuquerque, University of New Mexico Press. 3-59.

RENFREW, C. (1984a) Culture Systems and the Multiplier Effect, in C. RENFREW *Approaches to social archaeology*, Edinburgh, Edinburgh University Press. 258-82.

RENFREW, C. (1984b) The Multiplier Effect in action, in C. RENFREW *Approaches to social archaeology*, Edinburgh, Edinburgh University Press. 283-308.

RENFREW, C. (1986) Varna and the emergence of wealth in prehistoric Europe, in A. APPADURAI (Ed.) *The social life of things : commodities in cultural perspective***,** Cambridge, Cambridge University Press. 141-68.

RENFREW, C. (1993) Trade Beyond the Material, in C. J. SCARRE & F. HEALY (Eds.) *Trade and Exchange in Prehistoric Europe*, Oxford, Oxbow Books. 5-16.

RENFREW, C. & BAHN, P. G. (2008) *Archaeology theories, methods and practice,* (5th edition), London, Thames & Hudson.

RENFREW, C. & COOKE, K. L. (Eds.) (1979) *Transformations : mathematical approaches to culture change***,** New York, Academic Press.

RENNER, F. B. (1982) *Beiträge zur Gletschergeschichte des Gotthardgebietes und dendroklimatologische Analysen an fossilen Hölzern*, Zürich, Geographisches Institut Universität Zürich.

RICHTER, I. (1970) *Der Arm- und Beinschmuck der Bronze- und Urnefelderzeit in Hessen und Rheinhessen, Prähistorische Bronzefunde 10 / 1*, München, Beck.

RICOEUR, P. (1971) The model of the Text: Meaningful Action Considered as a Text, *Social Research,* 38, 529-62.

RIEK, G. (1962) *Der Hohmichele : ein Fürstengrabhügel der späten Hallstattzeit bei der Heuneburg*, Berlin, Walter de Gruyter.

RIETH, A. (1960) *5000 Jahre Töpferscheibe,* ([Neubearbeitung] edition), Konstanz, Jan Thorbecke.

ŘÍHOVSKÝ, J. (1972) *Das Messer in Mähren und dem Ostalpengebiet*, Prähistorische Bronzefunde 7 / 1, München, Beck.

ŘÍHOVSKÝ, J. (1979) *Die Nadeln in Mähren und im Ostalpengebiet (von der mittleren Bronzezeit bis zur älteren Eisenzeit)*, Prähistorische Bronzefunde 13 / 5, München, Beck.

ŘÍHOVSKÝ, J. (1989) *Die Sicheln in Mähren*, Prähistorische Bronzefunde 18 / 3, München, C. H. Beck.

ŘÍHOVSKÝ, J. (1996) *Die Lanzen-, Speer- und Pfeilspitzen in Mähren,* Stuttgart, Franz Steiner Verlag.

RIND, M. M. (1999) *Der Frauenberg oberhalb Kloster Weltenburg I,* Regensburg, Universitätsverlag Regensburg.

RIVERS, W. H. R. (1910) The genealogical method of anthropological inquiry, *Sociological Review,* 3 (1), 1-12.

RIVIÈRE, P. (1995) Houses, places and people: community and continuity in Guiana, in J. CARSTEN & S. HUGH-JONES (Eds.) *About the house : Lévi-Strauss and beyond***,** Cambridge, Cambridge University Press. 189-205.

ROCHNA, O. (1962) Hallstattzeitlicher Lignit- und Gagatschmuck, *Fundberichte aus Schwaben. Neue Folge,* 16, 44-83.

ROMANOWSKA-GRABOWSKA, O. (1982) Gród halsztacki w Izdebnie, gm. Rogowo, woj. bydgoskie wświetle dotychczasowych badań archeologicznych., *Komunikaty Archeologiczne,* 1973-1979, 101-25.

ROOS-BARRACLOUGH, F., VAN DER KNAAP, W. O., VAN LEEUWEN, J. F. N. & SHOTYK, W. (2004) A Late-glacial and Holocene record of climatic change from a Swiss peat humification profile, *The Holocene,* 14 (1), 7-19.

ROSCIO, M., DELOR, J.-P. & MULLER, F. (2011) Late Bronze Age Graves with Weighing Equipment from Eastern France, *Archäologisches Korrespondenzblatt,* 41 (2), 173-87.

ROSSIUS, K. O. (1933) Die sogenannten Pfahlbauten Ostpreußens, *Praehistorische Zeitschrift,* 24, 22-95.

ROWLANDS, M. (1993) The Role of Memory in the Transmission of Culture, *World archaeology,* 25 (2), 141-51.

ROWLANDS, M. J. (1971) The Archaeological Interpretation of Prehistoric Metalworking, *World archaeology,* 3.2, 210-24.

ROYMANS, N. (1991) Late Urnfield Societies in the Northwest European Plain and the expanding networks of Central European Hallstatt Groups, in N. ROYMANS & F. THEUWS (Eds.) *Images of the past : studies on ancient societies in Northwestern Europe***,** Amsterdam, Instituut voor Pre- en Protohistorische Archeologie. 9-89.

RUBAT BOREL, F. (2009) Entre Italie et Gaule: le Bronze Final et le Premier âge du Fer dans le Piémont nord-occidental et la Vallée d'Aoste, *Colloque International de l'Association Française pour l'Etude de l'Âge du Fer (A. F. E. A. F.) No. 30*, Dijon, Société archéologique de l'Est. 237-52.

RUBAT BOREL, F. (2006b) "Quasi al vertice d'Italia": itinerari protostorici lungo la Dora Baltea tra la pianura piemontese e i valchi valdostani, in P. I. IIIA (Ed.) *Alpis Graia: Archéologie sans frontières au col du Petit-Saint-Bernard***,** Quart, Musumeci S.p.A. 259-68.

RUOFF, U. (1974) *Zur Frage der Kontinuität zwischen Bronze- und Eisenzeit in der Schweiz* Basel, Schweizerische Gesellschaft für Ur- und Frühgeschichte.

RUOFF, U. (2004) Lake dwelling studies in Switzerland since 'Meilen 1854', in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 9-21.

RYCHNER-FARAGGI, A.-M. (1993) *Hauterive-Champréveyres 9: Métal et parure au Bronze final,* Neuchâtel, Musée cantonal d'archéologie.

RYCHNER, V. (1979) *L'âge du bronze final à Auvernier (Lac de Neuchâtel, Suisse) : typologie et chronologie des anciennes collections conservées en Suisse*, Lausanne, Bibliothèque historique vaudoise.

RYCHNER, V. (1984) La matière première des bronziers lacustres, *Archäologie der Schweiz,* 7 (2), 73-78.

RYCHNER, V. (1987) *Auvernier 1968-1975, le mobilier métallique du Bronze final : formes et techniques*, Lausanne, Bibliothèque historique vaudoise.

RYCHNER, V. (1995) Stand und Aufgaben Dendrochronologischer Forschung zur Urnenfelderzeit, in R.-G. Z. MAINZ (Ed.) *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*, Bonn, Rudolf Habelt. 455-87.

RYCHNER, V. (1998) Gesichte und Kulturen der Bronzezeit in der Schweiz, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 103-32.

RYCHNER, V. (2001) Objects "manipulés" des Palafittes de Suisse Occidentale au Bronze Final : une première approche, *Revue archéologique de l'Ouest,* supplément no. 9, 217-24.

RYCHNER, V. & FASNACHT, W. (1998) Die wirtschaftliche Bedeutung der Bronze, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 241-52.

RYCHNER, V. & KLÄNTSCHI, N. (1995) *Arsenic, nickel et antimoine : une approche de la métallurgie du Bronze moyen et final en Suisse par l'analyse spectrométrique*, Lausanne, Cahiers d'archéologie romande.

SABATINI, S. (2013) Local and transcultural burial practices in Northern Europe in the Late Bronze Age: Face, house and face/door urns, in M. E. ALBERTI & S. SABATINI (Eds.) *Exchange networks and local transformations***,** Oxford, Oxbow. 134-45.

SAHLINS, M. D. (1974) *Stone age economics,* London, Tavistock.

SALZANI, L. (1976) Fondo Paviani (Legnago, Verona), *Bollettino del Museo Civico di Storia Naturale di Verona,* 3, 587-90.

SALZANI, L. (2009) Rovigo. Notizie preliminari sulle ricerche nel sito dell'età del Bronzo di Grignano Polesine, *Quaderni di archeologia del Veneto,* 25, 37-39.

SALZANI, L. & COLONNA, C. (2010) *la Fragilità dell'Urna: I recenti scavi a Narde Necropoli di Frattesina (XII-IX sec. a.C.),* Rovigo, Soprintendenza per i beni archeologici del Veneto.

SANDARS, N. K. (1959) Amber spacer-beads again, *Antiquity,* 33 (132), 292-95.

SANTI, P., RENZULLI, A., ANTONELLI, F. & ALBERTI, A. (2009) Classification and provenance of soapstones and garnet chlorite schist artifacts from Medieval sites of Tuscany (Central Italy): insights into the Tyrrhenian and Adriatic trade, *Journal of Archaeological Science,* 36 (11), 2493-501.

SAUNDERS, N. J. (1999) Biographies of Brilliance: Pearls, Transformations of Matter and being, c. AD 1492, in C. GOSDEN & Y. MARSHALL (Eds.) *The cultural biography of objects*, Vol. 31.2**,** London, Routledge. 243-57.

SCHAUER, P. (1971) *Die Schwerter in Süddeutschland, Oesterreich und der Schweiz I : (Griffplatten-, Griffangel- und Griffzungenschwerter)*, Prähistorische Bronzefunde 4 / 2, München, Beck.

SCHAUER, P. (1972) Zur Herkunft der Bronzenen Hallstatt-Schwerter, *Archäologisches Korrespondenzblatt,* 2 (3), 261-70.

SCHAUER, P. (1985) Spuren orientalisch und ägäischen Einfluss im bronzezeitlischen Nordischen Kreis, *Jahrbuch des Römisch-Germanisches Zentralmuseum,* 32, 123-95.

SCHAUER, P. (1995) Stand und Aufgaben der Urnenfelderforschung in Süddeutschland, in R.-G. Z. MAINZ (Ed.) *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*, Bonn, Rudolf Habelt. 121-99.

SCHIBLER, J., BREITENLECHNER, E., DESCHLER-ERB, S., GOLDENBERG, G., HANKE, K., HIEBEL, G., PLOGMANN, H. H., NICOLUSSI, K., MARTI-GRÄDEL, E., PICHLER, S., SCHMIDL, A., SCHWARZ, S., STOPP, B. & OEGGL, K. (2011) Miners and mining in the Late Bronze Age: a

multidisciplinary study from Austria, *Antiquity,* 85 (330), 1259-78.

SCHIBLER, J. & CHAIX, L. (1995) Wirtschaftliche Entwicklung aufgrund archäozoologischer Daten, in W. E. STÖCKLI, U. NIFFELER & E. GROSS-KLEE (Eds.) *Die Schweiz vom Paläolithikum bis zum frühen Mittelalter : Neolithikum*, Vol. 2**,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 97-118.

SCHIBLER, J. & STUDER, J. (1998) Haustierhaltung und Jagd während der Bronzezeit der Schweiz, in S. HOCHULI, U. NIFFELER & V. RYCHNER (Eds.) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte. 171-91.

SCHIBLER, J. & VESZELI, M. (1996) Die Tierknochen der Seeufersiedlungen von Zug-Sumpf und ihre Bedeutung im Rahmen der bronzezeitlichen Wirtschaft im nördlichen Alpenvorland, in REGIERUNGSRAT DES KANTONS ZUG (Ed.) *Die Dorfgeschichte: Die spätbronzezeitlichen Ufersiedlungen von Zug Sumpf 1***,** Zug, Kantonales Museum für Urgeschichte Zug. 305-43.

SCHIFFER, M. B. (1996) *Formation processes of the archaeological record,* Salt Lake City, University of Utah Press.

SCHINDLER, C. (1971) Geologie von Zürich und ihre Beziehung zu Seespiegelschwankungen, *Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich,* 116 (2), 285-315.

SCHLANGER, N. (1994) Mindful technology: unleashing the chaîne opératoire for an archaeology of mind, in C. RENFREW & E. B. W. ZUBROW (Eds.) *The ancient mind : elements of cognitive archaeology***,** Cambridge, Cambridge University Press. 143-51.

SCHLICHTHERLE, H. (1995) Bemerkungen zur Siedlungsstruktur der Feuchtbodensiedlungen im Südwestdeutschen Alpenvorland, in A. ASPES (Ed.) *Settlement patterns between the Alps and the Black Sea 5th to 2nd Millennium B.C.*, Verona, Museo Civico di Storia Naturale di Verona. 251-59.

SCHLICHTHERLE, H. (1997) Pfahlbauten rund um die Alpen, in H. SCHLICHTHERLE (Ed.) *Pfahlbauten rund um die Alpen***,** Stuttgart, Theiss. 7-15.

SCHLICHTHERLE, H. (2002) Prähistorische Siedlungen, Bohlenwege und Fischfanganlagen. Fortschritte der archäologischen Federseeforschung, *Denkmalpflege in Baden-Württemberg,* 31, 115-21.

SCHLICHTHERLE, H. (2004) Lake dwellings in south west Germany: history of research and contemporary perspectives, in F. MENOTTI (Ed.) *Living on the lake in prehistoric Europe : 150 years of lake-dwelling research***,** London, Routledge. 22-35.

SCHLICHTHERLE, H. (2009) Eine neue Siedlungskammer im westlichen Federseeried und ihre Bedeutung für das Verständnis neolithischer Siedelsysteme, in J. BIEL, J. HEILIGMANN & D. KRAUSSE (Eds.) *Landesarchäologie: Festschrift für Dieter Planck zum 65. Geburtstag***,** Stuttgart, Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg. 61-86.

SCHLICHTHERLE, H. & STROBEL, M. (Eds.) (1999) *Archaeology and Protection of Nature in the Federsee Bog***,** Stuttgart, Landesdenkmalamt Baden-Württemberg.

SCHMID-SIKIMIĆ, B. (1996) *Der Arm- und Beinschmuck der Hallstattzeit in der Schweiz : mit einem Anhang der Gürtelhaken und Gürtelgehänge der Hallstattzeit im Schweizerischen Mittelland, Jura und Wallis*, Prähistorische Bronzefunde 10 / 5, Stuttgart, Franz Steiner Verlag.

SCHMID-SIKIMIĆ, B. & BECK, C. W. (2002) *Mesocco Coop (GR) : eisenzeitlicher Bestattungsplatz im Brennpunkt zwischen Süd und Nord*, Bonn, Komm. R. Habelt.

SCHMIDHEINY, M. (2006) *Zürich-Mozartstrasse (ZH) : die frühbronzezeitliche Besiedlung*, unpublished thesis for Master of Archaeology, (Universität Zürich).

SCHNEKENBURGER, G. (2002) *Über die Alpen : Menschen Wege Waren,* Stuttgart, Theiss.

SCHÖBEL, G. (1992) Die Pfahlbauten von Unteruhldingen, *Plattform,* 1, 9-23.

SCHÖBEL, G. (1996) Die Spätbronzezeit am nordwestlichen Bodensee. Taucharchäologische Untersuchungen in Hagnau und Unteruhldingen 1982-1989, in G. SCHÖBEL (Ed.) *Siedlungsarchäologie im Alpenvorland IV*, Vol. IV**,** Stuttgart, Konrad Theiss Verlag. 9-202.

SCHOPPER, F. (1995) *Das Urnenfelder- und Hallstattzeitliche Gräberfeld von Künzing, Lkr. Deggendorf (Niederbayern)*, Bonn, Rudolf Habelt.

SCHUMACHER-MATTHÄUS, G. (2008) Varia zum grab von Gevelinghausen, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 233-40.

SCHWAB, H. (2002) *Les artisans de l'âge du Bronze sur la Broye et la Thielle*, Archéologie de la 2e correction des

eaux du Jura 3, Fribourg, Editions Universitaires Fribourg Suisse.

SCHWEIZERISCHES LANDESMUSEUM (2004) *Die Pfahlbauer : 150 Objekte erzählen 150 Geschichten : Begleitband zur Ausstellung im Schweizerischen Landesmuseum Zürich*, Zürich, Schweizerisches Landesmuseum.

SEIFERT, M. (1996) Der archäologische Befund von Zug-Sumpf, in REGIERUNGSRAT DES KANTONS ZUG (Ed.) *Die Dorfgeschichte***,** Zug, Kantonales Museum für Urgeschichte Zug. 1-197.

SEIFERT, M. (1997) *Die Funde der Grabungen 1952-54,* Zug, Kantonales Museum für Urgeschichte Zug.

SHANKS, M. (1998) The life of an artifact in an interpretive archaeology, *Fennoscandia Archaeologica,* 15, 15-30.

SHANKS, M. (2001) Culture/Archaeology: The Dispersion of a Discipline and its Objects, in I. HODDER (Ed.) *Archaeological Theory Today***,** Cambridge, Polity. 284-305.

SHANKS, M. & TILLEY, C. Y. (1992) *Re-constructing archaeology : theory and practice*, Cambridge, Cambridge University Press.

SHAPLAND, F. & ARMIT, I. (2012) The Useful Dead: Bodies as Objects in Iron Age and Norse Atlantic Scotland, *European Journal of Archaeology,* 15 (1), 98-116.

SHARP, L. (1954) Steel Axes for Stone Age Australians, in E. H. SPICER (Ed.) *Human problems in technological change : a casebook***,** New York, Russel Sage Foundation. 69-90.

SHARPLES, N. M. (2007) Building communities and creating identities in the first millenium B.C, in C. HASELGROVE & R. POPE (Eds.) *The earlier Iron Age in Britain and the near continent***,** Oxford, Oxbow Books. 174-84.

SHARPLES, N. M. (2010) *Social relations in later prehistory : Wessex in the first millennium BC*, Oxford, Oxford University Press.

SHENNAN, S. J. (1982) Exchange and ranking: the role of amber in the earlier bronze age of Europe, in C. RENFREW & S. SHENNAN (Eds.) *Ranking, resource, and exchange : aspects of the archaeology of early European society***,** Cambridge, Cambridge University Press. 33-45.

SHENNAN, S. J. (2006) *Quantifying archaeology,* Iowa City, University of Iowa Press.

SHENNAN, S. J. (Ed.) (2009) *Pattern and process in cultural evolution***,** Berkeley, University of California Press.

SHERIDAN, A. & DAVIS, M. (1998) The Welsh 'Jet Set' in Prehistory: a Case of Keeping Up with the Joneses?, in A. GIBSON & A. BURL (Eds.) *Prehistoric ritual and religion***,** Stroud, Sutton Publishing. 148-62.

SHERIDAN, A. & DAVIS, M. (2002) Investigating jet and jet-like artefacts from Prehistoric Scotland: the National Museums of Scotland project, *Antiquity,* 76 (293), 812-25.

SHERRATT, A. (1993) What would a Bronze Age World System look like?, *European Journal of Archaeology,* 1 (2), 1-57.

SHERRATT, A. (1996) Why Wessex? The Avon Route and River Transport in Later British Prehistory, *Oxford Journal of Archaeology,* 15 (2), 211-34.

SHERRATT, A. (1998) The Human Geography of Europe: A Prehistoric Perspective, in R. A. BUTLIN & R. A. DODGSHON (Eds.) *An historical geography of Europe***,** Oxford, Clarendon Press. 1-25.

SHERRATT, S. (2010) Greeks and Phoenicians: Perceptions of Trade and Traders in the Early First Millennium BC, in A. A. BAUER & A. S. AGBE-DAVIES (Eds.) *Social Archaeologies of Trade and Exchange: Exploring Relationships among People, Places, and Things***,** California, West Cost Press. 119-42.

SHERRATT, S. & SHERRATT, A. (1993) The Growth of the Mediterranean Economy in the Early First Millennium B.C., *World archaeology,* 24 (3), 361-78.

SICHERL, B. (2008) Gedanken zur schwertproduktion und -distribution in der späten urnenfelderzeit am beispiel der Tachloviceschwerter, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 241-57.

SIEDLUNGSARCHÄOLOGIE IM ALPENVORLAND XI (Ed.) (2009) *Die früh- und mittelbronzezeitliche "Siedlung Forschner" im Federseemoor. Befunde un Dendrochronologie*, Stuttgart, Konrad Theiss.

SIEPEN, M. (2005) *Der hallstattzeitliche Arm- und Beinschmuck in Österreich*, Prähistorische Bronzefunde 10 / 6, Stuttgart, Franz Steiner.

SIEVERS, S. (1982) *Die mitteleuropäischen Hallstattdolche*, Prähistorische Bronzefunde 6 / 6, München, C. H. Beck.

SIEVERS, S., DRESCHER, H. & ROCHNA, O. (1984) *Die Kleinfunde der Heuneburg : die Funde aus den Grabungen von 1950-1979,* Mainz/Rh. Philipp von Zabern,

SIMMEL, G. (1978) *The Philosophy of Money,* London, Routledge.

SKEATES, R. (1995) Animate objects: a biography of prehistoric 'axe-amulets' in the central Mediterranean region, *Proceedings of the Prehistoric Society,* 61, 279-301.

SKEATES, R. (2009) Trade and Interaction, in B. W. CUNLIFFE, C. GOSDEN & R. A. JOYCE (Eds.) *The Oxford handbook of archaeology***,** Oxford, Oxford University Press. 555-78.

ŚLUSARSKA, K. (2007) Some remarks on the possibility that there existed an "eastern branch" in the system of amber routes in the late Bronze and early Iron Ages, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 371-75.

SNODGRASS, A. M. (1980) Iron and Early Metallurgy in the Mediterranean, in T. A. WERTIME & J. D. MUHLY (Eds.) *The coming of the age of iron***,** New Haven, Yale University Press. 335-74.

SOMMERFELD, C. (1994) *Gerätegeld Sichel : Studien zur monetären Struktur bronzezeitlicher Horte im nördlichen Mitteleuropa*, Berlin, Walter de Gruyter.

SØRENSEN, M. L. S. & THOMAS, R. (Eds.) (1989) *The Bronze Age-Iron Age transition in Europe : aspects of continuity and change in European societies, c. 1200 to 500 B.C, Vol. 1 & 2*, Oxford, B.A.R.

SOSNOWSKA, A. (1995) Charakterystyka ceramiki naczyniowej z osiedla Nawodnego kultury kurhanów zachodniobałtyjskich w mołtajnach, woj. Olsztyn (stanowisko 1), *Acta Universitatis Nicolai Copernici Archaeologia,* 25 (288), 3-18.

SPECK, J. (1955a) Ausgrabungen in der spätbronzezeitlichen Ufersiedlung Zug-Sumpf, in W. U. GUYAN (Ed.) *Das Pfahlbauproblem***,** Basel, Birkhäuser. 275-334.

SPECK, J. (1955b) Zur Kenntnis der prähistorischen Ufersiedlungen auf der Landzunge bei Mariazell (Gemeinde Sursee, Luzern), *Mitteilungen der Naturforschenden Gesellschaft Luzern,* 17, 177-95.

SPECK, J. (1981a) Frühes Eisen in den Ufersiedlungen der Spätbronzezeit, *Helvetia Archaeologica,* 45/48, 265-71.

SPECK, J. (1981b) Pfahlbauten: Dichtung oder Wahrheit? Ein Querschnitt durch 125 Jahre Forschungsgeschichte, *Helvetia Archaeologica,* 45/48, 98-138.

SPECK, J. (1981c) Schloss und Schlüssel zur späten Pfahlbauzeit, *Helvetia Archaeologica,* 45/48, 230-41.

SPERBER, L. (1992) Bemerkungen zur sozialen Bewertung von goldenem Trachtschmuck und Schwert in der Urnenfelderkultur, *Archäologisches Korrespondenzblatt,* 22, 63-77.

SPERBER, L. (1999) Zu den Schwertträgern im Westlichenkreis der Urnenfelderkultur: profane und religiöse aspekte, in RÖMISCH-GERMANISCHES ZENTRALMUSEUM (MAINZ) (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 605-59.

SPERBER, L. (2004) Zur Bedeutung des nördlichen Alpenraumes für die spätbronzezeitliche Kupferversorgung in Mitteleuropa, in G. WEISGERBER & G. GOLDENBERG (Eds.) *Alpenkupfer - Rame delle Alpi***,** Bochum, Deutsches Bergbau-Museum. 303-45.

SPINDLER, K. (2001) *The Man in the Ice: The Preserved Body of a Neolithic Man Reveals the Secrets of the Stone Age*, London, Phoenix.

SPRIGGS, M. (2008) Ethnographic parallels and the denial of history, *World archaeology,* 40 (4), 538 - 52.

SPROCKHOFF, E. (1934) *Die germanischen Vollgriffschwerter der jüngeren Bronzezeit,* Berlin ; Leipzig, Walter de Gruyter & Co.

SPROCKHOFF, E. (1951) Pfahlbaubronzen in der Südzone des Nordischen Kreises während der jüngeren Bronzezeit, *Archaeologica Geographica,* 2 (3/4), 120-28.

SPROCKHOFF, E. (1956) *Jungbronzezeitliche Hortfunde der Südzone des nordischen Kreises (Periode V)*, Mainz, Römisch-Germanischen Zentralmuseums.

SPROCKHOFF, E. (1966) Ein Geschenk aus dem Norden, in R. DEGEN, W. DRACK & R. WYSS (Eds.) *Helvetia antiqua : Festschrift Emil Vogt : Beiträge zur Prähistorie und Archäologie der Schweiz***,** Zürich, Conzett und Huber. 101-10.

SPROCKHOFF, E. & HÖCKMANN, O. (1979) *Die gegossenen Bronzebecken der jüngeren nordischen Bronzezeit,* Mainz, Römisch-Germanischen Zentralmuseums Mainz.

STAHL, C. (2006) *Mitteleuropäische Bernsteinfunde von der Frühbronze- bis zur Frühlatènezeit : ihre Verbreitung,*

Formgebung, Zeitstellung und Herkunft, Dettelbach, J.H. Röll.

STAMPOLIDIS, N. C. (Ed.) (2003) *Sea routes ... from Sidon to Huelva : interconnections in the Mediterranean 16th - 6th c.BC*, Athens, Museum of Cycladic Art.

STARÈ, F. (1957) Polmesenče britve iz Jugoslavije, *Arheološki vestnik,* 8 (3-4), 204-34.

STARK, M. T. (1991) Ceramic Change in Ethnoarchaeological Perspective: A Kalinga Case Study, *Asian Perspectives,* 30 (2), 193-216.

STARKEL, L. (1995) Reconstruction of hydrological changes between 7000 and 3000 BP in the upper and middle Vistula River Basin, Poland, *The Holocene,* 5 (1), 34-42.

STARY, P. F. (1995) Rohstoffe im früheisenzeitlichen Nord-Süd-Handel, *Münstererscher Beiträge zur antiken Handelgeschichte,* 14 (1), 82-108.

STAUFFER-ISENRING, L. & KAUFMANN, B. (1983) *Die Siedlungsreste von Scuol-Munt Baselgia (Unterengadin GR) : ein Beitrag zur inneralpinen Bronze- und Eisenzeit*, Basel, Schweiz. Ges. für Ur- und Frühgeschichte.

STEGMAIER, G. (2010) Keramik zwischen Ost und West: ein beitrag zur erforschung von Fernkontakten während der Frühen Eisenzeit, *Archäologisches Korrespondenzblatt,* 40 (1), 67-75.

STEIN, G. J. (2002) From Passive Periphery to Active Agents: Emerging Perspectives in the Archaeology of Interregional Interaction, *American Anthropologist,* 104 (3), 903-16.

STEINHAUSER-ZIMMERMANN, R. A. (1989) *Der Montlingerberg im Kanton St. Gallen (Schweiz) : Funde und Grabungen von 1898 bis 1960*, Buchs, Amt für Kulturpflege des Kantons St. Gallen.

STEINHAUSER-ZIMMERMANN, R. A. (2002) Früher Handel mit Luxusgütern auf dem Montlingerberg im St. Galler Rheintal, in G. SCHNEKENBURGER (Ed.) *Über die Alpen : Menschen - Wege - Waren***,** Stuttgart, Theiss. 169-74.

STEINHAUSER, R. A. & PRIMAS, M. (1987) Der Bernsteinfund vom Montlingerberg (Kt. St. Gallen, Schweiz), *Germania,* 65, 203-14.

STJERNQUIST, B. (1967) *Ciste a cordoni (Ripenzisten) : Produktion, Funktion, Diffusion*, Bonn, Habelt.

STRAHM, C. (1997) Chronologie der Pfahlbauten, in H. SCHLICHTHERLE (Ed.) *Pfahlbauten rund um die Alpen*, Stuttgart, Theiss. 124-26.

STRATHERN, M. (1988) *The gender of the gift : problems with women and problems with society in Melanesia*, Berkeley, University of California Press.

STRATHERN, M. (1991) One man and many men, in M. GODELIER & M. STRATHERN (Eds.) *Big men and great men : personifications of power in Melanesia***,** Cambridge, Cambridge University Press. 197-214.

STRATHERN, M. (1997) Prefigured features: A view from the New Guinea highlands, *Australian Journal of Anthropology,* 8 (1), 89.

STRATHERN, M. (1999) The Ethnographic Effect I, in M. STRATHERN *Property, substance and effect : anthropological essays on persons and things*, London, The Athlone Press. 1-26.

STROBEL, P. (1874) Intorno all'origine delle terramare, *Archivio per l'Antropologia e l'Etnologia,* IV, 1-19.

STRUVE, K. W. (1979) *Die jüngere Bronzezeit,* Neumünster, Wachholtz.

SULLIVAN, A. P. (1978) Inference and Evidence in Archaeology: A Discussion of the Conceptual Problems, in M. B. SCHIFFER (Ed.) *Advances in Archaeological Method and Theory*, Vol. 1**,** New York, Academic Press. 183-222.

SULLIVAN, L. H. (1896) The tall office building artistically considered, *Lippincott's Magazine,* 1896 (March), 403-09.

SUTER, P. J., JACOMET, S., RICHTER, B., SCHIBLER, J. & SCHUBERT, P. (1987) *Zürich "Kleiner Hafner" : Tauchgrabungen 1981-1984,* Zürich, Fotorotar AG.

SUTER, P. J. & SCHLICHTHERLE, H. (2009) *Pfahlbauten : UNESCO Welterbe-Kandidatur "Prähistorische Pfahlbauten rund um die Alpen",* Bern, Palafittes, Archäologischer Dienst des Kantons Bern.

SYDOW, W. (1995) Der hallstattzeitliche Bronzehort von Fliess im Oberinntal, Tirol, Wien, Verlag Ferdinand Berger.

SZABÓ, G. & SZÓNÓKY, M. (2002) Experimental data on the trade of raw materials in Europe during the Late Bronze Age, in E. JEREM & K. T. BIRÓ (Eds.) *Archaeometry 98 : proceedings of the 31st symposium*, Oxford, Archaoeopress. 267-72.

SZAMAŁEK, K. (1987) Kruszwicki zespół osadniczy w młodszej epoce brazu i w początkach epoki żelaza, Wroclaw, Ossolineum.

SZAMAŁEK, K. (1991) Kruszwicki zespół osadniczy kultury łużyckiej na tle środowiska geograficznego, in P. M. ARCHEOLOGICZNE (Ed.) *Prahistoryczny gród w Biskupinie : problematyka osiedli obronnych ma początku epoki żelaza***,** Warszawa, Wydawnictwo Naukowe PWN. 225-33.

TACKENBERG, K. (1971) *Die jüngere Bronzezeit in Nordwestdeutschland*, Hildesheim, Lax.

TAROT, J. (2000) *Die bronzezeitlichen Lanzenspitzen der Schweiz : unter Einbeziehung von Liechtenstein und Vorarlberg*, Bonn, Habelt.

TAUTAVIČIUS, A. (2001) A partial survey of research on pre-nineteenth-century Lithuanian amber artefacts (archaeoogical finds), in A. BUTRIMAS (Ed.) *Baltic Amber: Baltic amber in natural sciences, archaeology and applied arts*, Vilnius, Vilnius Academy of Fine Arts. 281-84.

TEHRANI, J. J., COLLARD, M. & SHENNAN, S. J. (2010) The cophylogeny of populations and cultures: reconstructing the evolution of Iranian tribal craft traditions using trees and jungles, *Philosophical Transactions of the Royal Society of London (B) on Cultural and Linguistic Diversity,* 365 (1559), 3865-74.

TEODOR, E. S., TEODOR, E. D., VIRGOLICI, M., MANEA, M. M., TRUICA, G. & LITESCU, S. C. (2010) Non-destructive analysis of amber artefacts from the prehistoric Cioclovina hoard (Romania), *Journal of Archaeological Science,* 37 (10), 2386-96.

TERŽAN, B. (1996) Urnenfelderzeitliche Halsringe zwischen der nördlichen Adria und Südpolen, in J. CHOROCHOROWSKI (Ed.) *Problemy epoki brazu i wczesnej epoki zelaza w Europie Srodkowej : ksiega jubileuszowa poswiecona Markowi Gedlowi w szescdziesiata rocznice urodzin i czterdziestolecie pracy Uniwersytecie Jagiellonskim*, Kraków, Oficyna Cracovia. 489-501.

TERŽAN, B. (2004) L'aristocrazia femminile nella prima età del Ferro, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 221-29.

TERŽAN, B. (2007) Cultural connections between *Caput Adriae* and the Aegean in the late Bronze and early Iron Age, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 157-65.

TERŽAN, B., MIHOVILIĆ, K. & HÄNSEL, B. (1999) Eine protourbane Siedlung der älteren Bronzezeit im istrischen Karst, *Praehistorische Zeitschrift,* 74, 154-93.

THOMAS, N. (1991) *Entangled objects : exchange, material culture, and colonialism in the Pacific*, Cambridge (Mass.), Harvard University Press.

THRANE, H. (1965) Dänische funde fremder bronzegefässe der jüngeren Bronzezeit (Periode IV), *Acta Archaeologica,* 36, 157-207.

THRANE, H. (1972) Urnenfeldermesser aus Dänemarks Jüngerer Bronzezeit (Periode IV-V), *Acta Archaeologica,* 43, 165-228.

THRANE, H. (1975) *Europaeiske forbindelser : bidrag til studiet af fremmede forbindelser i Danmarks yngre broncealder (periode IV-V)*, København, Nationalmuseet.

THRANE, H. (1976) A new hoard of Jensovice cups from South Jutland, *Acta Archaeologica,* 47, 168-71.

THURSTON, T. (2009) Unity and Diversity in the European Iron Age: Out of the Mists, Some Clarity?, *Journal of Archaeological Research,* 17 (4), 347-423.

TILLEY, C. Y. (1982) Social formation, social structures and social change, in I. HODDER (Ed.) *Symbolic and structural archaeology***,** Cambridge, Cambridge University Press. 26-38.

TILLEY, C. Y. (1989) Interpreting Material Culture, in I. HODDER (Ed.) *The Meanings of Things: material culture and symbolic expression***,** London, Leicester University Press. 185-94.

TILLEY, C. Y. (1996) *An ethnography of the Neolithic: early prehistoric societies in southern Scandinavia*, Cambridge, Cambridge University Press.

TILLEY, C. Y. (2006) Theoretical Perspectives, in C. Y. TILLEY (Ed.) *Handbook of material culture***,** London, SAGE Publications. 7-11.

TILLEY, C. Y. (2010) *Interpreting Lanscapes: Geologies, Topographies, Identities,* Walnut Creek (California), Left Coast Press.

TITE, M. S., SHORTLAND, A. J. & ANGELINI, I. (2008) Faience production in Northern and Western Europe, in M. S. TITE & A. J. SHORTLAND *Production technology of faience and related early vitreous materials*, Oxford, School of Archaeology. 129-46.

TOMEDI, G. (1994) Der Übergang von der Bronzezeit zur Eisenzeit am Beispiel von Frög, Tumulus "K", in P. SCHAUER (Ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus*, Bonn, Universitätsverlag Regensburg / Rudolf Habelt. 365-82.

TOMEDI, G. (2002) Zur Emblematik der späten Bronzezeit und der frühen Eisenzeit im alpinen Raum, in L. ZEMMER-PLANK (Ed.) *Kult der Vorzeit in den Alpen : Opfergaben - Opferplätze - Opferbrauchtum***,** Bozen, Athesia. 1211-35.

TORBRÜGGE, W. (1959) *Vor- und Frühgeschichte in Stadt und Landkreis Rosenheim*, Rosenheim.

TORBRÜGGE, W. (1965) *Die Hallstattzeit in der Oberpfalz,* Kallmünz/Opf., Lassleben.

TORBRÜGGE, W. (1972) Vor- und frühgeschichtliche Flußfunde. Zur Ordnung und Bestimmung einer Denkmälergruppe, *Bericht der Römisch-Germanischen Kommission,* 51-52 (1970-1971), 1-145.

TOWLE, A. (2002) *A scientific and archaeological investigation of prehistoric glasses from Italy*, unpublished thesis for Doctor of Philosophy, (University of Nottingham).

TOWLE, A. & HENDERSON, J. (2007) The Glass Bead Game: Archaeometric evidence for the existence of an Etruscan glass industry, *Etruscan Studies,* 10 (1), 47-66.

TOWLE, A., HENDERSON, J., BELLINTANI, P. & GAMBACURTA, G. (2001) Frattesina and Adria: report of scientific analyses of early glass from the Veneto, *Padusa,* 37, 7-68.

TRACHSEL, M. (1999) Are there 'Cimmerian' and 'Scythian' finds in Switzerland? The absolute dating of the early Iron Age between the Als and the Altai region, in E. JEREM & I. POROSZLAI (Eds.) *Archaeology of the bronze and iron age : experimental archaeology, environmental archaeology, archaeological parks*, Budapest, Archaeolingua. 189-205.

TRACHSEL, M. (2004) *Untersuchungen zur relativen und absoluten Chronologie der Hallstattzeit*, Bonn, Rudolf Habelt.

TRIFKOVIĆ, V. (2005) *Construction of space in early Holocene Iron Gates*, unpublished thesis for Doctor of Philosophy, (University of Oxford).

TRIGGER, B. G. (1989) *A history of archaeological thought,* Cambridge, Cambridge University Press.

TRIGGER, B. G. (2004) Cross-Cultural Comparison and Archaeological Theory, in L. MESKELL & R. W. PREUCEL (Eds.) *A companion to social archaeology***,** Oxford, Blackwell. 43-65.

TRINGHAM, R. (2000) The Continuous House. A view from the deep past, in R. A. JOYCE & S. D. GILLESPIE (Eds.) *Beyond kinship : social and material reproduction in house societies***,** Philadelphia, University of Pennsylvania Press. 115-34.

TURFA, J. M. (1986) International Contacts: Commerece, Trade and Foreign Affairs, in L. BONFANTE (Ed.) *Etruscan : life and afterlife : a handbook of Etruscan studies***,** Warminster, Aris and Phillips. 66-91.

UENZE, H. P. (2002) Opfer in Mooren, Seen, Quellen und Flüssen im Alpenraum, in L. ZEMMER-PLANK (Ed.) *Kult der Vorzeit in den Alpen : Opfergaben - Opferplätze - Opferbrauchtum***,** Bozen, Athesia. 441-56.

UENZE, O. (1949/50) Der Hortfund von Allendorf, *Praehistorische Zeitschrift,* 34/35, 202-20.

UNZ, C. (1973) Die spätbronzezeitliche Keramik in Südwestdeutschland, in der Schweiz und in Ostfrankreich, *Prähistorische Zeitschrift,* 48, 1-124.

URBAN, G. (2010) Objects, Social Relations, and Cultural Motion, in A. A. BAUER & A. S. AGBE-DAVIES (Eds.) *Social Archaeologies of Trade and Exchange: Exploring Relationships among People, Places, and Things***,** California, West Coast Press. 207-25.

URTANS, J. & RAINS, V. (2006) New Discoveries in Latvian Lake Dwellings, in A. HAFNER, U. NIFFELER & U. RUOFF (Eds.) *Die neue Sicht : Unterwasserarchäologie und Geschichtsbild : Akten des 2. Internationalen Kongresses für Unterwasserarchäologie*, Basel, Archäologie Schweiz. 97-100.

VAGNETTI, L. (1999) Mycenaean pottery in the central Mediterranean: imports and local production in their context, in J. P. CRIELAARD, V. STISSI & G. J. VAN WIJNGAARDEN (Eds.) *The complex past of pottery : production, circulation and consumption of Mycenaen and Greek pottery (sixteenth to early fifth centuries BC) : proceedings of the ARCHON international conference*, Amsterdam, J. C. Gieben. 137-61.

VAGNETTI, L. & JONES, R. E. (1988) Towards the identification of local Mycenean pottery in Italy, in E. B. FRENCH & K. A. WARDLE (Eds.) *Problems in Greek prehistory : papers presented at the Centenary Conference of the British School of Archaeology at Athens*, Bristol, Bristol Classical Press. 335-48.

VAGNETTI, L., PERCOSSI, E., SILVESTRINI, M., SABBATINI, T., JONES, R. E. & LEVI, S. T. (2006) Ceramiche egeo-micenee dalle Marche: analisi archeometriche e inquadramento preliminare dei risultati, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1159-72.

VAN BINSBERGEN, W. M. J. (2005) Commodification: Things, agency, and identities: Introduction, in W. M. J. V. BINSBERGEN & P. GESCHIERE (Eds.) *Commodification : things, agency, and identities : (The social life of things revisited)***,** Münster, Lit Verlag. 9-51.

VAN DEN BOOM, H. (2002) Die Bedeutug der Fernkontakte für die Entstehung metallurgischer Zentren in der frühen Eisenzeit in Polen, in A. LANG & V. SALAČ (Eds.) *Fernkontakte in der Eisenzeit*, Praha, Archäologisches Institut der Akademie der Wissenschaften der Tschechischen Republik. 239-53.

VAN DYKE, R. M. & ALCOCK, S. E. (2003) Archaeologies of Memory: An Introduction, in R. M. VAN DYKE & S. E. ALCOCK (Eds.) *Archaeologies of memory***,** Oxford, Blackwell. 1-13.

VAN GEEL, B., BUURMAN, J. & WATERBOLK, H. T. (1996) Archaeological and palaeoecological indications of an abrupt climate change in The Netherlands, and evidence for climatological teleconnections around 2650 BP, *Journal of Quaternary Science,* 11 (6), 451-60.

VAN GEEL, B. & MAGNY, M. (2002) Mise en évidence d'un forçage solaire du climat á partir de données paléoécologiques et archéologiques: la transition Subboréal-Subatlantique, in H. RICHARD & A. VIGNOT (Eds.) *Équilibres et ruptures dans les écosystèmes durant les 20 derniers millénaires en Europe de l'Ouest*, Besançon, Presses Universitaires Fromc-Comtoises. 107-22.

VAN WILLIGEN, S. (2011) 3.48. Chiave, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 476.

VANDKILDE, H. (2007) *Culture and change in Central European prehistory : 6th to 1st millenium BC*, Aarhus, Aarhus University Press.

VASIĆ, R. (1999) *Die Fibeln im Zentralbalkan : (Vojvodina, Serbien, Kosovo und Makedonien)*, Prähistorische Bronzefunde 14 / 12, Stuttgart, Franz Steiner Verlag.

VENCLOVÁ, N. (1983) Prehistoric Eye Beads in Central Europe, *Journal of Glass Studies,* 25, 11-17.

VENCLOVÁ, N. (2006) Enclosing, enclosures and elites in the Iron Age, in A. F. HARDING, S. SIEVERS & N. VENCLOVÁ (Eds.) *Enclosing the past: inside and outside in prehistory***,** Sheffield, J.R. Collis. 140-54.

VERGER, S. (1992) L'épée du guerrier et le stock de métal: de la fin du Bronze ancien à lâge du Fer, in G. KAENEL & P. CURDY (Eds.) *L'âge du Fer dans le Jura : actes du 15e colloque de l'Association française pour l'étude sur l'âge du Fer*, Lausanne, Bibliothèque historique vaudoise. 135-51.

VIANELLO, A. (2005) *Late Bronze Age Mycenaean and Italic products in the West Mediterranean : a social and economic analysis*, Oxford, Archaeopress.

VIOLLIER, D. (1926) Les Tumulus hallstattiens d'Ossingen (Zurich), *Jahresberichte der Schweizerischen Landesmuseums Zürich,* 35, 37-46.

VIOLLIER, D., SULZBERGER, K., SCHERER, P., EMANUEL, SCHLAGINHAUFEN, O., HESCHELER, K. & NEUWEILER, E. (1924) *Pfahlbauten, zehnter Bericht*, Mitteilungen der Antiquarischen Gesellschaft in Zürich, Zürich, Leemann.

VITAL, J. (1992) Du IXe au VIIe siècle av. J.-C. dans le Jura méridional: scénario d'évolution culturelle, in G. KAENEL & P. CURDY (Eds.) *L'âge du Fer dans le Jura : actes du 15e colloque de l'Association française pour l'étude sur l'âge du Fer*, Lausanne, Bibliothèque historique vaudoise. 163-80.

VITAL, J. (1993) *Habitats et sociétés du Bronze final au Premier Age du Fer dans le Jura : les occupations protohistoriques et néolithiques du Pré de la Cour à Montagnieu (Ain)*, Paris, CNRS Editions.

VITAL, J. & VORUZ, J.-L. (1984) *L'habitat protohistorique de Bavois-en-Raillon (Vaud),* Lausanne, Bibliothèque historique vaudoise.

VOGT, E. (1931) Die ältesten Schlüssel, *Germania,* 15 (1), 142-45.

VOGT, E. (1951) Das steinzeitliche Uferdorf Egolzwil 3 (Kt. Luzern). Bericht über die Ausgrabung 1950, *Zuschrift für Schweizerische Archäologie und Kunstgeschichte,* 12, 193-219.

VOGT, E. (1952) Der Zierstil der späten Pfahlbaubronzen, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 4, 193-206.

VOGT, E. & GUYAN, W. U. (1977) *Schriften zum Neolithikum : Chronologie und Pfahlbaufrage*, Frauenfeld, Huber.

VON FREEDEN, U. & VON SCHNURBEIN, S. (2002) *Spuren der Jahrtausende : Archäologie und Geschichte in Deutschland*, Stuttgart, Theiss.

VON HASE, F. W. (1969) *Die Trensen der Früheisenzeit in Italien*, Prähistorische Bronzefunde 16 / 1, München, Beck.

VON HASE, F. W. (1992) Etrurien und Mitteleuropa - zur bedeutung der ersten Italisch-Etruskischen funde der späten Urnenfelder- und frühen Hallstattzeit in Zentraleuropa, in L. AIGNER-FORESTI (Ed.) *Etrusker nördlich von Etrurien : etruskische Präsenz in Norditalien und nördlich der Alpen sowie ihre Einflüsse auf die einheimischen Kulturen*, Wien, Verlag der Österreichischen Akademie der Wissenschaften. 235-66.

VONBANK, E. (1966) Frühbronzezeitliche Siedlungsfunde in Vorarlberger Rheintal, in R. DEGEN, W. DRACK & R. WYSS (Eds.) *Helvetia Antiqua. Festschrift Emil Vogt***,** Zurich, Conzett & Huber. 55-58.

VORLAUF, D. (1996) Für Glattrasuren ungeeignet. Die Funktion bronzezeitlicher Rasiermesser, *Experimentelle archäologie in Deutschland,* 13, 100-01.

VORLAUF, D. (1997) *Die etruskischen Bronzeschnabelkannen : eine Untersuchung anhand der technologisch-typologischen Methode*, Espelkamp, Verlag Marie Leidorf.

WAGNER, K. H. (1943) *Nordtiroler Urnenfelder,* Berlin, De Gruyter.

WAGNER, R. (1991) The fractal person, in M. GODELIER & M. STRATHERN (Eds.) *Big men and great men : personifications of power in Melanesia***,** Cambridge, Cambridge University Press. 159-73.

WARMENBOL, E. (1988) Broken Bronzes and Burned Bones: the transition from Bronze to Iron Age in the Low Countries, *Helinium,* 28 (2), 244-70.

WAŻNY, T. (1994) Dendrochronology of Biskupin - Absolute dating of the Early Iron Age Settlement, *Bulletin of the Polish Academy of Sciences - Biological Sciences,* 42 (3), 283-89.

WAŻNY, T. (2009) Dendrochronologia drewna biskupińskiego, czyli co drzewa zapisały w przyrostach rocznych, in L. BABIŃSKI (Ed.) *Stan i perspektywy zachowania drewna biskupińskiego (Biskupińskie Prace Archeologiczne 7)***,** Biskupin, Muzeum Archeologiczne w Biskupinie. 63-76.

WEBER, C. (1996) *Die Rasiermesser in Südosteuropa*, Prähistorische Bronzefunde 8 / 5, Stuttgart, Franz Steiner Verlag.

WEBER, G. (1992) *Händler, Krieger, Bronzegiesser : Bronzezeit in Nordhessen*, Kassel, Hessisches Landesmuseum.

WEIDMANN, T. (1981) Bronzegussformen des unteren Zürichseebeckens, *Helvetia Archaeologica,* 45/48, 218-29.

WEIDMANN, T. (1982) Keramische Gussformen aus der spätbronzezeitlichen Seerandsiedlung Zug "Sumpf", *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 65, 69-81.

WEIDMANN, T. (1983) Ein reicher Ringfund der Spätbronzezeit aus Sursee, *Helvetia Archaeologica,* 55/56 (1), 179-92.

WEINER, A. B. (1992) *Inalienable possessions : the paradox of keeping-while-giving,* Berkeley, University of California Press.

WELLS, P. S. (1980) *Culture contact and culture change : Early Iron Age central Europe and the Mediterranean world*, Cambridge, Cambridge University Press.

WELLS, P. S. (1981) *The emergence of an iron age economy : the Mecklenburg Grave Groups from Hallstatt and Stična*, Cambridge (Mass.), Harvard University Press.

WELLS, P. S. (1989) Intensification, Entrepreneurship, and Cognitive Change in the Bronze-Iron Age Transition, in M. L. S. SØRENSEN & R. THOMAS (Eds.) *The Bronze Age-Iron Age transition in Europe : aspects of continuity and change in European societies, c. 1200 to 500 B.C*, Vol. 1**,** Oxford, B.A.R. 173-83.

WELLS, P. S. (1995) Trade and exchange, in M. J. GREEN (Ed.) *The Celtic World***,** London, Routledge. 230-43.

WELLS, P. S. (1998) Identity and Material Culture in the Later Prehistory of Central Europe, *Journal of Archaeological Research,* 6 (3), 239-98.

WELLS, P. S. (2007) Boundaries and identity in Early Iron Age Europe, in C. HASELGROVE & R. POPE (Eds.) *The earlier Iron Age in Britain and the near continent***,** Oxford, Oxbow Books. 390-99.

WHEATLEY, D. (1995) Cumulative viewshed analysis: a GIS-based method for investigating intervisibility, and its archaeological application, in G. R. LOCK & Z. STANČIČ (Eds.) *Archaeology and geographical information*

*systems : a European perspective***,** London, Taylor and Francis. 171-86.

WHEATLEY, D. & GILLINGS, M. (2002) *Spatial technology and archaeology : the archaeological applications of GIS*, London, Taylor & Francis.

WHITLEY, J. (2002) Objects with Attitude: Biographical Facts and Fallacies in the Study of Late Bronze Age and Early Iron Age Warrior Graves, *Cambridge Archaeological Journal,* 12 (02), 217-32.

WHITTAKER, H. (Ed.) (2008) *The Aegean Bronze Age in relation to the wider European context : papers from a session at the eleventh annual meeting of the European Association of Archaeologists*, Cork, 5-11 September 2005**,** Oxford, Archaeopress.

WHITTLE, A. (2003) *The archaeology of people : dimensions of Neolithic life*, London, Routledge.

WIEMANN, P., KÜHN, M., HEITZ-WENIGER, A., STOPP, B., JENNINGS, B., RENTZEL, P. & MENOTTI, F. (2012) Zurich-Alpenquai: A Multidisciplinary Approach to the Chronological Development of a Late Bronze Age Lakeside Settlement in the Northern Circum-Alpine Region, *Journal of Wetland Archaeology,* 12, 58-85.

WIENER, M. H. (1991) The nature and control of Minoan foreign trade, in N. H. GALE (Ed.) *Bronze Age Trade in the Mediterranean*, Göteborg, Paul Åström. 325-50.

WILBERTZ, O. M. (1982) *Die Urnenfelderkultur in Unterfranken,* Kallmünz/Opf., Michael Lassleben.

WILKE, G. (1991) Sprawozdanie z badań wykoplasikowych na stanowisku 1 w mołtajnach w woj. olsztyńskim w 1986 r. na osiedlu nawodnym kultury kurhanów zachodniobałtyjskich, *Acta Universitatis Nicolai Copernici Archaeologia,* 15 (199), 25-41.

WILKE, G. (1996/97) Masurische Siedlungen am Seeufer und auf künstlichen Inseln mit Rostplattformen, *Plattform,* 5/6, 12-31.

WILLIAMS, B. (2010) Foreign Objects With Domestic Meanings; The Feast of Lanterns and the Point Alones Village, in C. D. DILLIAN & C. L. WHITE (Eds.) *Trade and exchange : archaeological studies from history and prehistory***,** New York, Springer. 149-63.

WINGHART, S. (2000) Mining, processing and distribution of bronze: reflections on the organisation of metal supply between the northern Alps and the Danube region, in C. F. E. PARE (Ed.) *Metals make the world go round : the supply and circulation of metals in Bronze Age Europe*, Oxford, Oxbow Books. 151-59.

WINGHART, S. (1998) Produktion, Verarbeitung und Distribution Zur Rolle spätbronzezeitlicher Eliten im Alpenvorland, in B. HÄNSEL (Ed.) *Mensch und Umwelt in der Bronzezeit Europas***,** Kiel, Oetker-Voges Verlag. 261-63.

WINTER, L. (2008) From Diffusion to Interaction: connections between the Nordic area and Valcamonica during the First Millennium BC, in H. WHITTAKER (Ed.) *The Aegean Bronze Age in relation to the wider European context : papers from a session at the eleventh annual meeting of the European Association of Archaeologists, Cork, 5-11 September 2005***,** Oxford, Archaeopress. 35-55.

WIRTH, S. (1999) Auf der Suche nach Eliten der späten Bronzezeit und der Urnenfelderzeit. Bausteine zum Thema aus dem Altsiedelland am unteren Lech in Bayerisch-Schwaben, in R.-G. Z. M. KOLLOQUIUM (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 565-604.

WIRTH, S. (1998) *Grabfunde der späten Bronzezeit und der Urnenfelderzeit von Augsburg-Haunstetten und Friedberg in Bayern : ein Beitrag zur vorgeschichtlichen Besiedlung des unteren Lechtals*, Augsburg, Bernd Wissner.

WOODMAN, P. E. (2000) Beyond significant patterning, towards past intentions: the location of Orcadian chambered tombs, in C. E. BUCK, V. CUMMINGS, C. HENLEY, S. MILLS & S. TRICK (Eds.) *Proceedings of the UK chapter of Computer Applications and Quantitative Methods in Archaeology 1999*, Oxford, Archaeopress. 91-105.

WOODWARD, A. (2002) Beads and Beakers: heirlooms and relics in the British Early Bronze Age, *Antiquity,* 76 (294), 1040-47.

WÜSTEMANN, H. (2004) *Die Schwerter in Ostdeutschland*, Prähistorische Bronzefunde 4 / 15, Stuttgart, Franz Steiner Verlag.

WÜSTEMANN, H. (2011) Zur Funktionsbeurteilung von Vollgriffschwerten aus der Sicht radiografischer Untersuchungen, in U. L. DIETZ & A. JOCKENHÖVEL (Eds.) *Bronzen im Spannungsfeld zwischen praktischer Nutzung und symbolischer Bedeutung : Beiträge zum internationalen Kolloquium am 9. und 10. Oktober 2008 in Münster***,** Stuttgart, Steiner. 291-96.

WYSS, R. (1967) *Bronzezeitliche Gusstechnik*, Aus dem Schweizerischen Landesmuseum 19, Bern, Paul Haupt.

WYSS, R. (1972) *Bronzezeitliches Töpferhandwerk*, Bern, Haupt.

WYSS, R. (1981a) Archäologische Zeugnisse der Gaesaten, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 38 (4), 227-38.

WYSS, R. (1981b) Kostbare Perlenkette als Zeuge ältesten Fernhandels in Zürich, *Helvetia Archaeologica,* 45/48, 242-51.

WYSS, R. (1983) *Die jungsteinzeitlichen Bauerndörfer von Egolzwil 4 im Wauwilermoos*, Zürich, Schweizerisches Landesmuseum.

WYSS, R. (1990) Ein Netzbeutel zur Thematik des Fernhandels, in M. HÖNEISEN (Ed.) *Die ersten Bauern : Pfahlbaufunde Europas*, Vol. 1**,** Zürich, Schweizerisches Landesmuseum. 131-33.

ZOLITSCHKA, B., WULF, S. & NEGENDANK, J. F. W. (2000) Circum-Mediterranean lake records as archives of climatic and human history, *Quaternary International,* 73-74, 1-5.

ZOLLER, H. (1977) Alter und Ausmass Postglazialer Klimaschwankungen in den Schweizer Alpen, in B. FRENZEL (Ed.) *Dendrochronologie und postglaziale Klimaschwankungen in Europa : Verhandlungen des Sympsoiums über die Dendrochronologie des Postglazials, Grundlagen und Ergebnisse*, Wiesbaden, Franz Steiner Verlag. 271-81.

ZÜRN, H. (1975) Der "Grafenbühl", ein späthallstattzeitlicher fürstengrabhügel bei Asperg, in RÖMISCH-GERMANISCHES ZENTRALMUSEUM MAINZ (Ed.) *Ausgrabungen in Deutschland, gefördert von der Deutschen Forschungsgemeinshcaft 1950-1975*, Mainz, Komm. Habelt. 216-20.

Travelling Objects : Changing Values

Trade, exchange, and cultural influences for the decline of the lake-dwelling tradition in the northern Circum-Alpine region during the Late Bronze Age

Appendix

Inauguraldissertation
zur
Erlangung der Würde eines Doktors der Philosophie
vorgelegt der
Philosophisch-Naturwissenschaftlichen Fakultät
der Universität Basel
von

Benjamin Jennings

aus Evesham United Kingdom

Basel. 2013

Genehmigt von der Philosophisch-Naturwissenschaftlichen Fakultät
auf Antrag von

Prof. Dr. Francesco Menotti

Univ. Doz. Dr. habil. Urs Leuzinger

Basel, den 18th June 2013

Prof. Dr. Jörg Schibler
Dekanin/Dekan

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List of Maps (in the Appendix)

List of Viewshed Analyses (in the Appendix)

List of Charts (in the Appendix)

Abbreviations

Countries

AL	Albania
AT	Austria
BA	Bosnia and Herzegovina
BE	Belgium
BG	Bulgaria
CH	Switzerland
CZ	Czech Republic
D	Germany
DK	Denmark
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IL	Israel
IT	Italy
LA	Latvia
LI	Lichtenstein
LT	Lithuania
MO	Moldova
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Republic of Serbia
RU	Russia
SE	Sweden
SI	Slovenia
SK	Slovakia
SY	Syria
TR	Turkey
UA	Ukraine

General

Cty	Country
Dendro	Dendrochronology
Dendro-dated	Dendrochronologically dated
EBA	Early Bronze Age
EIA	early Iron Age[49]
LBA	Late Bronze Age
LTA	La Tène A
MBA	Middle Bronze Age
MCA	Multiple Correspondence Analysis
MRV	Middle Rhine Valley
nCA	northern Circum-Alpine region
PBF	Prähistorische Bronzefunde
Qty	Quantity
sCA	southern Circum-Alpine region
SNM	Swiss National Museum, Zurich

MCA Variables

A	Small metal work
B	Beads
BV	Bronze vessels
C	Ceramics
D	Domestic
F	Fasteners
H	Horse
I	Inorganics
K	Keys
L	Large jewellery
M	Metal working
O	Small jewellery
R	Organics
T	Tools
U	Utensils
V	Vessels
W	Weapons

[49] Acronym 'EIA' is always in capital letters but in full text 'early' is spelt with lower case 'e'.

Appendix

Distribution Maps

Density Maps

Viewshed Analysis

Charts and Multiple Correspondence Analysis Charts

Maps

Country abbreviations

AL	Albania
AT	Austria
BA	Bosnia and Herzegovina
BE	Belgium
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CH	Switzerland
CZ	Czech Republic
D	Germany
DK	Denmark
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IL	Israel
IT	Italy
LA	Latvia
LI	Lichtenstein
LT	Lithuania
MO	Moldova
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
RS	Republic of Serbia
RU	Russia
SE	Sweden
SI	Slovenia
SK	Slovakia
SY	Syria
TR	Turkey
UA	Ukraine

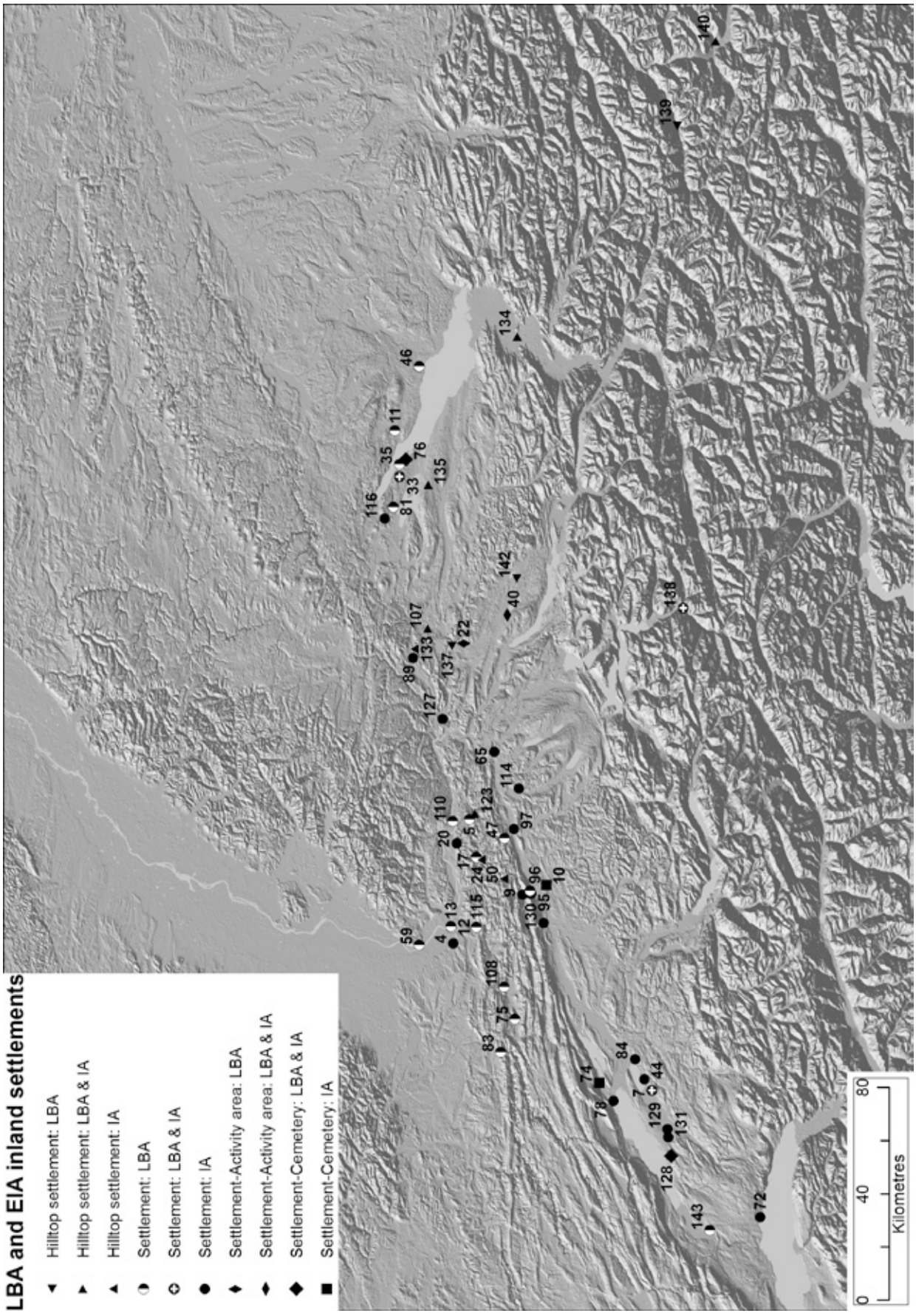
Map conventions

- Note that the numbers plotted on the maps are listed in the map numbering next to the page (or the page before).
- Abbreviation ‘Cty’ on map site lists means ‘Country’.
- Numbers adjacent to symbols in map legend (e.g. Map 101) refer to the quantity of objects found at a site.
- Numbers adjacent to points in map refer to appropriate site list.
- Sites named with second name in brackets (e.g. Biesenbrow (Angermünde)) relate to sites which have towns/villages that have changed name following World War II, or have different spellings in different literature sources.
- All maps created using ArcGIS 10.0, with the SRTM dataset available on the ArcMAP Data Pack 3.0 and for download from http://www2.jpl.nasa.gov/srtm/cbanddataproducts.html, and the Water overlay feature available on the ArcMAP Data Pack 3.0.

Appendix

Map 1

No.	Site	Site type	Country	Referencess
4	Allschwil-Vogelgärten	Settlement	CH	(Deschler-Erb 1989; Hochuli, S *et al.* 1998; Lüscher 1986)
5	Alt-Thierstein	Settlement	CH	(Deschler-Erb 1989)
7	Avenches - En Chaplix	Settlement	CH	(Doiteau 1989; Dunning and Rychner 1992)
9	Balsthal-Holzfluh	Settlement	CH	(Deschler-Erb 1989)
10	Bannwil	Settlement-Cemetery	CH	(Deschler-Erb 1989; Dunning and Rychner 1992)
11	Banzenreuthe	Settlement	D	(Hopert *et al.* 1998)
12	Basel-Martinskirchplatz	Settlement	CH	(Deschler-Erb 1989)
13	Basel-Utengasse	Settlement	CH	(Matt 2012)
17	Bischofsstein	Settlement	CH	(Deschler-Erb 1989)
20	Bönistein	Settlement	CH	(Deschler-Erb 1989)
22	Bülach-Schwerzgrueb	Settlement-Activity area	CH	(Deschler-Erb 1989)
24	Burgenrain	Hilltop Settlement	CH	(Hopert *et al.* 1998)
33	Dettingen-Weiherried	Settlement	D	(Hopert *et al.* 1998)
35	Dingelsdorf-Bussensee	Settlement	D	(Hopert *et al.* 1998)
40	Fällanden-Fröschbach	Settlement-Activity area	CH	(Fischer, C 1997)
44	Faoug - Derriere le Chaney	Settlement	CH	(Doiteau 1991, 1992; Dunning and Rychner 1992)
46	Friedrichshafen-Waggershausen	Settlement	D	(Hopert *et al.* 1998)
47	Frohburg	Settlement	CH	(Deschler-Erb 1989)
50	Gerstelfluh	Hilltop Settlement	CH	(Deschler-Erb 1989)
59	Isteiner Klotz	Settlement	D	(Deschler-Erb 1989)
65	Kestenberg	Settlement	CH	(Deschler-Erb 1989; Holstein 2003)
72	Lausanne - Vidy Basilique	Settlement	CH	(Moinat and Elbiali 1993)
74	Le Landeron-Les Carougets	Settlement-Cemetery	CH	(Hofmann, P 1991; Hofmann Rognon and Doswald 2005)
75	Les Esserts-Est	Settlement	CH	(Arnold, B 1990)
76	Litzelstetten "Burren"	Settlement-Cemetery	D	(Hopert *et al.* 1998)
78	Marin - Les Bourgignones	Settlement	CH	(Arnold 1992)
81	Möggingen-Mindelsee	Settlement	D	(Hopert *et al.* 1998)
83	Mont Terri	Settlement	CH	(Deschler-Erb 1989)
84	Murten - Löwenberg	Settlement	CH	(Bouyer and Boisaubert 1992)
89	Neunkirch-Tobeläcker	Settlement	CH	(Gutzwiller 1994; Ruckstuhl 1989)
95	Oensingen-Lehnfluh	Settlement	CH	(Deschler-Erb 1989)
96	Oensingen-Ravellenfluh	Settlement	CH	(Deschler-Erb 1989)
97	Olten-Wartenberg	Settlement	CH	(Deschler-Erb 1989)
107	Rheinau	Hilltop Settlement	CH	(Frascoli 1991)
108	Roc de Courroux	Settlement	CH	(Deschler-Erb 1989)
110	Säckingen	Settlement	D	(Deschler-Erb 1989)
114	Schafrain	Settlement	CH	(Deschler-Erb 1989)
115	Schalberg	Settlement	CH	(Deschler-Erb 1989)
116	Stahringen-"Oberes Weidfeld"	Settlement	D	(Hopert *et al.* 1998)
123	Wittnau Horn	Hilltop Settlement	CH	(Berger, L and Brogli 1980; Bersu 1945)
127	Zurzach-Rainen	Settlement	CH	(Gutzwiller 1994)
128	Châbles-Les Biolleyres	Settlement-Cemetery	CH	(Vigneau and Boisaubert 2008)
129	Bussy-Pré de Fond	Settlement	CH	(Boisaubert *et al.* 2008)
130	Attiswil-Wybrunne	Settlement	CH	(Ramstein 2010)
131	Frasses - Praz-au-Doux	Settlement	CH	(Mauvilly *et al.* 1997; Mauvilly and Ruffieux 2008)
133	Neunkirch-Vorder Häming	Hilltop Settlement	CH	(Ruckstuhl 1989)
134	Montlingerberg	Hilltop Settlement	CH	(Steinhauser-Zimmermann 1989)
135	Wäldi-Hohenrain	Hilltop Settlement	CH	(Hochuli, Stefan 1990)
137	Rhinsberg	Hilltop Settlement	CH	(Bigler 2005)
138	Flüeli-Amsteg	Settlement	CH	(Primas *et al.* 1992)
139	Scuol-Munt Baselgia	Hilltop Settlement	CH	(Stauffer-Isenring and Kaufmann 1983)
140	Schulderns	Hilltop Settlement	IT	(Krause 2005)
141	Frauenberg	Hilltop Settlement	D	(Neudert 2003; Rind 1999)
142	Heidenburg, Seegräben-Aathal	Hilltop Settlement	CH	(Altorfer 2010)
143	Bavois-En Raillon	Settlement	CH	(Vital and Voruz 1984)

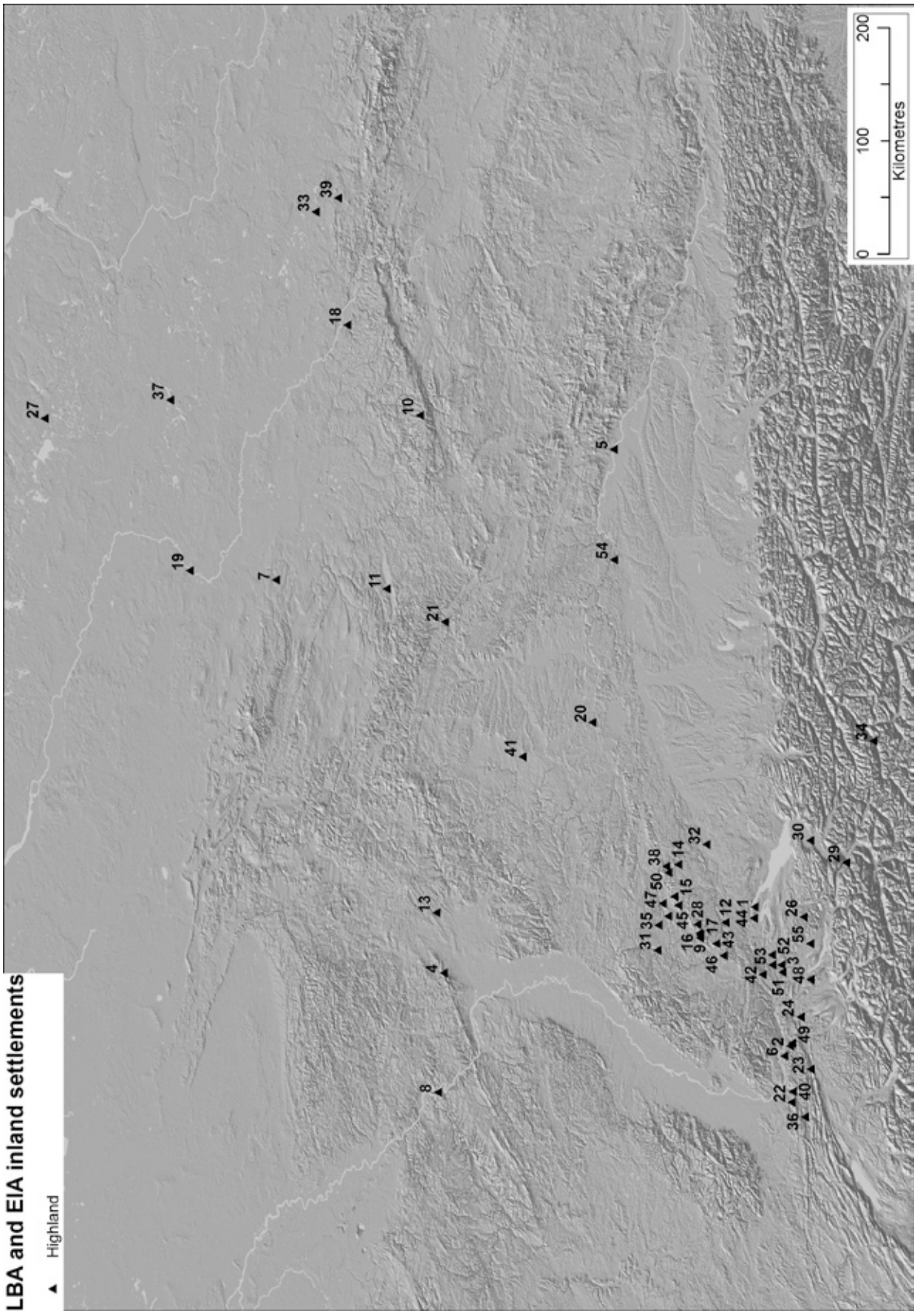


Map 1: Studied Late Bronze Age and early Iron Age inland settlements in Switzerland and surrounding regions.

Appendix

Map 2

No.	Site	Country	References
1	Allensbach-Langenrain "Hals"	D	(Hopert *et al.* 1998)
2	Alt-Thierstein	CH	(Deschler-Erb 1989)
3	Berg am Irchel	CH	(Biel 1987)
4	Bleibeskopf (Bad Homburg)	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
5	Bogenberg	D	(Hopert *et al.* 1998)
6	Bönistein	CH	(Biel 1987)
7	Bösenburg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
8	Dommelberg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
9	Dotternhausen-Plettenberg	D	(Biel 1987)
10	Eisenberg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
11	Felsburg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
12	Fridingen-Lehenbühl	D	(Biel 1987)
13	Glauberg	D	(Herrmann 2008; Jockenhövel 1974b; Jockenhövel and Kubach 1994; Kreuz and Schäfer 2006)
14	Gomadingen-Hackberg	D	(Biel 1987)
15	Gönningen-Roßberg	D	(Biel 1987)
16	Hausen am Tann, Lochenstein	D	(Biel 1987)
17	Hausen am Tann, Schafberg	D	(Biel 1987)
18	Heidenschanze-Coschütz	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
19	Heinrichsberg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
20	Hesselberg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
21	Heunischenburg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
22	Hoffstetten-Chöpfli	CH	(Biel 1987)
23	Holderbank-Alt Bechburg	CH	(Biel 1987)
24	Kestenberg	CH	(Biel 1987; Holstein 2003; Laur-Belart 1952)
25	Kiebingen-Bergvorsprung - Rammert	D	(Biel 1987)
26	Kirchberg-Iddaburg	CH	(Biel 1987)
27	Kratzeburg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
28	Laufen an der Eyach, Schalksburg	D	(Biel 1987)
29	Mels-Castels	CH	(Biel 1987)
30	Montlingerberg	CH	(Biel 1987; Steinhauser-Zimmermann 1989)
31	Nagold, Schloßberg	D	(Biel 1987)
32	Offingen-Bussen	D	(Biel 1987)
33	Radisch	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
34	Ramosch-Mottata	CH	(Biel 1987)
35	Reusten-Kirchberg	D	(Biel 1987)
36	Roc de Courroux	CH	(Biel 1987)
37	Römerschanze	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
38	Runden Bergs - Urach	D	(Biel 1987; Pauli, J 1994)
39	Schafberg	D	(Jockenhövel 1974b; Jockenhövel and Kubach 1994)
40	Schalberg	CH	(Biel 1987)
41	Seinsheim Bullenheimer Berg	D	(Falkenstein *et al.* 2011; Hagl 2008; Jockenhövel and Kubach 1994)
42	Siblingen-Schönägertli	CH	(Biel 1987)
43	Spaichingen-Dreifaltigkeitsberg	D	(Biel 1987)
44	Stahringen-"Oberes Weidfeld"	D	(Biel 1987)
45	Talheim-Farrenberg	D	(Biel 1987)
46	Talheim-Lupfen	D	(Biel 1987)
47	Tübingen-Burgholz	D	(Biel 1987)
48	Üetliberg	CH	(Bauer *et al.* 1991; Biel 1987)
49	Wittnau Horn	CH	(Berger, L and Brogli 1980; Bersu 1945; Biel 1987)
50	Würtingen-Stettenrain	D	(Biel 1987)
51	Rhinsberg	CH	(Bigler 2005)
52	Schlossberg-Rudolfingen	CH	(Bigler 2005)
53	Rheinau	CH	(Bigler 2005; Frascoli 1991)
54	Frauenberg	D	(Rind 1999)
55	Heidenburg, Seegräben-Aathal	CH	(Altorfer 2010)

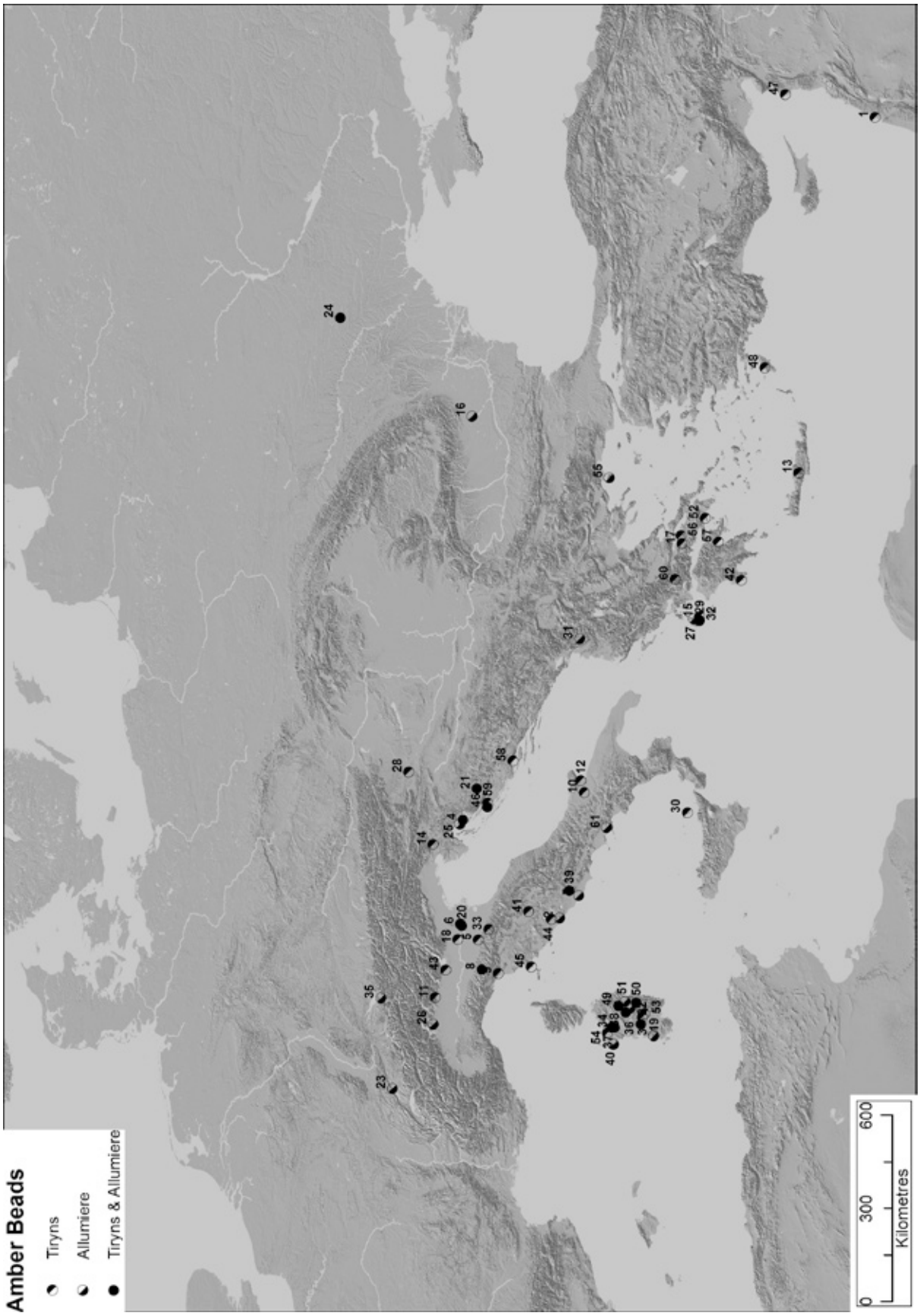


Map 2: Late Bronze Age and early Iron Age 'highland' fortified sites in Switzerland and selected examples from central Europe.

Appendix

Map 3

No.	Site	Country	References
1	Akhziv	IL	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
2	Allumiere	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004; Peroni 1960)
3	Antas	IT	(Bellintani 2004; Massari 1998; Negroni Catacchio *et al.* 2004)
4	Baska	HR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
5	Bologna, Borgo Panigale	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
6	Campestrin di Grignano Polesine	IT	(Salzani 2009)
7	Campo del Fico	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
8	Campo Pianelli di Bismantova	IT	(Bellintani 2004; Dall'Aglio 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
9	Candalla Riparo dell'Ambra, Camaiore	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
10	Capitanata	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
11	Clanezzo, Grotta Costa Cavallina	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
12	Coppa Nevigata	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
13	Creta, Antro Dicteo	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
14	Debeli	SI	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
15	Diakata	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
16	Dridu	RO	(Boroffka 2001)
17	Elateia-Alonaki	GR	(Negroni Catacchio *et al.* 2004)
18	Fondo Paviani	IT	Negroni Catacchio, 2004 #1043}(Bellintani 2004)
19	Forraxi Nioi – Nuragus	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
20	Frattesina	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004; Salzani and Colonna 2010)
21	Golubnjaca	HR	(Negroni Catacchio *et al.* 2004; Palavestra 1993)
22	Gremanu-Fonni	IT	(Bellintani 2004; Massari 1998; Negroni Catacchio *et al.* 2004)
23	Hauterive-Champréveyres	CH	(Beck *et al.* 1993)
24	Hordeevka	UA	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
25	Insel Krk	HR	(Forenbaher 1992; Palavestra 1993)
26	Isolino di Varese	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
27	Kefallenia	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
28	Kritevci	SI	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
29	Lakithra	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
30	Lipari	IT	(Bellintani 2004; Cultraro 2004, 2005; Negroni Catacchio *et al.* 2004)
31	Mati	AL	(Negroni Catacchio *et al.* 2004; Prendi 1975)
32	Metaxata	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
33	Monte Battaglia	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
34	Monte Sant'Antonio	IT	(Massari 1998; Negroni Catacchio *et al.* 2004)
35	Montlingerberg	CH	(Steinhauser-Zimmermann 1989; Steinhauser and Primas 1987)
36	Motrox'e Bois	IT	(Massari 1998; Negroni Catacchio *et al.* 2004)
37	Nuraghe Attentu	IT	(Massari 1998; Negroni Catacchio *et al.* 2004)
38	Nurdòle-Orani	IT	(Bellintani 2004; Massari 1998; Negroni Catacchio *et al.* 2004)
39	Osteria dell'Osa	IT	(Bietti Sestieri 1992b; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
40	Palmavera-Alghero	IT	(Bellintani 2004; Massari 1998; Negroni Catacchio *et al.* 2004)
41	Panicarola	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
42	Pilo - Territorio	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
43	Ponte San Marco, Calcinato	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
44	Ponte San Pietro Valle	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
45	Populonia	IT	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
46	Privlaka	HR	(Batović 1959; Negroni Catacchio *et al.* 2004)
47	Ras Shamra	SY	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
48	Rodi, Jalysos	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
49	Romanzesu-Bitti	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
50	Sa Carcaredda-Villagrande Strisaili	IT	(Negroni Catacchio *et al.* 2004)
51	Sa Sedda 'e Sos Carros	IT	(Bellintani 2004; Massari 1998; Negroni Catacchio *et al.* 2004)
52	Salamina	GR	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
53	Santa Vittoria Serri	IT	(Bellintani 2004; Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
54	Serra Niedda di Sorso	IT	(Bellintani 2004; Negroni Catacchio 1996)
55	Thasos	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
56	Thisbhe	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
57	Tiryns	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
58	Vranjic	HR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
59	Vrsi Nin	HR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
60	Zeli	GR	(Negroni Catacchio 1996; Negroni Catacchio *et al.* 2004)
61	Poggiomarino	IT	(Cicirelli and Albore Livadie 2012)
62	Mariconda di Melara	IT	(Bellintani 2004)



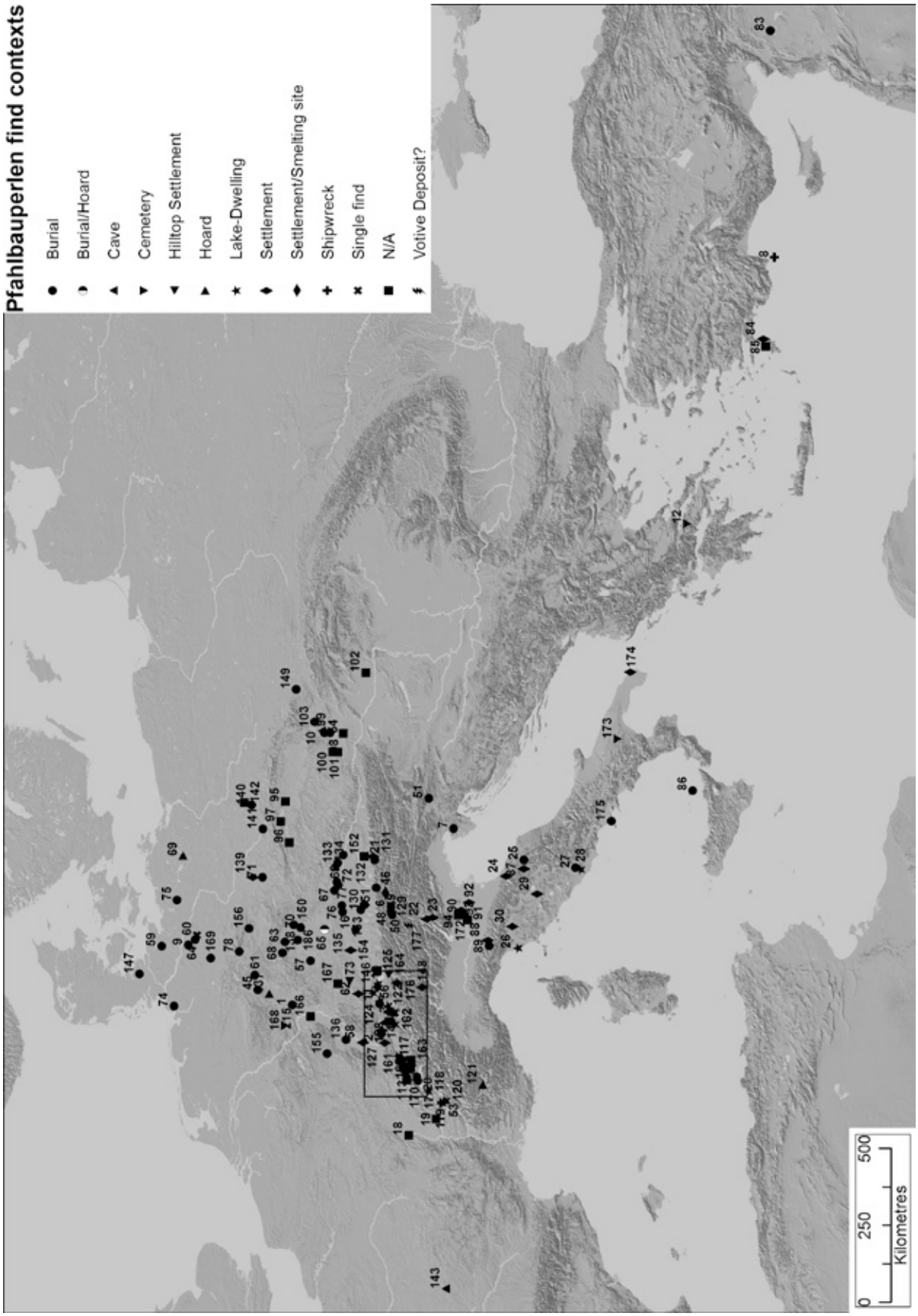
Map 3: Distribution of *Tiryns* and *Allumiere* type amber beads.

Appendix

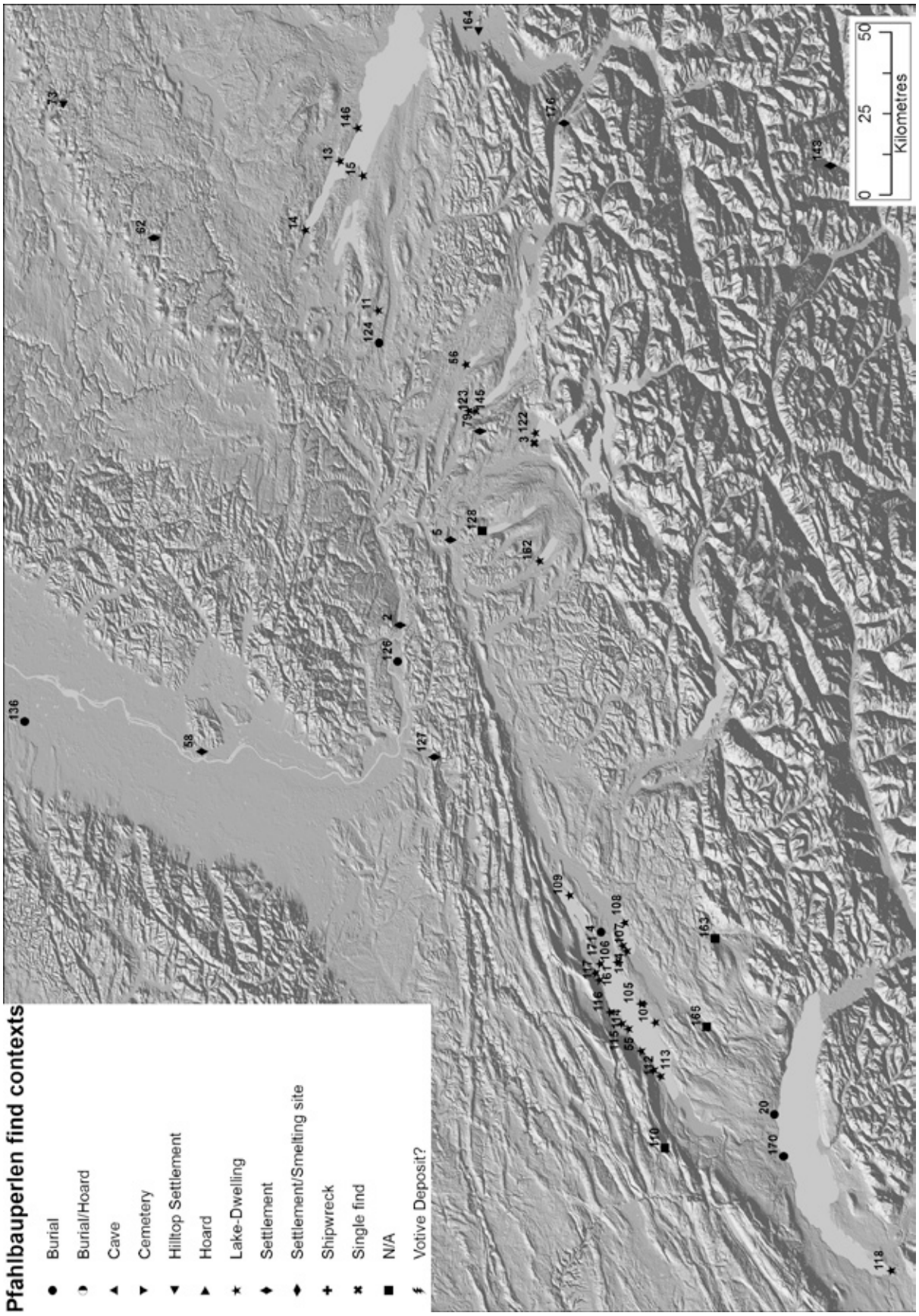
Maps 4 & 5

No.	Site	Qty.	Country	References
1	Frankfurt-Berkersheim	1	D	(Hundt 1958; Mildner 2008)
2	Säckingen	2	D	(Gersbach 1968)
3	Cham-Städtlerwald	1	CH	(Scherer 1922)
4	Ins	1	CH	(Drack 1958)
5	Kestenberg	2	CH	(Holstein 2003)
6	Volders	3	AT	(Kasseroler 1959)
7	Limska Gradina	3	SI	(Bellintani and Residori 2000; Mihovilić 1972)
8	Gelidonya	2	TR	(Bass 1967)
9	Deutsch-Evern	3	D	(Laux 1971)
10	Býcí Skála Cave	1	CZ	(Haevernick 1981)
11	Ürschhausen-Horn	2	CH	(Nagy 1999)
12	Elateia-Alonaki	1	GR	(Nikita and Henderson 2006; Nikita *et al.* 2006)
13	Unteruhldingen-Stollenwiesen	1	D	(Schöbel 1996)
14	Bodman-Schachen 1	1	D	(Schöbel 1996)
15	Konstanz-Frauenpfah l	1	CH	(Schöbel 1996)
16	Haunstetten	8	D	(Mildner 2008; Wirth 1998)
17	Chindrieux-Châtillon	1	FR	(Billaud and Gratuze 2002; Haevernick 1978)
18	Saint Marcel	1	FR	(Billaud and Gratuze 2002)
19	Ambérieu	3	FR	(Billaud and Gratuze 2002)
20	Vidy-Chavannes	1	CH	(Kaenel and Klausener 1990; Moinat and David-Elbiali 2003)
21	Marzoll	1	D	(Mildner 2008)
22	Salorno	12	IT	(Bellintani 2002; Bellintani and Stefan 2008)
23	Montesei di Serso	1	IT	(Bellintani and Residori 2000)
24	San Marino	2	IT	(Bellintani and Residori 2000)
25	Pianello di Genga	1	IT	(Bellintani and Residori 2000)
26	Livorno-Stagno	3	IT	(Bellintani and Residori 2000; Zanini and Martinelli 2001)
27	Osteria dell'Osa	16	IT	(Bellintani and Residori 2000)
28	Villaggio delle macine	1	IT	(Bellintani and Residori 2000)
29	Chiusi - I Forti	1	IT	(Bellintani and Residori 2000)
30	Bibbiani	3	IT	(Bellintani and Residori 2000)
45	Bergheim	2	D	(Mildner 2008)
46	Mauk A	1	AT	(Schibler *et al.* 2011)
48	Völs bei Innsbruck	1	AT	(Wagner 1943)
49	Innsbruck-Hötting II	8	AT	(Mildner 2008)
50	Innsbruck-Wilten	3	AT	(Wagner 1943)
51	Kompolje	1	SI	(Haevernick 1978)
52	Han-Sur-Lesse	6	BE	(Haevernick 1978)
53	Conjux	1	FR	(Haevernick 1978)
54	Poysdorf	1	AT	(Haevernick 1978)
55	St-Aubin NE	1	CH	(Haevernick 1978)
56	Greifensee-Böschen	1	CH	(Eberschweiler *et al.* 2007)
57	Acholshausen	1	D	(Pescheck 1972)
58	Burkheim	7	D	(Reim 1997)
59	Wensin	4	D	(Jantzen and Schmidt 1999; Kunter 1996; Splieth 1900)
60	Wellendorf	1	D	(Jantzen and Schmidt 1999; Laux 1971)
61	Vollmarshausen	1	D	(Bergmann and Czarnetzki 1982)
62	Truchtelfingen	1	D	(Kreutle 2007)
63	Römhild	1	D	(Feustel 1958; Mons Steinberg 1954; Wiegel 1994)
64	Ripdorf-Molzen	1	D	(Geschwinde 2000; Jantzen and Schmidt 1999)
65	Pippenhof	1	D	(Nadler and Pfauth 1994)
66	Pinkofen	3	D	(Hofmann, A 2000; Mildner 2008)
67	Peising	1	D	(Schütz-Tillmann 1997)
68	Ostheim vor der Rhön	1	D	(Jahn 1998; Von Berchem 1998)
69	Neustrelitz	1	D	(Jantzen and Schmidt 1999)
70	Memmelsdorf	1	D	(Hennig 1980)
71	Lehma	6	D	(Kroitzsch 1983; Mildner 2008)
72	Aufhausen	2	D	(Schütz-Tillmann 1997)
73	Runden Bergs bei Urach	5	D	(Pauli, J 1994)
74	Debstedt	1	D	(Aust 1951; Jantzen and Schmidt 1999)
75	Friedrichsruhe	10	D	(Beltz 1910; Hundt 1958; Jantzen and Schmidt 1999; Keiling 1987; Reinecke 1911; Schubart 1972)
76	Ingolstadt-Zuchering	11	D	(Schütz 2006)
77	Ilmendorf-Geisenfeld	3	D	(Gläser and Conrad 2010)
78	Osterode-am-Herz	1	D	(Flindt 2000)
79	Üetliberg	2	CH	(Bauer *et al.* 1991)
83	Aleppo	1	SY	(Bellintani and Residori 2000)
84	Jalysos	1	GR	(Bellintani and Residori 2000)
85	Kamiros	1	GR	(Bellintani and Residori 2000)
86	Lipari	5	IT	(Bellintani and Residori 2000; Haevernick 1978)
87	Monte Ingino	2	IT	(Bellintani and Residori 2000)
88	S. Michele di Valestra	1	IT	(Bellintani and Residori 2000)
89	Campo Pianelli di Bismantova	45	IT	(Bellintani and Residori 2000)
90	Fondo Paviani	2	IT	(Bellintani and Residori 2000)
91	Mariconda di Melara	1	IT	(Bellintani and Residori 2000)
92	Frattesina	100	IT	(Bellintani and Residori 2000; Salzani and Colonna 2010)
93	Sabbionara di Veronella	1	IT	(Bellintani and Residori 2000)
94	Montagnana	2	IT	(Bellintani and Residori 2000)
95	Repín	1	CZ	(Bellintani and Residori 2000)

96	Dolánky-Rubín	1	CZ	(Bellintani and Residori 2000)
97	Lovosice	1	CZ	(Bellintani and Residori 2000)
98	Blucina	1	CZ	(Bellintani and Residori 2000; Tihelka 1969)
99	Brno – Obrany	1	CZ	(Bellintani and Residori 2000)
100	Krepice	1	CZ	(Bellintani and Residori 2000)
101	Oblekovice	1	CZ	(Bellintani and Residori 2000)
102	Kolta	1	SK	(Bellintani and Residori 2000)
103	Pteni	1	CZ	(Bellintani and Residori 2000)
104	Estavayer-le-Lac	37	CH	(Bellintani and Residori 2000; Gessner 1947; Gross, V 1883; Haevernick 1978)
105	Chevroux	1	CH	(Bellintani and Residori 2000)
106	Cudrefin	2	CH	(Bellintani and Residori 2000; Gessner 1947)
107	Vallamand	5	CH	(Bellintani and Residori 2000; Haevernick 1978)
108	Montilier	4	CH	(Bellintani and Residori 2000; Haevernick 1978)
109	Mörigen	5	CH	(Bellintani and Residori 2000; Bernatzky-Goetze 1987; Ischer 1928)
110	Ste. Croix	1	CH	(Bellintani and Residori 2000)
112	Onnens	4	CH	(Bellintani and Residori 2000)
113	Concise	19	CH	(Bellintani and Residori 2000; Gessner 1947; Haevernick 1978)
114	Bevaix	5	CH	(Bellintani and Residori 2000; Gessner 1947)
115	Cortaillod Est	11	CH	(Bellintani and Residori 2000; Haevernick 1978)
116	Auvernier	15	CH	(Bellintani and Residori 2000)
117	Hauterive-Champréveyres	206	CH	(Bellintani and Residori 2000; Rychner-Faraggi 1993)
118	Genève-Eaux Vives	2	CH	(Bellintani and Residori 2000; Gessner 1947)
119	Grésine	1	FR	(Bellintani and Residori 2000; Perrin 1869)
120	Le Saut, Lac du Bourget	2	FR	(Bellintani and Residori 2000; Haevernick 1978; Perrin 1869)
121	Réallon	2	FR	(Bellintani and Residori 2000; Billaud and Gratuze 2002; Gratuze *et al.* 1998; Haevernick 1978)
122	Zug-Sumpf	25	CH	(Bauer *et al.* 2004; Bellintani and Residori 2000)
123	Zürich-Wollishofen	13	CH	(Bellintani and Residori 2000; Gessner 1947; Haevernick 1978; Heierli 1886)
124	Ossingen	1	CH	(Bellintani and Residori 2000; Haevernick 1978; Ruoff 1974; Viollier 1926)
125	Ebersberg	1	D	(Bellintani and Residori 2000)
126	Möhlin	1	CH	(Bellintani and Residori 2000)
127	Pfeffingen	3	CH	(Bellintani and Residori 2000)
128	Rieslen bei Seengen	3	CH	(Bellintani and Residori 2000; Gessner 1947)
129	Innsbruck-Mühlau	4	AT	(Bellintani and Residori 2000; Wagner 1943)
130	Unterhaching	1	D	(Bellintani and Residori 2000; Müller-Karpe 1957, 1959)
131	Salzburg	1	AT	(Bellintani and Residori 2000)
132	Altheim	1	AT	(Bellintani and Residori 2000)
133	Steinkirchen	2	D	(Bellintani and Residori 2000; Kossack 1949; Müller-Karpe 1975)
134	Bogenberg	2	D	(Bellintani and Residori 2000; Hundt 1950)
135	Günzberg	2	D	(Bellintani and Residori 2000; Stroh 1952)
136	Lingolsheim	12	FR	(Bellintani and Residori 2000; Haevernick 1978; Richter 1970)
137	Allendorf	5	D	(Bellintani and Residori 2000; Uenze 1949/50)
138	Reundorf-Grundfeld	2	D	(Bellintani and Residori 2000; Mildner 2008)
139	Leipzig – Südfriedhof	1	D	(Bellintani and Residori 2000)
140	Purschwitz	1	D	(Bellintani and Residori 2000)
141	Dresden-Laubegast	1	D	(Bellintani and Residori 2000; Grünberg 1943)
142	Groß – Tschernitz	1	D	(Bellintani and Residori 2000)
143	Rancogne	2	FR	(Bellintani and Residori 2000; Gratuze *et al.* 1998)
144	Guévaux	10	CH	(Bellintani and Residori 2000; Colomb and Muyden 1896; Gessner 1947)
145	Zürich-Alpenquai	2	CH	(Künzler Wagner 2005)
146	Hagnau-Burg	12	D	(Schöbel 1996)
147	Uelsby	1	D	(Pahlow 2006)
148	Tec Nev	1	CH	(Della Casa 2000)
149	Kiertz	4	PL	(Teržan 2005)
150	Staffelberg	3	D	(Ullrich 2006/7)
151	Flintsbach	3	D	(Möslein 1998/99)
152	Künzing	1	D	(Mildner 2008)
153	München-Obermenzing	1	D	(Mildner 2008)
154	Reisensburg	1	D	(Mildner 2008)
155	Medelsheim	1	D	(Mildner 2008)
156	Auleben	1	D	(Mildner 2008)
161	St-Blaise	1	CH	(Haevernick 1978)
162	Sursee - Landzunge	1	CH	(Haevernick 1978; Rigert 1997)
163	Pont-en-Ogoz	1	CH	(Haevernick 1978)
164	Montlingerberg	1	CH	(Haevernick 1978)
165	La Cerjaulaz	1	CH	(Haevernick 1978)
166	Worms	1	D	(Haevernick 1978)
167	Waiblingen	1	D	(Haevernick 1978)
168	Straßheim	1	D	(Haevernick 1978)
169	Niendorf	1	D	(Haevernick 1978)
170	Le Boiron	2	CH	(Beeching 1977)
171	Marin-Epagnier	1	CH	(Schwab 2002)
172	Franzine Nuove di Villabartolomea	2	IT	(Bellintani and Residori 2000)
173	Timmari	1	IT	(Bellintani 2011a,b)
174	Roca Vecchia	5	IT	(Bellintani 2011a,b)
175	Cumae	1	IT	(Müller-Karpe 1959)
176	Flums-Gräpplang	1	CH	(Neubauer 1994)
177	Finailgrube	1	IT	(Putzer 2012)
186	Zeil am Main	1	D	(Wilbertz 1982)
215	Ober-Erlenbach	1	D	(Lüning and von Kaenel 2006)



Map 4: European distribution of *Pfahlbauperlen* and their find contexts. For inset region see Map 5.

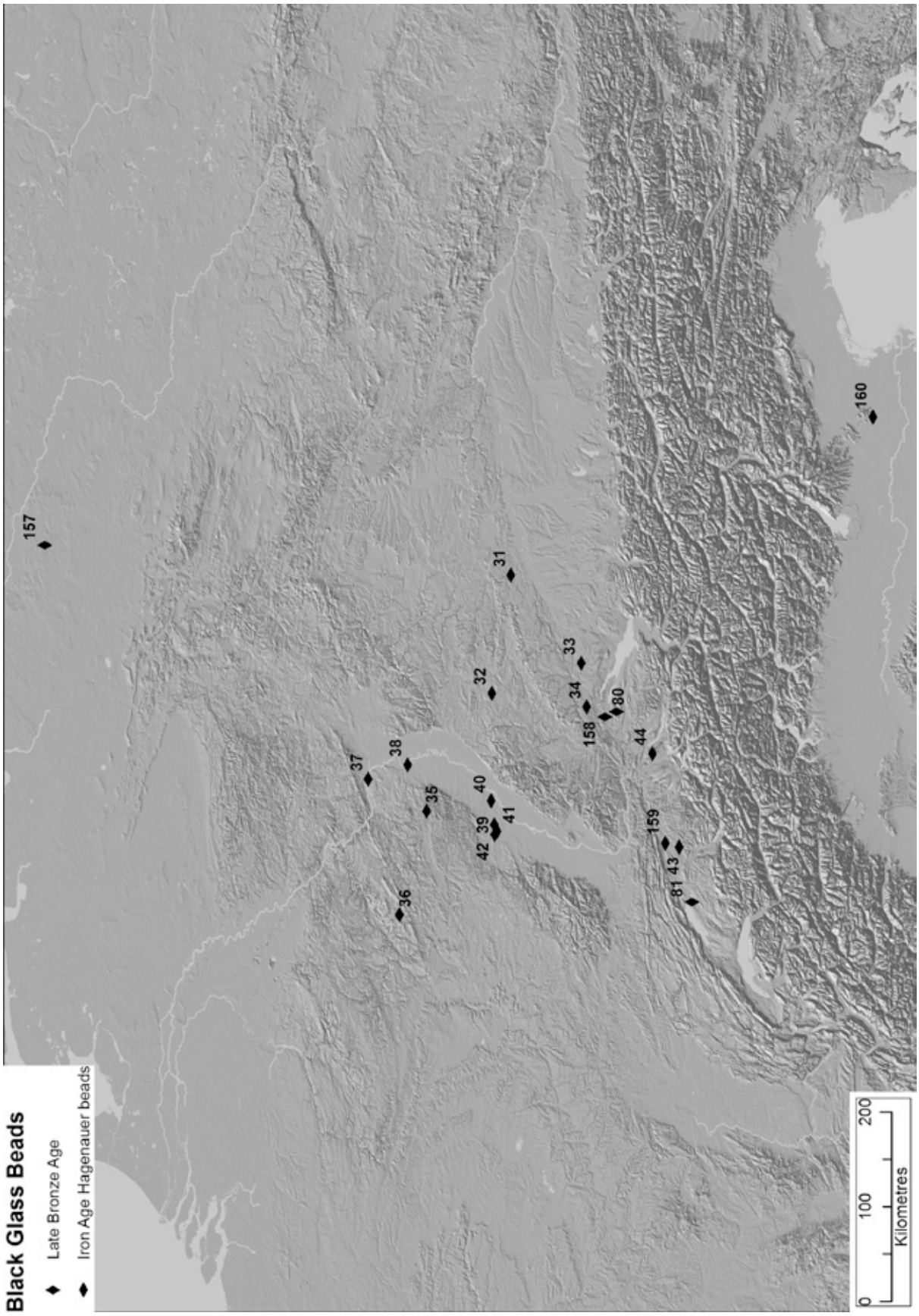


Map 5: Distribution and contexts of *Pfahlbauperlen* from the northern Circum-Alpine region.

Appendix

Map 6

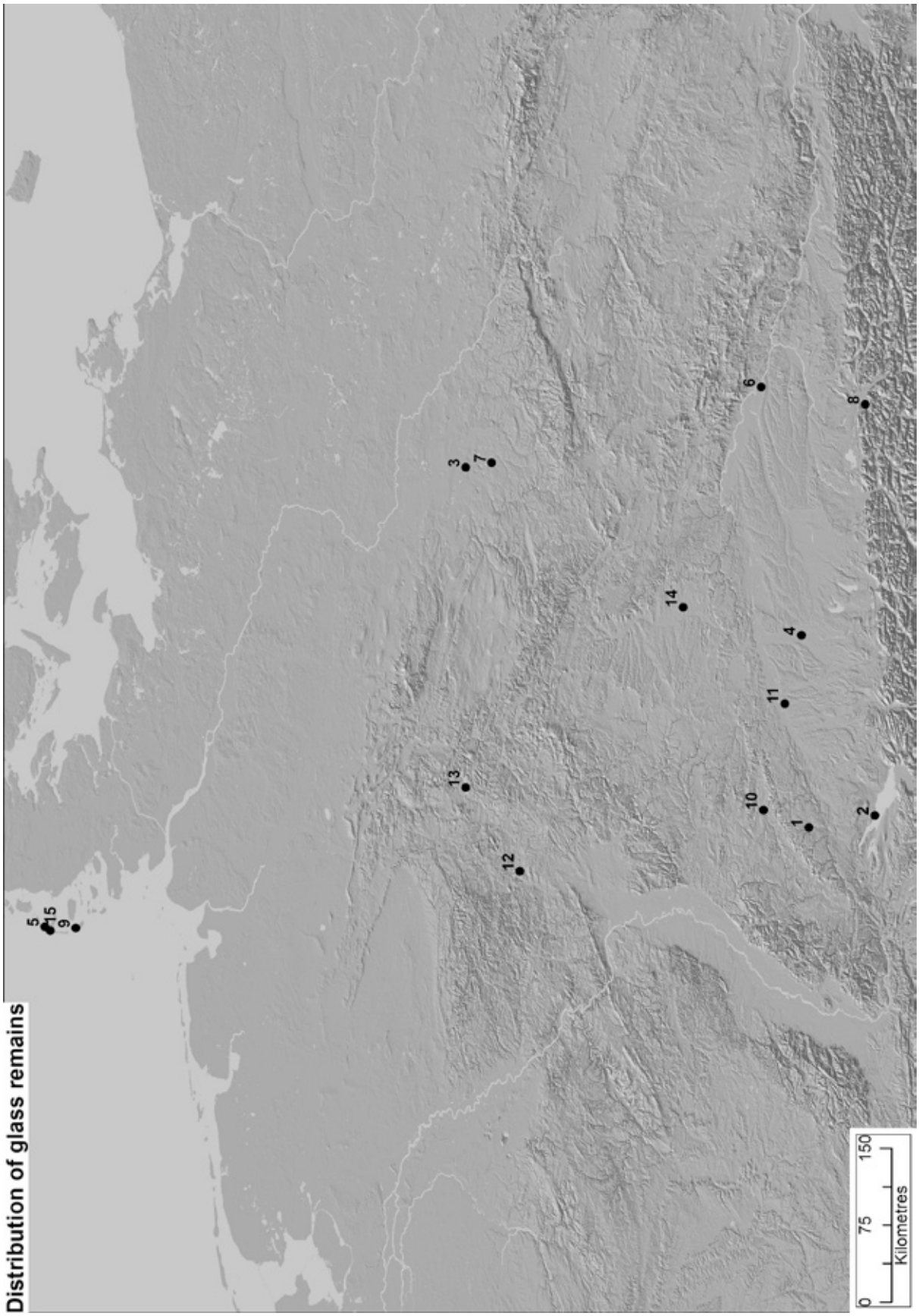
No.	Site	Qty	Country	References
Hagenauer Beads				
31	Mergelstetten-Heidenheim	4	D	(Haevernick 1975)
32	Hirschlanden	74	D	(Haevernick 1975)
33	Habsthal	65	D	(Haevernick 1975)
34	Liptingen	4	D	(Haevernick 1975)
35	Fischbach	26	D	(Haevernick 1975)
36	Roscheid	3	D	(Haevernick 1975)
37	Mainz-Gausenheim	3	D	(Haevernick 1975)
38	Worms	1	D	(Haevernick 1975)
39	Hagenau	295	FR	(Haevernick 1975)
40	Leutenheim	515	FR	(Haevernick 1975)
41	Harthouse	21	FR	(Haevernick 1975)
42	Ohlungen	1012	FR	(Haevernick 1975)
43	Lyssach	40	CH	(Haevernick 1975)
44	Bonstetten	397	CH	(Drack 1985)
159	Subingen	40	CH	(Haevernick 1975)
160	Este	24	IT	(Haevernick 1975)
Black Beads				
80	Eschenz-Insel Werd	12	CH	(Brem *et al.* 1987)
81	Guévaux	8	CH	(Brem *et al.* 1987; Colomb and Muyden 1896)
157	Haarstorf	1	D	(Mildner 2008)
158	Singen-Hohentwiel	1	D	(Mildner 2008)



Map 6: Distribution of Late Bronze Age black glass beads in the nCA, and of early Iron Age *Hagenauer* beads.

Map 7

No.	Site	Country	References
1	Gammertingen	D	(Mildner 2008)
2	Hagnau-Burg	D	(Schöbel 1996)
3	Harth	D	(Mildner 2008)
4	Haunstetten	D	(Mildner 2008)
5	Kampen	D	(Mildner 2008)
6	Künzing	D	(Mildner 2008)
7	Lehma	D	(Mildner 2008)
8	Marzoll	D	(Mildner 2008)
9	Norddorf	D	(Mildner 2008)
10	Oberboihingen	D	(Mildner 2008)
11	Reisensburg	D	(Mildner 2008)
12	Schröck	D	(Mildner 2008)
13	Vollmarshausen	D	(Mildner 2008)
14	Wendelstein	D	(Mildner 2008)
15	Westerland	D	(Mildner 2008)

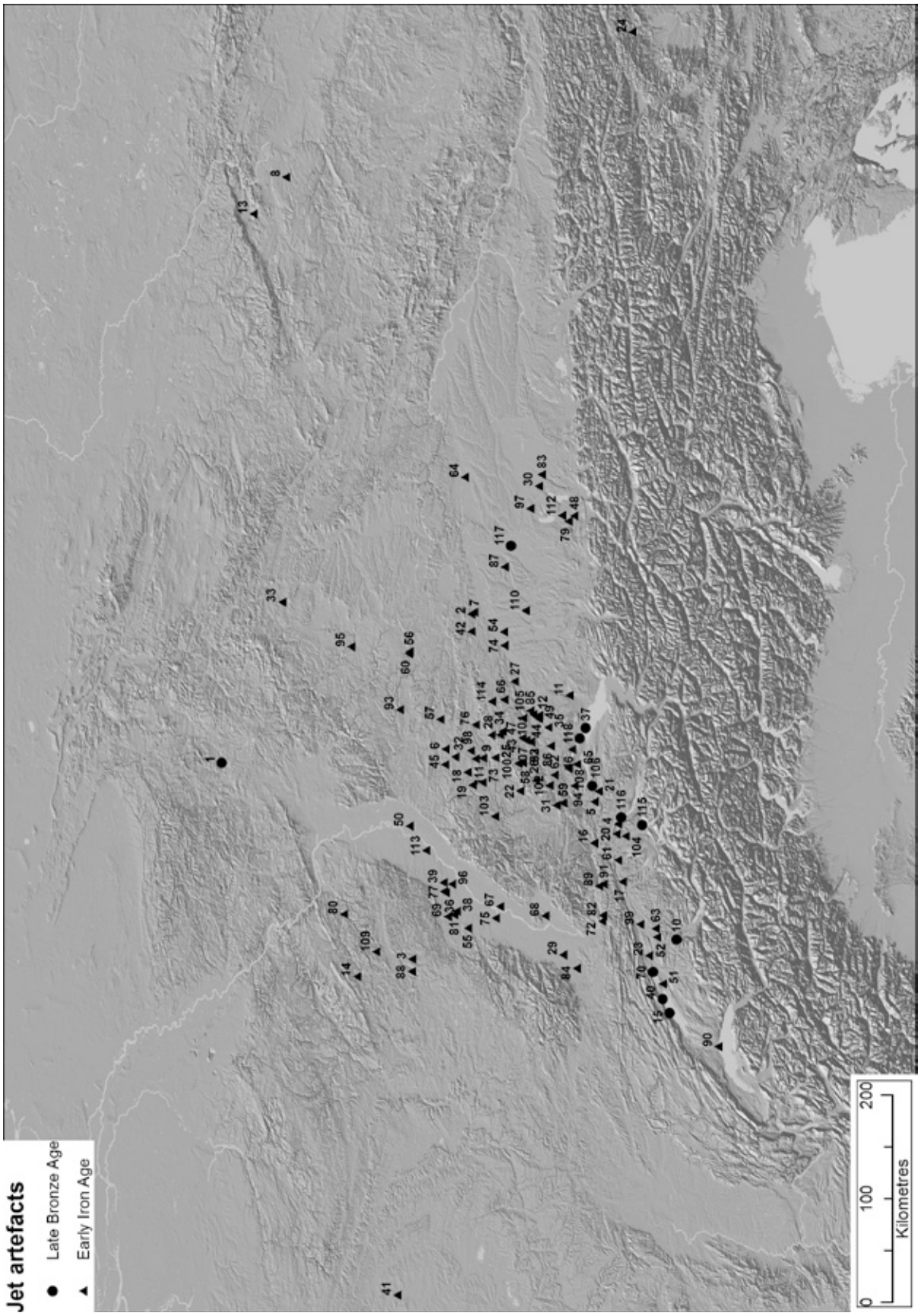


Map 7: Distribution of fragmentary and molten glass remains from selected LBA sites in northern Europe.

Map 8

No.	Site	Country	References
LBA			
1	Allendorf	D	(Lorenz 2006)
10	Belp	CH	(Tschumi 1953)
15	Cortaillod Est	CH	(Arnold 1986)
37	Hagnau-Burg	D	(Schöbel 1996)
40	Hauterive-Champréveyres	CH	(Rychner-Faraggi 1993)
70	Mörigen	CH	(Bernatzky-Goetze 1987)
106	Ürschhausen-Horn	CH	(Nagy 1999)
115	Zug-Sumpf	CH	(Seifert 1997a)
116	Zürich-Grosser-Hafner	CH	(Wyss 1981)
117	Haunstetten	D	(Wirth 1998)
118	Unteruhldingen-Stollenwiesen	D	(Schöbel 1996)
EIA			
2	Altenberg	D	(Rochna 1962)
3	Altheim-Homburg	D	(Rochna 1962)
4	Altstetten	CH	(Rochna 1962)
5	Andelfingen	CH	(Rochna 1962)
6	Asperg	D	(Rochna 1962)
7	Bachhagel	D	(Rochna 1962)
8	Bakov	CZ	(Rochna 1962)
9	Bebenhausen	D	(Rochna 1962)
11	Berg	D	(Rochna 1962)
12	Bettelbühl	D	(Krausse and Ebinger-Rist 2011)
13	Bilina	CZ	(Rochna 1962)
14	Birkenfeld	D	(Rochna 1962)
16	Dangstetten	D	(Rochna 1962)
17	Däniken	CH	(Rochna 1962)
18	Darmsheim	D	(Rochna 1962)
19	Deckenpfronn	D	(Rochna 1962)
20	Dietikon	CH	(Rochna 1962)
21	Dinhard	CH	(Drack 1973a; Rochna 1962)
22	Dormettingen	D	(Rochna 1962)
23	Dotzigen	CH	(Rochna 1962)
24	Dürrnberg	AT	(Rochna 1962)
25	Dußlingen	D	(Rochna 1962)
26	Ebingen	D	(Rochna 1962)
27	Ehingen	D	(Rochna 1962)
28	Eningen	D	(Rochna 1962)
29	Ensisheim	FR	(Rochna 1962; Stahl 2006)
30	Forst Kasten	D	(Rochna 1962)
31	Geisingen	D	(Rochna 1962)
32	Gerlingen	D	(Rochna 1962)
33	Großeibstadt	D	(Stahl 2006)
34	Grossengstingen	D	(Rochna 1962)
35	Habsthal	D	(Haevernick 1975; Rochna 1962)
36	Hagenau-Schelmenhofstadt	FR	(Rochna 1962)
38	Harthouse	FR	(Rochna 1962)
39	Hatten-Selz	FR	(Rochna 1962)
41	Hauviné	FR	(Rochna 1962)
42	Heidenheim-Mergelstetten	D	(Rochna 1962)
43	Hettingen	D	(Rochna 1962)
44	Heuneburg	D	(Rochna 1962)
45	Hochdorf	D	(Rochna 1962)
46	Hödingen	D	(Rochna 1962)
47	Honau	D	(Rochna 1962)
48	Huglfing	D	(Rochna 1962)
49	Hundersingen	D	(Rochna 1962)
50	Huttenheim	D	(Rochna 1962)
51	Ins	CH	(Rochna 1962)
52	Jegenstorf	CH	(Drack 1973a; Rochna 1962)
53	Jungnau	D	(Rochna 1962)
54	Kadeltshofen-Remmeltshofen	D	(Rochna 1962)
55	Kienheim	FR	(Rochna 1962)
56	Kirchberg an der Jagst	D	(Stahl 2006)
57	Kirschenhardthof	D	(Rochna 1962)
58	Königsheim	D	(Rochna 1962)
59	Leipferdingen	D	(Rochna 1962)

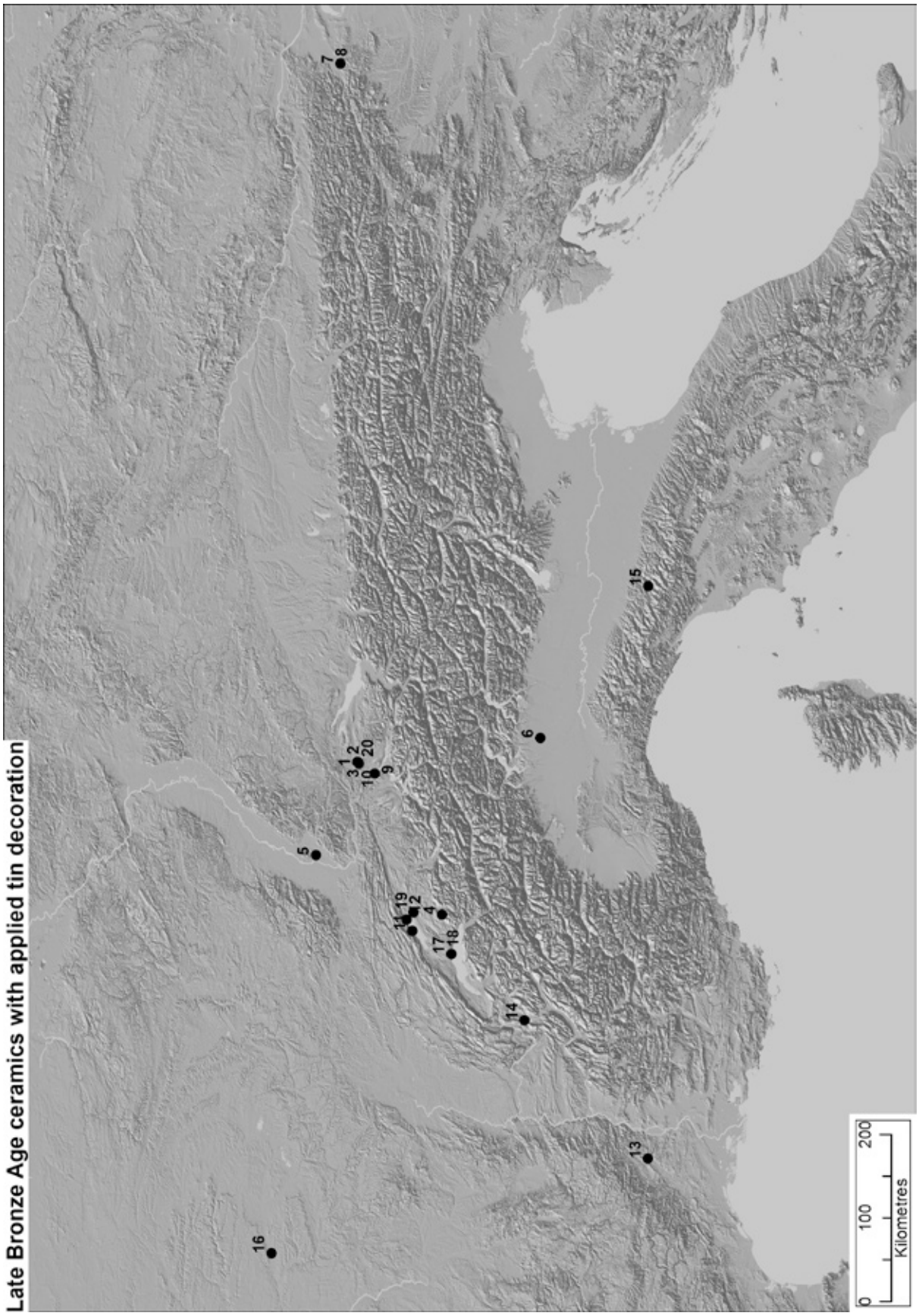
60	Lendsiedel	D	(Rochna 1962)
61	Lenzburg	CH	(Rochna 1962)
62	Liptingen	D	(Haevernick 1975; Rochna 1962)
63	Lyssach	CH	(Haevernick 1975; Rochna 1962)
64	Manching	D	(Rochna 1962)
65	Markelfingen	D	(Rochna 1962)
66	Mehrstetten	D	(Rochna 1962)
67	Meißenheim	D	(Rochna 1962)
68	Merdingen	D	(Rochna 1962)
69	Mertzwiller	FR	(Rochna 1962)
72	Muttenz	CH	(Rochna 1962)
73	Nebringen	D	(Rochna 1962)
74	Neu-Ulm	D	(Rochna 1962)
75	Nordhouse bei Erstein	FR	(Rochna 1962)
76	Nürtingen	D	(Stahl 2006)
77	Oberbetschdorf	FR	(Rochna 1962)
79	Oderding	D	(Rochna 1962)
80	Odernheim am Glan	D	(Rochna 1962)
81	Ohlungen	FR	(Rochna 1962)
82	Pratteln	CH	(Rochna 1962)
83	Pullach	D	(Rochna 1962)
84	Reiningue	FR	(Rochna 1962; Stahl 2006)
85	Riedlingen	D	(Rochna 1962)
86	Ringgenbach	D	(Rochna 1962)
87	Rommelsried	D	(Rochna 1962)
88	Rubenheim	D	(Rochna 1962)
89	Säckingen	D	(Rochna 1962)
90	Saint Sulpice	CH	(Rochna 1962)
91	Schupfart	CH	(Rochna 1962)
92	Sigmaringen-Jungnau	D	(Stahl 2006)
93	Sindringen	D	(Rochna 1962)
94	Singen-Hohentwiel	D	(Krause and Christoforidis 1988; Rochna 1962)
95	Sommershausen	D	(Rochna 1962)
96	Soufflenheim	FR	(Rochna 1962)
97	Staatswald Mühlhart	D	(Rochna 1962)
98	Steinenbronn	D	(Rochna 1962)
99	Subingen	CH	(Lüscher 1993; Rochna 1962)
100	Tailfingen	D	(Rochna 1962)
101	Tübingen-Waldhausen	D	(Rochna 1962)
102	Tuttlingen	D	(Rochna 1962)
103	Unteriflingen	D	(Rochna 1962)
104	Unterlunkhofen	CH	(Lüscher 1993; Rochna 1962)
105	Upflamör	D	(Rochna 1962)
107	Veringenstadt	D	(Rochna 1962)
108	Wahlwies	D	(Rochna 1962)
109	Wahnwegen	D	(Rochna 1962)
110	Waltenhausen-Hairenbuch	D	(Rochna 1962)
111	Weil im Schönbuch	D	(Rochna 1962)
112	Wielenbach	D	(Rochna 1962)
113	Wörth	D	(Stahl 2006)
114	Zainingen	D	(Rochna 1962)



Map 8: Distribution of Late Bronze Age and early Iron Age jet (Gagat) artefacts from central Europe.

Map 9

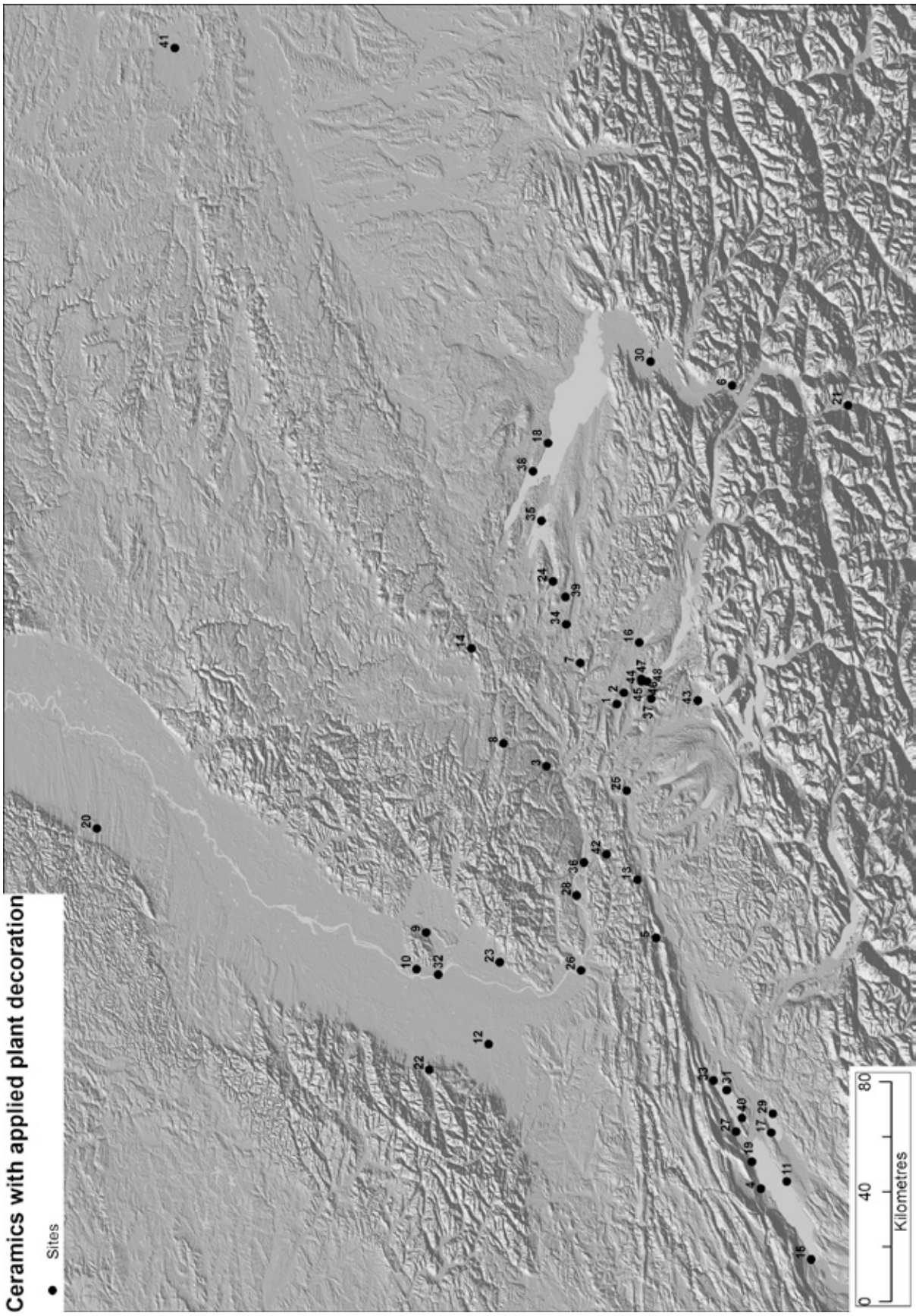
No.	Site	Vessel	Context	Country	References
1	Neftenbach	Cylinder neck urn	Burial	CH	(Fischer, C 1993, 1997)
2	Neftenbach	Ball neck urn	Burial	CH	(Fischer, C 1993, 1997)
3	Neftenbach	Bowl	Burial	CH	(Fischer, C 1993, 1997)
4	Vuadens Le Briez	Bowl	Burial	CH	(Fischer, C 1993, 1997)
5	Oberrimsingen	Funnel neck bowl	Burial	D	(Fischer, C 1993, 1997)
6	Canegrate	Bowl	Burial	IT	(Fischer, C 1993)
7	Pitten	Sherds	Burial	AT	(Fischer, C 1993, 1997)
8	Pitten	Sherds	Burial group	AT	(Fischer, C 1993, 1997)
9	Zürich-Wollishofen	Sherds	Lake-Dwelling	CH	(Bolliger Schreyer 2001)
10	Neftenbach-Zürichstrasse	Beaker	Burial	CH	(Fischer, C 1997)
11	Cortaillod Est	Plate-Bowl	Lake-Dwelling	CH	(Borrello 1986)
12	Hauterive-Champréveyres	Beakers	Lake-Dwelling	CH	(Borrello 1993)
13	Vallon	Bowl	Cave	FR	(Coutier and Sordes 1939)
14	Grésine	Bowl, Urn, Spinning Whorl	Lake-Dwelling	FR	(Coutil 1915)
15	Corneto	Biconical Urn	Burial	IT	(Coutil 1915)
16	Villiers-sur-Seine	Bowl	Settlement	FR	(Peake *et al.* 2009)
17	Vidy-Chavannes	Urn	Burial	CH	(Kaenel and Klausener 1990)
18	Vidy-Chavannes	Urn	Burial	CH	(Kaenel and Klausener 1990)
19	Vallamand	Beaker	Lake-Dwelling	CH	(Wyss 1972)
20	Neftenbach-Zürichstrasse	Pot, Beaker	Burial	CH	(Fischer, C 1993, 1997)



Map 9: Distribution of Late Bronze Age tin decorated ceramics north of the Alps.

Map 10

No.	Site	Qty	Country	References
1	Adlikon-Regensdorf	1	CH	(Bauer *et al.* 1992)
2	Affoltern	1	CH	(Mäder 1996)
3	Aichen - Gutenburg	5	D	(Gersbach 1968)
4	Auvernier	22	CH	(Rychner 1979)
5	Balsthal-Holzfluh	1	CH	(Deschler-Erb 1989)
6	Balzers	1	LI	(Bill *et al.* 1992)
7	Berg am Irchel	3	CH	(Bauer *et al.* 1992)
8	Bonndorf	1	D	(Hoydem *et al.* 1994)
9	Bötzingen	2	D	(Grimmer 1982)
10	Burkheim	2	D	(Grimmer 1982)
11	Chevroux	1	CH	(Colomb and Muyden 1896)
12	Ensisheim	1	FR	(Zumstein 1966)
13	Frohburg	1	CH	(Gutzwiller and Frey-Kupper 1989)
14	Geisingen	1	D	(Gersbach 1951)
15	Grandson-Corcelettes	7	CH	(Colomb and Muyden 1896)
16	Greifensee-Böschen	2	CH	(Eberschweiler *et al.* 1987, 2007)
17	Guévaux	1	CH	(Keller 1863)
18	Hagnau-Burg	1	D	(Schöbel 1996)
19	Hauterive-Champréveyres	5	CH	(Borrello 1992, 1993)
20	Heuchelheim-Klingen	1	D	(Zylmann 1983)
21	Hohen-Rätien	1	CH	(Della Casa *et al.* 1997)
22	Hohlandsberg-Wintzenheim	2	FR	(Bonnet 1973)
23	Hügelheim	1	D	(Mäder 2001b)
24	Eschenz-Insel Werd	8	CH	(Brem *et al.* 1987)
25	Kestenberg	2	CH	(Laur-Belart 1952)
26	Klein Basel	1	CH	(Mäder 2001b)
27	Le Landeron	1	CH	(Ruoff 1974)
28	Möhlin-Niederriburg	13	CH	(Maier 1986)
29	Montilier	2	CH	(Keller 1866)
30	Montlingerberg	1	CH	(Steinhauser-Zimmermann 1989)
31	Mörigen	5	CH	(Bernatzky-Goetze 1987; Keller 1876)
32	Münsterberg	?	D	(Mäder 2001b)
33	Nidau-Steinberg	1	CH	(Keller 1863)
34	Ossingen	1	CH	(Ruoff 1974)
35	Reichenau	2	D	(Kimmig 1940)
36	Säckingen	2	D	(Gersbach 1968)
37	Üetliberg	6	CH	(Bauer *et al.* 1991)
38	Unteruhldingen-Stollenwiesen	1	D	(Schöbel 1996)
39	Ürschhausen-Horn	2	CH	(Nagy 1999)
40	Vinelz	4	CH	(Gross, E 1986)
41	Wechingen	1	D	(Ludwig-Lukanow 1983)
42	Wittnau Horn	2	CH	(Bersu 1945)
43	Zug-Sumpf	12	CH	(Mäder 1996; Ruoff 1974; Seifert 1992, 1997b)
44	Zürich Kleiner-Hafner	1	CH	(Suter *et al.* 1987)
45	Zürich-Alpenquai	20	CH	(Mäder 2001b; Ruoff 1974; Viollier *et al.* 1924)
46	Zürich-Grosser-Hafner	3	CH	(Ruoff 1974; Wyss 1972)
47	Zürich-Mozartstrasse	2	CH	(Gross, E *et al.* 1987)
48	Zürich-Wollishofen	9	CH	(Bolliger Schreyer 2001; Heierli 1886)

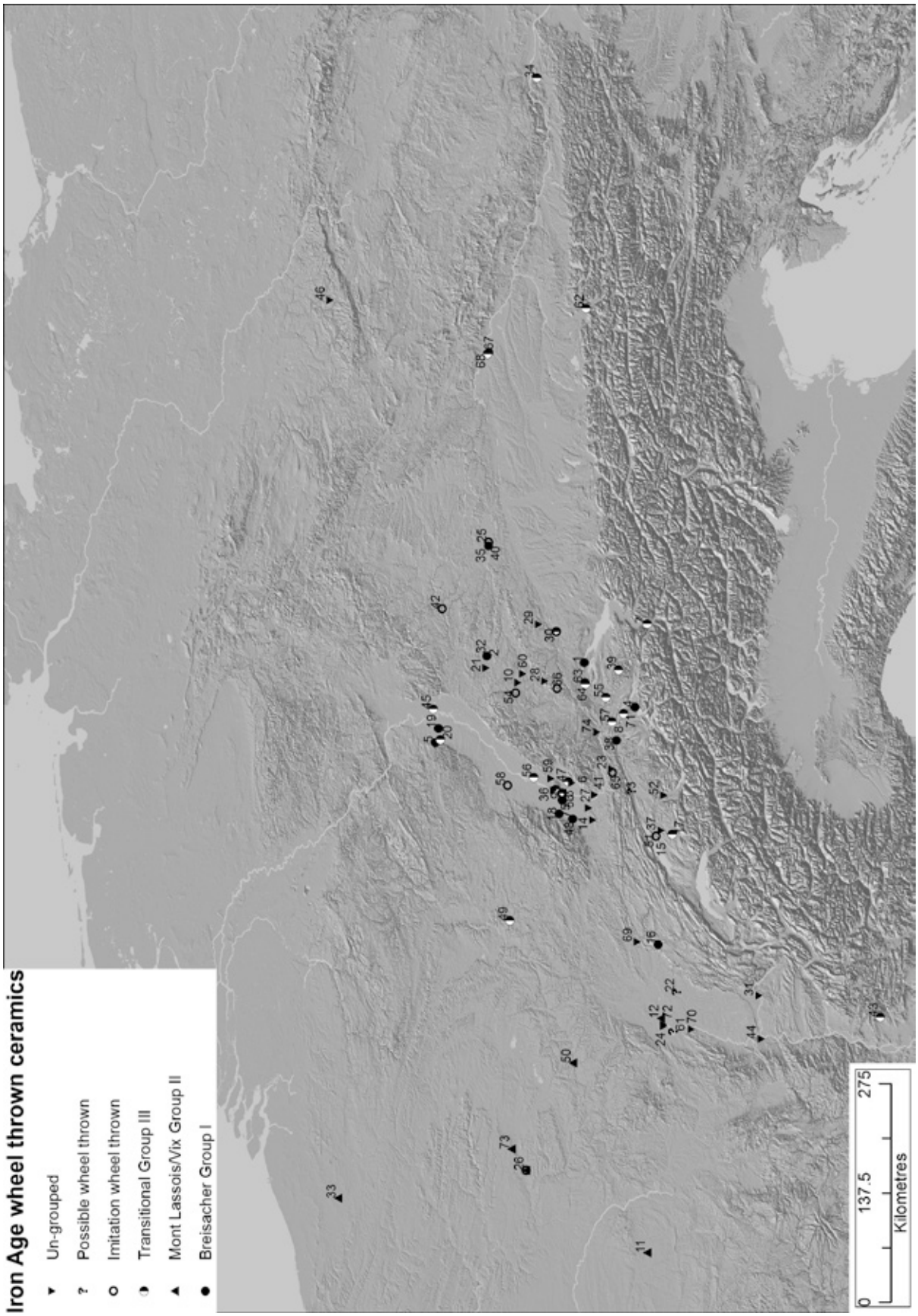


Map 10: Distribution of LBA ceramics with applied plant decoration in the northern Circum-Alpine region.

Map 11

All site references from (Balzer 2009) unless marked with * (Pauli, L 1993).

No.	Site	Country	
1	Allensbach-Langenrain "Hals"	D	
2	Asperg	D	
4	Baarburg	CH	
5	Bad Dürkheim "Heidenmauer"	D	
6	Bad Krozingen	D	
7	Balzers "Runder Büchel"	LI	
8	Berikon	CH	
9	Bischoffingen "Dielen"/"Waldsberg"	D	
10	Bondorf	D	
12	Bragny-sur-Saône	FR	
13	Breisach	D	
14	Britzgyberg	FR	
16	Camp-de-Château	FR	
18	Colmar, Rue Balzac/Rue des Aulnes	FR	
19	Dannstadt-Schauernheim	D	
20	Deidesheim	D	
21	Eberdingen-Hochdorf	D	
22	Fragny-en-Bresse	FR	*
23	Gelterkinden	CH	*
24	Gergy	FR	
25	Goldburghausen, Goldberg	D	
26	Grisy sur Seine "Les Terres du Bois Mortier"	FR	
27	Habsheim "Le Lobelia"	FR	
28	Hausen am Tann, Lochenstein	D	
29	Hayingen-Indelhausen	D	
31	Hières-sur-Amby	FR	
32	Hohenasperg	D	
33	Houplin-Ancoisne	FR	
34	Inzersdorf-Walpersdorf	AT	
35	Ipf	D	
36	Jechtingen "Kapellenfeld"/"Lachenmüngle"	D	
37	Jeuss	CH	
38	Kestenberg	CH	
39	Kirchberg-Gähwil	CH	
40	Kirchheim-Osterholz	D	
41	Kleinkems	D	*
42	Klepsau	D	
44	Lyon-Vaise	FR	
45	Mannheim-Feundenheim	D	
47	Mengen-Hohle/-Merzengraben/-Löchleacker	D	
48	Merxheim "Trummelmatten"	FR	
49	Messein "Cite d' Affrique"	FR	
51	Mont Vully	CH	
52	Münsingen-Rain	CH	*
54	Nagold, Schloßberg	D	
55	Neftenbach-Riedt "Oberwiesen"	CH	
56	Nonnenweier "Auf dem Bühl"	D	
57	Otelfingen "Bonenberg"	CH	
58	Pfulgriesheim	FR	
59	Riegel	D	
60	Rottenburg	D	
61	Saint-Marcel	FR	*
62	Salzburg Hellbrunnerberg	AT	
63	Singen - Hohentwiel "Mühlenzelgle"	D	
64	Singen-Hohentwiel	D	
65	Sissach-Burgenrainweg	D	
66	Spaichingen-Dreifaltigkeitsberg	D	
67	Straubing Asterweg "Jungmeier"	D	
68	Straubing Bajuwarenstrasse	D	
69	Thoraise	FR	
70	Tournus	FR	
72	Verjux-Mutschellen	FR	
73	Villenauxe-la-Grande, Eglise de Dival	FR	
74	Waldshut-Altenburg	D	
75	Wolfgantzen	FR	
15	Bussy-Pré de Fond	CH	
3	Attiswil-Wybrunne	CH	

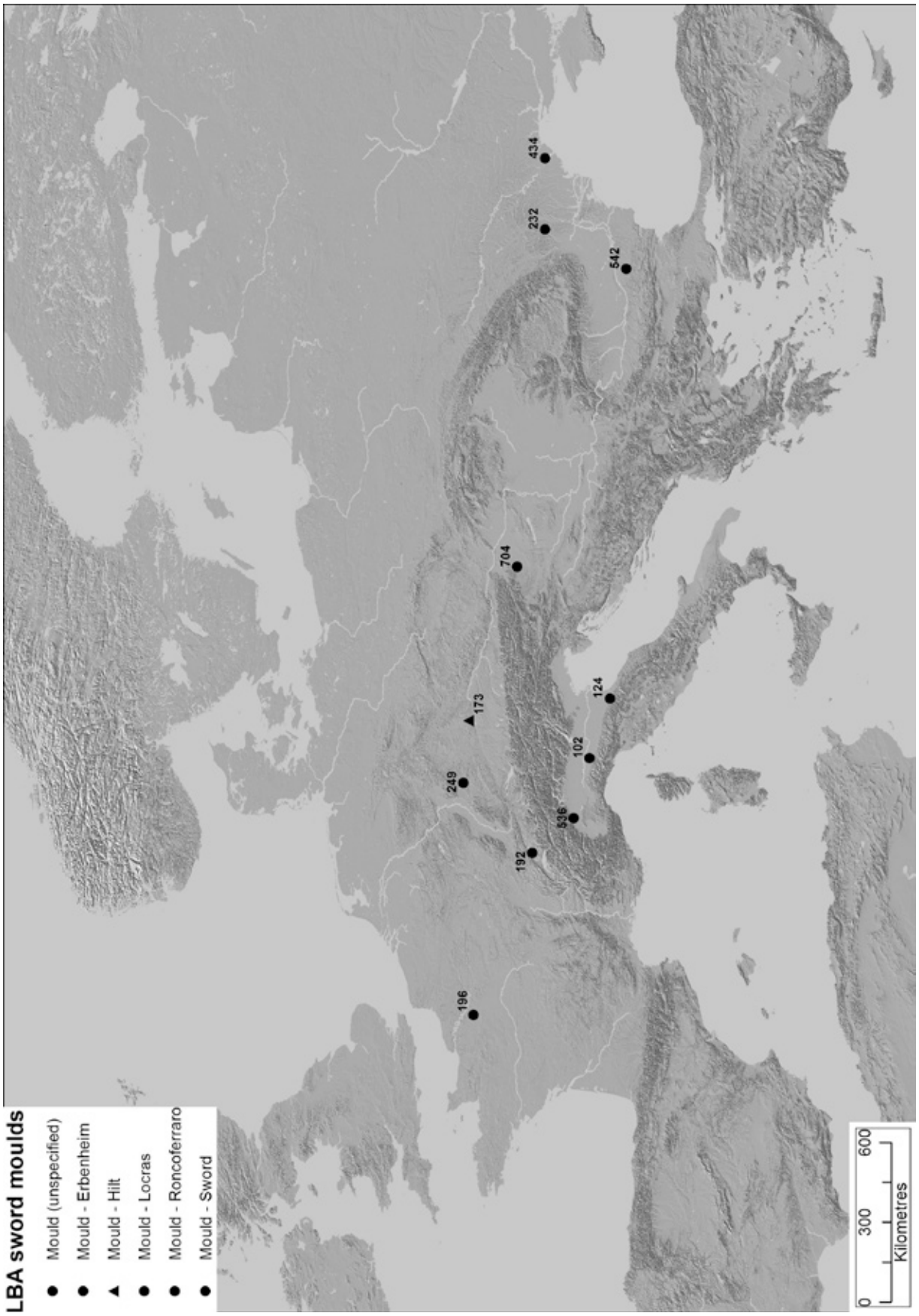


Map 11: Distribution of early Iron Age wheel thrown pottery north of the Alps (data from Balzer 2009).

Map 12

Contexts: L-D = Lake-Dwelling.

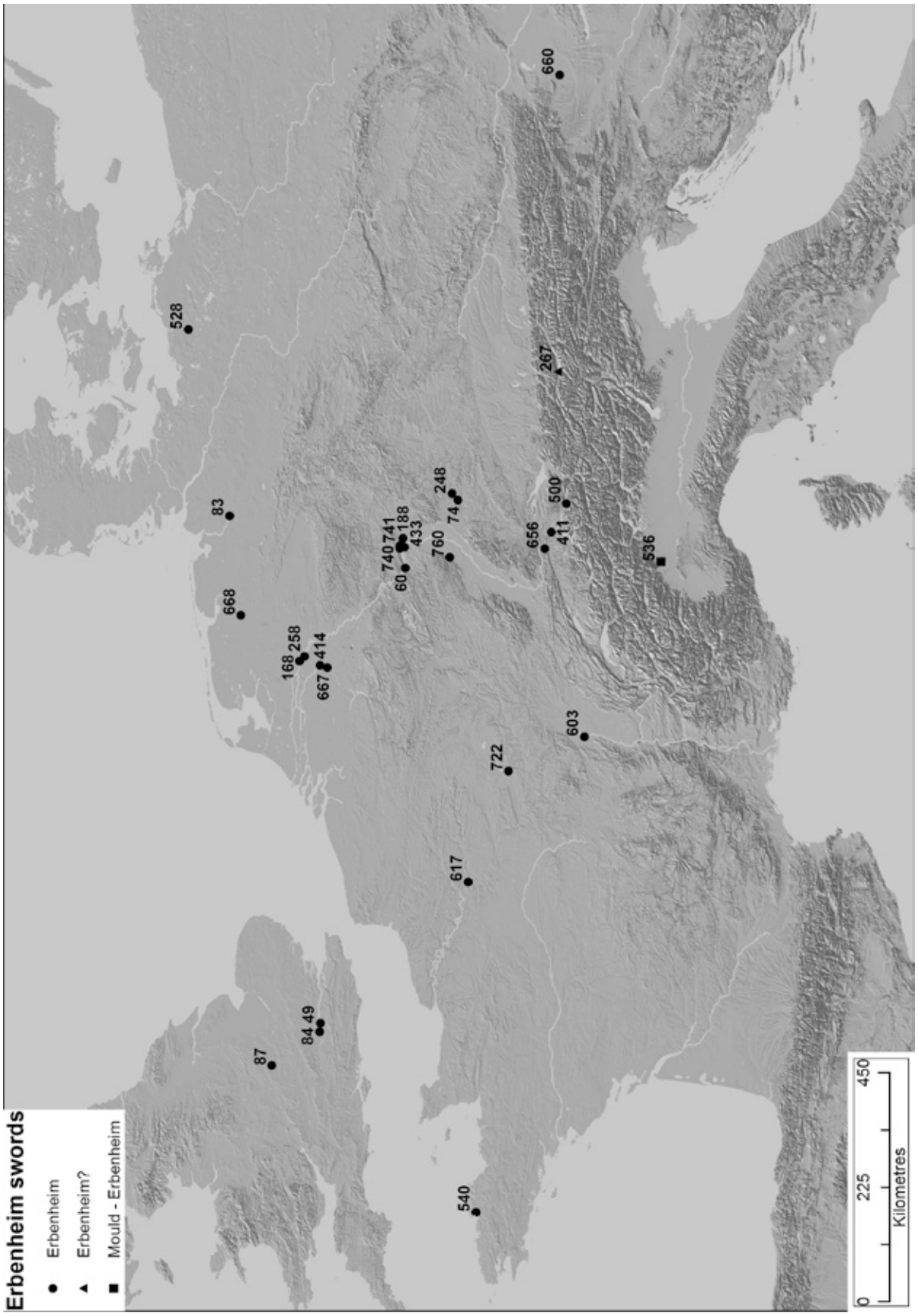
No.	Site	Context	Period	Creates (sword)	Country	References
102	Castione dei Marchesi	Terramare	Bronzo Medio	Roncoferraro	IT	(Bianco Peroni 1970; Mödlinger 2011)
124	Coriano	N/A	LBA	?	IT	(Cupitò 2006; Mödlinger 2011)
173	Erlingshofen	Hoard	LBA	Mörigen hilt	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
192	Font – La Pianta	L-D	LBA	Locras	CH	(Mödlinger 2011; Schauer 1971)
196	Fort-Harrouard	Settlement	LBA	?	FR	(Mohen and Bailloud 1987)
232	Gura Idrici	Settlement	LBA	?	RO	(Bader 1991; Mödlinger 2011)
249	Heilbronn Neckargartach	Hoard	HaB2-HaB3	?	D	(Binggeli 2011; Mödlinger 2011; Schauer 1971)
434	Majaki (Mayaky)	Settlement	BA	?	UA	(Bočkarev and Leskov 1981; Mödlinger 2011)
536	Piverone	Settlement	HaA	Erbenheim	IT	(Bertone *et al.* 2004; Bianco Peroni 1970; Mödlinger 2011)
542	Pobit Kamăk	Hoard	LBA	?	BG	(Mödlinger 2011; Wanzek 1989)
704	Velem	Settlement	HaA	?	HU	(Mödlinger 2011; Wanzek 1989)



Map 12: Late Bronze Age sword moulds from central Europe.

Map 13

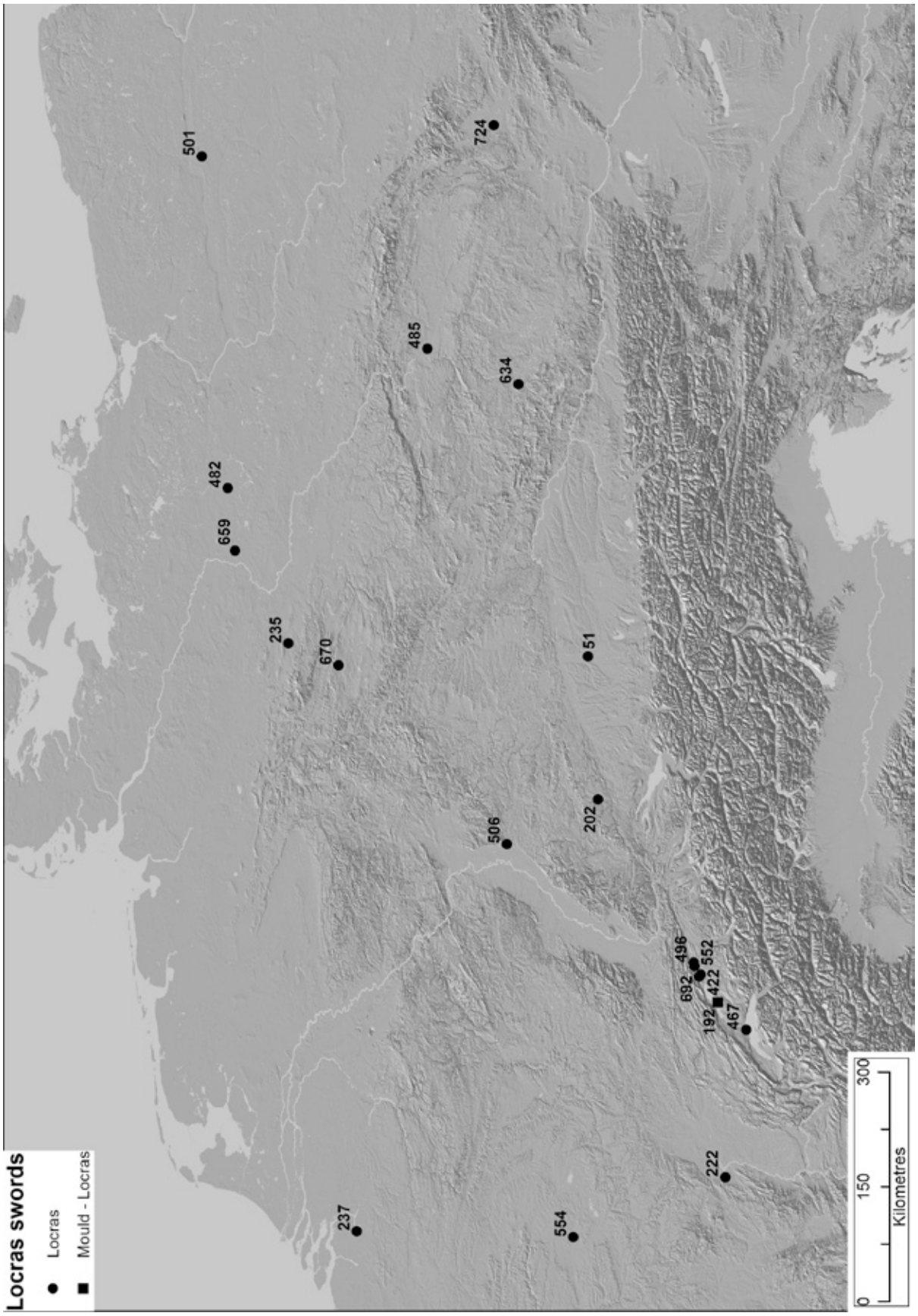
No.	Site	Country	References
49	Battersea	UK	(Burgess and Colquhoun 1988)
60	Bingen	D	(Cowen 1968; Schauer 1971)
74	Bönnigheim	D	(Cowen 1968; Schauer 1971)
83	Bremen	D	(Cowen 1968; Schauer 1971)
84	Brentford	UK	(Burgess and Colquhoun 1988)
87	Brixworth	UK	(Burgess and Colquhoun 1988)
168	Emmerich	D	(Schauer 1971)
188	Flörsheim	D	(Cowen 1968; Schauer 1971)
248	Heilbronn	D	(Cowen 1968; Schauer 1971)
258	Hoennepel	D	(Schauer 1971)
267	Hötting	AT	(Cowen 1955)
411	Letten - Zürich	CH	(Hahnekamp 2012; Schauer 1971)
414	Limburg-Arcen Blitterswijk	NL	(Cowen 1955; Fontijn 2002)
433	Mainz	D	(Schauer 1971)
500	Niederurnen	CH	(Schauer 1971)
528	Parum	D	(Wüstemann 2004)
536	Piverone	IT	(Bertone *et al.* 2004; Bianco Peroni 1970; Mödlinger 2011)
540	Ploulec'h	FR	(Schauer 1971)
603	Saône	FR	(Schauer 1971)
617	Seine-Paris	FR	(Cowen 1968; Schauer 1971)
656	Stroppel	CH	(Schauer 1971)
660	Szombathely	HU	(Cowen 1955; Schauer 1971)
667	Tegelen-Maas	NL	(Cowen 1955; Fontijn 2002)
668	Ter Apel	NL	(Schauer 1971)
722	Virey-sous-Bar	FR	(Schauer 1971)
740	Wiesbaden	D	(Schauer 1971)
741	Wiesbaden-Erbenheim	D	(Schauer 1971)
760	Wollmesheim	D	(Schauer 1971)



Map 13: Distribution of *Erbenheim* type swords

Map 14

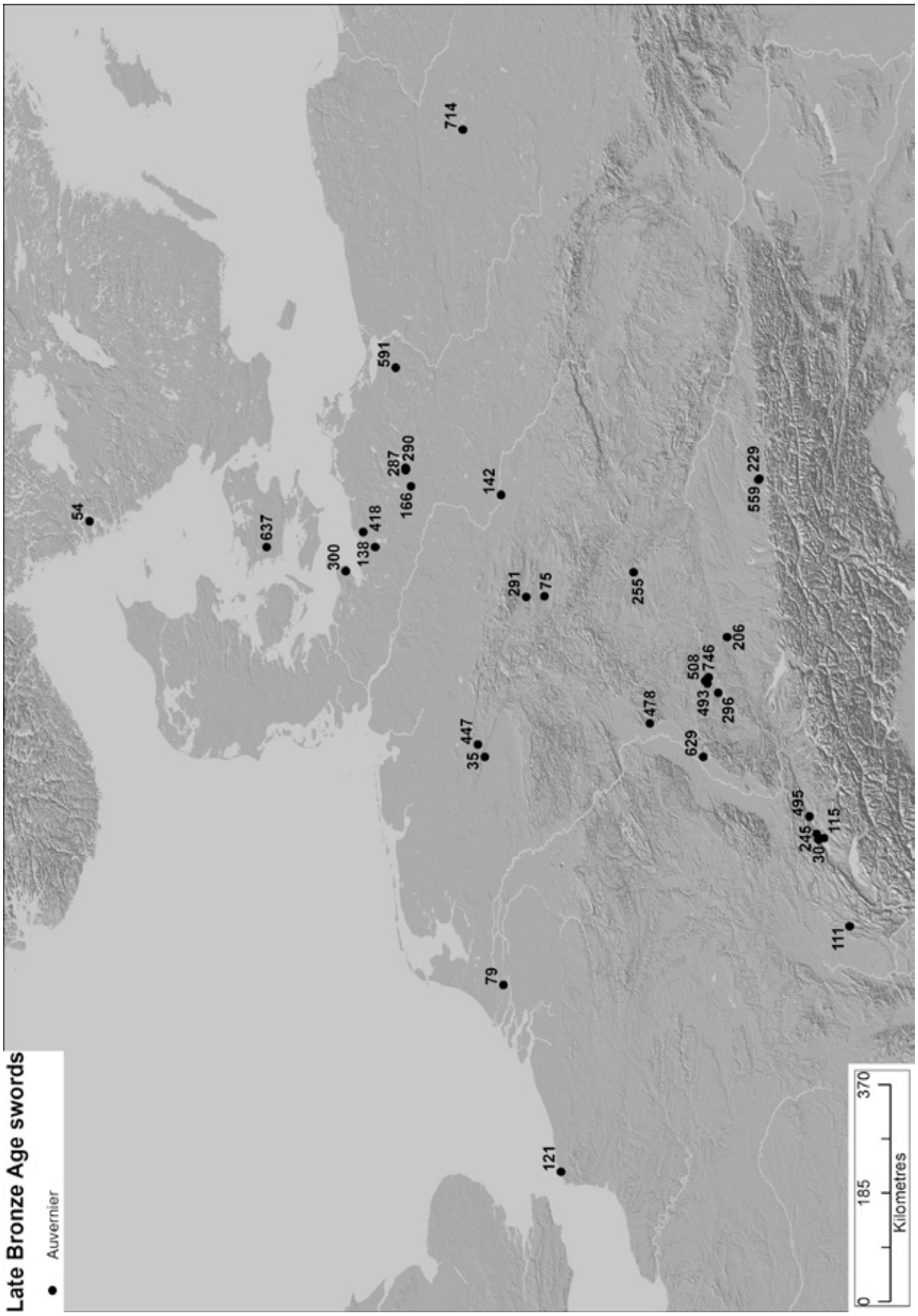
No.	Site	Country	References
51	Bei Augsburg	D	(Schauer 1971)
192	Font - La Pianta	CH	(Mödlinger 2011; Schauer 1971)
202	Gammertingen	D	(Schauer 1971)
222	Granges bei Grivy	FR	(Schauer 1971)
235	Halberstadt	D	(Wüstemann 2004)
237	Hamme	BE	(Fontijn 2002)
422	Locras (Lüscherz)	CH	(Schauer 1971)
467	Morges-Grand Cité	CH	(Schauer 1971)
482	Nauen	D	(Wüstemann 2004)
485	Neratovice	CZ	(Novák 1975)
496	Nidau-Büren-Kanal	CH	(Schauer 1971)
501	Niewiemków	PL	(Wüstemann 2004)
506	Nußloch	D	(Schauer 1971)
552	Port	CH	(Schauer 1971)
554	Pouan-les-Vallées	FR	(Hahnekamp 2012)
634	Skocice	CZ	(Novák 1975)
659	Sydow	D	(Wüstemann 2004)
670	Thalebra	D	(Wüstemann 2004)
692	Twann Petersinsel	CH	(Schauer 1971)
724	Vrahovice	CZ	(Novák 1975)



Map 14: Distribution of *Locras*/*Port* type sword.

Map 15

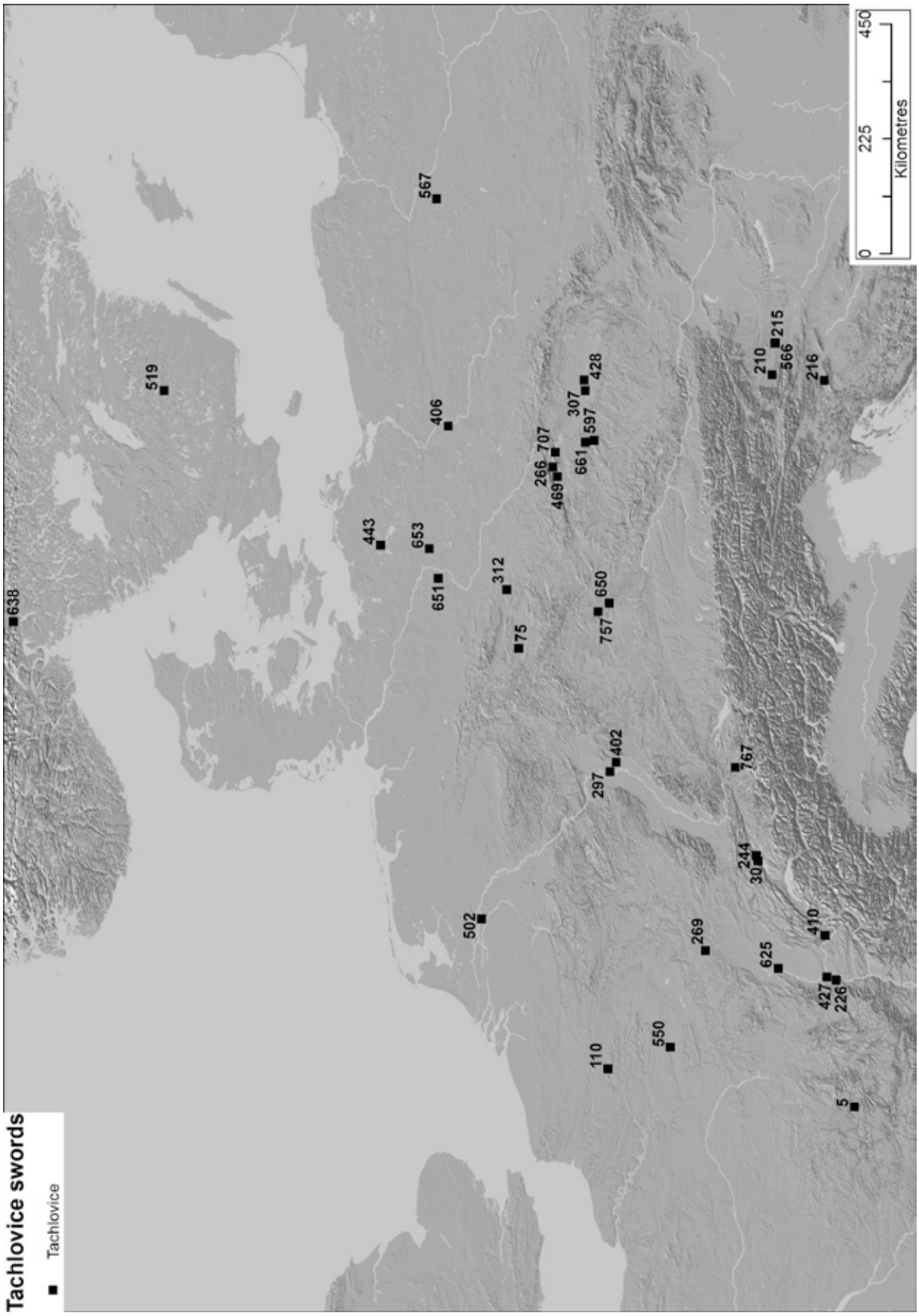
No.	Site	Qty	Country	References
30	Auvernier	2	CH	(Krämer 1985; Müller-Karpe 1961)
35	Bad Rothenfelde	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
54	Beläteröd	1	SE	(Quillfeldt 1995)
75	Bothenheilingen	1	D	(Müller-Karpe 1961; Wüstemann 2004)
79	Brabant	1	NL	(Müller-Karpe 1961; Sprockhoff 1934)
111	Chavéria	1	FR	(Kimmig 1981; Quillfeldt 1995; Vuaillat 1977)
115	Chevroux	1	CH	(Krämer 1985; Müller-Karpe 1961; Sprockhoff 1934)
118	Cochem	1	D	(Berger, D 2011; Quillfeldt 1995)
121	Coquelles	1	FR	(Quillfeldt 1995)
138	Dambeck	1	D	(Wüstemann 2004)
142	Dessau-Kühnau	1	D	(Müller-Karpe 1961; Wüstemann 2004)
166	Ellershagen	1	D	(Müller-Karpe 1961; Wüstemann 2004)
206	Gegend von Ulm	1	D	(Müller-Karpe 1961)
229	Gstadt am Chiemsee	1	D	(Hochuli, S *et al.* 1998)
234	Hagnau-Burg	1	D	(Schöbel 1996)
245	Hauterive-Champréveyres	1	CH	(Krämer 1985; Rychner-Faraggi 1993)
255	Hirschaid	1	D	(Müller-Karpe 1961)
287	Kambs	1	D	(Sicherl 2008; Wüstemann 2004)
290	Karbow	1	D	(Sicherl 2008; Wüstemann 2004)
291	Kehmstedt	1	D	(Müller-Karpe 1961; Wüstemann 2004)
296	Kirchentellinsfurt	1	D	(Quillfeldt 1995)
300	Klenau	2	D	(Müller-Karpe 1961; Sicherl 2008; Sprockhoff 1956)
418	Lischow	1	D	(Müller-Karpe 1961; Wüstemann 2004)
447	Melle	1	D	(Roymans 1991)
478	Nächstenbach Weinheim	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
493	Neuhausen auf den Fildern	1	D	(Hochuli, S *et al.* 1998)
495	Nidau	1	CH	(Müller-Karpe 1961)
508	Obereßlingen	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
559	Preinersdorf	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Torbrügge 1959)
591	Rossow	1	D	(Sicherl 2008; Wüstemann 2004)
629	Sinzheim	1	D	(Müller-Karpe 1961)
637	Sønderup	1	DK	(Quillfeldt 1995; Thrane 1968)
714	Vietkow (Wicewo)	1	PL	(Müller-Karpe 1961; Sprockhoff 1934)
746	Wendlingen-Unterboihingen	1	D	(Müller-Karpe 1961)



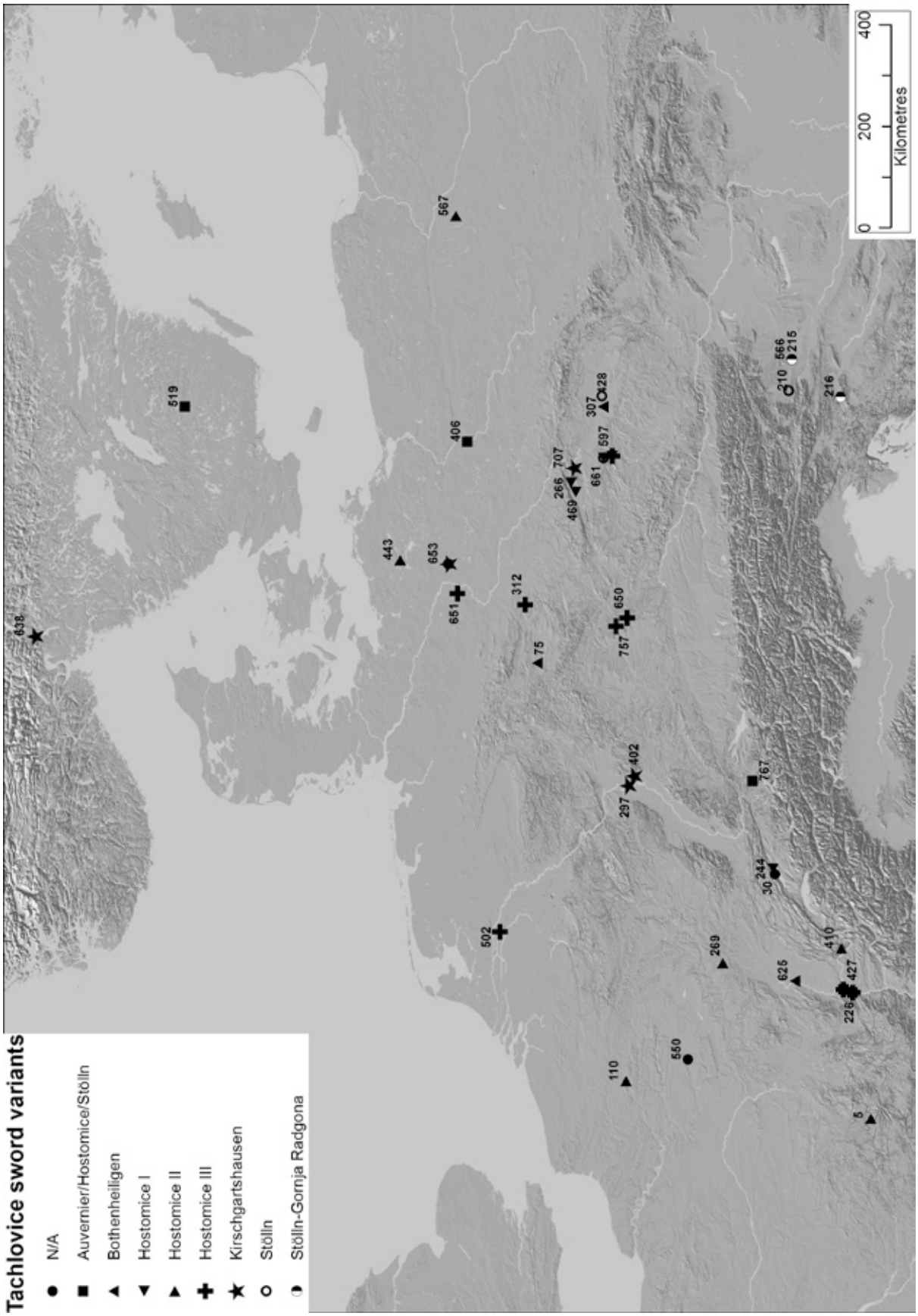
Map 15: Distribution of *Auvernier* type sword.

Maps 16, 17 & 18

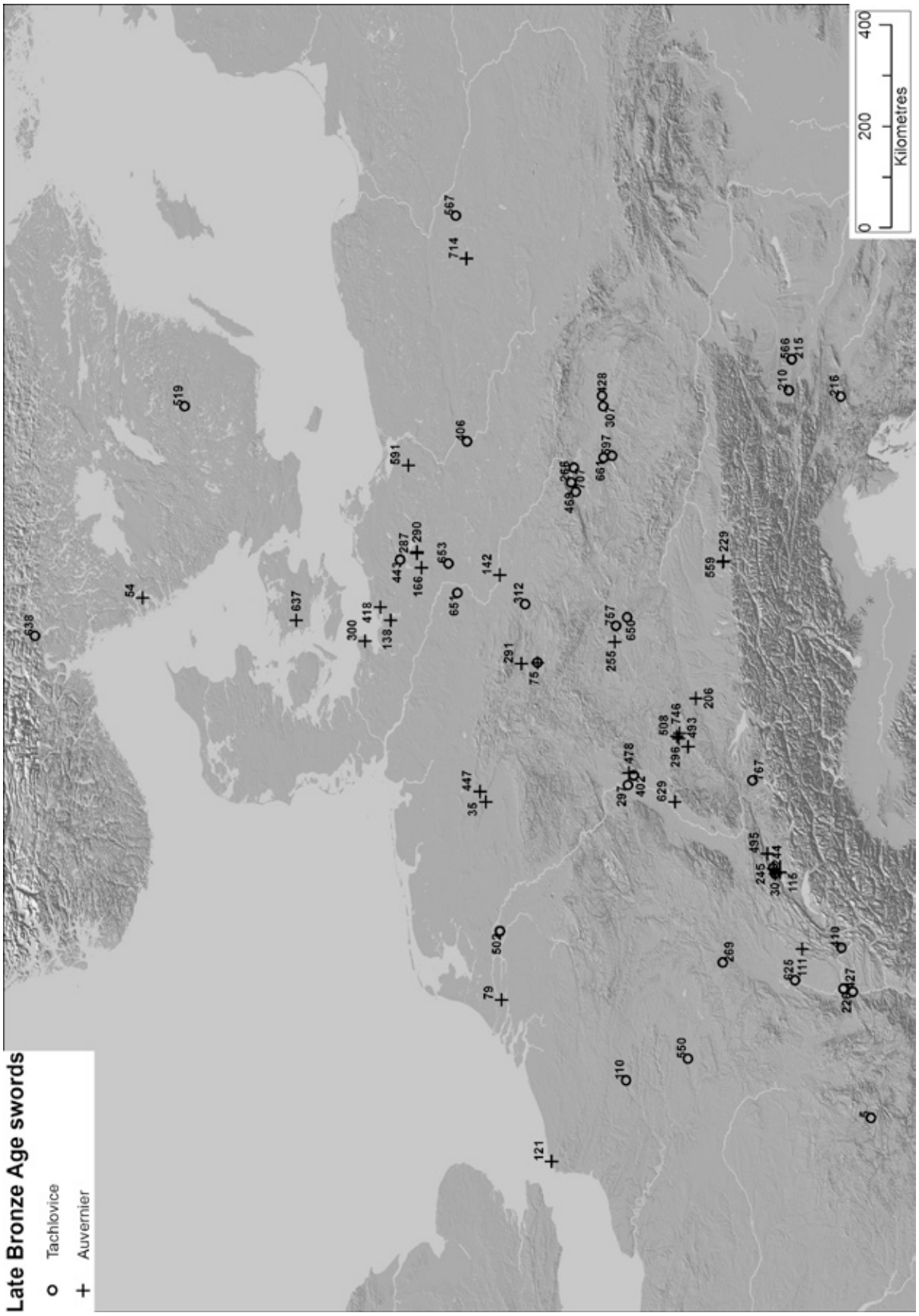
No.	Site	Qty	Country	References
5	Aliès	1	FR	(Sicherl 2008)
30	Auvernier	2	CH	(Krämer 1985)
75	Bothenheilingen	1	D	(Sicherl 2008; Wüstemann 2004)
110	Chauny	1	FR	(Sicherl 2008)
210	Goldes	1	AT	(Krämer 1985; Sicherl 2008)
215	Gornja Radgona	1	SI	(Sicherl 2008)
216	Gornje Vrhpolje	1	SI	(Sicherl 2008)
226	Grigny	3	FR	(Sicherl 2008)
244	Hauterive	1	CH	(Sicherl 2008)
266	Hostomice	1	CZ	(Novák 1975; Sicherl 2008)
269	Humes	1	FR	(Berger, D 2011; Sicherl 2008)
297	Kirschgartshausen	1	D	(Sicherl 2008)
307	Kolín	1	CZ	(Novák 1975; Sicherl 2008)
312	Kuckenburg	1	D	(Sicherl 2008; Wüstemann 2004)
402	Ladenburg	1	D	(Sicherl 2008)
406	Lebus	1	D	(Sicherl 2008)
410	L'Epineuse	1	FR	(Berger, D 2011; Sicherl 2008)
427	Lyon	2	FR	(Sicherl 2008)
428	Lžovice	1	CZ	(Sicherl 2008)
443	Mecklenburg	1	D	(Sicherl 2008; Wüstemann 2004)
469	Most	1	CZ	(Sicherl 2008)
502	Nijmegen	1	NL	(Sicherl 2008)
519	Östands Barnhus	1	SE	(Sicherl 2008)
550	Pont-sur-Seine	1	FR	(Boulud-Gazo 2011)
566	Radkersburg	1	AT	(Krämer 1985)
567	Radziejów	1	PL	(Sicherl 2008)
597	Rymane	2	CZ	(Novák 1975; Sicherl 2008)
625	Simandre	1	FR	(Sicherl 2008)
638	Sørum	1	NO	(Quillfeldt 1995; Sicherl 2008)
650	Steinsittenbach	1	D	(Sicherl 2008)
651	Stendal	1	D	(Sicherl 2008; Wüstemann 2004)
653	Stölln	2	D	(Sicherl 2008; Wüstemann 2004)
661	Tachlovice	2	CZ	(Novák 1975; Sicherl 2008)
707	Velké	1	CZ	(Gerdsen 1986; Novák 1975)
757	Wohlmannsgesees	1	D	(Sicherl 2008)
767	Zürich	1	CH	(Sicherl 2008)



Map 16: Distribution of *Tachlovice* type swords.



Map 17: Distribution of variants of the *Tachlovice* type sword.

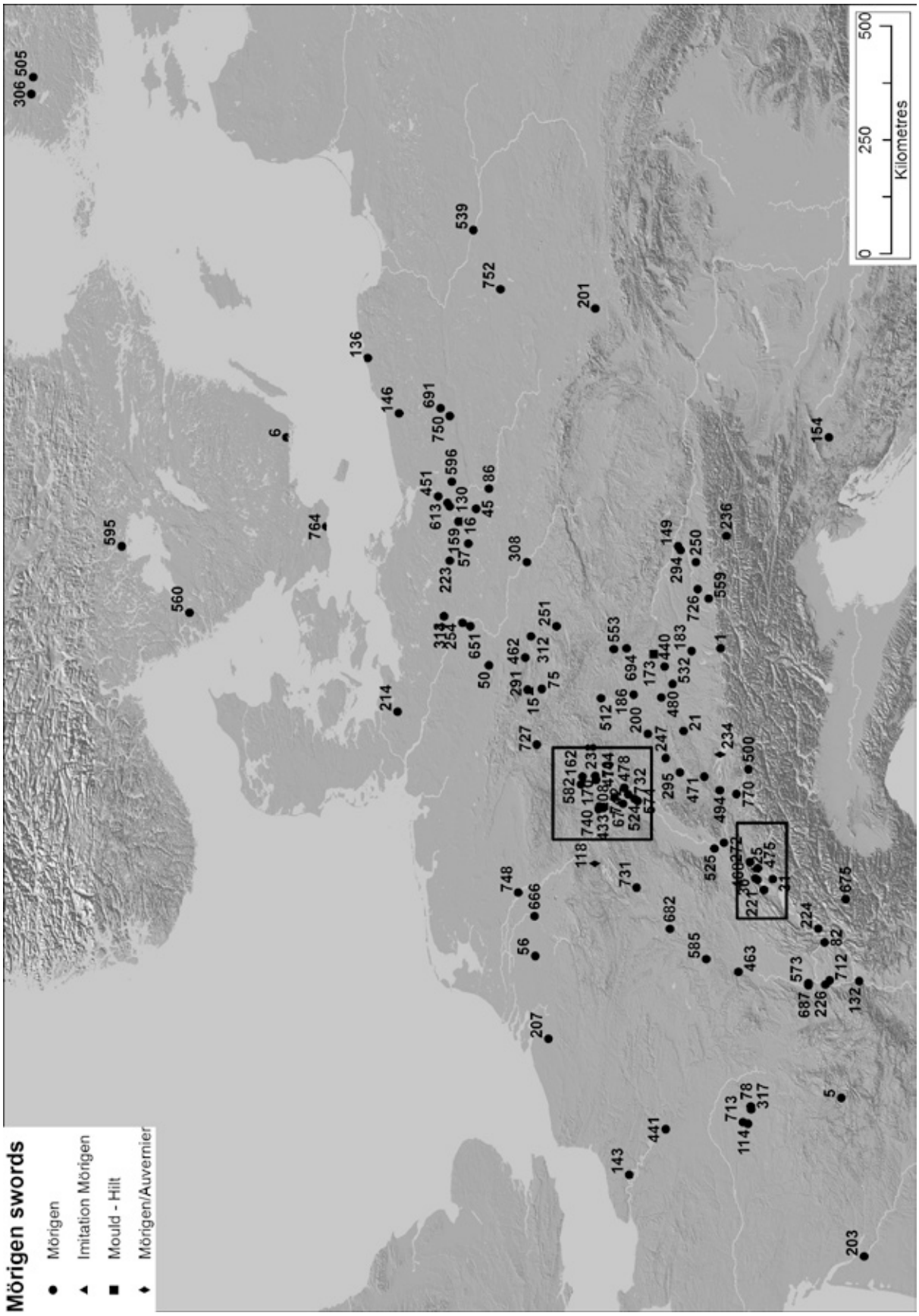


Map 18: Comparative distribution of *Auvernier* and *Tachlovice* types swords.

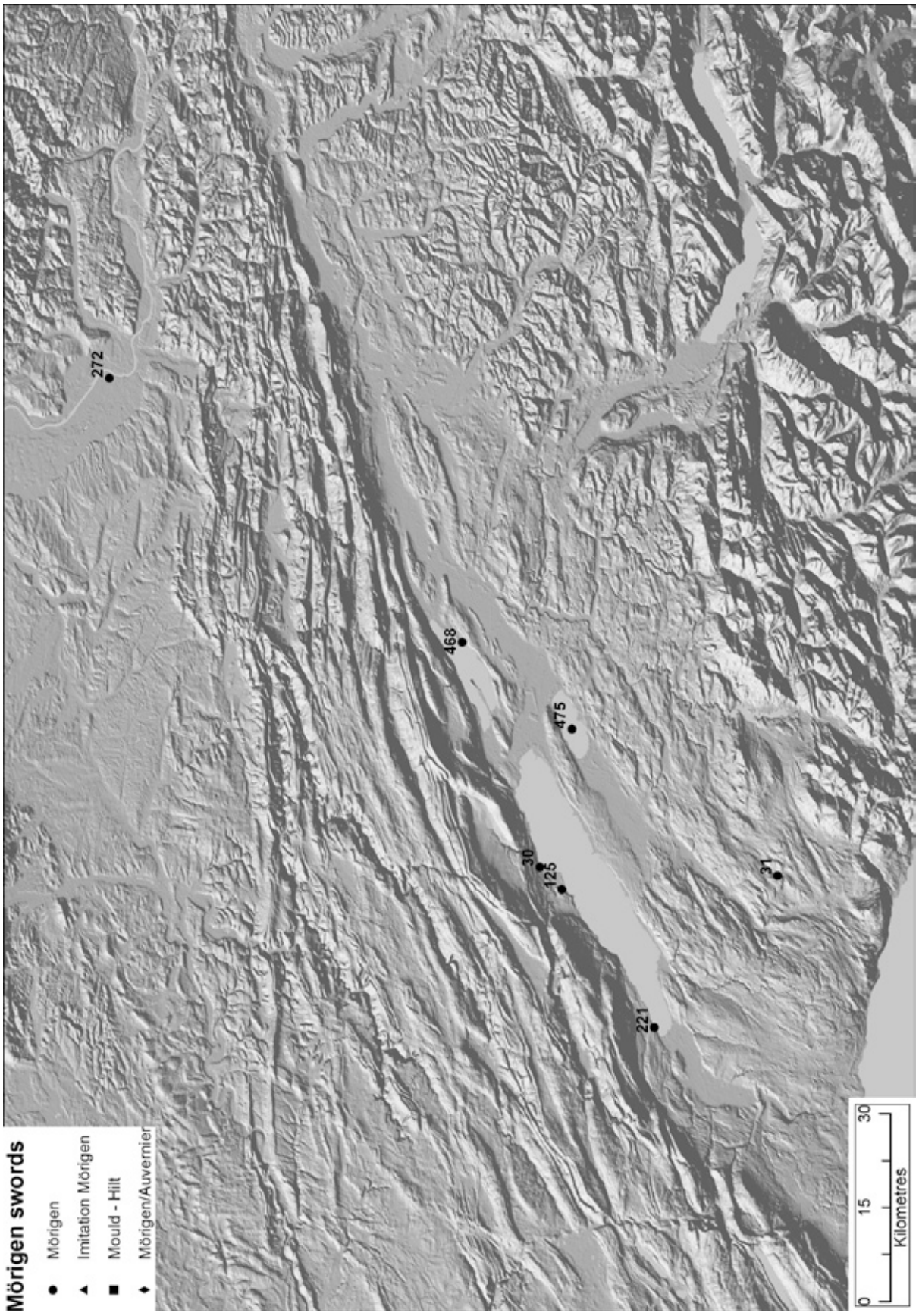
Maps 19, 20, 21 & 22

No.	Site	Qty	Country	References
1	Aich	1	D	(Quillfeldt 1995)
5	Aliès	1	FR	(Abauzit 1973; Quillfeldt 1995)
6	Allatrop	1	SE	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
15	Angeblich Bleicherode	1	D	(Wüstemann 2004)
16	Angeblich Nioederfinow	1	D	(Wüstemann 2004)
21	Asch bei Blaubeuren	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
30	Auvernier	1	CH	(Krämer 1985)
31	Auvernier-Est	1	CH	(Krämer 1985)
45	Bärwalde-Elisenhof	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
50	Beendorf	1	D	(Quillfeldt 1995; Wüstemann 2004)
56	Bergeijk	1	NL	(Fontijn 2002; Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
57	Berlin-Buch	3	D	(Wüstemann 2004)
67	Bobenheim-Roxheim	1	D	(Berger, D 2011; Brandherm and Sicherl 2001)
75	Bothenheilingen	2	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
78	Bourges	1	FR	(Quillfeldt 1995)
82	Brégnier-Cordon	1	FR	(Quillfeldt 1995)
86	Brieskow-Finkenheerd	1	D	(Krämer 1985; Müller-Karpe 1961; Wüstemann 2004)
114	Chéry	1	FR	(Cordier 1985)
118	Cochem	1	D	(Berger, D 2011; Quillfeldt 1995)
125	Cortaillod	2	CH	(Krämer 1985; Quillfeldt 1995)
130	Criewen	1	D	(Wüstemann 2004)
132	Crussol	1	FR	(Quillfeldt 1995)
136	Czysta	1	PL	(Berger, D 2011; Sprockhoff 1934)
143	Déville-lès-Rouen	1	FR	(O'Connor 1980; Quillfeldt 1995)
144	Dietesheim	1	D	(Quillfeldt 1995)
146	Dobrowo (Neuendorf)	1	PL	(Quillfeldt 1995; Sprockhoff 1956)
149	Dommelstadl	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
154	Draganici	1	HR	(Quillfeldt 1995; Vinski-Gasparini 1973)
159	Eberswalde-Niederfinow	1	D	(Quillfeldt 1995; Raddatz 1957)
162	Echzell	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
170	Erbenheim-Dotzheim	1	D	(Quillfeldt 1995)
183	Feldgeding	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
186	Flachslanden	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
200	Gailenkirchen	1	D	(Müller-Karpe 1961; Pleiner 1979; Quillfeldt 1995; Sprockhoff 1934)
201	Gammau (Gamów)	1	PL	(Müller-Karpe 1961; Pleiner 1979; Quillfeldt 1995)
203	Garonne-Bordeaux	1	FR	(Roussot-Larroque 2003)
207	Gent	1	BE	(Roymans 1991)
208	Gernsheim	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
214	Gönnebek	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
221	Grandson-Corcelettes	10	CH	(Krämer 1985; Müller-Karpe 1961; Sprockhoff 1934)
223	Gransee	1	D	(Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
224	Grésine	2	FR	(Müller-Karpe 1961; Quillfeldt 1995)
226	Grigny	1	FR	(Quillfeldt 1995)
234	Hagnau-Burg	1	D	(Schöbel 1996)
236	Hallstatt	1	AT	(Müller-Karpe 1961; Sprockhoff 1934)
238	Hanau	1	D	(Müller-Karpe 1961; Sprockhoff 1934)
247	Hedelfingen	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
250	Helpfau-Uttendorf	1	AT	(Krämer 1985; Müller-Karpe 1961; Pleiner 1979; Quillfeldt 1995)
251	Hermsdorf	1	D	(Müller-Karpe 1961; Sprockhoff 1934; Wüstemann 2004)
254	Hindenburg	1	D	(Sprockhoff 1934; Wüstemann 2004)
272	Huningue	1	FR	(Archäolgosche Bodenforschung Basel-Stadt 2008)
291	Kehmstedt	3	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
294	Neuhaus am Inn	1	D	(Quillfeldt 1995)
295	Kiebingen	1	D	(Quillfeldt 1995)
306	Kokemäki	1	FI	(Müller-Karpe 1961; Sprockhoff 1934)
308	Köllitsch	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
312	Kuckenburg	1	D	(Götze *et al.* 1909; Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
313	Kuhbier	2	D	(Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
317	La Chapelle-Saint-Ursin	1	FR	(Cordier 1985)
433	Mainz	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
440	Mauern	1	D	(Dunning and Rychner 1992; Eckstein 1963)
441	Maurepas	1	FR	(Quillfeldt 1995)
451	Mescherin	1	D	(Sprockhoff 1934; Wüstemann 2004)
462	Mohrungen (Morungen)	2	D	(Müller-Karpe 1961; Sprockhoff 1934; Wüstemann 2004)
463	Montausain	1	FR	(Quillfeldt 1995)
468	Mörigen	5	CH	(Krämer 1985; Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
470	Mühlheim-Offenbach	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
471	Mühlheim-Tuttlingen	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
475	Murtensee	1	CH	(Krämer 1985)
478	Nächstenbach - Weinheim	2	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
480	Nähermemmingen	1	D	(Quillfeldt 1995)
494	Neuhausen, Rheinfall	1	CH	(Krämer 1985)
500	Niederurnen	1	CH	(Krämer 1985; Müller-Karpe 1961; Sprockhoff 1934)
505	Noppari	1	FI	(Quillfeldt 1995)
512	Obertheres	1	D	(Quillfeldt 1995)
524	Otterstadt	2	D	(Quillfeldt 1995)
525	Ottmarsheim	1	FR	(Quillfeldt 1995; Zumstein 1966)
532	Pfaffenhofen	1	D	(Wirth 1996)

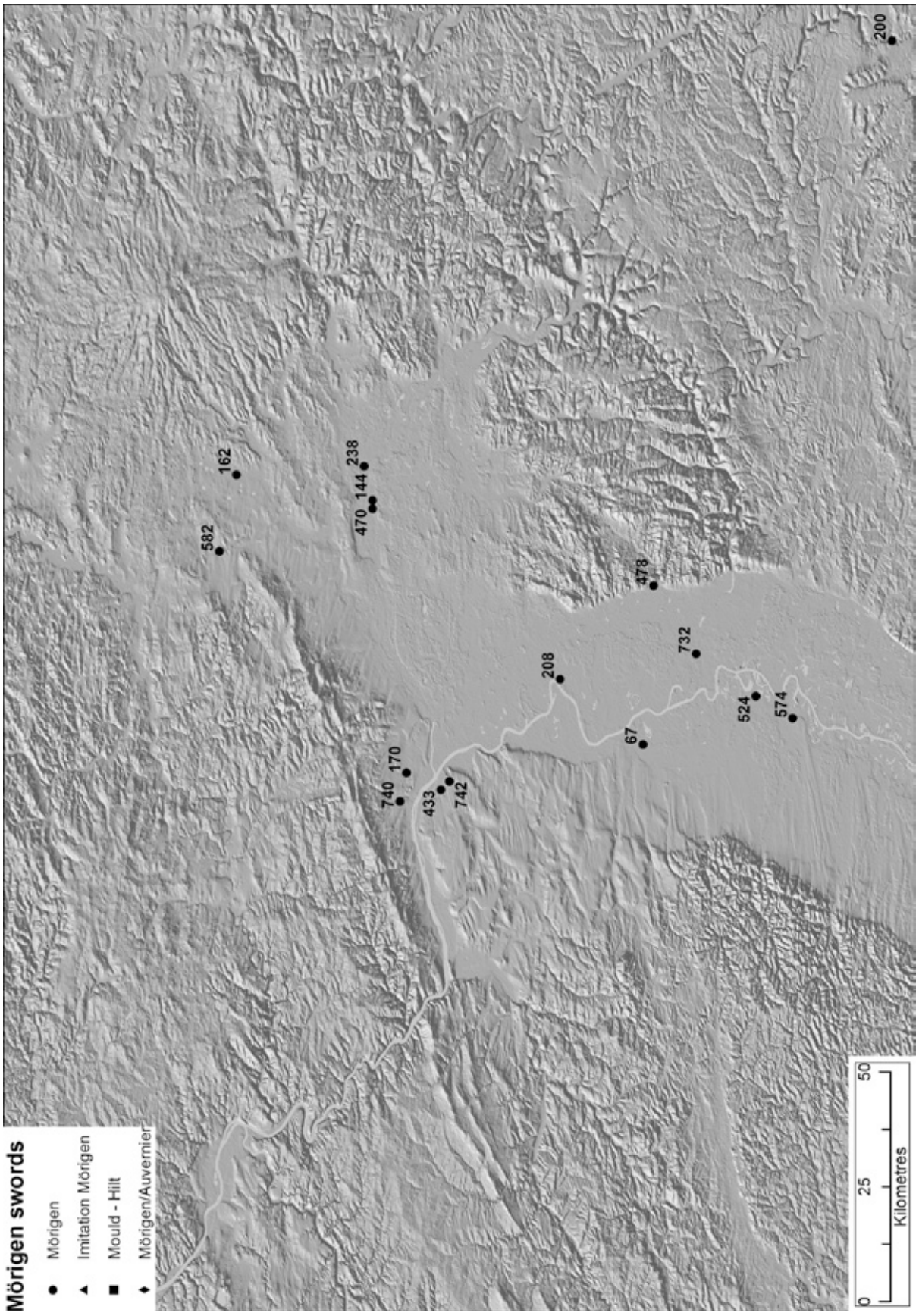
539	Plock	1	PL	(Quillfeldt 1995)
553	Pottenstein	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
559	Preinersdorf	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Torbrügge 1959)
560	Presseryr (Lilla Edet)	1	SE	(Müller-Karpe 1961; Sprockhoff 1934)
573	Reyrieux	1	FR	(Quillfeldt 1995)
574	Rheinpfalz	1	D	(Sperber 2004)
582	Rockenberg	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
585	Rolampont	1	FR	(Quillfeldt 1995)
595	Rud	2	SE	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
596	Rufen (Rów)	1	PL	(Müller-Karpe 1961; Quillfeldt 1995)
613	Schwedt-Oder	1	D	(Sprockhoff 1934; Wüstemann 2004)
651	Stendal	2	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934; Wüstemann 2004)
666	Tegelen-Blerik	1	NL	(Müller-Karpe 1961; Sprockhoff 1934)
675	Thyl	1	FR	(Quillfeldt 1995)
682	Toul	1	FR	(Liéger and Marguet 1974; Quillfeldt 1995)
687	Trévoux	1	FR	(Müller-Karpe 1961; Sprockhoff 1934)
691	Tütz (Tuczno)	1	PL	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934, 1956)
694	Unterkrumbach	1	D	(Müller-Karpe 1961; Pleiner 1979; Sprockhoff 1934)
712	Vienne	1	FR	(Müller-Karpe 1961; Sprockhoff 1934)
713	Vierzon	1	FR	(Cordier and Bourhis 1996)
726	Wald an der Alz	1	D	(Müller-Karpe 1961; Pleiner 1979; Quillfeldt 1995; Sprockhoff 1934)
727	Waldau	1	D	(Quillfeldt 1995)
731	Wallerfangen	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
732	Wallstadt	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
740	Wiesbaden	1	D	(Herrmann 1966)
742	Weisenau	2	D	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
748	Wesel	1	D	(Quillfeldt 1995)
750	Wierzchowo (Wurchow)	1	PL	(Quillfeldt 1995)
752	Wilamowo-Turek	1	PL	(Müller-Karpe 1961; Quillfeldt 1995; Sprockhoff 1934)
764	Ystad	1	SE	(Jacob-Friesen 1957)
770	Zürich-Wollishofen	1	CH	(Krämer 1985; Quillfeldt 1995; Sprockhoff 1934)



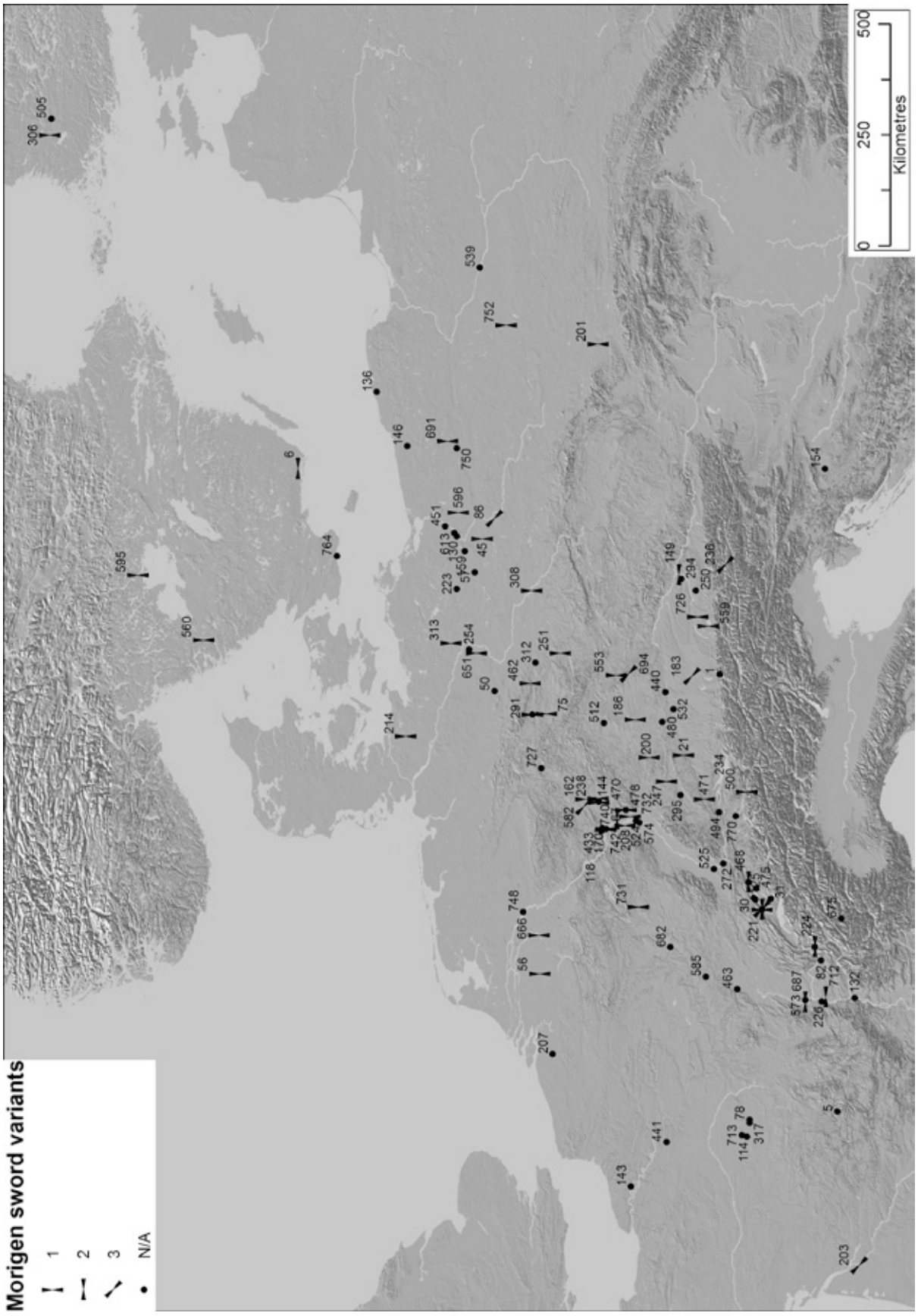
Map 19: European distribution of *Mörigen* type swords. For inset regions see Map 20 (western Switzerland) and Map 21 (Middle Rhine Valley).



Map 20: Distribution of *Mörigen* type swords in the Three Lakes region of western Switzerland.



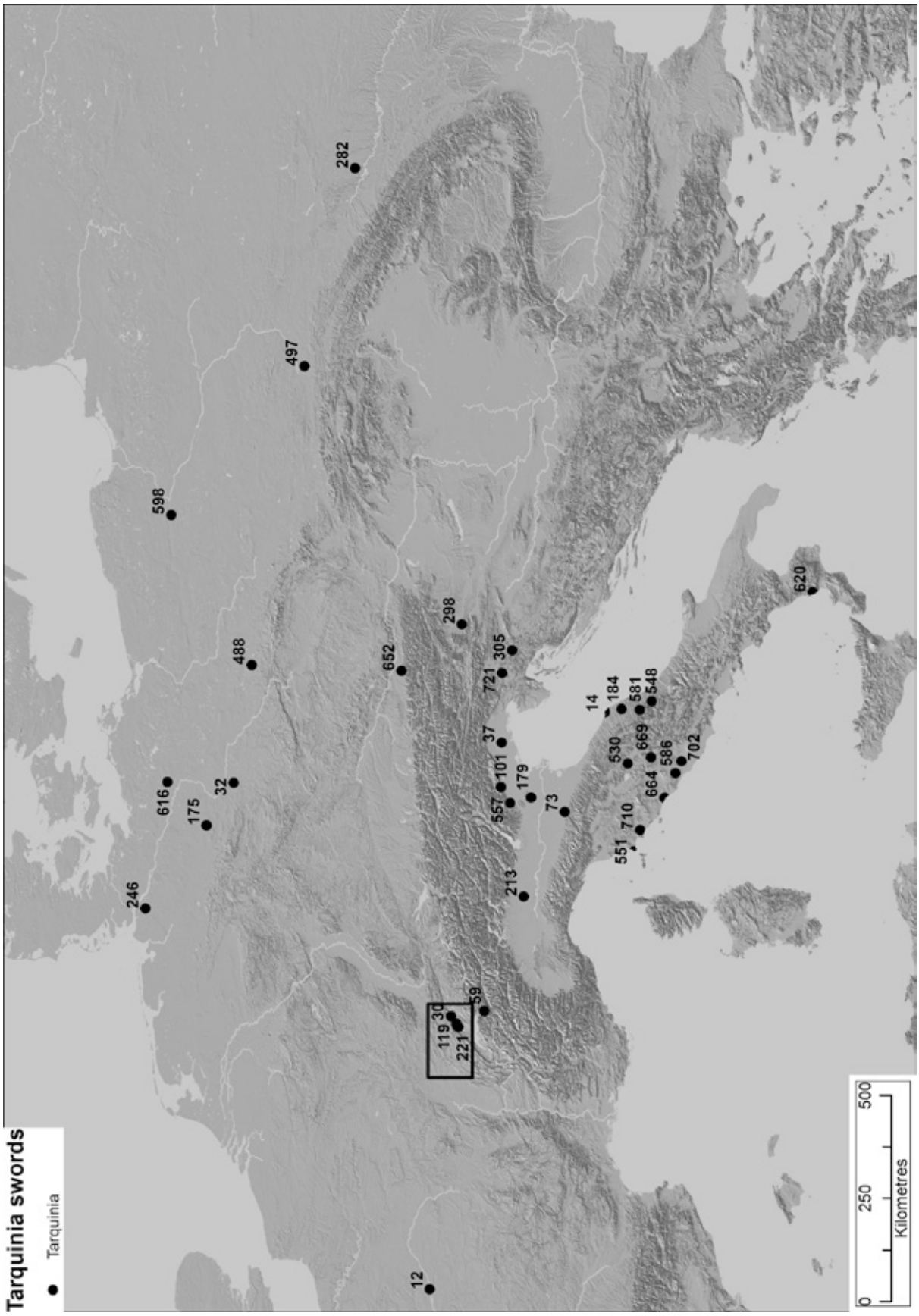
Map 21: Distribution of *Mörigen* swords in the Middle Rhine Valley.



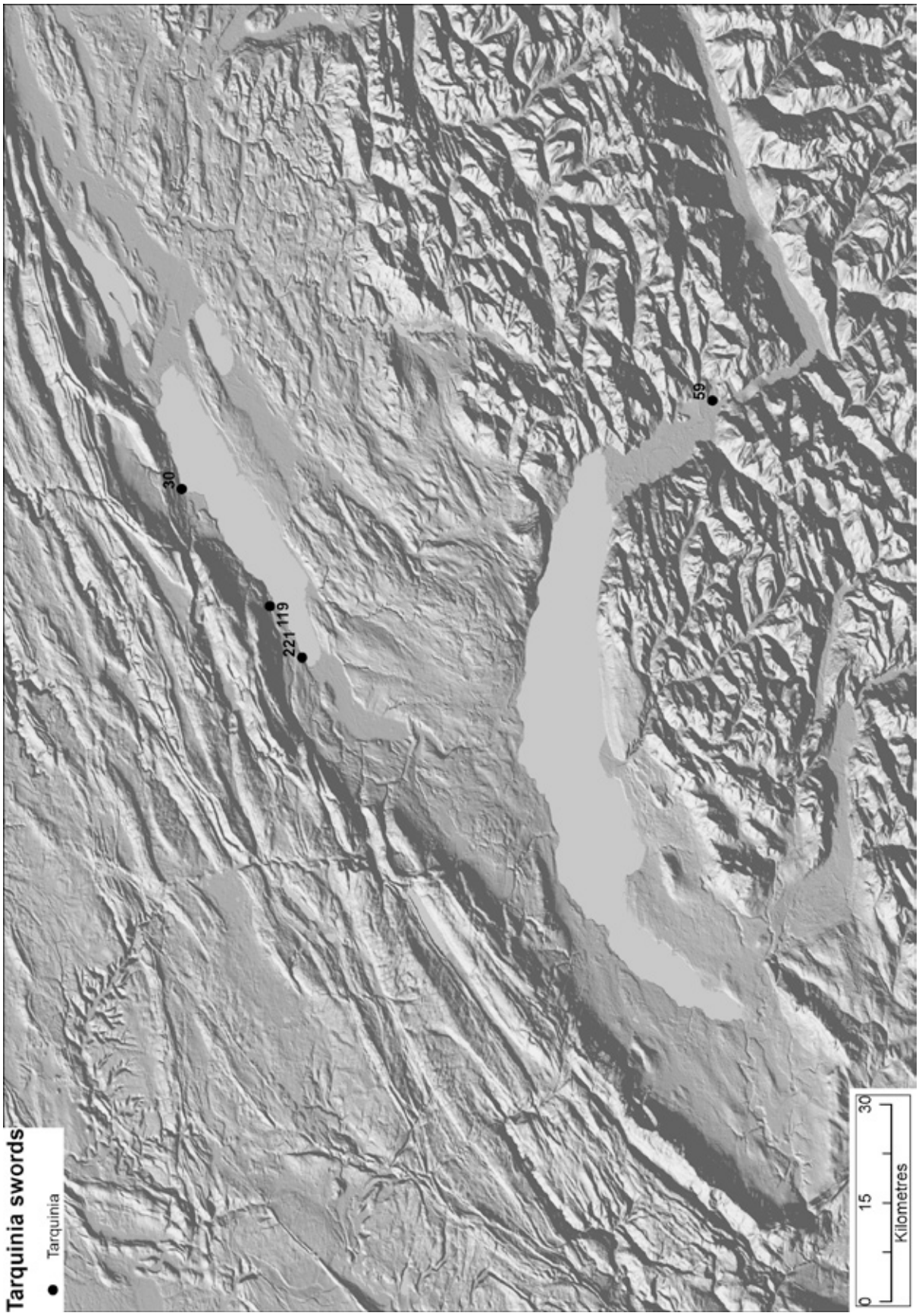
Map 22: Distribution of variants of the *Mörigen* type sword, as defined by Müller-Karpe 1961.

Maps 23, 24, 25, 26 & 28

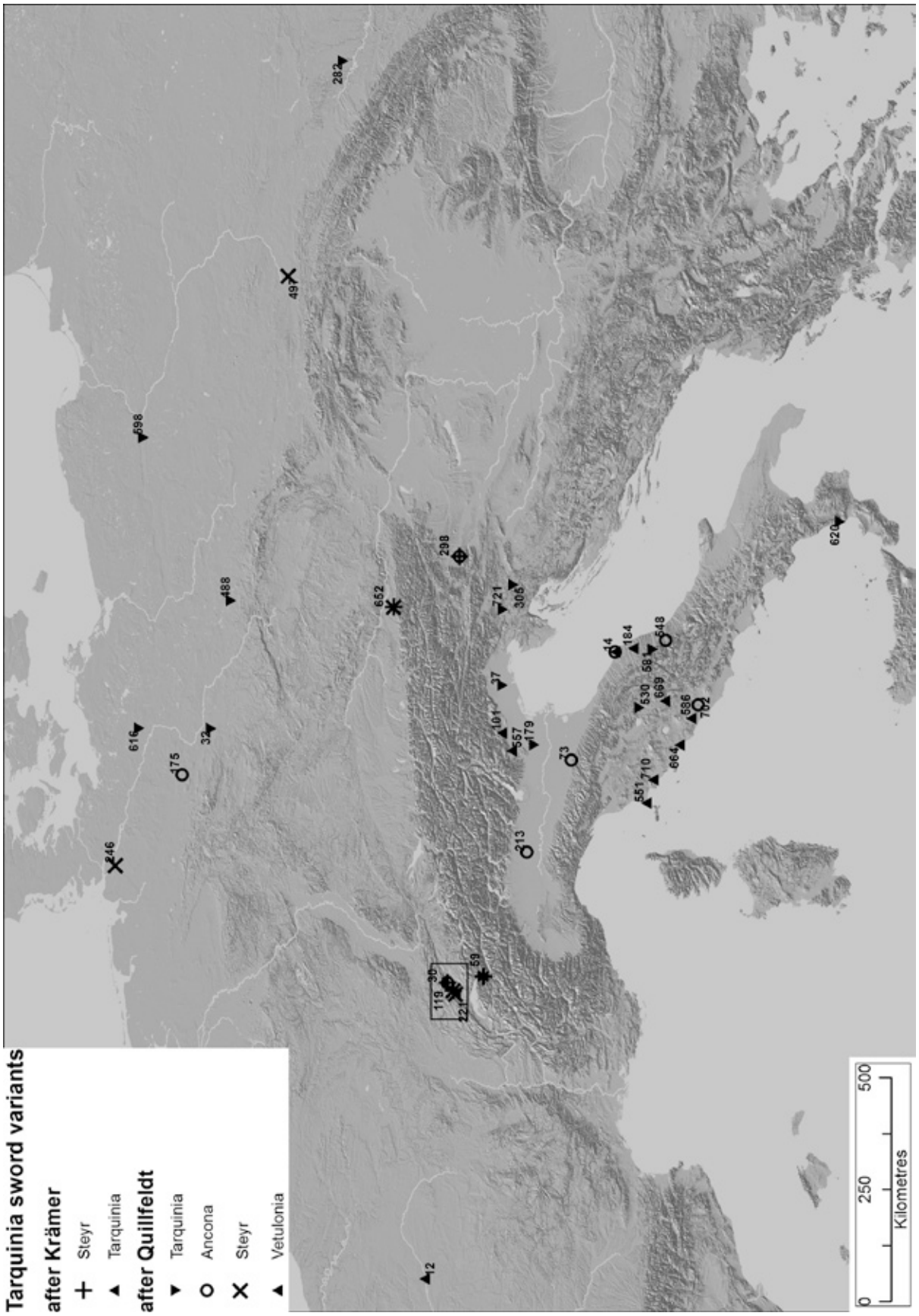
No.	Site	Qty	Country	References
12	Amboise	1	FR	(Cordier 1985; Quillfeldt 1995)
14	Ancona	2	IT	(Bianco Peroni 1970; Quillfeldt 1995)
30	Auvernier	2	CH	(Quillfeldt 1995; Rychner 1977)
32	Baasdorf	1	D	(Wüstemann 2004)
37	Bagnarola	1	IT	(Hochuli, S *et al.* 1998)
59	Bex	2	CH	(Krämer 1985)
73	Bologna	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
101	Casier	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
119	Concise	3	CH	(Krämer 1985)
175	Erxleben	1	D	(Drescher 1958; Quillfeldt 1995; Wüstemann 2004)
179	Este	1	IT	(Müller-Karpe 1959)
184	Fermo	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
213	Gombito	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
221	Grandson-Corcelettes	1	CH	(Krämer 1985; Quillfeldt 1995)
246	Hechthausen	1	D	(Quillfeldt 1995)
282	Jazlowice	1	UA	(Hochuli, S *et al.* 1998)
298	Klein-Klein	1	AT	(Krämer 1985; Quillfeldt 1995)
305	Kocevje	1	SI	(Hochuli, S *et al.* 1998)
488	Neudorf (Spree)	1	D	(Wüstemann 2004)
497	Nieczajna	1	PL	(Quillfeldt 1995)
530	Perugia	1	IT	(Hochuli, S *et al.* 1998)
548	Ponte a Vomano	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
551	Populonia	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
557	Preara	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
581	Rocca di Moro	1	IT	(Hochuli, S *et al.* 1998)
586	Roma	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
598	Rynarzewo (Renneberg)	1	PL	(Sprockhoff 1956)
616	Seddin	1	D	(Sprockhoff 1956; Wüstemann 2004)
620	Serra d'Aiello	1	IT	(Aversa 2011)
652	Steyr	1	AT	(Krämer 1985)
664	Tarquinia	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
669	Terni	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
702	Veio	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
710	Vetulonia	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
721	Vinij-Vrh	1	SI	(Hochuli, S *et al.* 1998)



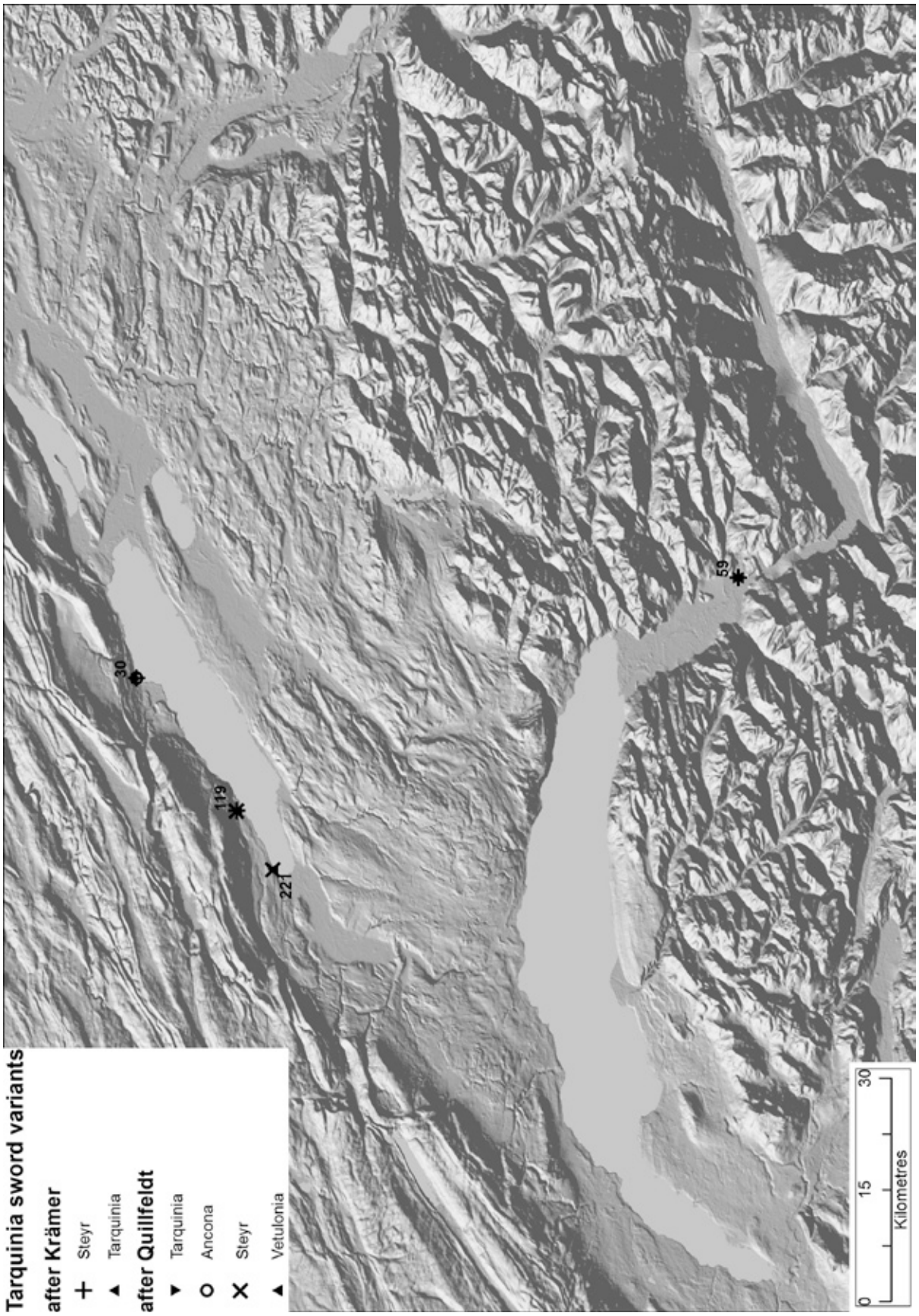
Map 23: European distribution of the *Tarquinia* type sword. For inset region see Map 24.



Map 24: Distribution of *Tarquinia* type sword in western Switzerland.



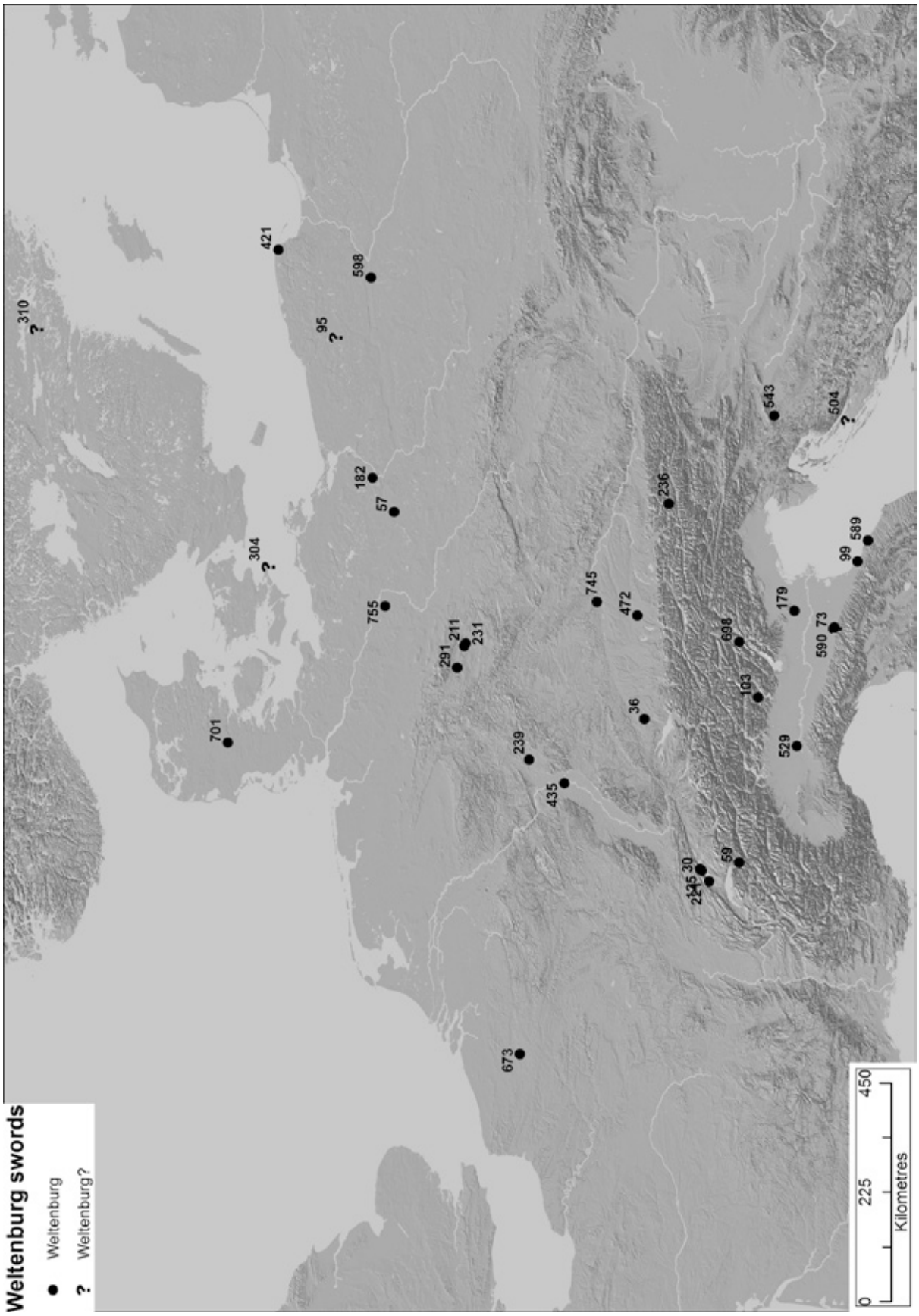
Map 25: European distribution of variants of the *Tarquinia* type sword. For inset region see Map 26



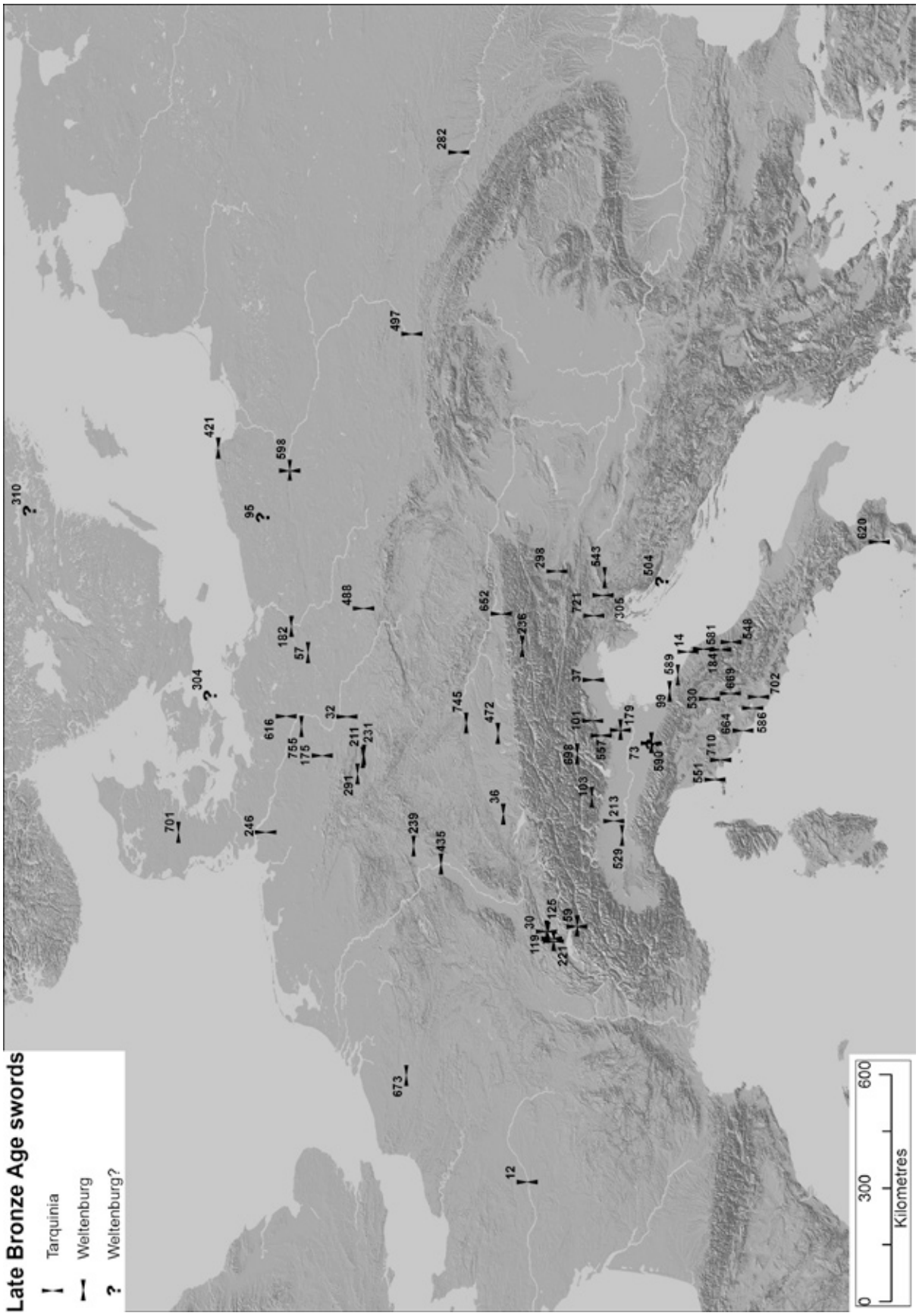
Map 26: Distibution of variants of the *Tarquinia* type sword in western Switzerland.

Maps 27 & 28

No.	Site	Qty	Country	References
30	Auvernier	1	CH	(Krämer 1985)
36	Bad Schussenried	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
57	Berlin-Buch	1	D	(Wüstemann 2004)
59	Bex	1	CH	(Krämer 1985; Müller-Karpe 1961; Quillfeldt 1995)
73	Bologna	3	IT	(Bianco Peroni 1970)
95	Buchwald	1	PL	(Müller-Karpe 1961)
99	Caprucolo	1	IT	(Bianco Peroni 1970)
103	Castione della Presolana	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
125	Cortaillod	1	CH	(Krämer 1985; Müller-Karpe 1961)
179	Este	1	IT	(Bianco Peroni 1970; Müller-Karpe 1961)
182	Felchow	1	D	(Müller-Karpe 1961; Wüstemann 2004)
211	Göllingen	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
221	Grandson-Corcelettes	4	CH	(Krämer 1985; Müller-Karpe 1961)
231	Günserode	1	D	(Wüstemann 2004)
236	Hallstatt	1	AT	(Krämer 1985; Müller-Karpe 1961)
239	Hanau	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
291	Kehmstedt	1	D	(Müller-Karpe 1961; Quillfeldt 1995; Wüstemann 2004)
304	Klintholm auf Møen	1	DK	(Müller-Karpe 1961)
310	Kråknäs	1	SE	(Müller-Karpe 1961)
421	Löbsch (Lebcz)	1	PL	(Sprockhoff 1956)
435	Mannheim	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
472	München	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
504	Nona	1	HR	(Müller-Karpe 1961)
529	Pavia	1	IT	(Bianco Peroni 1970; Müller-Karpe 1961; Quillfeldt 1995)
543	Podzemelj	1	SI	(Quillfeldt 1995)
589	Roncosambaccio	1	IT	(Bianco Peroni 1970)
590	Ronzano-Bologna	1	IT	(Bianco Peroni 1970; Müller-Karpe 1961)
598	Rynarzewo (Renneberg)	1	PL	(Müller-Karpe 1961; Sprockhoff 1956)
673	Thiant	1	FR	(Roymans 1991)
698	Val di Non	1	IT	(Bianco Peroni 1970)
701	Vandel	1	DK	(Müller-Karpe 1961)
745	Weltenburg	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
755	Wohl Altmark	1	D	(Wüstemann 2004)



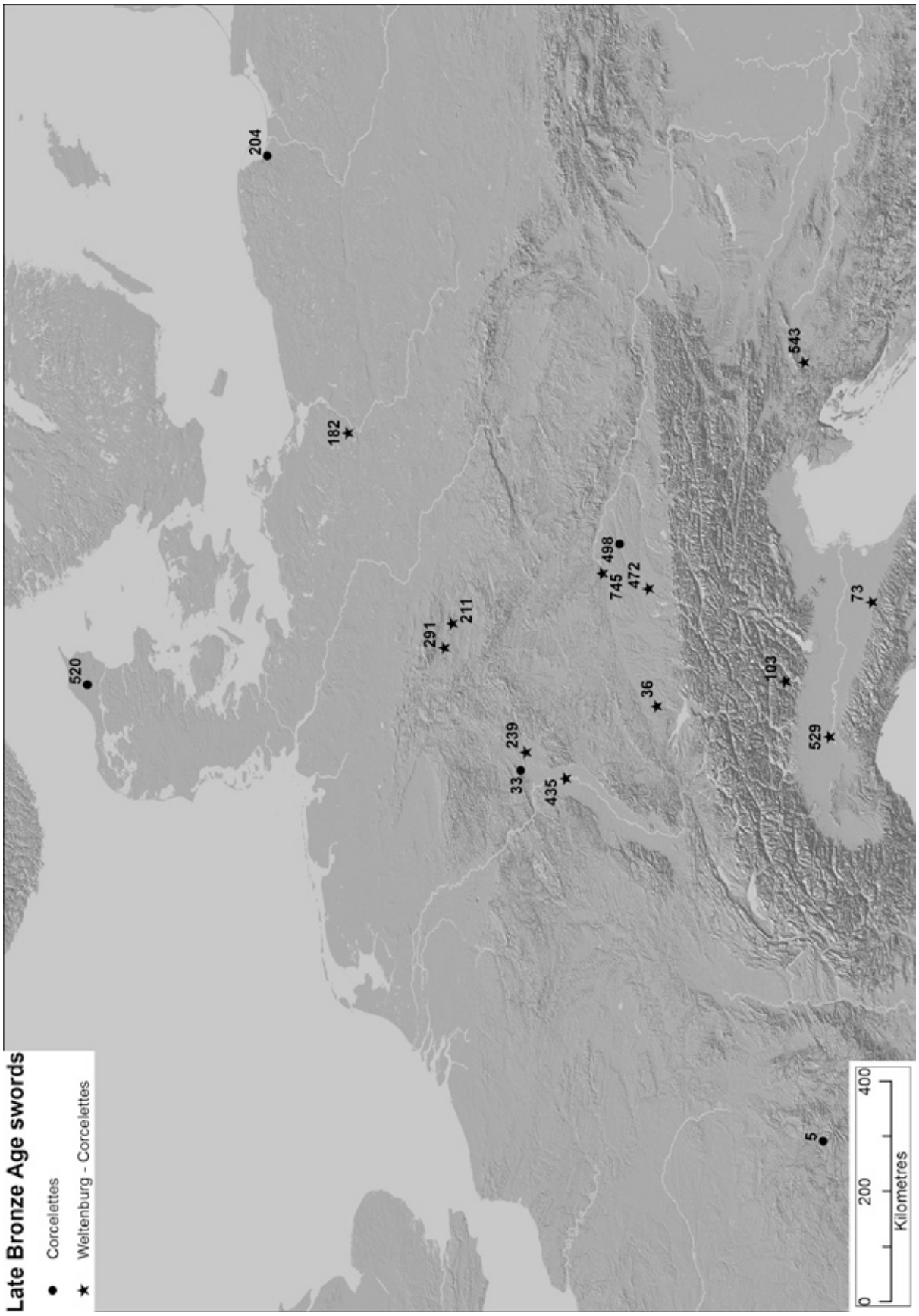
Map 27: Distribution of the *Weltenburg* type sword.



Map 28: Comparitive distribution of the *Tarquinia* and *Welterburg* type swords.

Map 29

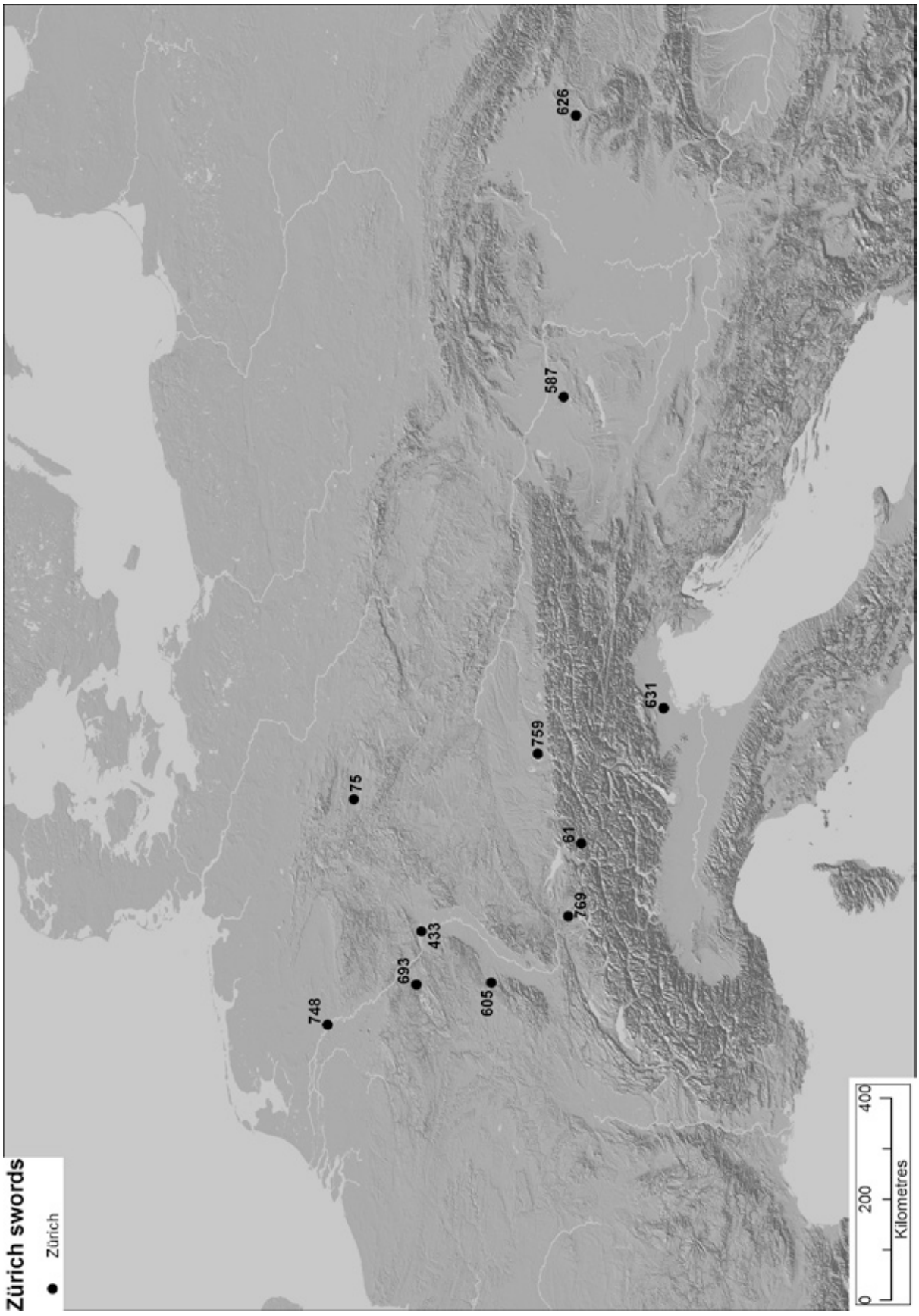
No.	Site	Qty	Country	References
5	Aliès	1	FR	(Abauzit 1973; Quillfeldt 1995)
33	Bad Homburg	1	D	(Quillfeldt 1995)
36	Bad Schussenried	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
73	Bologna	1	IT	(Bianco Peroni 1970; Müller-Karpe 1961; Quillfeldt 1995)
103	Castione della Presolana	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
182	Felchow	1	D	(Müller-Karpe 1961; Wüstemann 2004)
204	Gdansk-Rynarzewo	1	PL	(Quillfeldt 1995)
211	Göllingen	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
239	Hanau	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
291	Kehmstedt	1	D	(Krämer 1985; Müller-Karpe 1961; Quillfeldt 1995; Wüstemann 2004)
435	Mannheim	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
472	München	1	D	(Müller-Karpe 1961; Quillfeldt 1995)
498	Niederaichbach	1	D	(Quillfeldt 1995)
520	Østerå	1	DK	(Quillfeldt 1995; Thrane 1968)
529	Pavia	1	IT	(Bianco Peroni 1970; Müller-Karpe 1961; Quillfeldt 1995)
543	Podzemelj	1	SI	(Quillfeldt 1995)
745	Weltenburg	1	D	(Müller-Karpe 1961; Quillfeldt 1995)



Map 29: Distribution of *Corcelettes* type sword.

Map 30

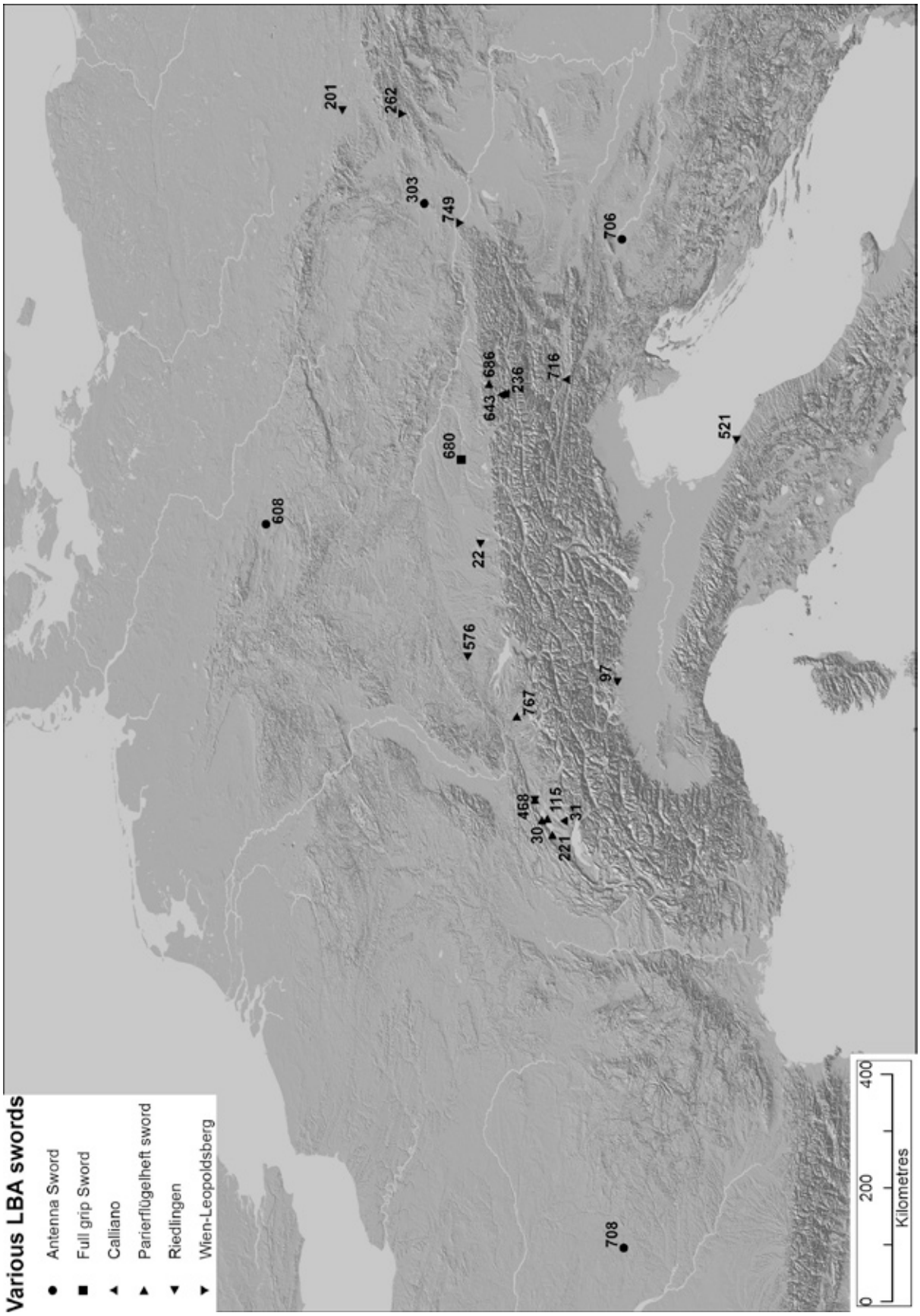
No.	Site	Qty	Country	References
61	Bings	1	AT	(Krämer 1985; Müller-Karpe 1961)
75	Bothenheilingen	1	D	(Müller-Karpe 1961)
433	Mainz	1	D	(Müller-Karpe 1961)
587	Románd	1	HU	(Kemenczei 1991; Wüstemann 2004)
605	Saverne	1	FR	(Müller-Karpe 1961)
626	Simleu Silvaniei	1	RO	(Bader 1991)
631	Sirio	1	IT	(Bianco Peroni 1970)
693	Unterfranken	1	D	(Wüstemann 2004)
699	Valea Rusului	1	MO	(Bader 1991)
748	Wesel	1	D	(Roymans 1991)
759	Wolfratshausen	1	D	(Wüstemann 2004)
769	Zürich-Walchequai	1	CH	(Krämer 1985; Müller-Karpe 1961)



Map 30: Distribution of *Zürich* type swords.

Map 31

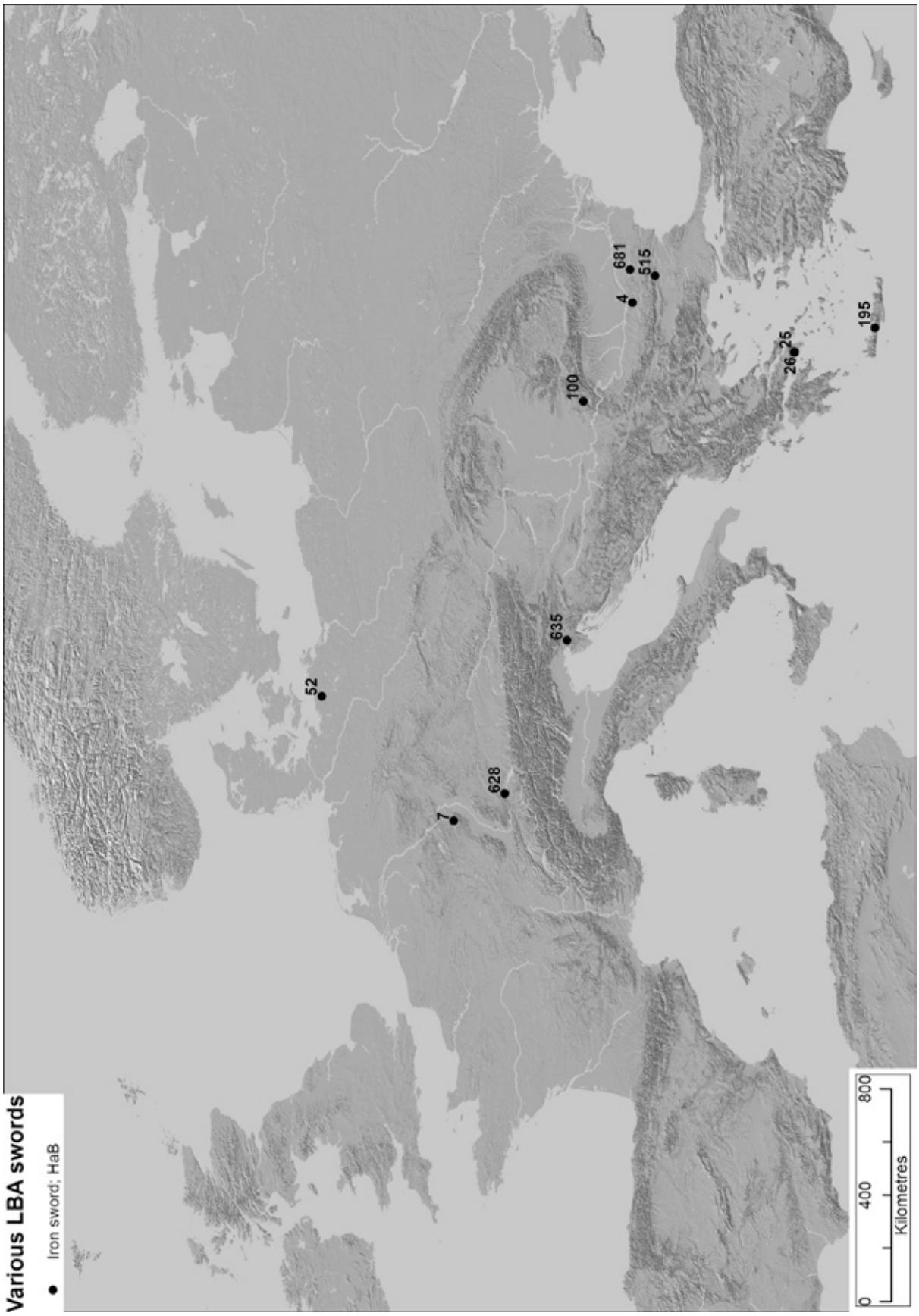
No.	Site	Qty	Country	References
Antenna Sword				
303	Klentnice	1	CZ	(Podborský 1970)
608	Schmon	1	D	(Götze *et al.* 1909)
706	Velika Gorica	1	HR	(Turk 2004; Vinski-Gasparini 1973)
708	Vénat	1	FR	(Coffyn *et al.* 1981)
Full grip dagger				
85	Bresinchen	1	D	(Schwenzer 2004)
Full grip Sword				
680	Töging	1	D	(Berger, D and Pernicka 2009; Pleiner 1979)
Calliano				
31	Auvernier-Est	1	CH	(Krämer 1985)
236	Hallstatt	1	AT	(Krämer 1985)
643	Stambach	1	AT	(Krämer 1985)
716	Villach	1	AT	(Krämer 1985)
Parierflügelheft sword				
30	Auvernier	1	CH	(Krämer 1985)
115	Chevroux	1	CH	(Krämer 1985)
221	Grandson-Corcelettes	1	CH	(Krämer 1985)
236	Hallstatt	1	AT	(Krämer 1985)
468	Mörigen	2	CH	(Krämer 1985)
686	Traunkirchen	1	AT	(Krämer 1985; Quillfeldt 1995)
767	Zürich	1	CH	(Krämer 1985)
Riedlingen				
22	Aschering	1	D	(Quillfeldt 1995)
97	Ca' Morta	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
201	Gammau (Gamów)	1	PL	(Quillfeldt 1995)
468	Mörigen	1	CH	(Krämer 1985)
521	Osteria del Fosso	1	IT	(Bianco Peroni 1970; Quillfeldt 1995)
576	Riedlingen	1	D	(Quillfeldt 1995)
Wien-Leopoldsberg				
262	Horní Lidec	1	CZ	(Podborský 1970)
749	Wien XIX	1	AT	(Krämer 1985)



Map 31: Distribution of selected Late Bronze Age sword types.

Map 32

No.	Site	Qty	Country	References
4	Alexandrovo	1	BG	(Wüstemann 2004)
7	Alsenborn	1	D	(Wüstemann 2004)
25	Athens-Agora	2	GR	(Wüstemann 2004)
26	Athens-Kerameikos	1	GR	(Wüstemann 2004)
52	bei Schwaan	1	D	(Wüstemann 2004)
100	Caras-Severin	1	RO	(Bader 1991)
195	Fortetsa	1	GR	(Wüstemann 2004)
515	Omarcevo	1	BG	(Wüstemann 2004)
628	Singen-Hohentwiel	1	D	(Brestrich and Wahl 1998; Kimmig 1979, 1981)
635	Škocjan	1	SI	(Wüstemann 2004)
681	Topcii	1	BG	(Bader 1991)



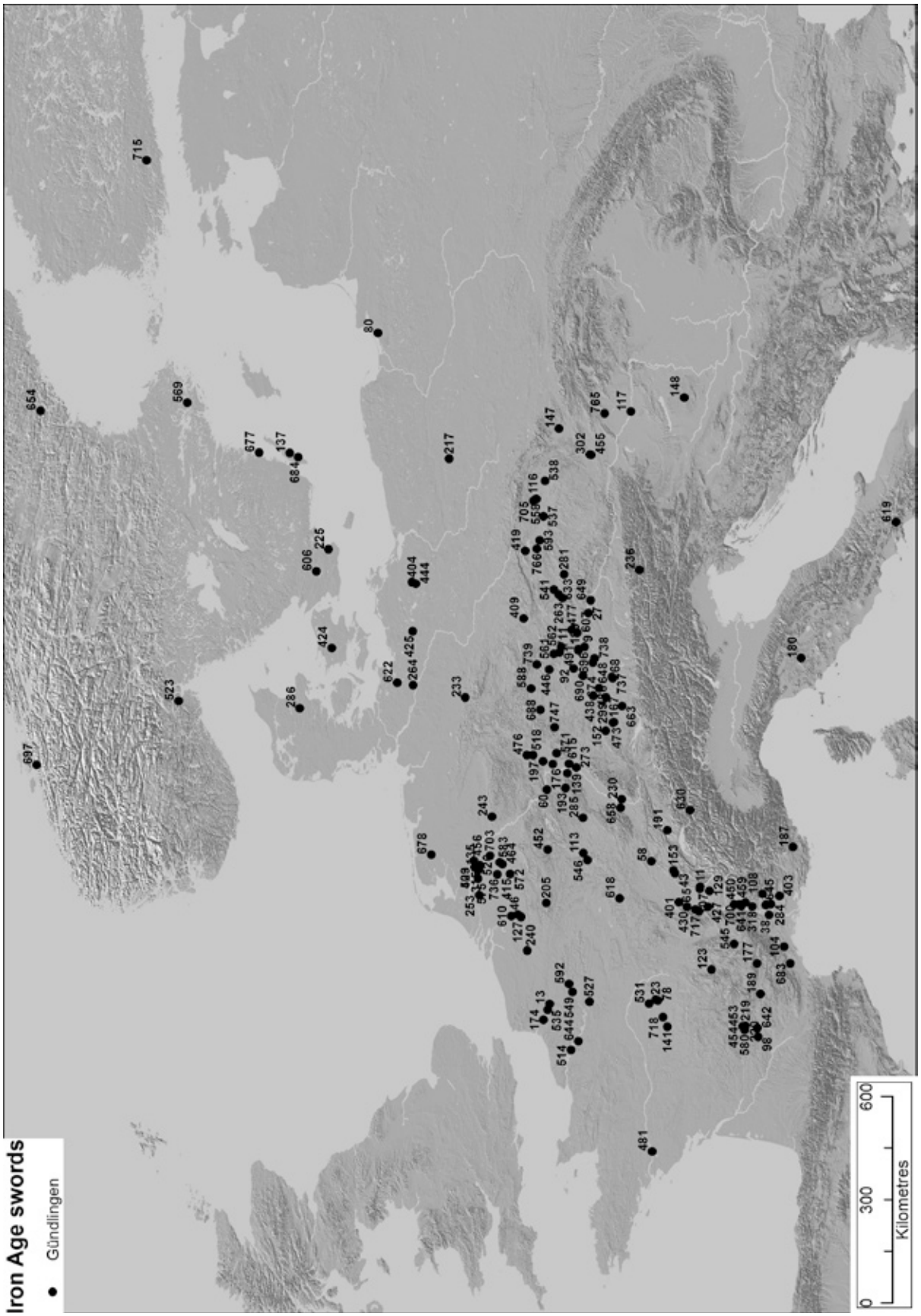
Map 32: Distribution of Late Bronze Age iron swords (studied sites).

Maps 33 & 34

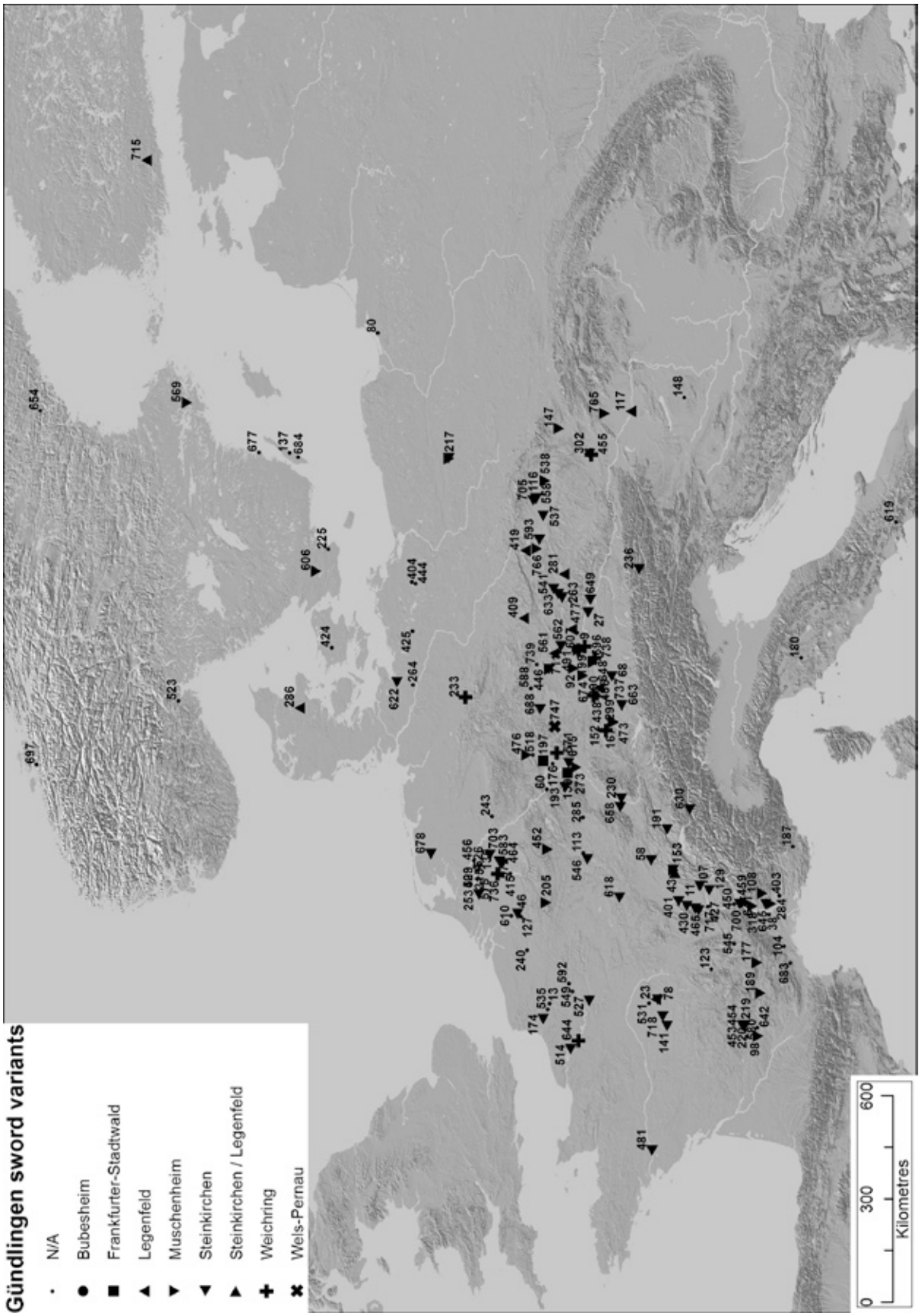
All references (Cowen 1968) in addition to those specified, unless marked with >.
a) = (Schauer 1971); b) = (Gerdsen 1986); c) = (Novák 1975); d) = (Fontijn 2002); e) (Kemenczei 1991); f) (Bianco Peroni 1970); g) = (Wüstemann 2004); h) = (van Impe 1980) i) = (Dijkman and Hulst 2000); j) = (Roymans 1991); k) = (Cordier and Bourhis 1996); l) = (Warmenbol 1988); m) = (Stroh 1952); n) = (Pare 1991); o) = (Pare 1992).

No.	Site	Qty	Country	References
9	Altmühlmünster	1	D	a)
11	Ambérieu	1	FR	a)
13	Amiens	1	FR	
23	Asnières-les-Bourges	1	FR	
27	Atting-Rinkam	1	D	a)
38	Bagnols-sur-Cèze	1	FR	
43	Barésia	8	FR	a; b)
46	Basse-Wavre	1	BE	a)
58	Besançon	1	FR	a)
60	Bingen	2	D	
68	Bobingen	1	D	a)
78	Bourges	1	FR	a)
80	Braniewo	1	PL	
92	Büchenbach	1	D	a)
98	Cahors	1	FR	a)
104	Cazevieille	1	FR	
107	Château-Gaillard	2	FR	
108	Châteauneuf-de-Bordette	1	FR	a)
113	Chérisey	1	FR	
116	Chudonice	2	CZ	a; c)
117	Cicov	1	SK	
123	Corent	1	FR	
127	Court-Saint-Etienne	4	BE	
129	Crémieu	1	FR	a)
135	Cuyk - St. Agatha	1	NL	d)
137	Dalby	1	SE	
139	Dannstadt	1	D	a)
141	Déols	1	FR	a)
147	Dolany	1	CZ	a; b)
148	Dombóvár	1	HU	> e)
152	Dottingen	1	D	a)
153	Doucier	2	FR	a)
167	Emerkingen	1	D	> a)
174	Erondell	1	FR	a)
176	Eschollbrücken	1	D	
177	Esclanèdes	1	FR	a)
180	Etruria	1	IT	> f)
187	Flayosc	1	FR	
189	Floyrac	1	FR	a)
191	Font	1	CH	a; b)
193	Forsthaus Schorlenberg	1	D	a)
197	Frankfurter Stadtwald	1	D	a)
199	Freihausen	1	D	> a)
205	Gedinne	1	BE	a)
217	Gorszewice	2	PL	a)
219	Gramat	1	FR	a)
220	Gramat	1	FR	a)
225	Grevlunda Nygård	1	SE	
230	Gündlingen	1	D	a)
233	Gustedt	1	D	
236	Hallstatt	1	AT	a)
240	Harchies	4	BE	
243	Hattingen	1	D	
253	Heusden	1	NL	a)
263	Horní Metelsko	1	CZ	a; c)
264	Horst bei Altengamme	1	D	
273	Huttenheim	1	D	a)
281	Jarov	1	CZ	c)
284	Jonquières	1	FR	a)
285	Kalhausen	1	FR	
286	Kalhovegård	1	DK	
299	Kleinkötz	1	D	
302	Klentnice	1	CZ	c)
315	Kuik	1	NL	
318	La Laupie	1	FR	a)
401	La Trouchère	1	FR	a)
403	Lagnes	2	FR	
404	Land Stargard	2	D	g)
409	Lengenfeld	1	D	a)
415	Limburg-Rekem	3	BE	> d; h)
419	Litomerice	1	CZ	c)
424	Løvenborg	1	DK	
425	Lübz	4	D	> g)
427	Lyon	1	FR	
429	Maastricht-Heer-Vroendael	1	NL	> d; i)
430	Mâcon	1	FR	a)
438	Mariabuch	1	D	
444	Mecklenburg-Strelitz	1	D	
446	Melkendorf	2	D	a)
450	Mercurol	1	FR	
452	Mettendorf	1	D	a)
453	Miers	1	FR	a)
454	Miers	1	FR	a)
455	Mikulov	1	CZ	c)
456	Millingen-Kekerdom	1	NL	
459	Mirabel	1	FR	a)
464	Montfort	1	NL	a)
465	Montmerle	1	FR	a)
473	Munderkingen	1	D	
476	Muschenheim	1	D	a)
477	Naabsiegenhofen	1	D	a)
481	Nantes	1	FR	a)
486	Neresheim	1	D	b)
491	Neuhaus	2	D	a)
503	Nijmegen-Waalkade	1	NL	> d; j)
514	Oissel	1	FR	a)
518	Ossenheim	1	D	
523	Østre Skjøl	1	NO	
526	Overasselt-Heumen	1	NL	
527	Paris	1	FR	a)
531	Petit Villatte	1	FR	> k)
535	Picquigny	1	FR	
537	Planany	1	CZ	c)
538	Plátenice	1	CZ	c)
541	Pnovany	1	CZ	a; c)
545	Polignac	1	FR	
546	Pont à Mousson	1	FR	a)
549	Pont-Ste-Maxence	1	FR	
558	Predmerice	1	CZ	a; c)
561	Prüllsbirkig	1	D	a)
562	Pruppach	1	D	a)
569	Råsunda	1	SE	a)
571	Reichelsheim	1	D	a)
572	Rekem	3	BE	> l)
575	Rhenen	1	NL	
580	Rocamadour	1	FR	
583	Roermond	1	NL	a)
588	Römhild	1	D	> b; g)
592	Royallieu	1	FR	
593	Roztoky	1	CZ	a; c)
606	Scania	1	SE	
607	Schirndorf	2	D	> m; n)
610	Schoonaerde	1	BE	
615	Schwetzingen	1	D	a)
618	Semoutiers	1	FR	a)
619	Serino	1	IT	
622	Siems	2	D	a)
630	Sion	1	CH	a)
633	Skapce	1	CZ	> c)
641	Soyons	1	FR	
642	St. Cirq Lapopie	1	FR	
644	St-Aubin-sur-Gaillon	1	FR	
645	Ste-Cécile-les-Vignes	2	FR	a)
648	Steinheim-Dillingen	1	D	a)
649	Steinkirchen	1	D	a)
654	Stöndar	1	SE	
658	Sundhoffen	1	FR	a)
663	Tannheim	1	D	a)
674	Thommetsheim	1	D	
677	Tjängdarve	1	SE	

678	Tjonger-Kanal	1	NL	a)
683	Toulouse	1	FR	
684	Träby	1	SE	
688	Trimberg	1	D	a)
690	Trommetsheim	1	D	> a)
696	Unterstall	1	D	a)
697	Våg	1	NO	
700	Valence	1	FR	a)
703	Velden-Arcen	1	NL	a; d)
705	Velešice	1	CZ	> c)
711	Viehhofen	1	D	
715	Vihti	1	FI	
717	Villefranche-sur-Saône	1	FR	a)
718	Villement	3	FR	a)
736	Weert-Boshoven	3	NL	b; d)
737	Wehringen "Hexenbergle"	1	D	> o)
738	Weichering	1	D	a)
739	Weichsau	1	D	
747	Wertheim am Main	1	D	a)
765	Zlkovce (Trakovice	1	CZ	c)
766	Zloveneves	1	CZ	c)



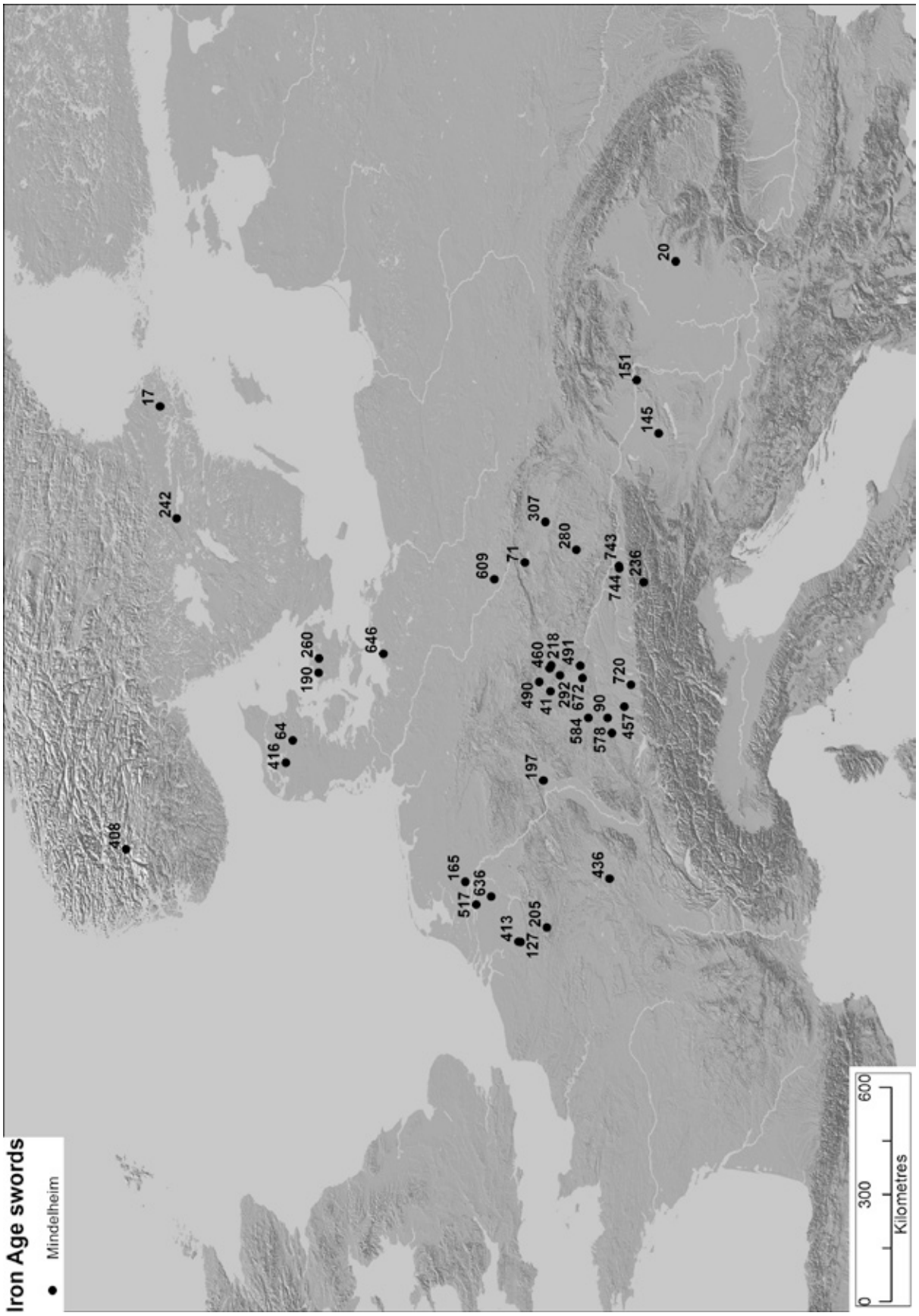
Map 33: Distribution of *Gündlingen* type swords in continental Europe.



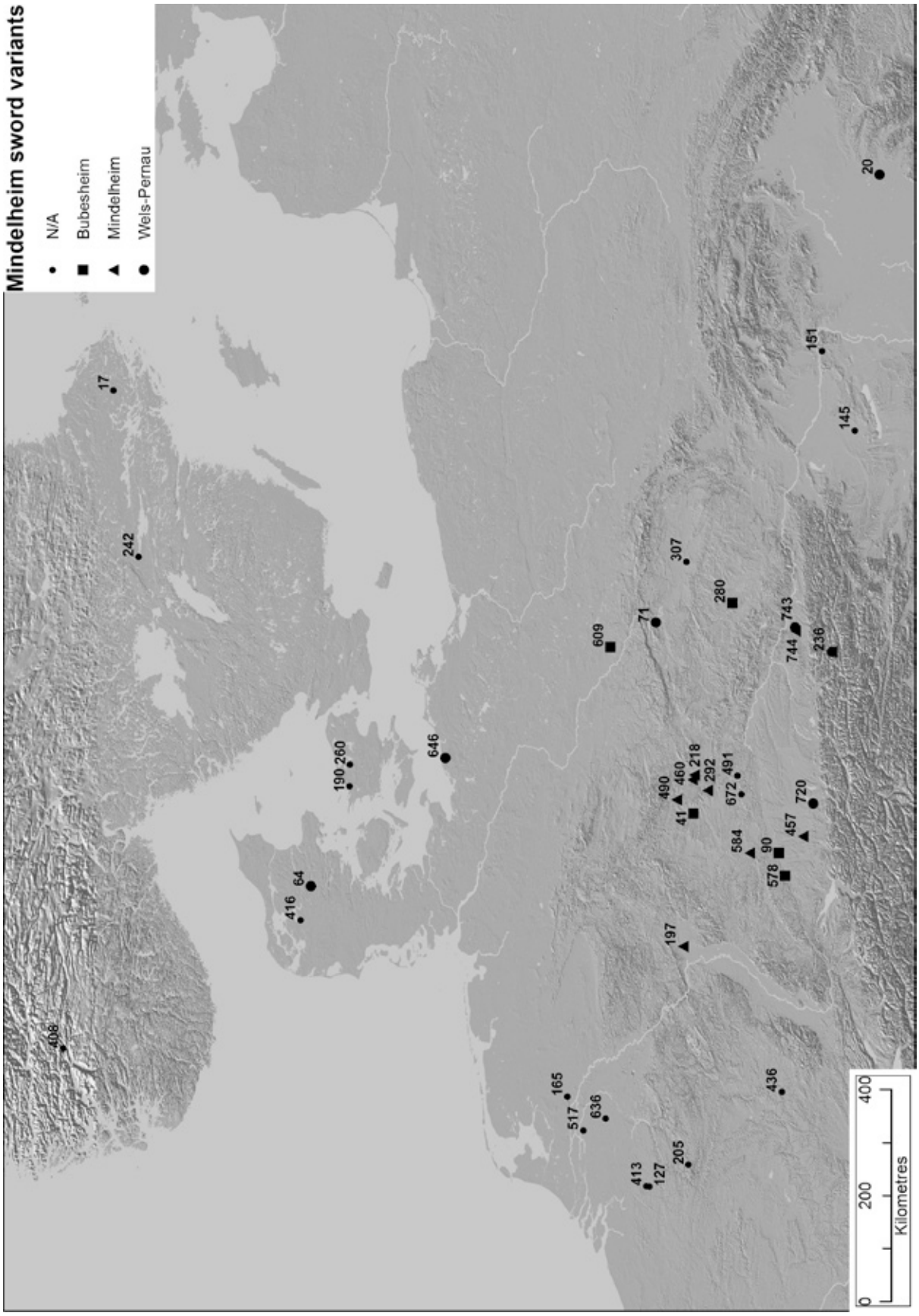
Map 34: Distribution of variant of the *Gündlingen* swords in continental Europe.

Maps 35 & 36

No.	Site	Qty	Country	References
17	Ånsta	1	SE	(Cowen 1968)
20	Arpad	1	RO	(Cowen 1968; Schauer 1971)
41	Bamberg	1	D	(Schauer 1971)
64	Bjerringbro	1	DK	(Cowen 1968; Schauer 1971)
71	Bohnšovice (Bohušovice)	1	CZ	(Cowen 1968; Novák 1975; Schauer 1971)
90	Bubesheim-Leipheim	1	D	(Cowen 1968; Schauer 1971)
127	Court-Saint-Etienne	1	BE	(Roymans 1991)
145	Doba	2	HU	(Kemenczei 1991)
151	Dorog	1	HU	(Kemenczei 1991; Wüstemann 2004)
165	Ellecom	1	NL	(Roymans 1991)
190	Føllenslev	1	DK	(Cowen 1968)
197	Frankfurter Stadtwald	1	D	(Cowen 1968; Schauer 1971)
205	Gedinne	1	BE	(Roymans 1991)
218	Gosen	1	D	(Cowen 1968; Schauer 1971)
236	Hallstatt	4	AT	(Cowen 1968; Schauer 1971)
242	Hassle	2	SE	(Cowen 1968)
260	Holbaek Slots Ladegård	1	DK	(Cowen 1968)
280	Jaroslavice (Jarošovice)	1	CZ	(Cowen 1968; Novák 1975; Schauer 1971)
292	Kemmathen	1	D	(Cowen 1968; Schauer 1971)
307	Kolín	1	CZ	(Cowen 1968)
408	Lekve	1	NO	(Cowen 1968)
413	Limal	1	BE	(Roymans 1991)
416	Limfjorden	1	DK	(Cowen 1968)
436	Marainville-sur-Madon	1	FR	(Stahl 2006)
457	Mindelheim	1	D	(Cowen 1968; Schauer 1971)
460	Mistelgau	1	D	(Cowen 1968; Schauer 1971)
490	Neuensee	1	D	(Cowen 1968; Schauer 1971)
491	Neuhaus	1	D	(Cowen 1968)
517	Oss	1	NL	(Roymans 1991)
578	Ringingen	1	D	(Cowen 1968; Schauer 1971)
584	Röhlingen	1	D	(Cowen 1968; Schauer 1971)
609	Schönfeld	1	D	(Cowen 1968; Schauer 1971; Wüstemann 2004)
636	Someren	1	NL	(Roymans 1991)
646	Steffenshagen	1	D	(Cowen 1968; Wüstemann 2004)
672	Thalmässing	1	D	(Cowen 1968; Schauer 1971)
720	Vils	1	D	(Cowen 1968; Schauer 1971)
743	Wels-Pernau	1	AT	(Schauer 1971)
744	Wels-Wimpassing/Gassl	1	AT	(Schauer 1971)



Map 35: Distribution of *Mindelheim* type swords.

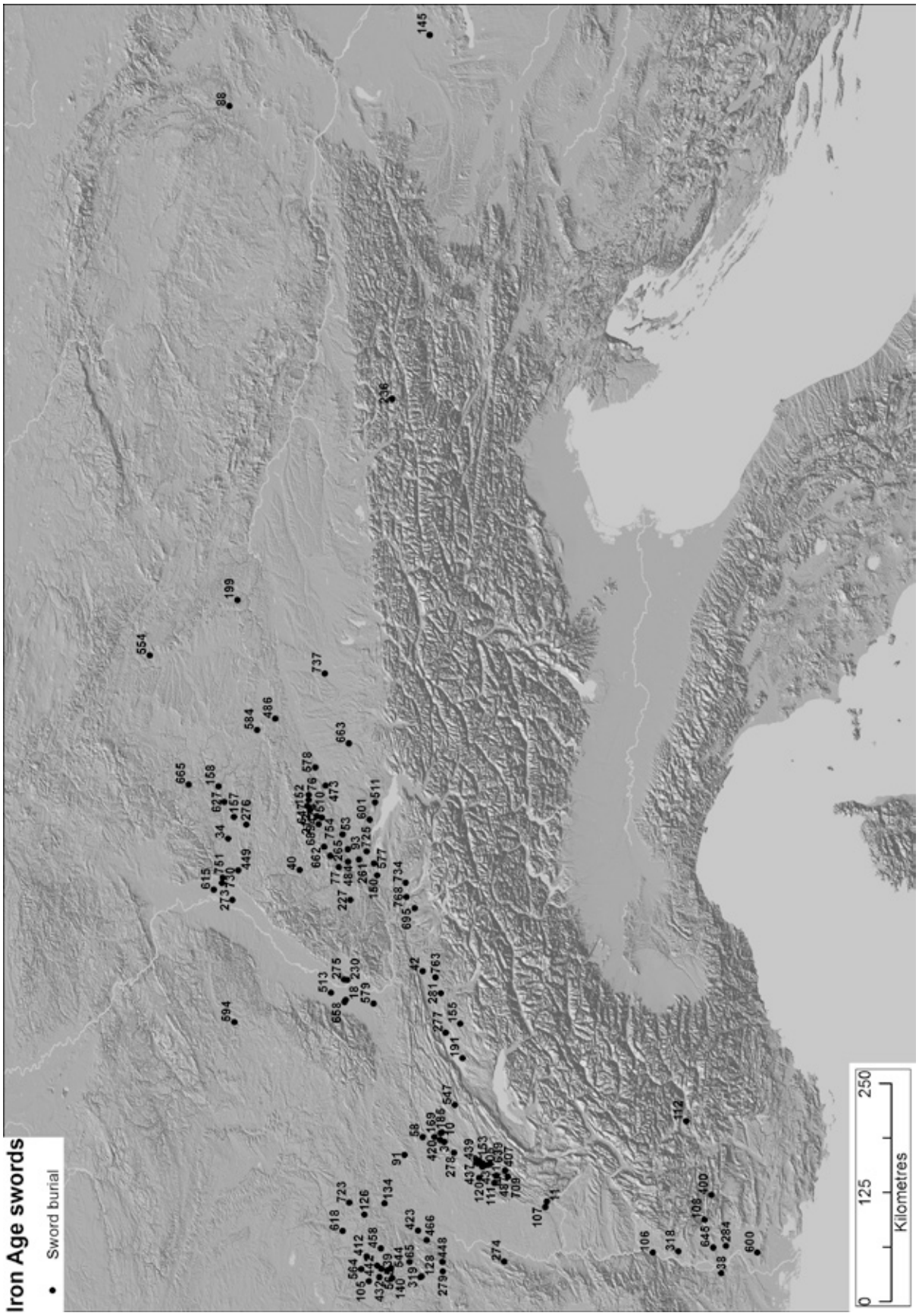


Map 36: Distribution of variants of the *Mindelheim* type sword.

Map 37

All sites from (Gerdsen 1986).

No.	Site	Qty	Country
3	Alaise	1	FR
10	Amancey	2	FR
11	Ambérieu	1	FR
18	Appenwihr	1	FR
34	Bad Rappenau	1	D
38	Bagnols-sur-Cèze	1	FR
39	Baigneux-les-Juifs	1	FR
40	Baisingen	1	D
42	Bannwil	1	CH
43	Barésia	8	FR
53	bei Vilsingen	1	D
58	Besançon	1	FR
65	Blaisy-Bas	1	FR
72	Boissia	1	FR
76	Böttingen	1	D
77	Böttingen, Tuttlingen	1	D
88	Brno – Obrany	1	CZ
91	Bucey-les-Gy	2	FR
93	Buchheim	4	D
105	Charcier	3	FR
106	Charmes-sur-Rhône	1	FR
107	Château-Gaillard	2	FR
107	Château-Gaillard	2	FR
108	Châteauneuf-de-Bordette	1	FR
111	Chavéria	3	FR
112	Chavignières-en-Avançon	1	FR
120	Conliège	1	FR
126	Courcelles-en-Montagne	1	FR
128	Créancey	2	FR
134	Cusey	2	FR
140	Darcey	2	FR
145	Doba	2	HU
150	Dörflingen	1	CH
152	Dottingen	1	D
153	Doucier	5	FR
155	Düdingen	1	CH
157	Eberstadt	1	D
158	Eberstal	1	D
169	Épeugney	1	FR
185	Fertans	1	FR
191	Font	1	CH
199	Freihausen	1	D
212	Gomadingen	1	D
227	Grüningen	1	D
230	Gündlingen	1	D
236	Hallstatt	20	AT
261	Honstetten	1	D
265	Hossingen	3	D
273	Huttenheim	1	D
274	Igé	1	FR
275	Ihringen	1	D
276	Ilsfeld	1	D
277	Ins	1	CH
278	Ivory	1	FR
279	Ivry-en-Montagne	1	FR
281	Jegenstorf	1	CH
284	Jonquières	1	FR
318	La Laupie	1	FR
319	La Roche Pot	1	FR
400	La Rochette-du-Buis	1	FR
407	Lect	3	FR
412	Leuglay	1	FR
420	Lizine	1	FR
423	Longvic-les-Dijon	1	FR
432	Magny-Lambert	11	FR
437	Marginy-sur-l'Ain	5	FR
439	Marigny	1	FR
442	Mauvilly	1	FR
448	Meloisey	3	FR
449	Menzingen	1	D
458	Minot	7	FR
466	Morey-Saint-Denis	1	FR
473	Munderkingen	1	D
474	Münsingen	1	D
484	Nendingen	2	D
486	Neresheim	1	D
487	Nermier	1	FR
510	Oberstetten	1	D
511	Oberteuringen	1	D
513	Ohnenheim	1	FR
544	Poiseul-la-Ville-et-Laperrière	3	FR
547	Pontarlier	1	FR
554	Prächting	1	D
564	Prusly-sur-Ource	1	FR
565	Quemigny-sur-Seine	4	FR
577	Rielasingen	1	D
578	Ringingen	3	D
579	Rixheim	1	FR
584	Röhlingen	1	D
594	Rubenheim	1	D
600	Saint Rémy-de-Provence	1	FR
601	Salem	3	D
615	Schwetzingen	1	D
618	Semoutiers	1	FR
627	Sindringen	1	D
639	Soucia	1	FR
641	Soyria	1	FR
645	Ste-Cécile-les-Vignes	2	FR
647	Steingebronn	1	D
658	Sundhoffen	1	FR
662	Tailfingen-Truchtelfingen	1	D
663	Tannheim	6	D
665	Tauberbischofsheim-Impfingen	1	D
689	Trochtelfingen	1	D
695	Unterlunkhofen	1	CH
709	Vescles	1	FR
723	Vitry-lès-Nogent	1	FR
725	Wahlries	1	D
730	Walldorf	1	D
734	Wangen	1	CH
737	Wehringen "Hexenbergle"	1	D
751	Wiesloch	1	D
754	Wilsingen	1	D
763	Wynigen	1	CH
768	Zürich-Höngg	1	CH
771	Chamesson	1	FR

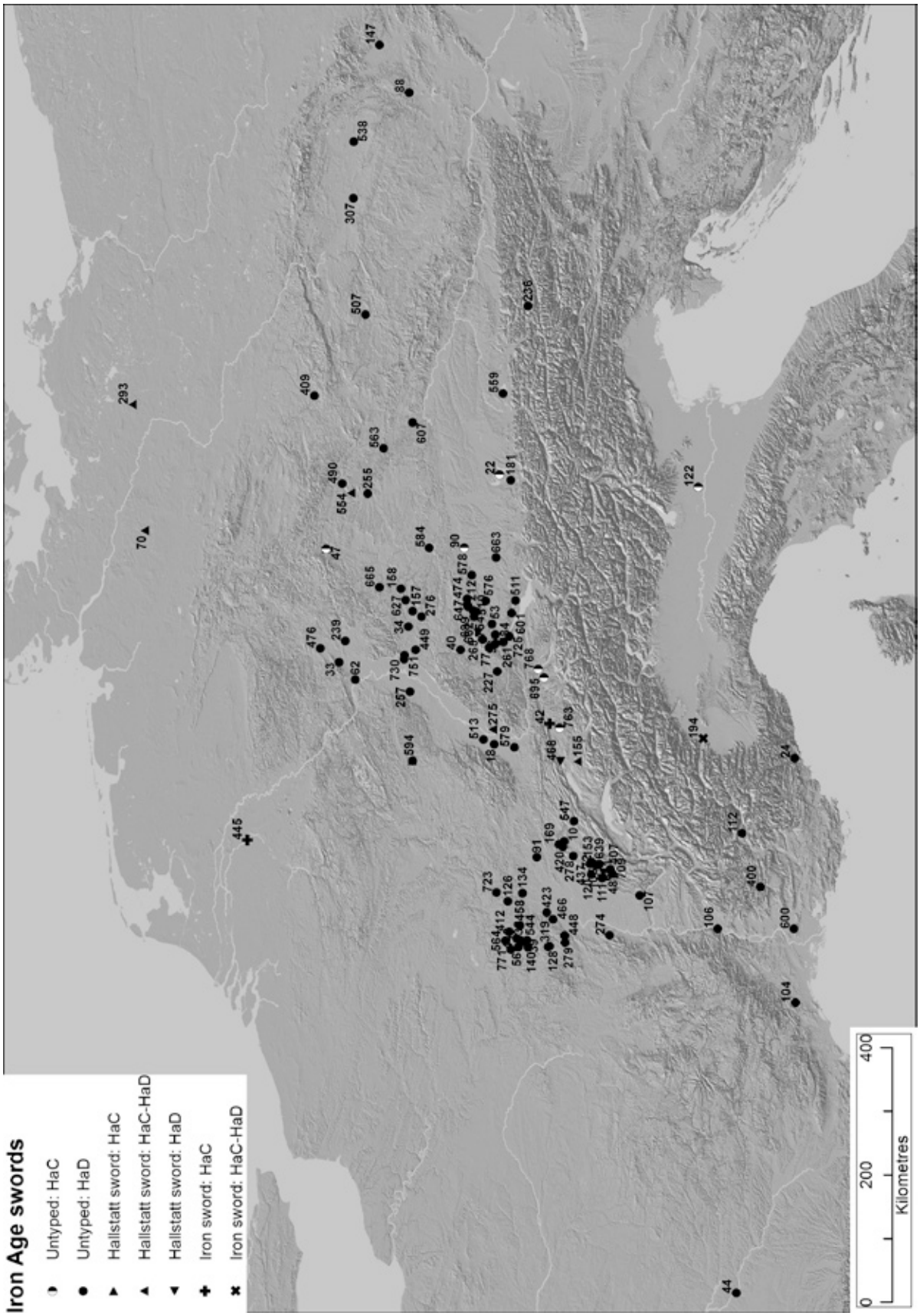


Map 37: Early Iron Age Sword burials from eastern France, southern Germany, Switzerland, and other studied sites (data from Gerdsen 1986).

Map 38

All refences for Un-typed swords = (Gerdsen 1986) in addition to those specified, unless marked with >. a) = (Kimmig 1981); b) = (Salzani 2004); c) = (Torbrügge 1959); d) = (Pleiner 1979); e) = (Müller-Karpe 1961); f) = (Lüscher 1993); g) = (Drack 1973b); h) = (Fontijn 2002); i) = (Roymans 1991); j) = (Stahl 2006); k) = (Laux 2009); l) = (Wüstemann 2004); m) = (Dunning and Rychner 1992).

No.	Site	Qty	Country	References
Un-typed				
10	Amancey	2	FR	
18	Appenwihr	1	FR	
22	Aschering	1	D	
24	Aspremont	1	FR	
33	Bad Homburg	2	D	
34	Bad Rappenau	1	D	
39	Baigneux-les-Juifs	1	FR	
40	Baisingen	1	D	
44	Barsac	1	FR	
47	Bastheim	2	D	
53	bei Vilsingen	1	D	
62	Bischofsheim	2	D	
72	Boissia	1	FR	
77	Böttingen, Tuttlingen	1	D	
88	Brno – Obrany	1	CZ	> a)
90	Bubesheim-Leipheim	1	D	
91	Bucey-les-Gy	2	FR	
93	Buchheim	4	D	
104	Cazevieille	2	FR	
105	Charcier	3	FR	
106	Charmes-sur-Rhône	1	FR	
107	Château-Gaillard	2	FR	
111	Chavéria	2	FR	> a)
112	Chavignières-en-Avançon	1	FR	
120	Conliège	1	FR	
122	Core Bronzo, Gazzo Veronese	1	D	> b)
126	Courcelles-en-Montagne	1	FR	
128	Créancey	2	FR	
134	Cusey	2	FR	
140	Darcey	2	FR	
147	Dolany	1	CZ	
153	Doucier	5	FR	
157	Eberstadt	1	D	
158	Eberstal	1	D	
169	Épeugney	1	FR	
181	Etting	1	D	
212	Gomadingen	1	D	
227	Grüningen	1	D	
236	Hallstatt	19	AT	
239	Hanau	1	D	
255	Hirschaid	2	D	
257	Hochstadt	1	D	
261	Honstetten	1	D	
265	Hossingen	3	D	
274	Igé	1	FR	
276	Ilsfeld	1	D	
278	Ivory	1	FR	
279	Ivry-en-Montagne	1	FR	
307	Kolín	2	CZ	
319	La Roche Pot	1	FR	
400	La Rochette-du-Buis	1	FR	
407	Lect	3	FR	
409	Lengenfeld	1	D	
412	Leuglay	1	FR	
420	Lizine	1	FR	
423	Longvic-les-Dijon	1	FR	
432	Magny-Lambert	11	FR	
437	Marginy-sur-l'Ain	2	FR	
442	Mauvilly	1	FR	
448	Meloisey	3	FR	
449	Menzingen	1	D	
458	Minot	7	FR	
466	Morey-Saint-Denis	1	FR	
474	Münsingen	1	D	
476	Muschenheim	1	D	
484	Nendingen	2	D	
490	Neuensee	1	D	
507	Nynice	1	CZ	
510	Oberstetten	1	D	
511	Oberteuringen	1	D	
513	Ohnenheim	1	FR	
538	Plátenice	2	CZ	
544	Poiseul-la-Ville-et-Laperrière	3	FR	
547	Pontarlier	1	FR	
559	Preinersdorf	1	D	> c)
563	Pruppach	1	D	
564	Prusly-sur-Ource	1	FR	
565	Quemigny-sur-Seine	4	FR	
576	Riedlingen	1	D	> d; e)
578	Ringingen	2	D	
579	Rixheim	1	FR	
584	Röhlingen	1	D	
594	Rubenheim	3	D	
600	Saint Rémy-de-Provence	1	FR	
601	Salem	3	D	
607	Schirndorf	3	D	
627	Sindringen	1	D	
639	Soucia	1	FR	
641	Soyria	1	FR	
647	Steingebronn	1	D	
663	Tannheim	5	D	
665	Tauberbischofsheim-Impfingen	1	D	
689	Trochtelfingen	1	D	
695	Unterlunkhofen	1	CH	> f; g)
709	Vescles	1	FR	
723	Vitry-lès-Nogent	1	FR	
725	Wahlries	1	D	
730	Walldorf	1	D	
751	Wiesloch	1	D	
754	Wilsingen	1	D	
763	Wynigen	1	CH	> f)
768	Zürich-Höngg	1	CH	> g)
Iron Sword				
42	Bannwil	1	CH	g)
194	Forte do Rivoli	1	D	> d; e)
445	Meerlo	1	NL	> h; i)
Hallstatt				
47	Bastheim	1	D	> j)
70	Bohlsen	2	D	> k)
111	Chavéria	2	FR	> a)
155	Düdingen	1	CH	
275	Ihringen	1	D	
293	Kemnitz	1	D	> l)
468	Mörigen	1	CH	> d)
487	Nermier	1	FR	> a)
554	Prächting	1	D	> j)
594	Rubenheim	1	D	m)
662	Tailfingen-Truchtelfingen	1	D	
771	Chamesson	1	FR	

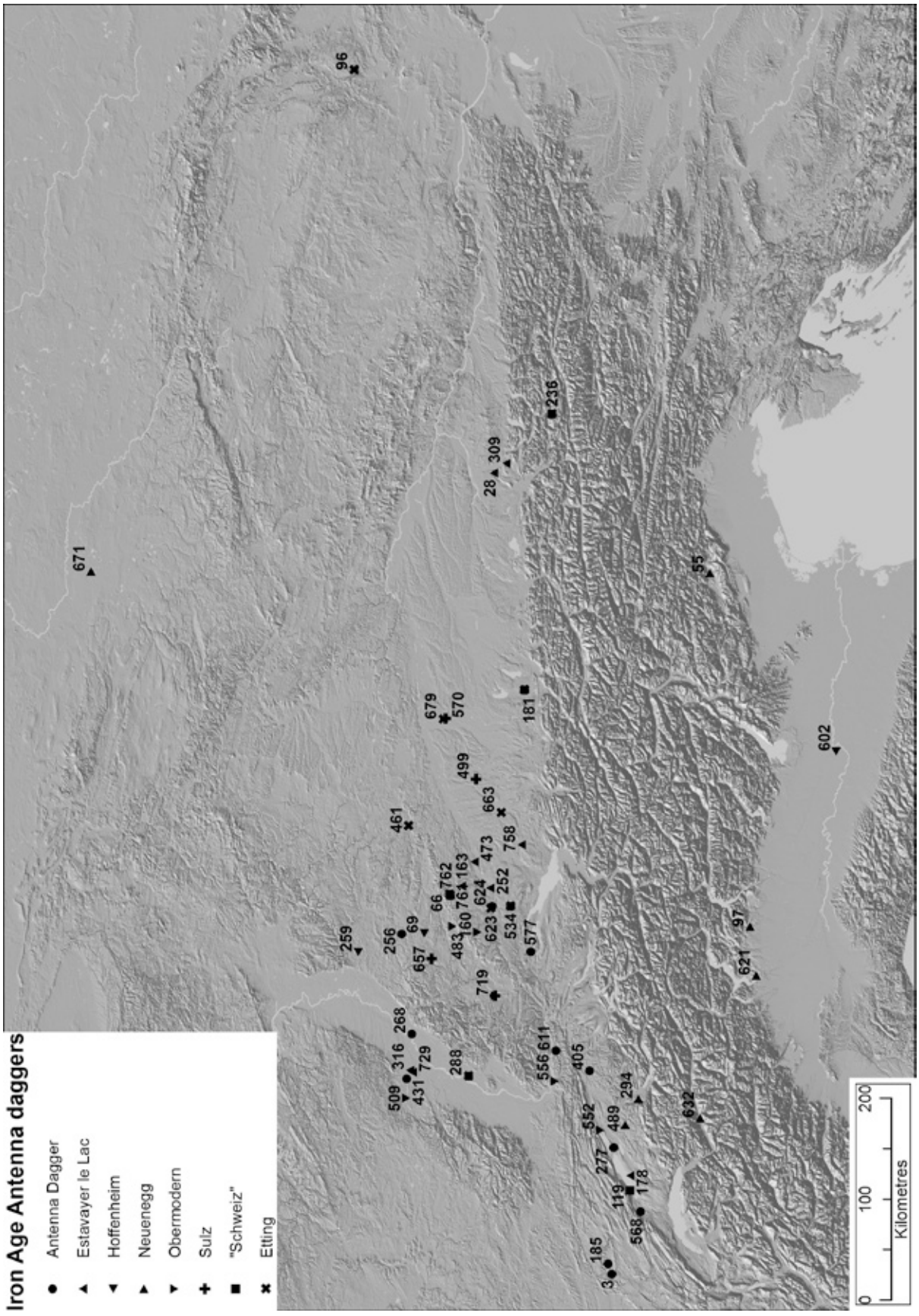


Map 38: Distribution of un-typed early Iron Age swords.

Map 39

All sites references (Sievers 1982) in addition to those specified, unless marked with >. a) = (Rieth 1942); b) (Perler 1962); c) = (Schwenzer 2004); d) = (Hansen, L 2010); e) = (Drack 1973b).

No.	Site	Qty	Country	Refs
Antenna Dagger				
3	Alaise	1	FR	
66	Bleichstetten	1	D	> a; b)
181	Etting	1	D	> a; b)
185	Fertans	1	FR	
236	Hallstatt	1	AT	
256	Hochdorf	1	D	> c; d)
268	Hügelsheim	1	D	
277	Ins	1	CH	e)
288	Kappel	2	D	> a; b)
405	Langenthal	2	CH	e)
431	Maegstub	1	FR	
534	Pfullendorf	1	D	> b)
568	Rances	1	CH	e)
577	Rielasingen	1	D	
611	Schupfart 1	CH	e)	
624	Sigmaringen-Ziegelholz			
		1	D	> b)
761	Würtingen 1	D	> a; b)	
Estavayer le Lac				
28	Auerbach	1	AT	
96	Býcí Skála Cave	1	CZ	
163	Eglingen	1	D	
178	Estavayer-le-Lac	1	CH	b; e)
252	Heuneburg	1	D	
288	Kappel	1	D	
309	Köstendorf	1	AT	
316	Kurzgeländ	1	FR	
473	Munderkingen	1	D	
729	Walk	1	FR	
758	Wolfegg	1	D	
Hoffenheim				
69	Böblingen	1	D	
236	Hallstatt	1	AT	
259	Hoffenheim	1	D	
602	San Matteo delle Chiaviche			
		1	IT	
Neuenegg				
55	Belluno	1	IT	
97	Ca' Morta	1	IT	
236	Hallstatt	2	AT	
294	Kerzers-Mühlehölzli	1	CH	
489	Neuenegg	1	CH	e)
621	Sesto Calende	1	IT	
632	Sitten	1	CH	e)
671	Thalheim	1	CH	
Obermodern				
160	Ebingen	2	D	
483	Nehren	1	D	
509	Obermodern	1	FR	
552	Port	1	CH	
556	Pratteln	1	CH	e)
719	Villingen-Magdalenenberg			
		1	D	
Sulz				
499	Niederraunau	1	D	
570	Rehling-Unterach	1	D	
657	Sulz	1	D	
719	Villingen-Magdalenenberg			
		1	D	
Schweiz				
119	Concise	1	CH	e)
Etting				
66	Bleichstetten	1	D	
96	Býcí Skála Cave	1	CZ	
181	Etting	1	D	
236	Hallstatt	2	AT	
288	Kappel	1	D	
461	Mögglingen	1	D	
534	Pfullendorf	1	D	
623	Sigmaringen	1	D	
663	Tannheim	1	D	
679	Todtenweis-Sand	1	D	
762	Würtingen-St. Johann			
		1	D	

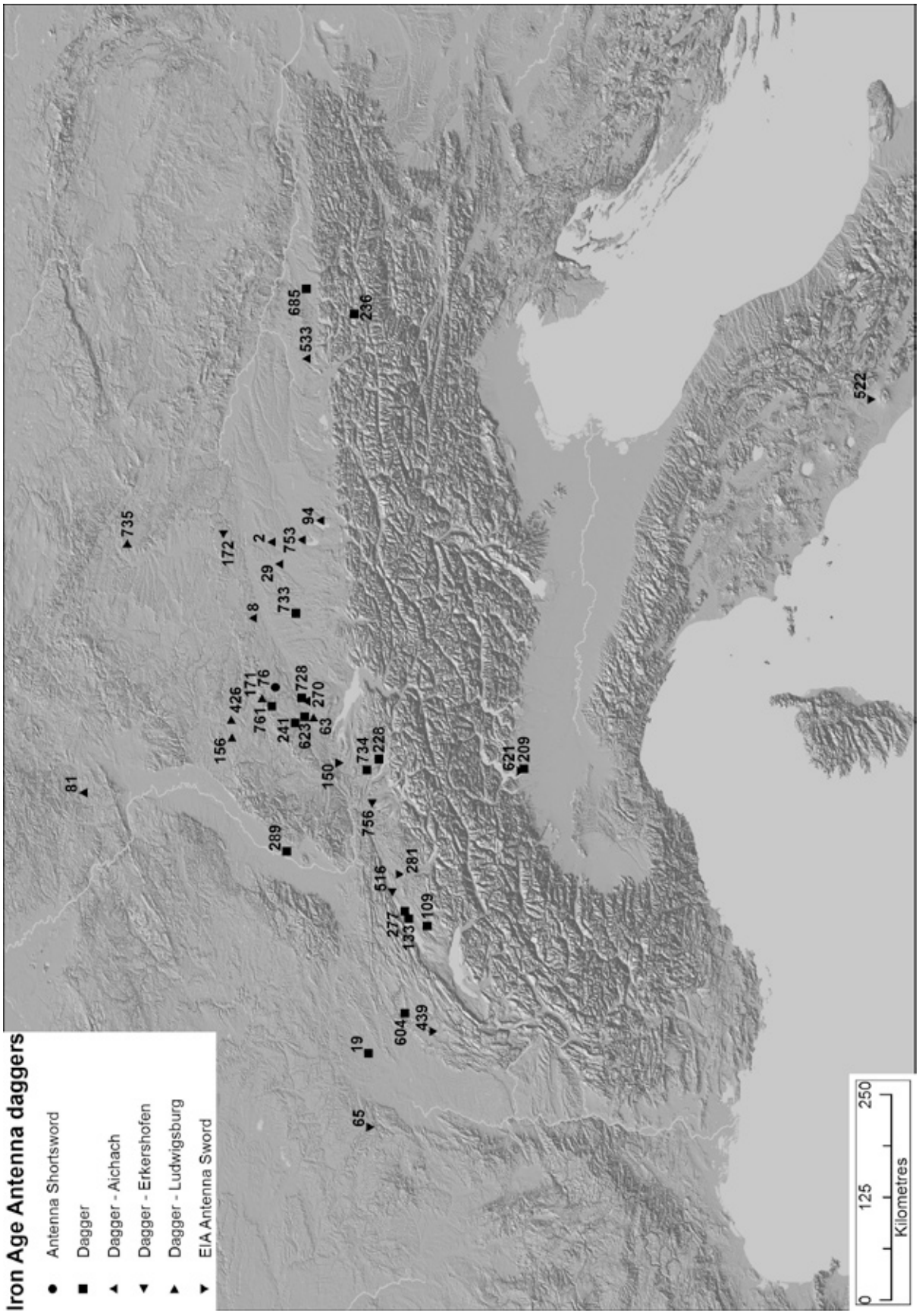


Map 39: Distribution of Iron Age Antenna daggers.

Map 40

All sites references (Sievers 1982) in addition to those specified, unless marked with >. a) = (Rieth 1942); b) (Perler 1962); c) = (Schwenzer 2004); d) = (Hansen, L 2010); e) = (Drack 1973b); f) = (Bietti Sestieri 1992a,b); g) = (Frontini 2004); h) = (De Marinis 1975).

No	Site	Qty	Type	References
Antenna Shortsword				
76	Böttingen	1	D	
Dagger				
19	Apremont	1	FR	
109	Châtonnaye	1	CH	e)
133	Cudrefin	1	CH	e)
209	Golasecca	1	IT	
228	Grüningen-CH	1	CH	e)
236	Hallstatt	2	AT	
241	Harthausen a. d. Scheer	1	D	
277	Ins	1	CH	e)
289	Kappel am Rhein	1	D	
604	Saraz	1	FR	
623	Sigmaringen	1	D	
685	Traun	1	AT	
728	Waldhausen	1	D	
733	Waltenhausen I	1	D	
734	Wangen	1	CH	e)
761	Würtingen	1	D	
Aichach				
2	Aichach	1	D	
8	Altenberg	1	D	
29	Augsburg	1	D	
81	Braunfels	1	D	
94	Buchsee	1	D	
236	Hallstatt	4	AT	
270	Hundersingen	3	D	
533	Pfaffstätt	1	AT	
753	Wildenroth-Grafrath	1	D	
Erkershofen				
172	Erkertshofen	1	D	
236	Hallstatt	5	AT	
516	Orpund	1	CH	e)
734	Wangen	1	CH	e)
756	Wohlen	1	CH	e)
Ludwigsburg				
63	Bittelschieß	1	D	
156	Eberdingen-Hochdorf	1	D	
171	Erkenbrechtsweiler-Burrenhof	1	D	
236	Hallstatt	2	AT	
426	Ludwigsburg	2	D	
735	Wattendorf	1	D	
EIA Antenna Sword				
65	Blaisy-Bas	1	FR	
150	Dörflingen	1	CH	e)
236	Hallstatt	1	AT	
281	Jegenstorf	1	CH	e)
439	Marigny	1	FR	
522	Osteria dell'Osa	1	IT	> f)
621	Sesto Calende	1	IT	g; h)

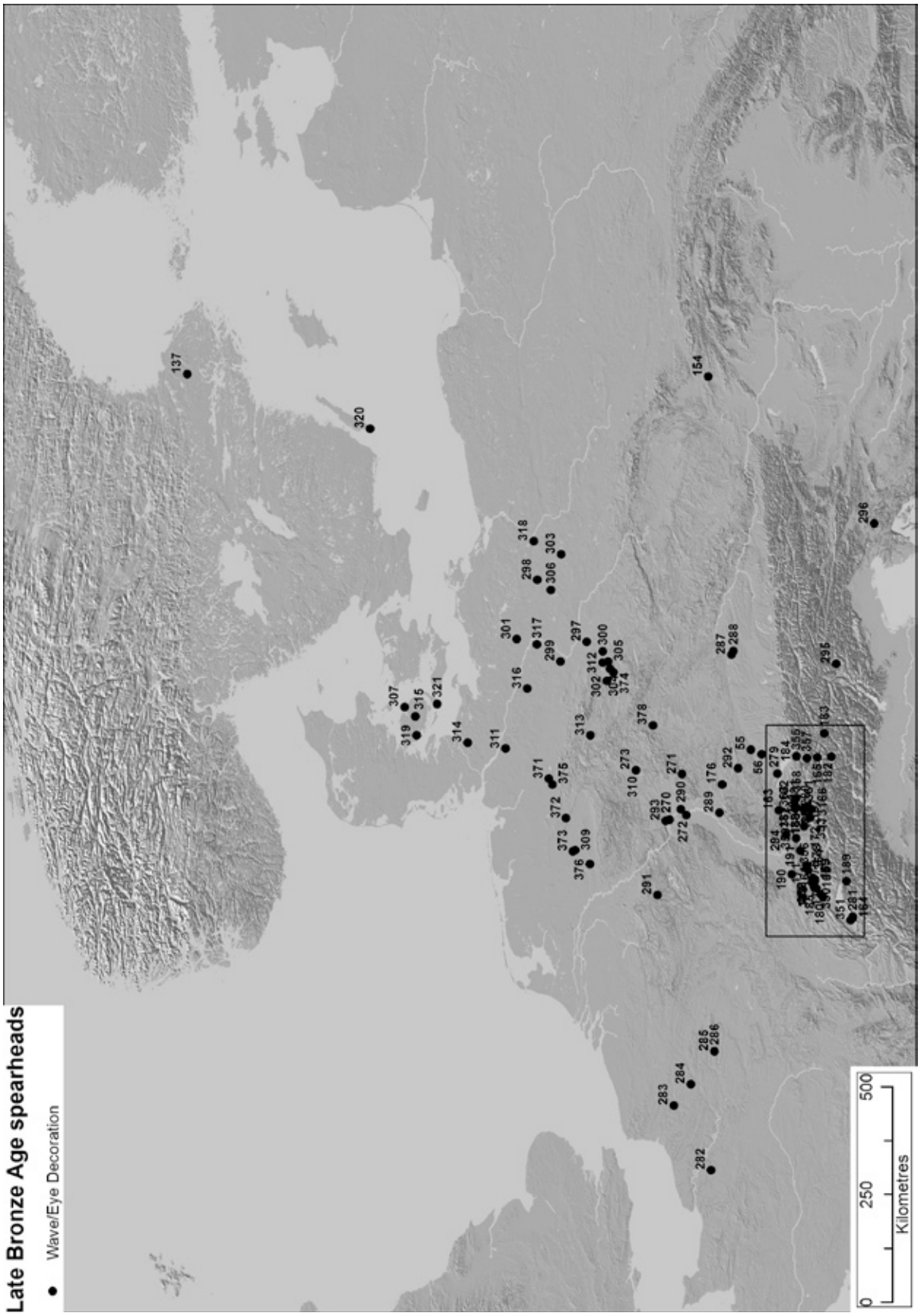


Map 40: Distribution of Iron Age daggers.

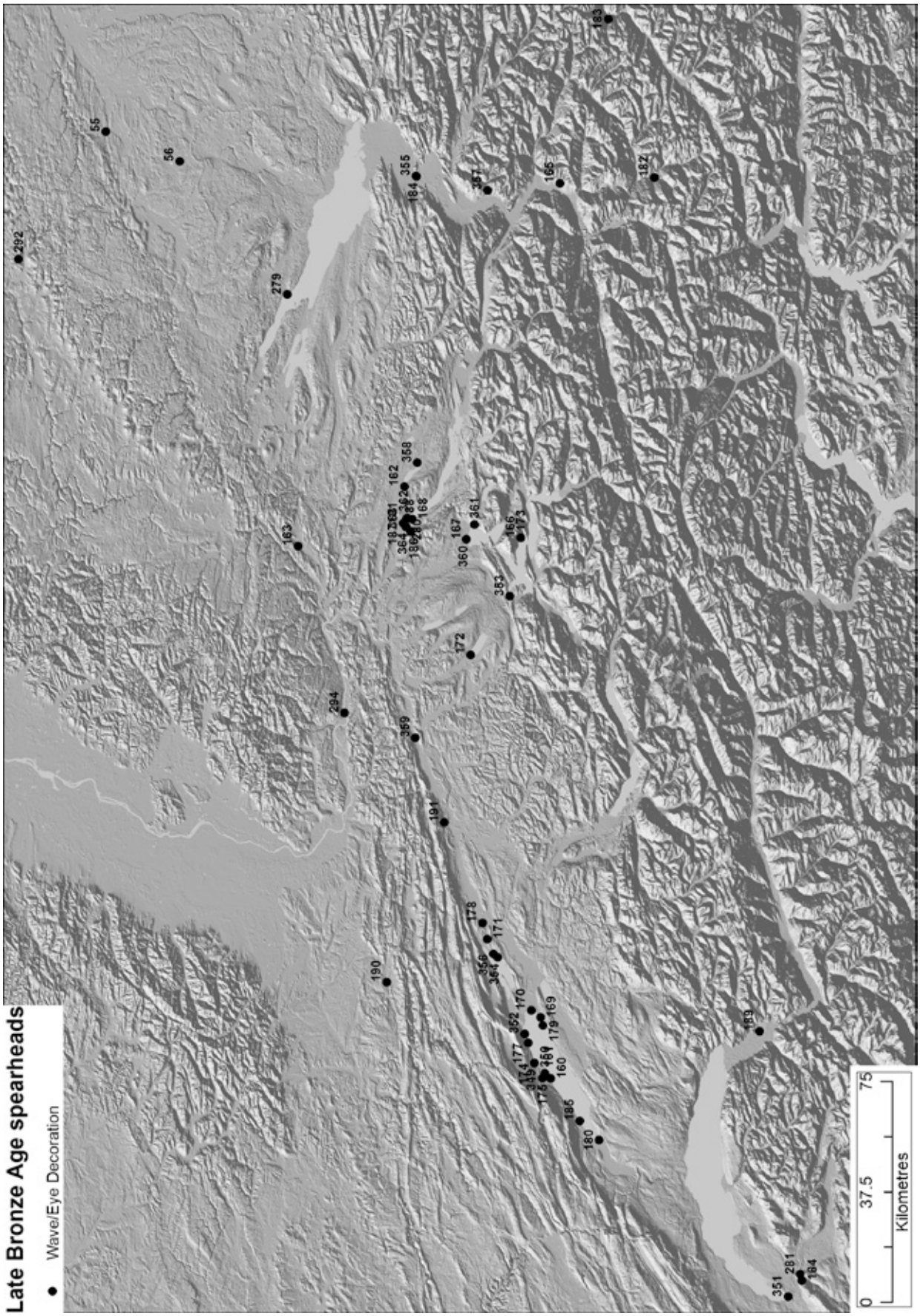
Maps 41 & 42

No.	Site	Qty	Country	References
1	Aiglsbach	1	D	(Jacob-Friesen 1967)
3	Alle	1	CH	(Tarot 2000)
5	Amiens	1	FR	(Jacob-Friesen 1967)
12	Attiswil	1	CH	(Tarot 2000)
13	Auvernier	2	CH	(Tarot 2000)
16	Baasdorf	1	D	(Jacob-Friesen 1967)
18	Bad Neustadt-Herschfeld	1	D	(Wilbertz 1982)
25	Bevaix	1	CH	(Tarot 2000)
33	Boudry	1	CH	(Tarot 2000)
36	Brasles	2	FR	(Jacob-Friesen 1967)
44	Chabrey	1	CH	(Tarot 2000)
49	Cortaillod	2	CH	(Tarot 2000)
51	Cudrefin	1	CH	(Tarot 2000)
52	Datteln	1	D	(Laux 2012)
63	Ehingen	2	D	(Müller-Karpe 1959; Schauer 1971)
66	Eisendorf	1	D	(Jacob-Friesen 1967)
69	Ettlingen	1	D	(Jacob-Friesen 1967)
70	Eure	1	FR	(Jacob-Friesen 1967)
71	Fällanden	1	CH	(Tarot 2000)
75	Fliegenhöle	1	SI	(Jacob-Friesen 1967)
78	Freltofte-Moor	1	DK	(Jacob-Friesen 1967)
80	Gabow	1	D	(Jacob-Friesen 1967)
83	Gampelen/Witzwil	1	CH	(Tarot 2000)
84	Genève-Eaux Vives	1	CH	(Tarot 2000)
85	Gernsheim	1	D	(Jacob-Friesen 1967)
95	Grauen	1	D	(Jacob-Friesen 1967; Laux 2012)
99	Gross Sachau	1	D	(Jacob-Friesen 1967; Laux 2012)
100	Grosswangen	1	D	(Jacob-Friesen 1967)
103	Haassel	1	D	(Jacob-Friesen 1967; Laux 2012)
104	Hallau	1	CH	(Tarot 2000)
113	Hauterive-Champréveyres	1	CH	(Tarot 2000)
114	Hävern	1	D	(Laux 2012)
116	Helle	1	D	(Jacob-Friesen 1967)
118	Helsned	1	DK	(Jacob-Friesen 1967)
120	Hindenburg	1	D	(Jacob-Friesen 1967)
121	Hochdorf	1	D	(Tarot 2000)
130	Jusiberg	1	D	(Jacob-Friesen 1967)
132	Kerssenbrock	1	D	(Laux 2012)
134	Kinderhaus - Münster	1	D	(Laux 2012)
135	Kirke Söby	1	DK	(Jacob-Friesen 1967)
137	Kleinheubach	1	D	(Hansen, S 1991)
139	Kolberg	1	D	(Jacob-Friesen 1967)
148	Krampnitz	1	D	(Jacob-Friesen 1967)
155	Långsjön	1	SE	(Baudou 1960; Jacob-Friesen 1967)
158	Leese	1	D	(Laux 2012)
159	Lehnitz	1	D	(Jacob-Friesen 1967; Sprockhoff 1937)
164	Lodersleben	1	D	(Jacob-Friesen 1967)
165	Lossa	1	D	(Jacob-Friesen 1967)
169	Luzern	1	CH	(Tarot 2000)
170	Mainz	1	D	(Hansen, S 1991)
175	Midskov	1	DK	(Jacob-Friesen 1967)
178	Monnetier-Mornex	1	FR	(Tarot 2000)
179	Montlingerberg	1	CH	(Tarot 2000)
182	Mörigen	1	CH	(Tarot 2000)
183	Mornex	1	FR	(Jacob-Friesen 1967)
184	Münster	1	D	(Jacob-Friesen 1967)
186	Napajedla	1	CZ	(Jacob-Friesen 1967; Podborský 1970; Říhovský 1972)
189	Neuchâtel "Le Crêt"	1	CH	(Tarot 2000)
196	Ober Sorg	1	D	(Jacob-Friesen 1967)
197	Oberriet	1	CH	(Tarot 2000)
198	Ober-Sorg	1	D	(Hansen, S 1991)
201	Olbersleben	1	D	(Laux 2012)
204	Ollon	1	CH	(Tarot 2000)
208	Onnens	1	CH	(Tarot 2000)
210	Orpund	1	CH	(Tarot 2000)
213	Ottenby	1	DK	(Jacob-Friesen 1967)
215	Zug-Sumpf	1	CH	(Tarot 2000)
216	Pelm	1	D	(Jacob-Friesen 1967)

220	Port - Zihlkanal	1	CH	(Tarot 2000)
228	Ressons-sur-Matz	1	FR	(Jacob-Friesen 1967)
230	Riom-Parsonz	1	CH	(Tarot 2000)
234	Sachsenburg	1	D	(Jacob-Friesen 1967)
235	Säckingen	1	D	(Jacob-Friesen 1967)
237	Samswegen	1	D	(Jacob-Friesen 1967)
239	Schafstädt	1	D	(Jacob-Friesen 1967)
240	Schleissbach	1	D	(Jacob-Friesen 1967)
260	Sudershausen	1	D	(Jacob-Friesen 1967; Laux 2012)
261	Sursee - Zellmoos	1	CH	(Tarot 2000)
262	Susch	1	CH	(Tarot 2000)
263	Sutz-Lattrigen	1	CH	(Tarot 2000)
272	Triesenberg	1	LI	(Tarot 2000)
273	Trimmis	1	CH	(Tarot 2000)
278	Ums	1	IT	(Jacob-Friesen 1967)
279	Unteruhldingen-Ried	1	D	(Schöbel 1996)
281	Uster-Riedikon	2	CH	(Tarot 2000)
295	Vitznau	2	CH	(Tarot 2000)
299	Wangen Bei Olten	1	CH	(Tarot 2000)
301	Wasserburg Buchau	1	D	(Kimmig 1992)
306	Wiesbaden	1	D	(Jacob-Friesen 1967)
309	Worms	1	D	(Hansen, S 1991; Kubach 1973)
311	Yverdon-les-Bains	1	CH	(Tarot 2000)
314	Zug-Mänibach	1	CH	(Tarot 2000)
315	Zug-Sumpf	1	CH	(Tarot 2000)
316	Zürich	4	CH	(Tarot 2000)
317	Zürich-Alpenquai	1	CH	(Tarot 2000)
318	Zürich-Grosser-Hafner	1	CH	(Tarot 2000)
319	Zürich-Kohlbenhoferegg	1	CH	(Tarot 2000)
320	Zürich-Wollishofen	2	CH	(Tarot 2000)
321	Zürich-Ziegelei Sihlfeld	3	CH	(Tarot 2000)



Map 41: Distribution of *Wellendekor* type spearheads in central Europe. For inset region see Map 42



Map 42: Spearheads with Waye/Eye deocration (*Wellendekor*) in the nCA.

Maps 43 & 44

References: a) = (Thrane 1975); b) = (Jacob-Friesen 1967); c) = (Tarot 2000); d) = (Herrmann 1966); e) = (Baudou 1960); f) = (Laux 2012); g) = (Müller-Karpe 1959); h) = (Gedl 2009); i) = (Sprockhoff 1956); j) = (Neudert 2003); k) = (Gaucher 1981); l) = (Reboul and Millotte 1975); m) = (Hansen, S 1991); n) = (Pfauth 1998); o) = (Schopper 1995); p) = (Milcent 1996).

No.	Site	Qty	Country	References
Pfahlbau				
2	Alise St. Reine	1	FR	a)
8	Arneburg	1	D	a; b)
13	Auvernier	5	CH	a; c)
17	Bad Homburg	1	D	a; d)
19	Bansin	1	D	a; b)
22	Basel-Elisabethenschanze	1	CH	c)
24	Bendesdorf	1	D	a; b)
26	Bex	1	CH	a; c)
29	Bjärsjölagård	1	SE	e)
40	Brügg	1	CH	a; c)
45	Chardonne	1	CH	a; c)
48	Cloppenburg	1	D	a; b)
50	Cortaillod Est	1	CH	a; c)
54	Debogórze	1	PL	a)
58	Djurnäs	1	SE	a)
64	Eibingen	1	D	a; b)
67	Ekes	1	SE	b; e)
8	Estavayer-le-Lac	1	CH	a; c)
76	Föhr	1	D	a)
77	Frejlev Skov	1	DK	b; e)
81	Gambach - Friedberg	1	D	a; b)
89	Gletterens	1	CH	a; c)
90	Glówczyce (Glowitz)	1	PL	a)
94	Grandson-Corcelettes	9	CH	a; c)
105	Halle	1	D	a; b)
106	Hamm	1	D	a; b; f)
107	Hanau	1	D	a; b)
108	Hannover Döhren	1	D	a; f)
109	Hannover Richlingen	1	D	a; b; f)
112	Hauterive-Champréveyres	1	CH	a; c)
117	Hellevad	1	DK	b; e)
119	Hericke	1	NL	a; b)
122	Hochstadt	1	D	a; b)
138	Klouby	1	DK	e)
141	Kølpengård	1	DK	b; e)
142	Konz	1	D	a; b)
145	Kosemühl	1	D	a)
150	Kronberg	1	D	a)
152	Kyrkan	1	SE	e)
157	Ledsgården	1	SE	e)
160	Lerskov	1	DK	a)
163	Limburg	1	BE	a)
167	Luissel	1	CH	a; b)
168	Lüttchendorf	1	D	a)
172	Mehrin	1	D	a)
173	Mejlstrup	1	DK	e)
174	Meseberg	1	D	a)
182	Mörigen	3	CH	a; c)
193	Nidau	1	CH	a; c)
194	Nya Åsle	1	SE	b; e)
195	Nybygget	1	SE	e)
200	Offenbach	1	D	a; g)
204	Ollon	1	CH	a; c)
205	Öllsjö	1	SE	e)
209	Öremöllavägen	1	SE	e)
210	Orpund	1	CH	a; c)
211	Östergarn	1	SE	e)
212	Österslöv	1	SE	e)
214	Ottenstall	1	D	a; g)
218	Pfullendorf	1	D	a)
225	Puidoux	1	CH	a; b)
231	Rovalls	1	SE	b; e)
249	Snøde	1	DK	e)
250	Spelvik	2	SE	e)
254	Steinheim	2	D	a; d)
257	Store Karleby	1	DK	e)
270	Torslunda	1	SE	a; b)
276	Uchizy	1	FR	a)
282	Valinge	1	SE	e)
285	Västerby	1	SE	e)
286	Vechta	1	D	a; f)
303	Werne	1	D	a; f)
317	Zürich-Alpenquai	1	CH	a; c)
320	Zürich-Wollishofen	2	CH	a; c)
Northern copy				
180	Morgenitz	1	D	a)
192	Neustrelitz	1	D	a)
West Baltic				
4	Allerup	1	DK	b)
6	Anst	1	DK	b)
7	Apelviken	1	SE	b)
9	Asdal	1	DK	b)
10	Askum	1	SE	b)
11	Assendløse	1	DK	b)
28	Bienice	1	PL	h)
34	Bozenice	1	PL	h)
37	Bregninge	1	DK	b)
38	Bro	1	SE	b)
39	Brønshøj	1	DK	b)
41	Brunsmose Banke	2	DK	b; e)
53	Davrup	1	DK	b)
55	Demzin	1	D	b)
56	Depenau	1	D	b)
62	Egense	1	DK	b)
65	Eindhoven	1	NL	b)
74	Flädie	1	SE	b)
80	Gabow	8	D	b)
86	Gingst	2	D	b; i)
87	Gjerlev	1	DK	b)
88	Glemminge	1	SE	b)
92	Goleniów	1	PL	h)
93	Górki	1	PL	h)
94	Grandson-Corcelettes	1	CH	a; c)
97	Griefstedt	1	D	b)
98	Grönhult	2	SE	b)
102	Gützkow	1	D	b)
110	Hasmark	1	DK	b)
111	Håstad	1	SE	b)
115	Hechthausen	1	D	b; f)
120	Hindenburg	1	D	b)
126	Hov	1	SE	b)
127	Hurum	1	NO	b)
131	Karås	1	SE	b)
139	Kolberg	1	D	b)
140	Kolobrzeg	2	PL	h)
146	Kozin	1	PL	h)
147	Krajnik Górny	1	PL	h)
149	Krog By	1	DK	b)
153	Lancken	1	D	b)
154	Långe mosse	1	SE	b)
161	Lilla Haglunda	1	SE	b)
171	Martebo	1	SE	b)
187	Nebstrup	1	DK	b)
188	Neddemin	1	D	b)
199	Ødegård	1	NO	b)
202	Oldenburg in Holstein	1	D	b)
203	Ollerup	1	DK	b; e)
206	Olovstorp	1	SE	b)
207	Ølstykke	1	DK	b)
219	Piaseczno	1	PL	h)
221	Poulholm	1	DK	b)
226	Racibórz	1	PL	h)
227	Raklev	1	DK	b)
233	Rzeszyneck	1	PL	h)
238	Sarup	1	DK	b)
243	Schwennenz	1	D	b; i)

248	Skælskør	2	DK	b)
255	Stenåsa	1	SE	b)
256	Stora Köpinge	1	SE	b)
258	Strærup	1	DK	b)
259	Straubing-Sand	2	D	j)
264	Szczecin-Kleskowo	1	PL	h)
265	Tetzitz	2	D	b)
266	Teugn	1	D	j)
269	Torsborg	2	SE	b)
271	Triberga	1	SE	b)
274	Trolle-Ljungby	1	SE	b)
275	Tvååker	1	SE	b)
280	Uskela	1	FI	b)
287	Veddinge	1	DK	b)
288	Vegestorp	1	SE	b)
289	Vejlegård	1	DK	b; e)
290	Vellerup	1	DK	b)
292	Verninge	1	DK	b; e)
293	Vietkow (Wicewo)	3	PL	h)
296	Vormark	1	DK	b; e)
300	Warnowo	1	PL	h)
307	Wittstock a. d. Dosse	1	D	b)
310	Wutike	2	D	b)
313	Zernickow	1	D	b)

Pfahlbau?

5	Amiens	1	FR	k)
13	Auvernier	5	CH	c)
15	Auvernier-Nord	1	CH	c)
20	Barberêche	1	CH	c)
23	Basse Yutz	1	FR	l)
26	Bex	3	CH	c)
32	Boissy-aux-Cailles	1	FR	k)
46	Chevroux	1	CH	c)
47	Choisy-le-Roi	1	FR	k)
61	Echarlens	1	CH	c)
68	Estavayer-le-Lac	4	CH	c)
73	Ferden	1	CH	c)
79	Fussach	1	AT	c)
89	Gletterens	1	CH	c)
91	Golaten	1	CH	c)
94	Grandson-Corcelettes	6	CH	c)
96	Greng	1	CH	c)
123	Hohenems	1	AT	c)
124	Hohenhewen	1	D	g)
133	Kerzers	1	CH	c)
181	Morges	3	CH	c)
182	Mörigen	6	CH	c)
185	Nächstenbach Weinheim	1	D	m)
190	Neudorf	1	CH	c)
193	Nidau	3	CH	c)
210	Orpund	2	CH	c)
225	Puidoux	1	CH	c)
229	Richterswil	1	CH	c)
232	Ruggell	1	LI	c)
236	Saint Sulpice	1	CH	c)
241	Schmitten	1	CH	c)
253	Steinhausen	1	CH	c)
263	Sutz-Lattrigen	1	CH	c)
267	Thronhofen	1	D	n)
283	Vallamand	1	CH	c)
294	Vinelz	1	CH	c)
312	Zdzary (Eicheberg)	1	PL	a; i)
315	Zug-Sumpf	1	CH	c)
320	Zürich-Wollishofen	1	CH	c)

Pfahlbau / West Baltic

30	Bjerne	1	DK	b; e)
82	Gamla Köpstad	1	SE	b; e)
118	Helsned	4	DK	b; e)
125	Holsteinbourg	2	DK	b; e)
128	Hyldtoft	1	DK	b; e)
136	Kjertinge	1	DK	b; e)
143	Kopparbol	1	SE	b; e)
151	Künzing	4	D	j; 0)
162	Lilla Ljungby	1	SE	b; e)
215	Pederstrup	3	DK	b; e)
284	Valleberga	1	SE	b; e)

West Baltic?

217	Petit Villatte	5	FR	p)

West Baltic? Ramelsloh

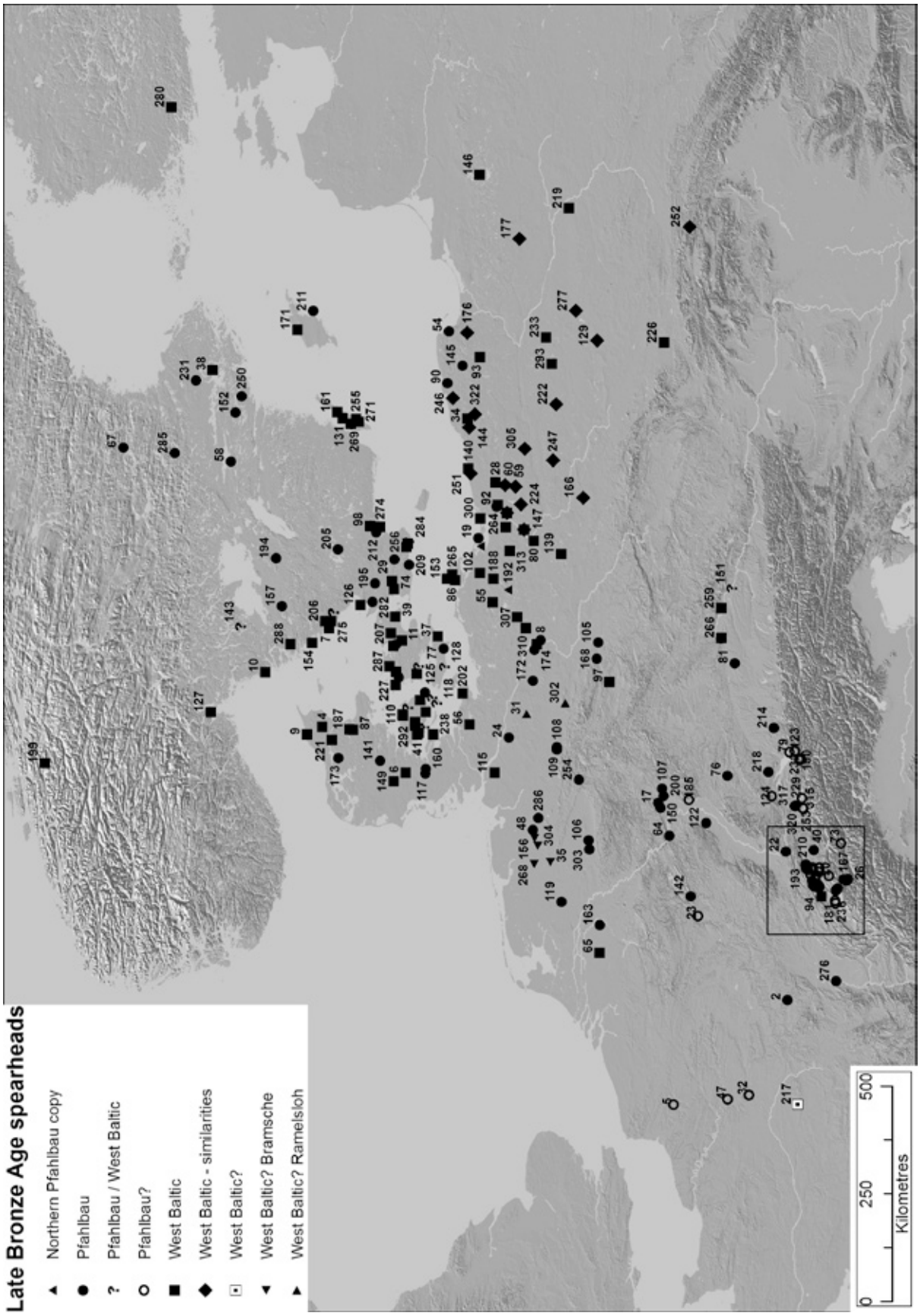
31	Bohlsen	1	D	f)
302	Werferlingen	1	D	f)

West Baltic? Bramsche

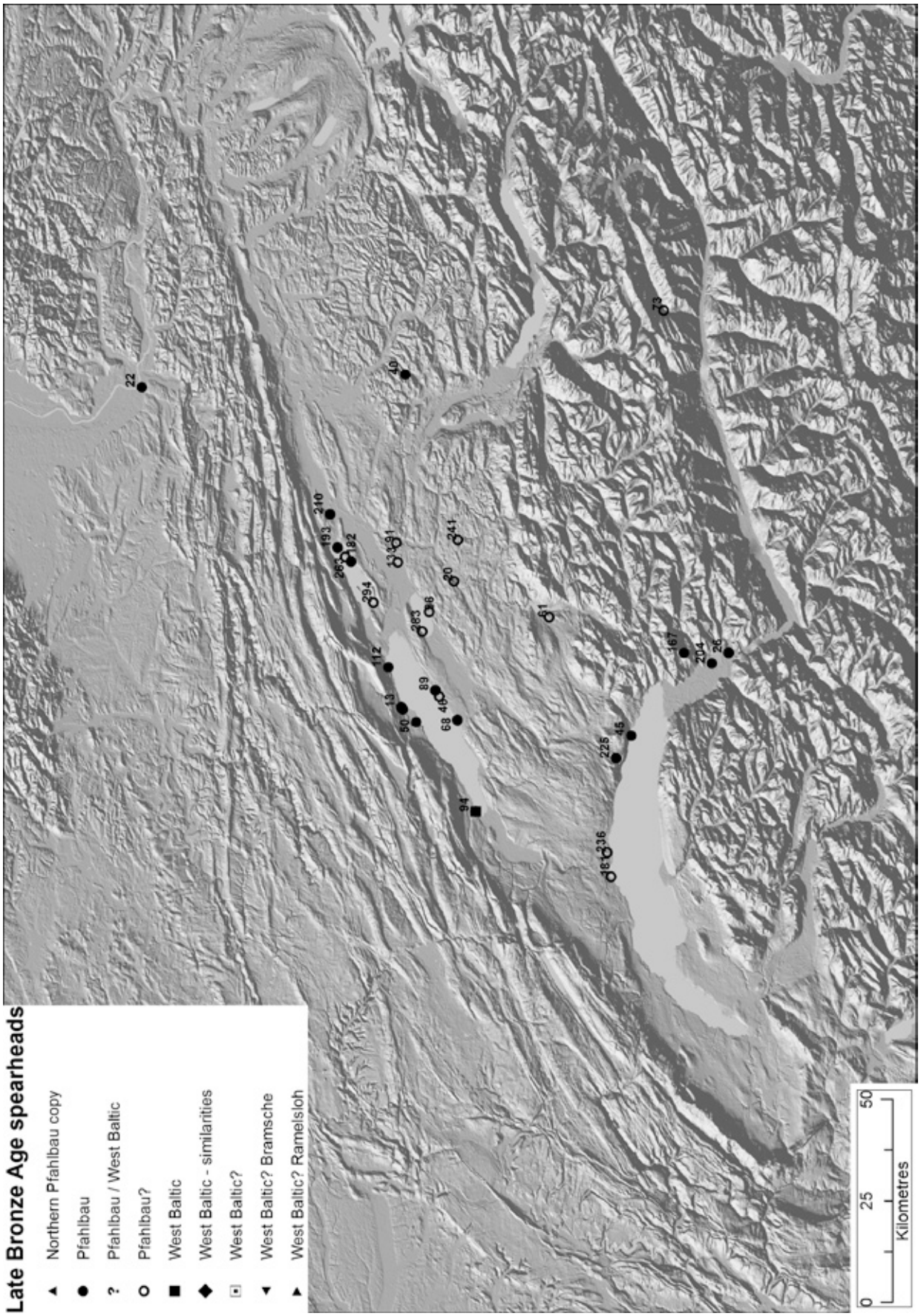
35	Bramsche	1	D	f)
156	Lastrup	1	D	f)
268	Tinnen	1	D	f)
304	Werwe	1	D	f)

West Baltic - similarities

59	Dolice	1	PL	h)
60	Dzwonowo	1	PL	h)
129	Jelenie	1	PL	h)
144	Kosciernica Slawienska	1	PL	h)
147	Krajnik Górny	1	PL	h)
166	Lubsko	1	PL	h)
176	Mierzezyn	1	PL	h)
177	Mlawa	1	PL	h)
222	Poznan-Wielka Staroleka	1	PL	h)
224	Przydarłów	1	PL	h)
246	Siemianice	1	PL	h)
247	Siercz	1	PL	h)
251	Stary Borek	1	PL	h)
252	Stary Sacz	1	PL	h)
264	Szczecin-Kleskowo	2	PL	h)
277	Ulany	1	PL	h)
305	Wierzchowo (Wurchow)	1	PL	h)
322	Zydowo Pomorskie	1	PL	h)



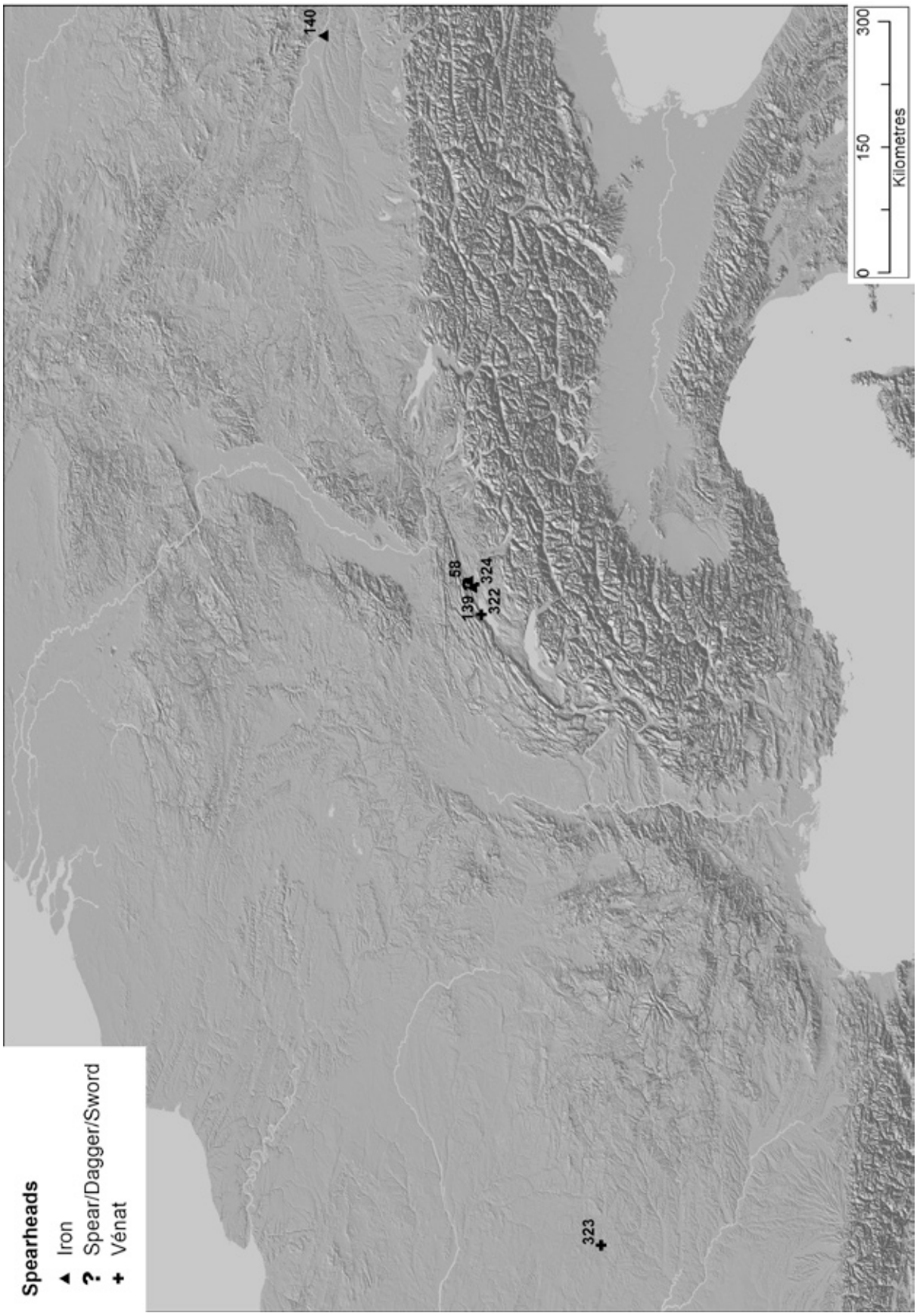
Map 43: Comparitive distribution of *Pfhalbau* and *West Baltic* type spearheads. For inset region see Map 44.



Map 44: Distribution of *Pfahlbau* and *West Baltic* type spearheads in western Switzerland.

Map 45 (location/lake marked with * have no further context of location information available).

No.	Site	Country	References
193	Nidau	CH	(Primas 2008; Tarot 2000)
27	Bielersee*	CH	(Primas 2008; Tarot 2000)
151	Künzing	D	(Neudert 2003; Schopper 1995)
14	Auvernier-Bréna	CH	(Tarot 2000)
291	Vénat	FR	(Coffyn *et al.* 1981; Tarot 2000)
182	Mörigen	CH	(Tarot 2000)

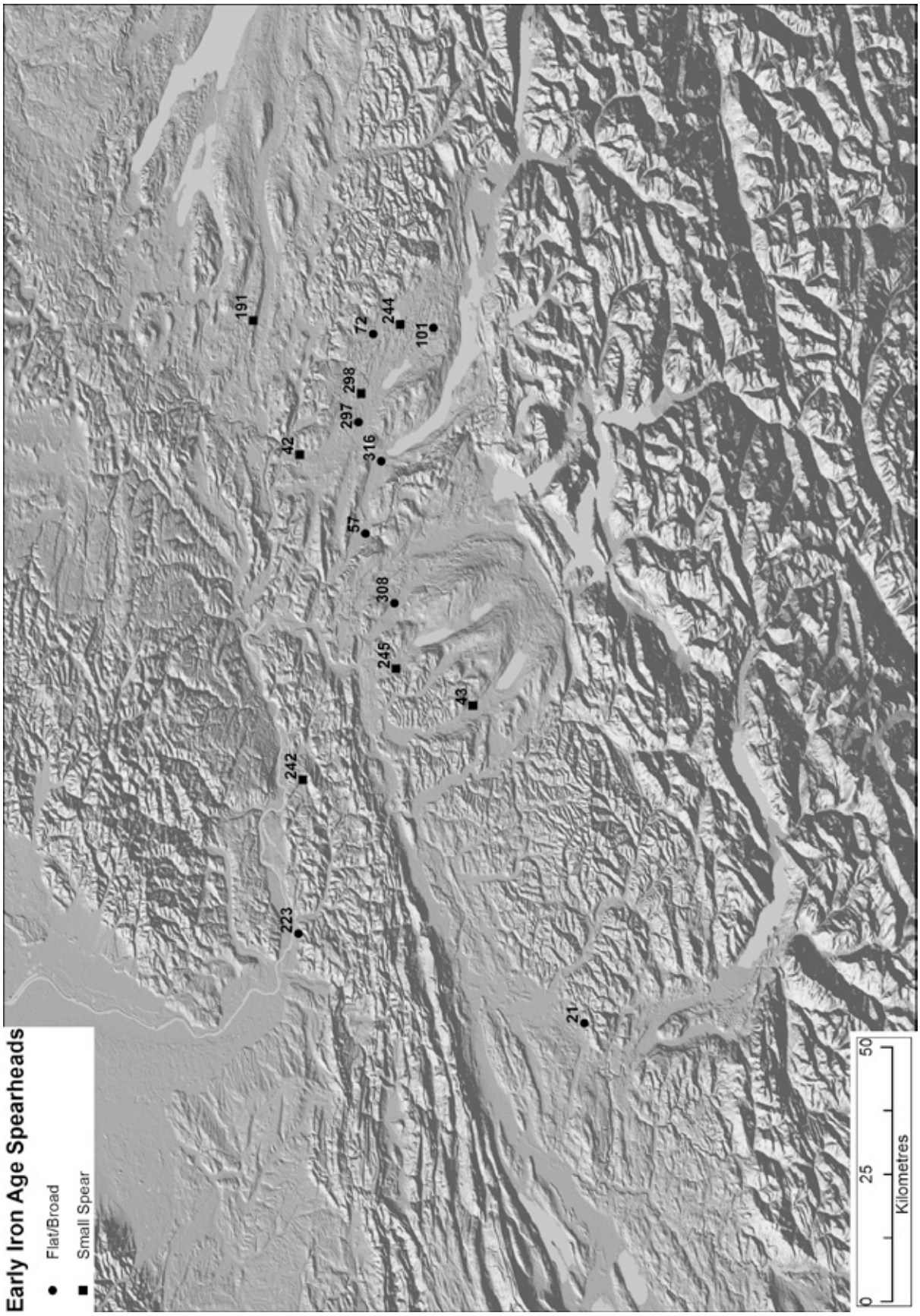


Map 45: Distribution of unusual spearheads from the northern Circum-Alpine region.

Map 46

All site references (Drack 1973b).

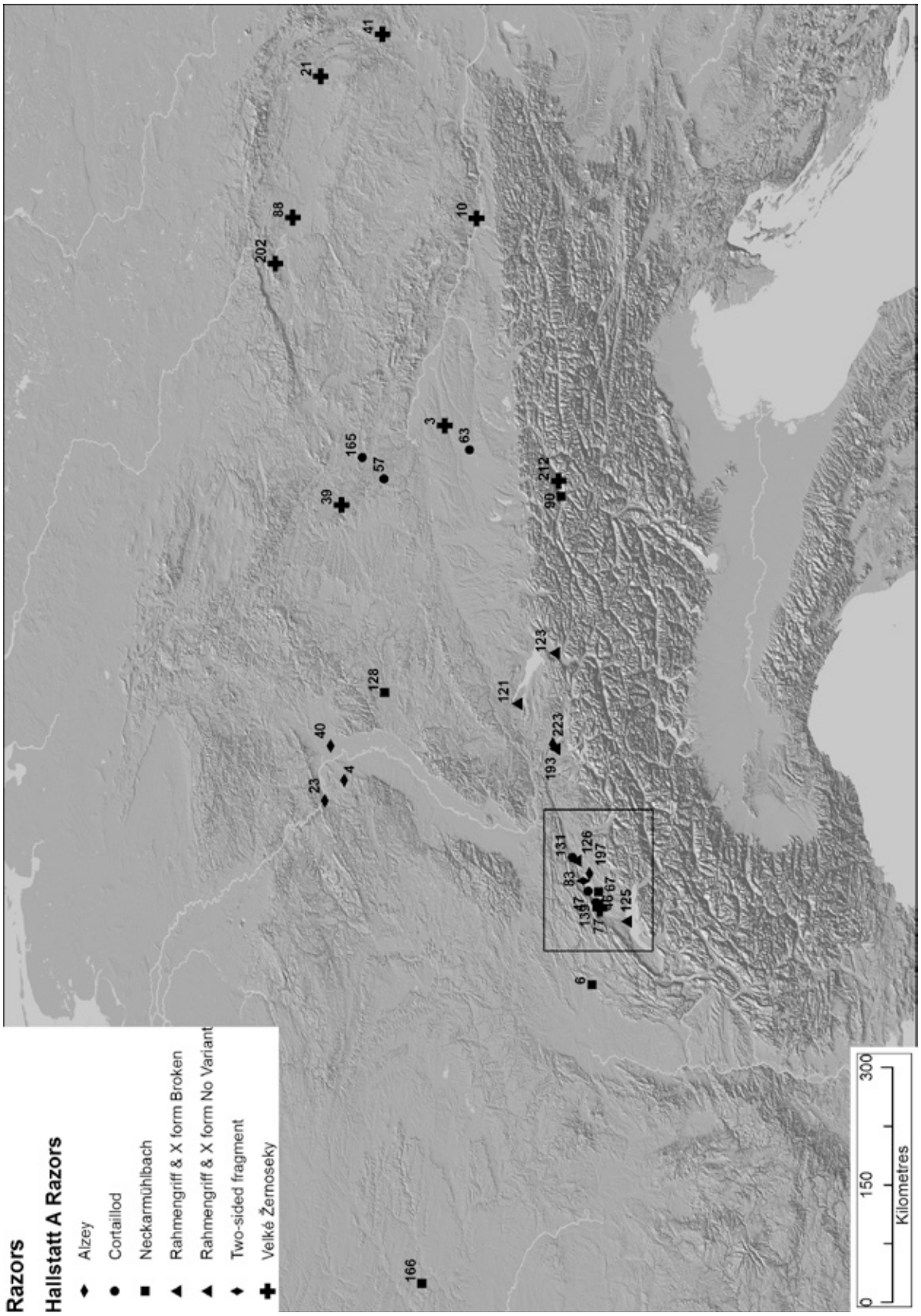
No.	Site	Qty	Country
Flat/Broad			
21	Bäriswil	2	CH
42	Bülach	1	CH
43	Büron	2	CH
57	Dietikon	1	CH
72	Fehraltorf	1	CH
101	Grüningen	3	CH
223	Pratteln	1	CH
297	Wallisellen	1	CH
308	Wohlen	2	CH
316	Zürich	1	CH
Small Spear			
42	Bülach	2	CH
43	Büron	3	CH
191	Neunforn	1	CH
242	Schupfart	1	CH
244	Seegräben	1	CH
245	Seon	3	CH
298	Wangen	2	CH



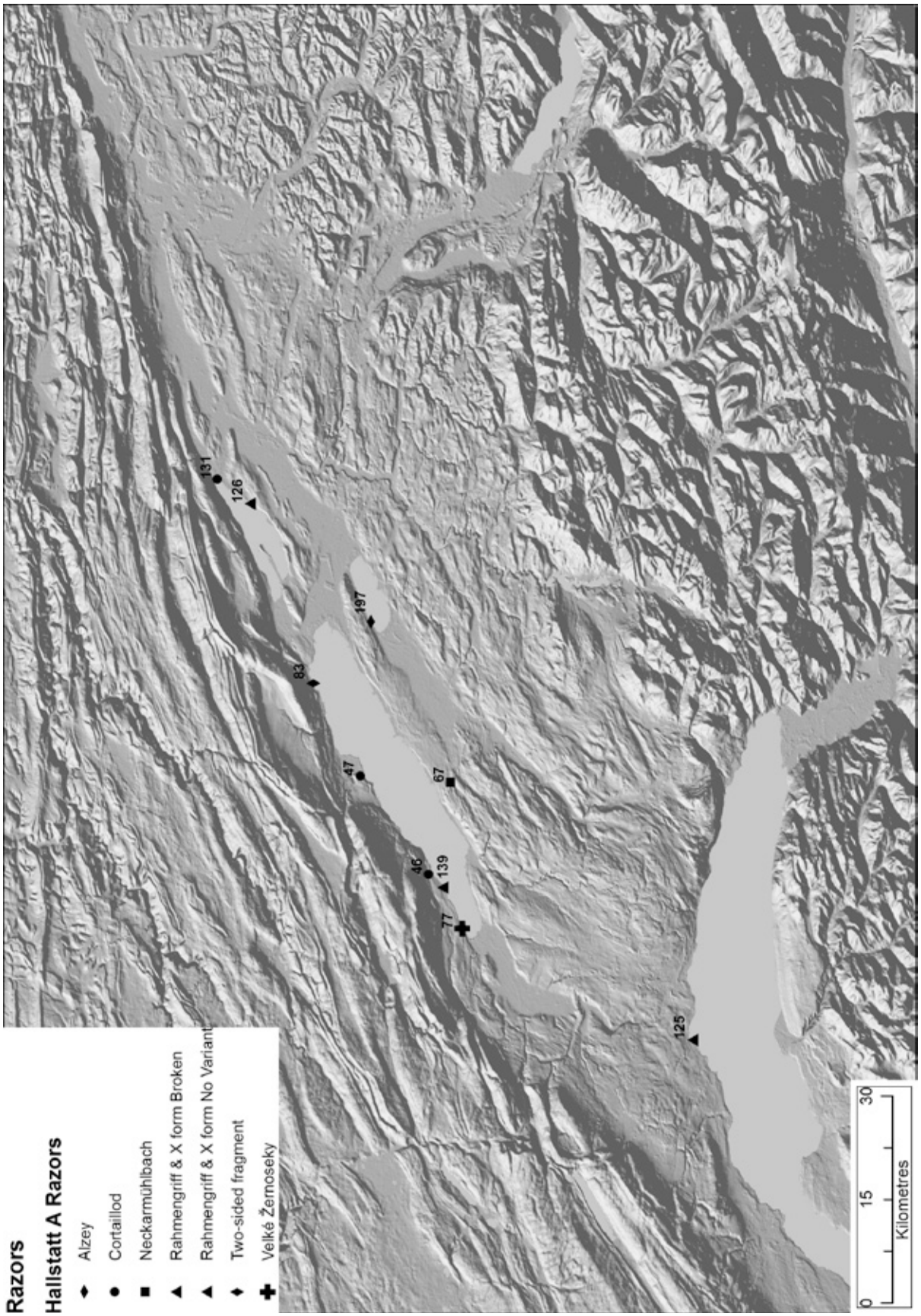
Map 46: Distribution of early Iron Age spearheads in central Switzerland.

Maps 47 & 48

No.	Site	Qty	Country	References
Alzey				
4	Alzey	1	D	(Jockenhövel 1971)
23	Bingerbrück	1	D	(Jockenhövel 1971)
40	Büttelborn	1	D	(Jockenhövel 1971)
197	Vallamand	1	CH	(Jockenhövel 1971)
223	Zürich-Wollishofen	1	CH	(Jockenhövel 1971)
Cortaillod				
46	Concise	1	CH	(Jockenhövel 1971)
47	Cortaillod	1	CH	(Jockenhövel 1971)
57	Dietkirchen	1	D	(Jockenhövel 1971)
63	Erding	1	D	(Jockenhövel 1971)
77	Grandson-Corcelettes	1	CH	(Jockenhövel 1971)
131	Nidau-Steinberg	1	CH	(Jockenhövel 1971)
165	Schalkenthan	1	D	(Jockenhövel 1971)
Neckarmühlbach				
6	Arbois	1	FR	(Jockenhövel 1980)
67	Font	1	CH	(Jockenhövel 1971)
90	Innsbruck-Wilten	1	AT	(Jockenhövel 1971)
128	Neckarmühlbach	1	D	(Jockenhövel 1971)
166	Seine-Paris	1	FR	(Jockenhövel 1980)
152	Preist	1	D	(Jockenhövel 1971)
Rahmengriff & X form Broken				
121	Möggingen	1	D	(Jockenhövel 1971)
123	Montlingerberg	1	CH	(Jockenhövel 1971)
125	Morges	1	CH	(Jockenhövel 1971)
193	Üetliberg	1	CH	(Jockenhövel 1971)
126	Mörigen	1	CH	(Jockenhövel 1971)
139	Onnens	1	CH	(Jockenhövel 1971)
Two sided fragment				
83	Hauterive-Champréveyres	2	CH	(Rychner-Faraggi 1993)
Velké Žernoseky				
3	Altheim-Bayern	1	D	(Jockenhövel 1971)
10	Au	1	AT	(Jockenhövel 1971)
21	Bestovice	1	CZ	(Jockenhövel 1971)
39	Burggaillenreuth	1	D	(Jockenhövel 1971)
41	Býcí Skála Cave	1	CZ	(Jockenhövel 1971)
77	Grandson-Corcelettes	1	CH	(Jockenhövel 1971)
88	Hostín	1	CZ	(Jockenhövel 1971)
202	Velké Žernoseky	1	CZ	(Jockenhövel 1971)
212	Volders	1	AT	(Jockenhövel 1971)



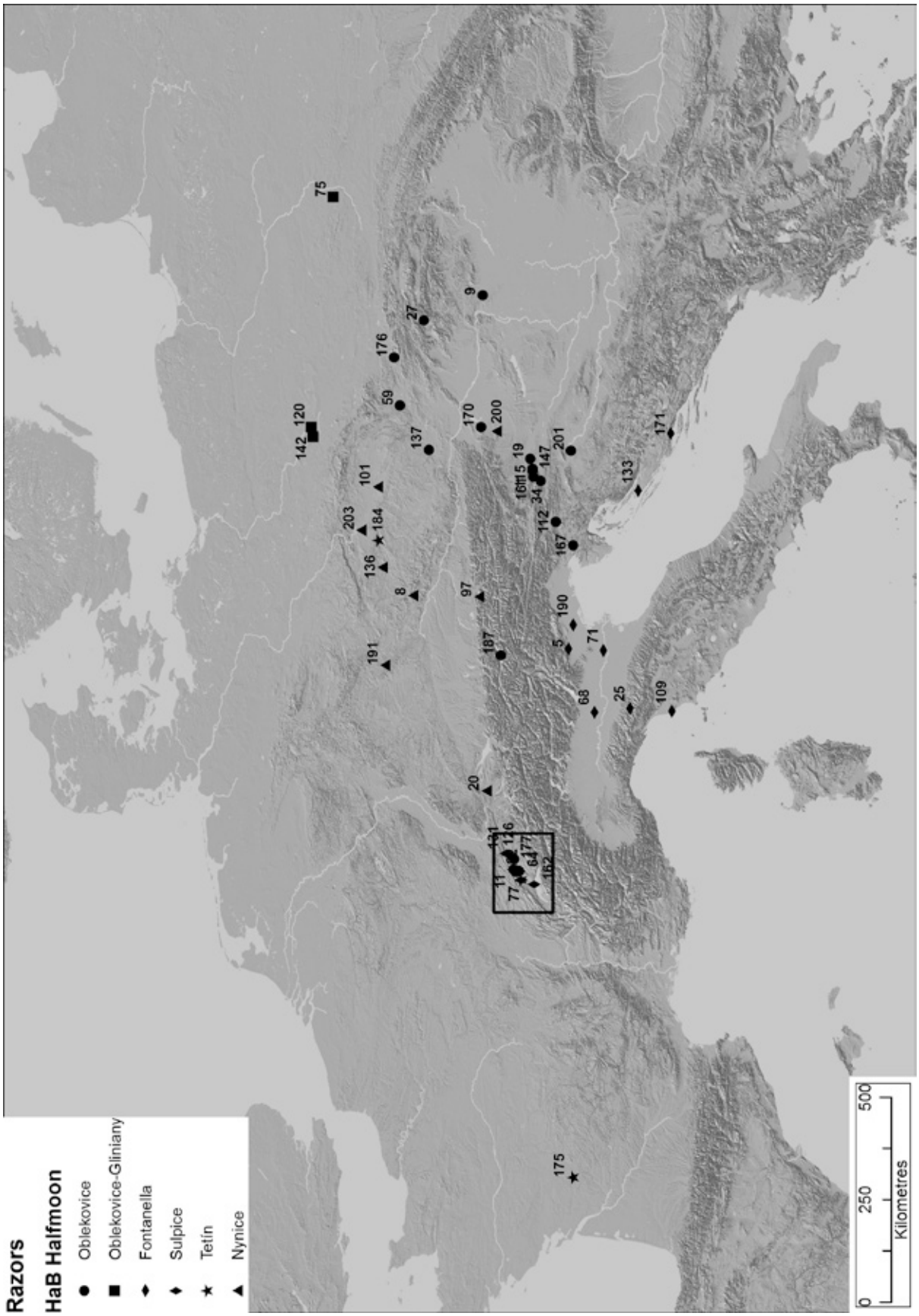
Map 47: European distribution of selected two-sided razors. For inset region see Map 48.



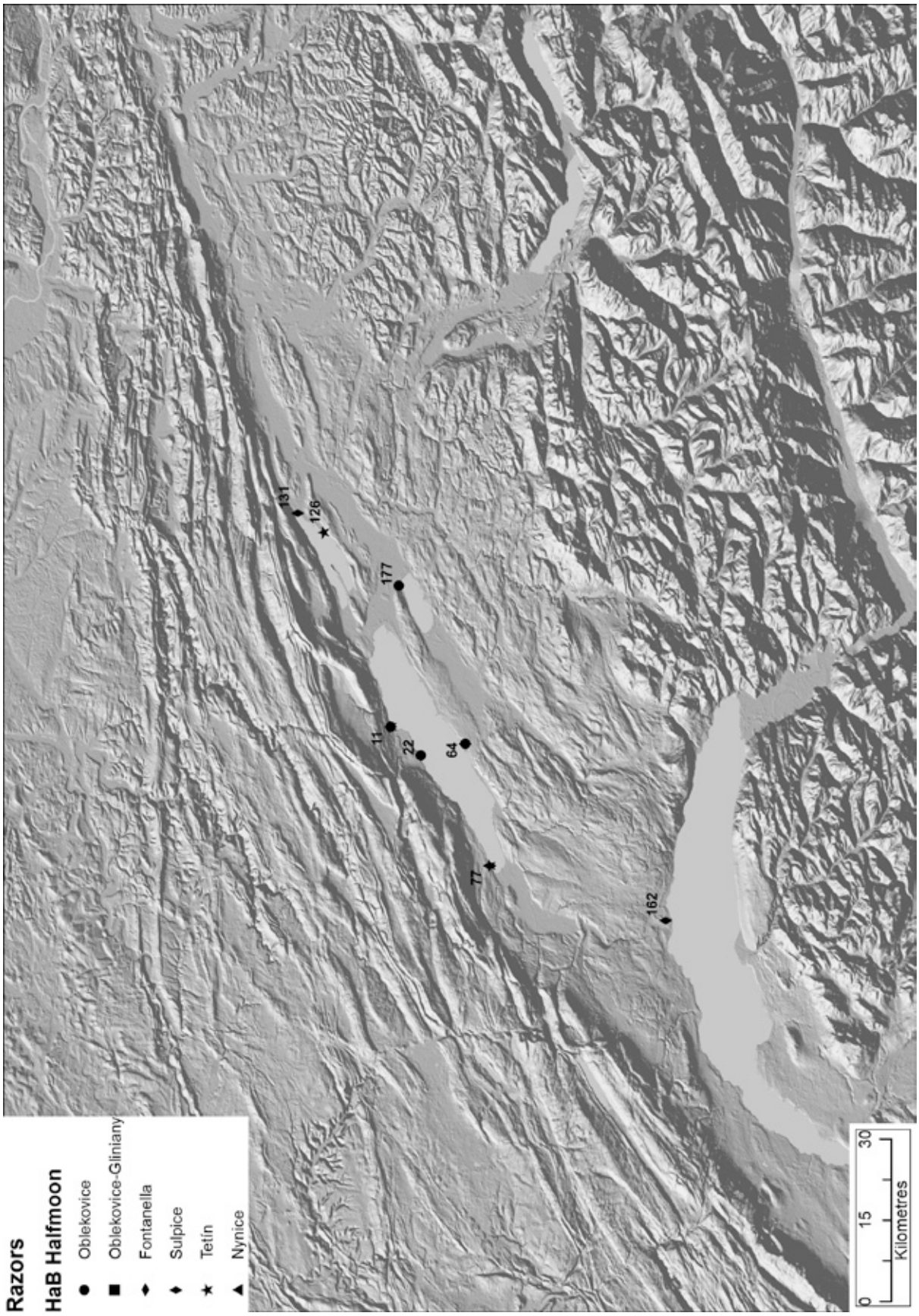
Map 48: Distribution of selected two-sided razors in western Switzerland.

Maps 49 & 50

No.	Site	Qty	Country	References
Fontanella				
5	Angarano	2	IT	(Bianco Peroni 1979)
25	Bismantova	1	IT	(Bianco Peroni 1979)
68	Fontanella Grazioli	2	IT	(Bianco Peroni 1979)
71	Frattesina	1	IT	(Colonna *et al.* 2010)
109	Limone	1	IT	(Bianco Peroni 1979)
133	Nin	7	HR	(Starè 1957)
171	Split	2	HR	(Starè 1957)
190	Treviso	1	IT	(Bianco Peroni 1979)
Nynice				
8	Arndorf	1	D	(Jockenhövel 1971)
20	Berg am Irchel	1	CH	(Jockenhövel 1971)
97	Karlstein	1	D	(Jockenhövel 1971)
101	Kutná Hora	1	CZ	(Jockenhövel 1971)
136	Nynice	1	CZ	(Jockenhövel 1971)
191	Tüchersfeld	1	D	(Jockenhövel 1971)
200	Velem	1	HU	(Weber 1996)
203	Veprek	1	CZ	(Jockenhövel 1971)
Oblekovice				
9	Aszód	1	HU	(Weber 1996)
11	Auvernier	1	CH	(Jockenhövel 1971)
19	Benedikt v Slovenskih goricah	1	SI	(Weber 1996)
22	Bevaix	1	CH	(Arnold and Langenegger 2012)
27	Blatnica	1	SI	(Jockenhövel 1971)
34	Brinjeva gora	2	SI	(Weber 1996)
59	Domamyslice	1	CZ	(Jockenhövel 1971)
64	Estavayer-le-Lac	1	CH	(Jockenhövel 1971)
112	Ljubljana	1	SI	(Weber 1996)
115	Maribor	1	SI	(Weber 1996)
137	Oblekovice	1	CZ	(Jockenhövel 1971)
147	Pobrežje	2	SI	(Weber 1996)
161	Ruše	1	SI	(Weber 1996)
167	Škocjan	1	SI	(Weber 1996)
170	Sopron	1	HU	(Weber 1996)
176	Štramberk	1	CZ	(Jockenhövel 1971)
177	Sugiez	1	CH	(Jockenhövel 1971)
187	Tirol	1	AT	(Jockenhövel 1971)
201	Velika Gorica	2	HR	(Weber 1996)
Oblekovice-Gliniany				
75	Gliniany	2	PL	(Gedl 1981)
120	Moczydlnica	1	PL	(Gedl 1981)
142	Parszowice	1	PL	(Gedl 1981)
Sulpice				
11	Auvernier	1	CH	(Jockenhövel 1971)
64	Estavayer-le-Lac	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	4	CH	(Jockenhövel 1971)
131	Nidau-Steinberg	1	CH	(Jockenhövel 1971)
162	Saint Sulpice	1	CH	(Jockenhövel 1971)
Tetín				
11	Auvernier	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	1	CH	(Jockenhövel 1971)
126	Mörigen	1	CH	(Jockenhövel 1971)
175	St. Yrieix	1	FR	(Jockenhövel 1980)
184	Tetín	1	CZ	(Jockenhövel 1971)



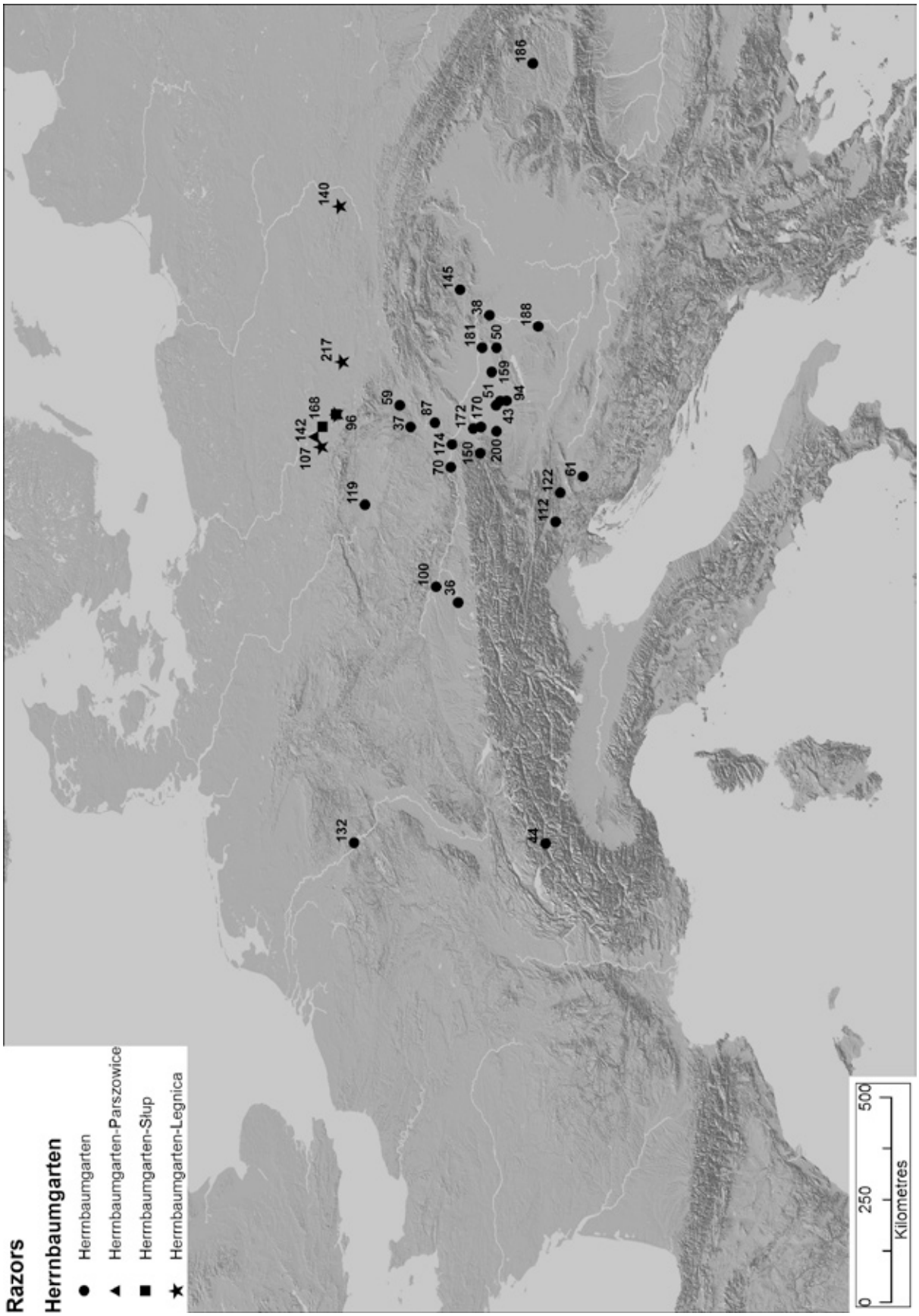
Map 49: European distribution of LBA Half-moon group razors. For inset region see Map 50.



Map 50: Distribution of LBA Half-moon group razors in western Switzerland.

Map 51

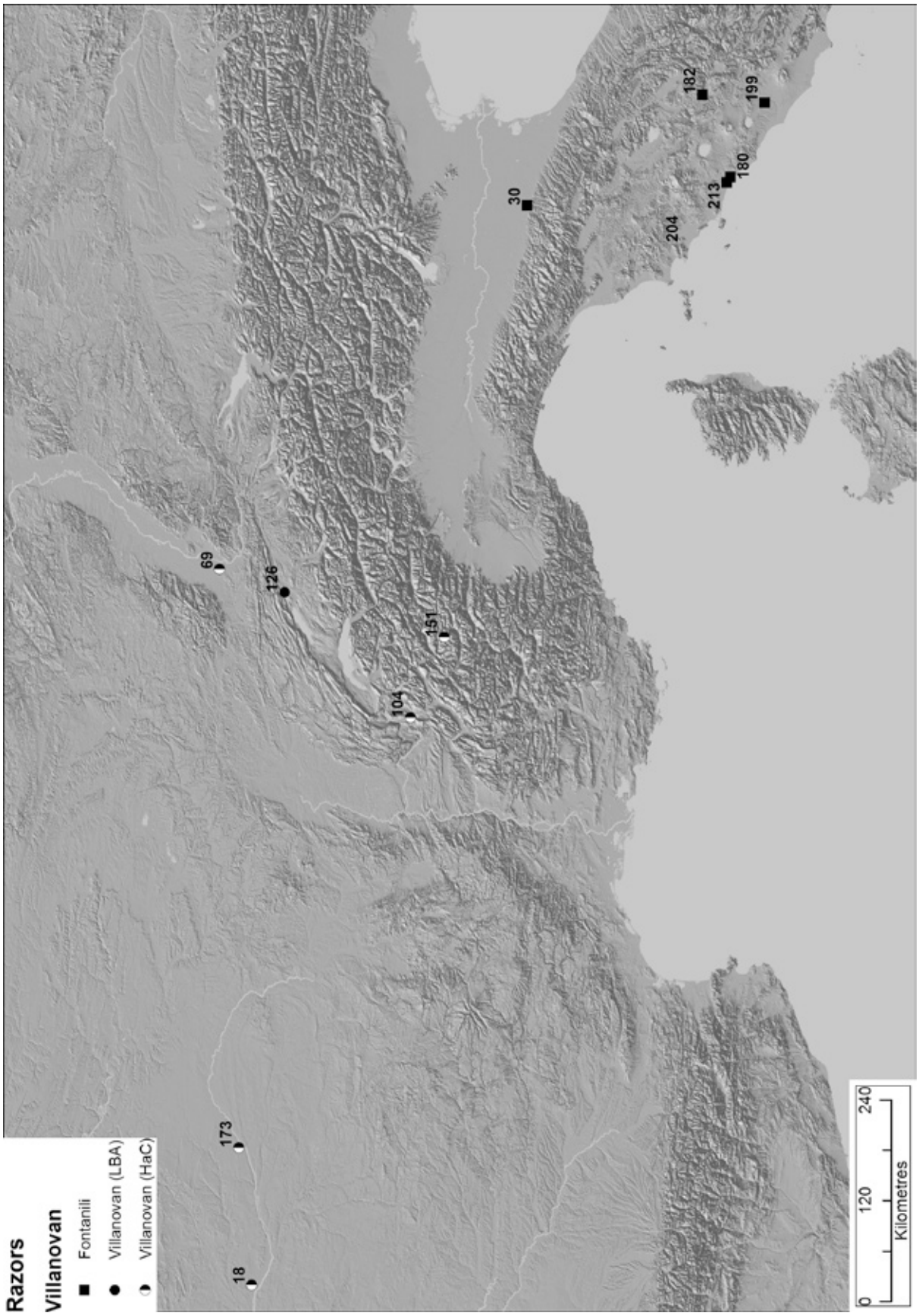
No.	Site	Qty	Country	References
Herrnbaumgarten				
36	Bruck	1	D	(Jockenhövel 1971)
37	Brünn-Královo Pole	1	CZ	(Jockenhövel 1971)
38	Budapest	1	HU	(Weber 1996)
43	Celldömölk	2	HU	(Weber 1996)
44	Chelin (Lens)	1	CH	(Jockenhövel 1971; Nicolas 2003)
50	Csákberény	1	HU	(Weber 1996)
51	Csönge	1	HU	(Weber 1996)
59	Domamyslice	1	CZ	(Jockenhövel 1971)
61	Duga Gora	1	HR	(Weber 1996)
70	Franzhausen	1	AT	(Neugebauer 1994)
87	Herrnbaumgarten	1	AT	(Jockenhövel 1971; Müller-Karpe 1959)
94	Jánosháza	1	HU	(Weber 1996)
100	Künzing	1	D	(Schopper 1995)
112	Ljubljana	1	SI	(Weber 1996)
119	Milovice	1	CZ	(Jockenhövel 1971)
122	Mokronog	1	SI	(Weber 1996)
132	Niederbieber-Segendorf	1	D	(Jockenhövel 1971)
145	Piliny	1	HU	(Weber 1996)
150	Pottschach	1	AT	(Jockenhövel 1971)
159	Románd	3	HU	(Weber 1996)
170	Sopron	2	HU	(Weber 1996)
172	St Georgen	1	AT	(Jockenhövel 1971)
174	St. Andrä vor dem Hagenthal	1	AT	(Jockenhövel 1971)
181	Tata	1	HU	(Weber 1996)
186	Tîrgu Mure?	1	RO	(Weber 1996)
188	Tolna	1	HU	(Weber 1996)
200	Velem	1	HU	(Weber 1996)
Herrnbaumgarten-Legnica				
96	Jordanów Slaski	1	PL	(Gedl 1981)
107	Legnica	3	PL	(Gedl 1981)
140	Opatów	1	PL	(Gedl 1981)
217	Wegry	1	PL	(Gedl 1981)
Herrnbaumgarten-Parszowice				
142	Parszowice	1	PL	(Gedl 1981)
Herrnbaumgarten-Slup				
96	Jordanów Slaski	1	PL	(Gedl 1981)
168	Slup	1	PL	(Gedl 1981)



Map 51: Distribution of the *Herrnbaumgarten* type razor.

Map 52 (locations/lakes marked with * have no further context information available).

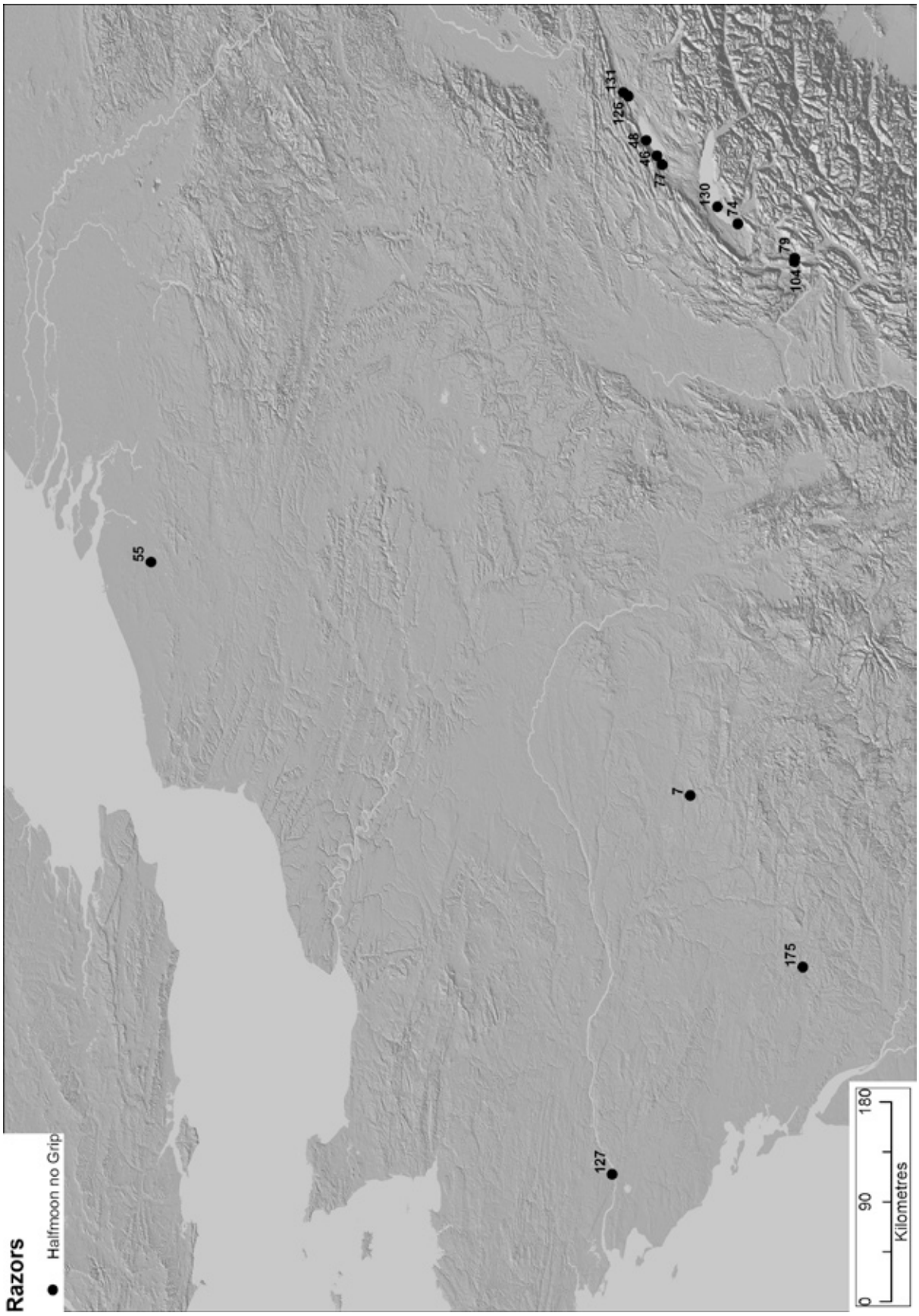
No.	Site	Qty	Country	References
Quattro Fontanili				
30	Bologna	3	IT	(Bianco Peroni 1979)
180	Tarquinia	8	IT	(Bianco Peroni 1979)
182	Terni	2	IT	(Bianco Peroni 1979)
199	Veio	3	IT	(Bianco Peroni 1979)
204	Vetulonia	1	IT	(Bianco Peroni 1979)
213	Vulci	2	IT	(Bianco Peroni 1979)
Villanovan				
18	Beaufort-en-Vallée	1	FR	(Jockenhövel 1980)
69	Forêt Domaniale	1	FR	(Jockenhövel 1980)
104	Lake Bourget*	1	FR	(Jockenhövel 1980)
126	Mörigen	1	CH	(Bernatzky-Goetze 1987)
151	Pralognan-la-Vanoise	1	FR	(Jockenhövel 1980)
173	St Sulpice de Pommeray	1	FR	(Jockenhövel 1980)



Map 52: Distribution of *Quattro Fontanili* and *Villanovan* razors.

Map 53 (locations/lakes marked with * have no further context information available).

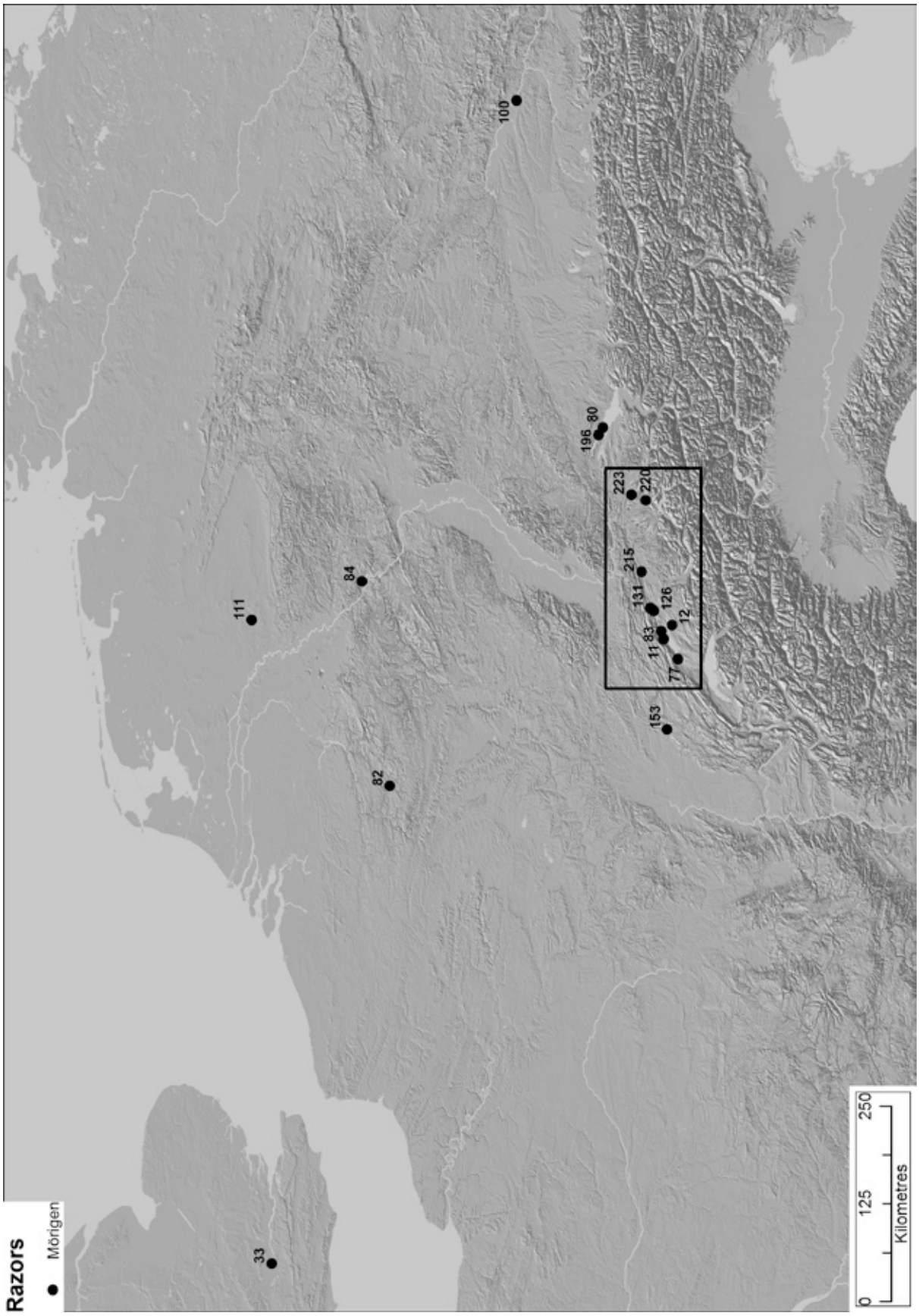
No.	Site	Qty	Country	References
7	Argenton-sur-Creuse	1	FR	(Jockenhövel 1980)
46	Concise	1	CH	(Jockenhövel 1971)
48	Cortaillod Est	1	CH	(Arnold 1986)
55	Dentergem	1	BE	(Jockenhövel 1980)
74	Genève-Eaux Vives	2	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	5	CH	(Jockenhövel 1971)
79	Grésine	8	FR	(Jockenhövel 1980)
104	Lake Bourget*	2	FR	(Jockenhövel 1980)
126	Mörigen	4	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
127	Nantes	1	FR	(Jockenhövel 1980)
130	Nernier	1	FR	(Jockenhövel 1980)
131	Nidau-Steinberg	1	CH	(Jockenhövel 1971)
175	St. Yrieix	4	FR	(Jockenhövel 1980)



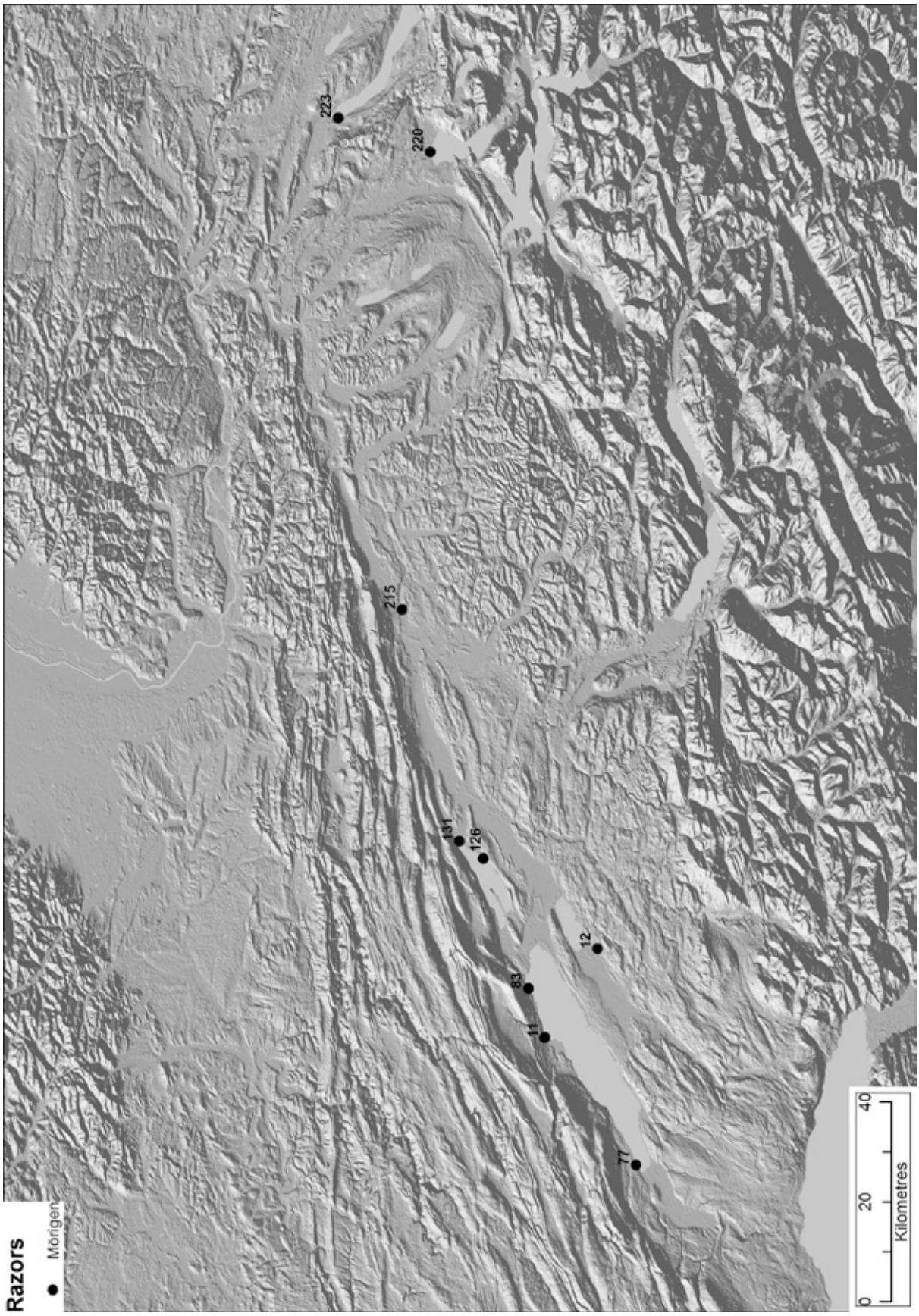
Map 53: Distribution of Late Bronze Age Halfmoon razors without grip.

Maps 54 & 55

No.	Site	Qty	Country	References
11	Auvernier	5	CH	(Jockenhövel 1971; Rychner 1979)
12	Avenches	1	CH	(Jockenhövel 1971)
33	Brentford	1	UK	(Jockenhövel 1980)
77	Grandson-Corcelettes	2	CH	(Jockenhövel 1971)
80	Hagnau	1	D	(Jockenhövel 1971)
82	Han-sur-Lesse	1	BE	(Jockenhövel 1980)
83	Hauterive-Champréveyres	2	CH	(Rychner-Faraggi 1993)
84	Heimbach	1	D	(Jockenhövel 1980)
100	Künzing	2	D	(Schopper 1995)
111	Lippramsdorf	1	D	(Jockenhövel 1980)
126	Mörigen	5	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
131	Nidau-Steinberg	2	CH	(Jockenhövel 1971)
153	Pretin	1	FR	(Jockenhövel 1980)
196	Unteruhldingen	2	D	(Schöbel 1996)
215	Wangen an der Aare	1	CH	(Jockenhövel 1971)
220	Zug-Sumpf	1	CH	(Jockenhövel 1971)
223	Zürich-Wollishofen	2	CH	(Jockenhövel 1971)



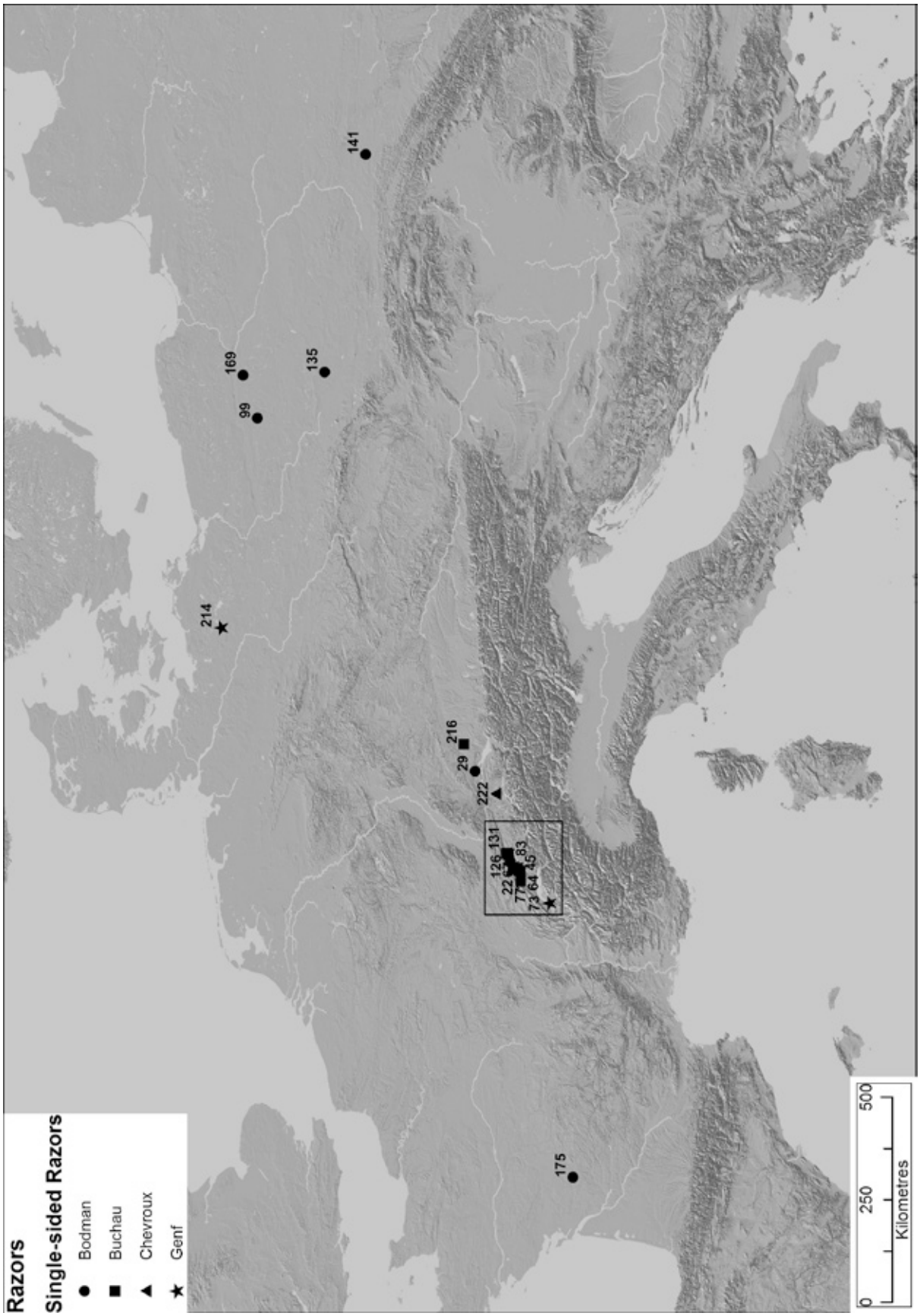
Map 54: European distribution of *Mörigen* types razors. For inset region see Map 55.



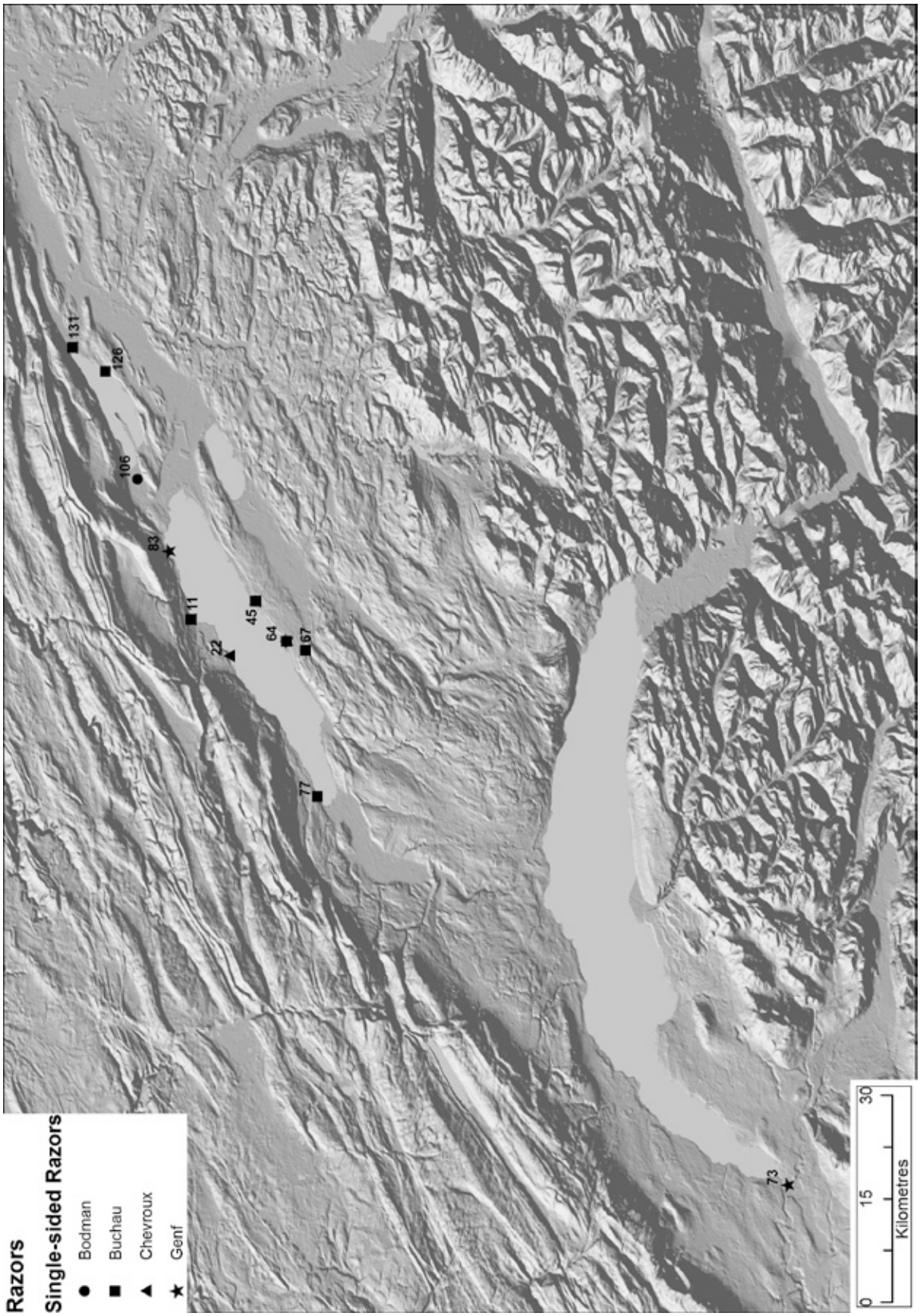
Map 55: Distribution of *Mörigen* type razors in the northern Circum-Alpine region.

Maps 56 & 57

No.	Site		Qty	Country	References
Bodman					
29	Bodman-Schachen I	1	D	(Jockenhövel 1971)	
45	Chevroux	1	CH	(Jockenhövel 1971)	
99	Kowalewko	1	PL	(Gedl 1981)	
106	Le Landeron - Grand Marais	1	CH	(Schwab 2002)	
126	Mörigen	1	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)	
135	Nowy Dwór	1	PL	(Gedl 1981)	
141	Paluchy	1	PL	(Gedl 1981)	
169	Sobiejuchy	1	PL	(Gedl 1981)	
175	St. Yrieix	2	FR	(Jockenhövel 1980)	
Buchau					
11	Auvernier	1	CH	(Jockenhövel 1971)	
45	Chevroux	1	CH	(Jockenhövel 1971)	
64	Estavayer-le-Lac	1	CH	(Jockenhövel 1971)	
67	Font	1	CH	(Jockenhövel 1971)	
77	Grandson-Corcelettes	1	CH	(Jockenhövel 1971)	
126	Mörigen	2	CH	(Jockenhövel 1971)	
131	Nidau-Steinberg	1	CH	(Jockenhövel 1971)	
216	Wasserburg Buchau	1	D	(Jockenhövel 1971)	
Chevroux					
11	Auvernier	1	CH	(Jockenhövel 1971)	
22	Bevaix	1	CH	(Jockenhövel 1971)	
45	Chevroux	1	CH	(Jockenhövel 1971)	
131	Nidau-Steinberg	1	CH	(Jockenhövel 1971)	
222	Zürich-Grosser-Hafner	1	CH	(Jockenhövel 1971)	
Genf					
64	Estavayer-le-Lac	1	CH	(Jockenhövel 1971)	
73	Genève	1	CH	(Jockenhövel 1971)	
83	Hauterive-Champréveyres	1	CH	(Jockenhövel 1971)	
214	Wangelin	1	D	(Jockenhövel 1980; Sprockhoff 1956)	



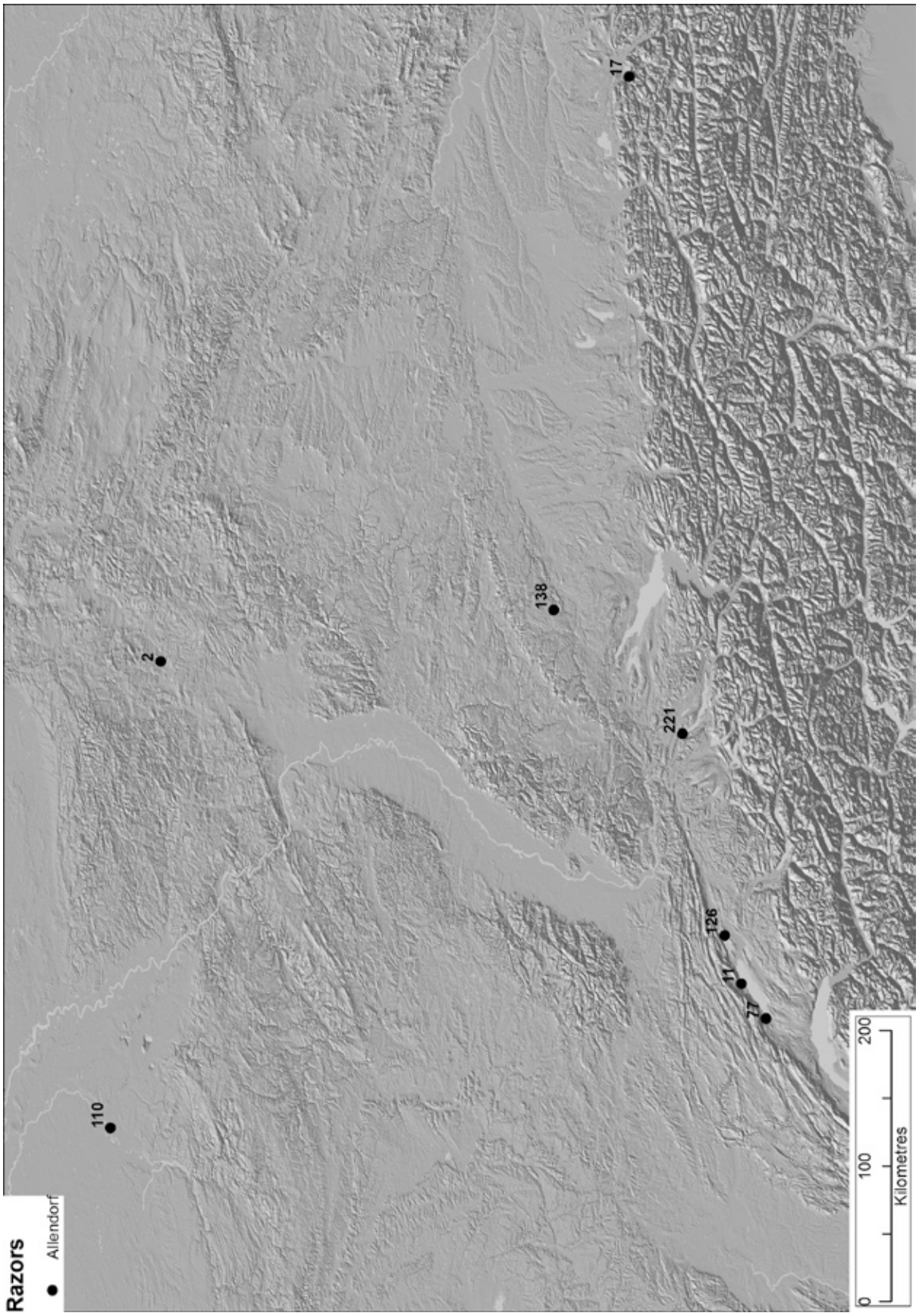
Map 56: European distribution of HaB period single-sided razor types. For inset region see Map 57.



Map 57: Distribution of HaB single-sided razor types in western Switzerland.

Map 58

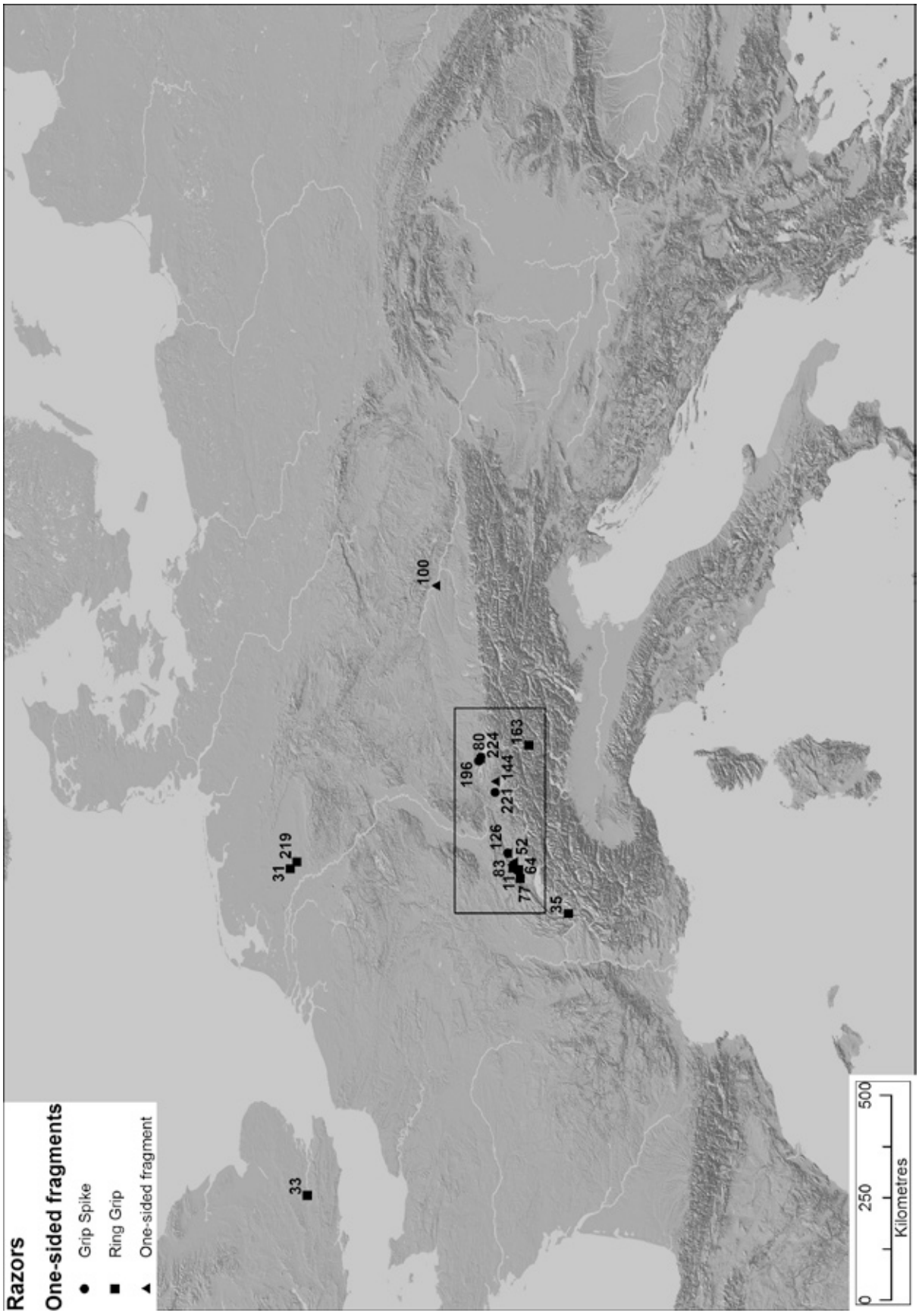
No.	Site	Qty	Country	References
2	Allendorf	1	D	(Jockenhövel 1971)
11	Auvernier	1	CH	(Jockenhövel 1971)
17	Bayerisch Gmain	1	D	(Jockenhövel 1971)
77	Grandson-Corcelettes	3	CH	(Jockenhövel 1971)
110	Lingen	1	NL	(Jockenhövel 1980)
126	Mörigen	1	CH	(Jockenhövel 1971)
138	Ohnhülben	1	D	(Jockenhövel 1971)
221	Zürich-Alpenquai	2	CH	(Jockenhövel 1971; Mäder 2001a)



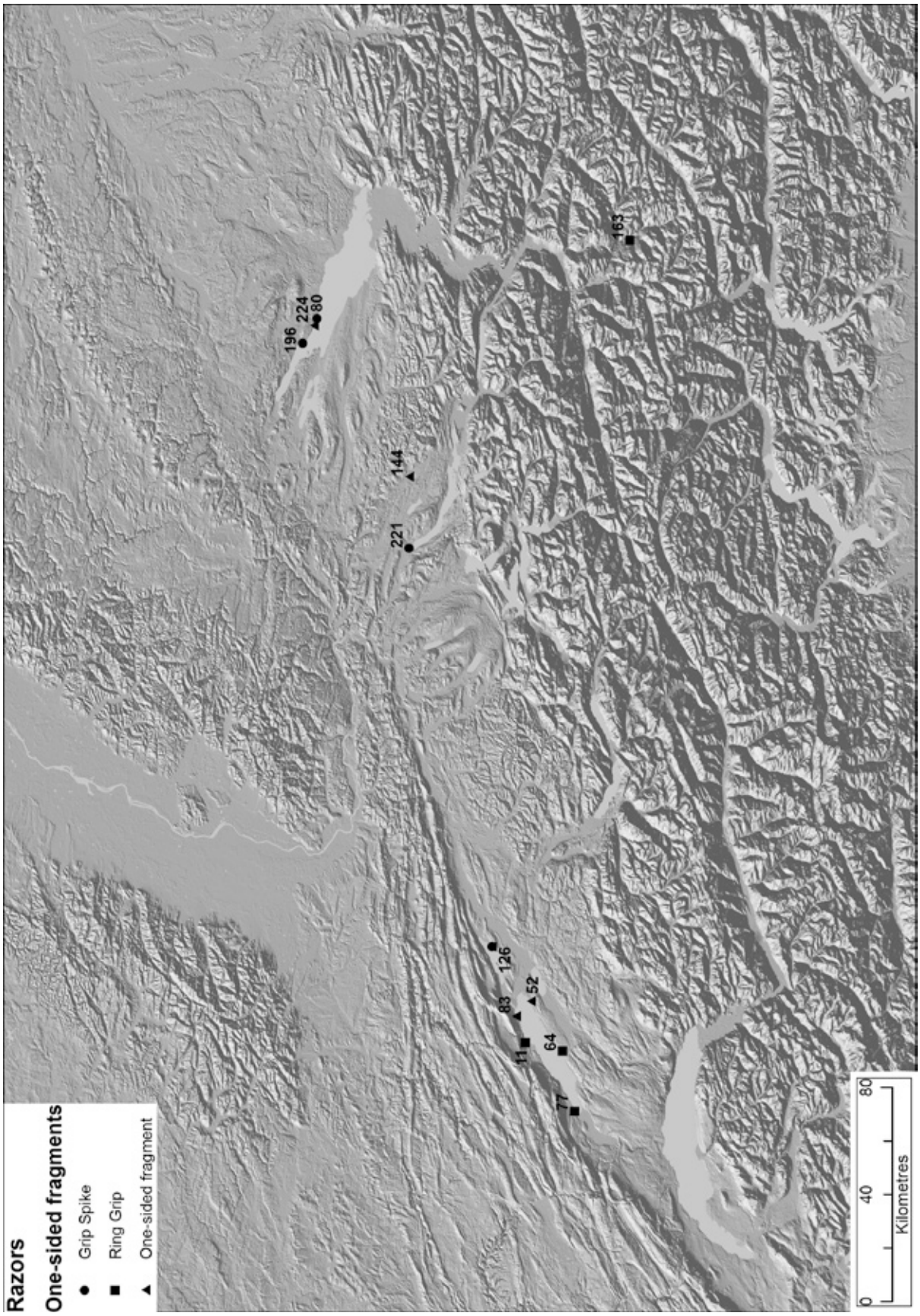
Map 58: Distribution of the *Allendorf* type LBA razor.

Maps 59 & 60

No.	Site	Qty	Country	References
One-sided fragments				
52	Cudrefin	1	CH	(Jockenhövel 1971)
83	Hauterive-Champréveyres	6	CH	(Rychner-Faraggi 1993)
100	Künzing	1	D	(Schopper 1995)
126	Mörigen	1	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
144	Pfäffikon	1	CH	(Altorfer 2010; Hauser-Fischer 1990; Jockenhövel 1971)
224	Haltnau	1	D	(Jockenhövel 1971)
Grip Spike un-typed				
80	Hagnau	1	D	(Schöbel 1996)
126	Mörigen	3	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
196	Unteruhldingen	3	D	(Schöbel 1996)
221	Zürich-Alpenquai	1	CH	(Künzler Wagner 2005)
Ring Grip un-typed				
11	Auvernier	2	CH	(Jockenhövel 1971)
31	Borken/Gemen	1	D	(Jockenhövel 1980)
33	Brentford	1	UK	(Jockenhövel 1980)
35	Brison - St. Innocent	1	FR	(Jockenhövel 1980)
64	Estavayer-le-Lac	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	1	CH	(Jockenhövel 1971)
163	Salouf	1	CH	(Jockenhövel 1971)
219	Wulfen/Sölten	1	D	(Jockenhövel 1980)



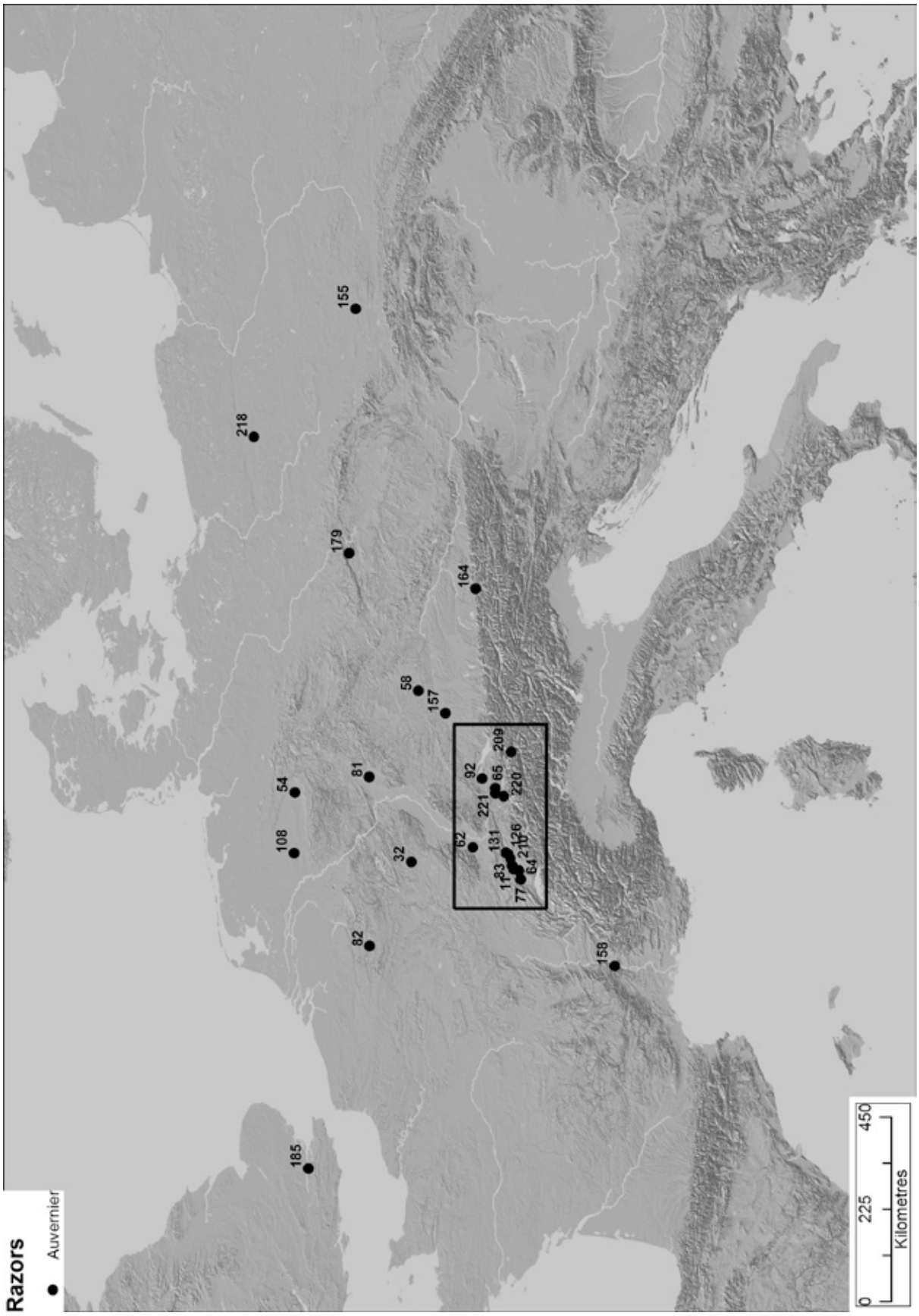
Map 59: European distribution of un-typed and fragments of HaB one-sided razors. For inset region see Map 60.



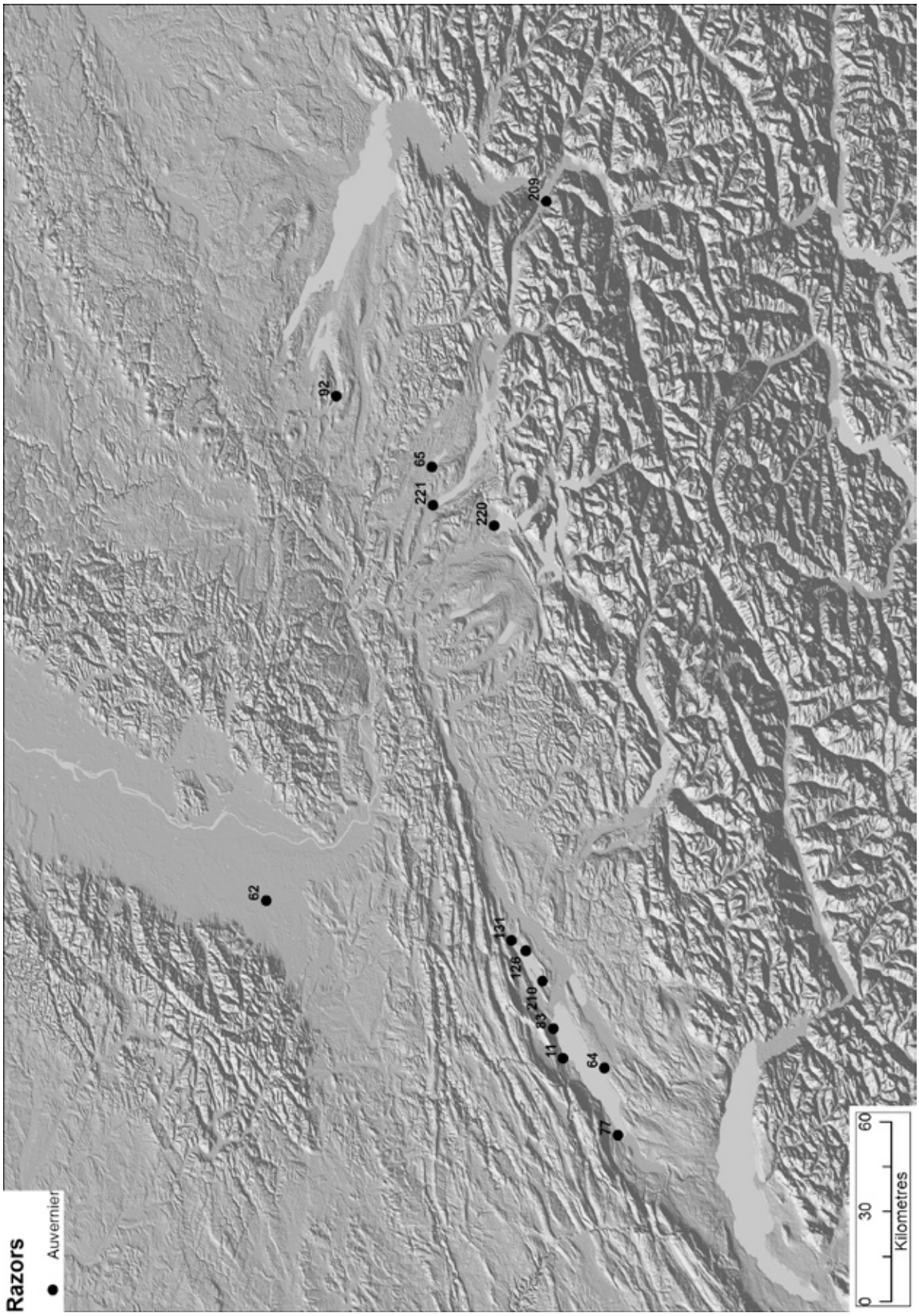
Map 60: Distribution of un-typed and fragments of HaB one-sided razors in the northern Circum-Alpine region.

Maps 61 & 62 (locations/lakes marked with * have no further context information available).

No.	Site	Qty	Country	References
11	Auvernier	5	CH	(Jockenhövel 1971; Rychner 1979)
32	Brebach-Fechingen	1	D	(Jockenhövel 1980)
54	Delbrück	1	D	(Jockenhövel 1980)
58	Dittenheim	1	D	(Jockenhövel 1971)
62	Ensisheim	1	FR	(Jockenhövel 1980)
64	Estavayer-le-Lac	2	CH	(Jockenhövel 1971)
65	Fällanden-Rietspitz	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	3	CH	(Jockenhövel 1971)
81	Hanau	2	D	(Jockenhövel 1971)
82	Han-sur-Lesse	2	BE	(Jockenhövel 1980)
83	Hauterive-Champréveyres	1	CH	(Jockenhövel 1971; Rychner-Faraggi 1993)
92	Eschenz-Insel Werd	1	CH	(Jockenhövel 1971)
108	Lehmbraken	1	D	(Jockenhövel 1980)
126	Mörigen	10	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
131	Nidau-Steinberg	3	CH	(Jockenhövel 1971)
155	Przeczyce	1	PL	(Gedl 1981)
157	Reisensburg	1	D	(Jockenhövel 1971)
158	Rhône Valley*	1	FR	(Jockenhövel 1980)
164	Salzburg	1	AT	(Jockenhövel 1971)
179	Svetec	1	CZ	(Jockenhövel 1971)
185	Thames Valley*	1	UK	(Jockenhövel 1980)
209	Vilters	1	CH	(Jockenhövel 1971)
210	Vinelz	1	CH	(Gross, E 1984)
218	Wierzchocin	1	PL	(Gedl 1981)
220	Zug-Sumpf	1	CH	(Jockenhövel 1971)
221	Zürich-Alpenquai	1	CH	(Jockenhövel 1971; Mäder 2001a)



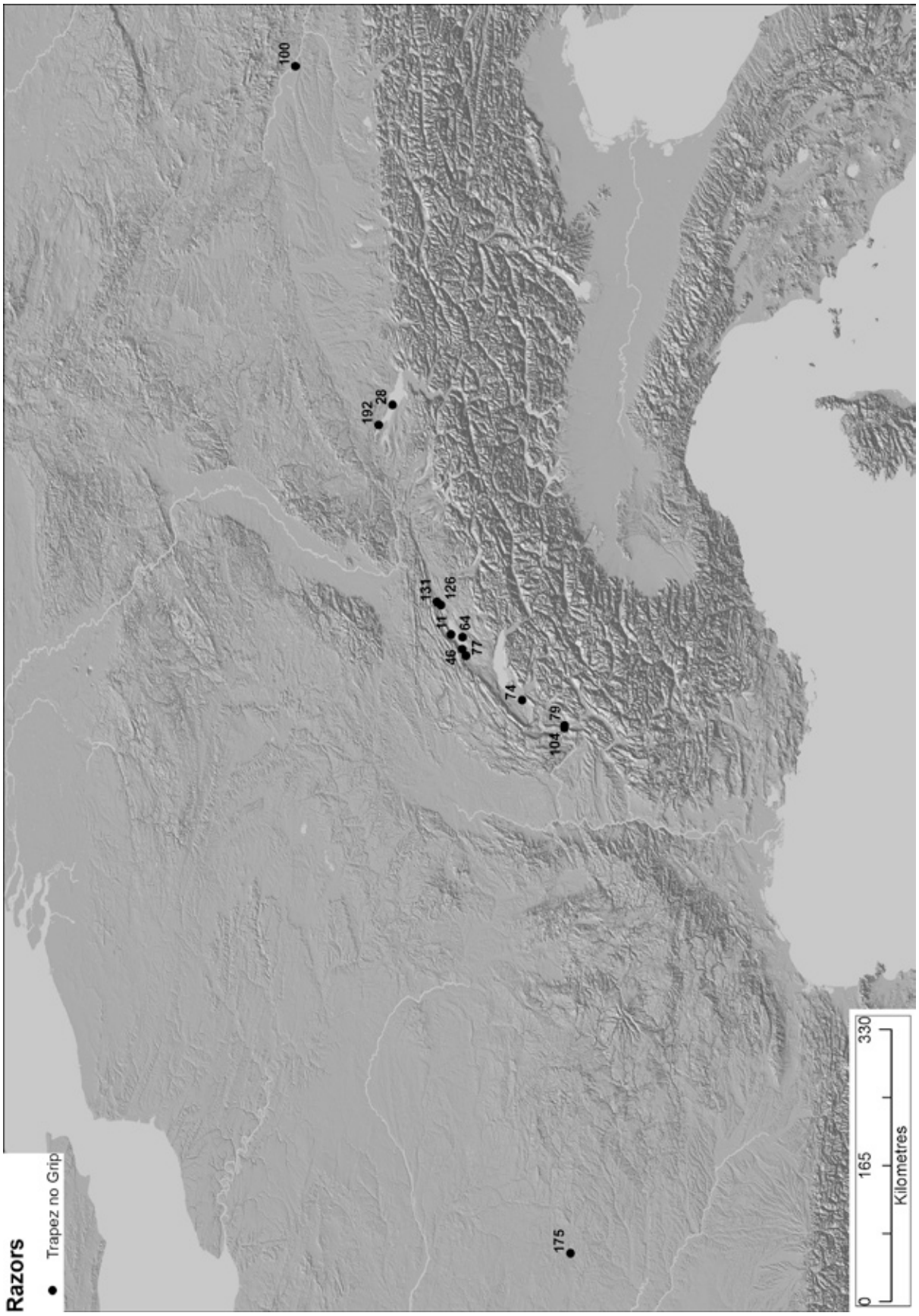
Map 61: European distribution of the *Auvernier* type LBA razor. For inset region see Map 62.



Map 62: Distribution of the *Auvernier* type razor in western Switzerland.

Map 63 (locations/lakes marked with * have no further context information available).

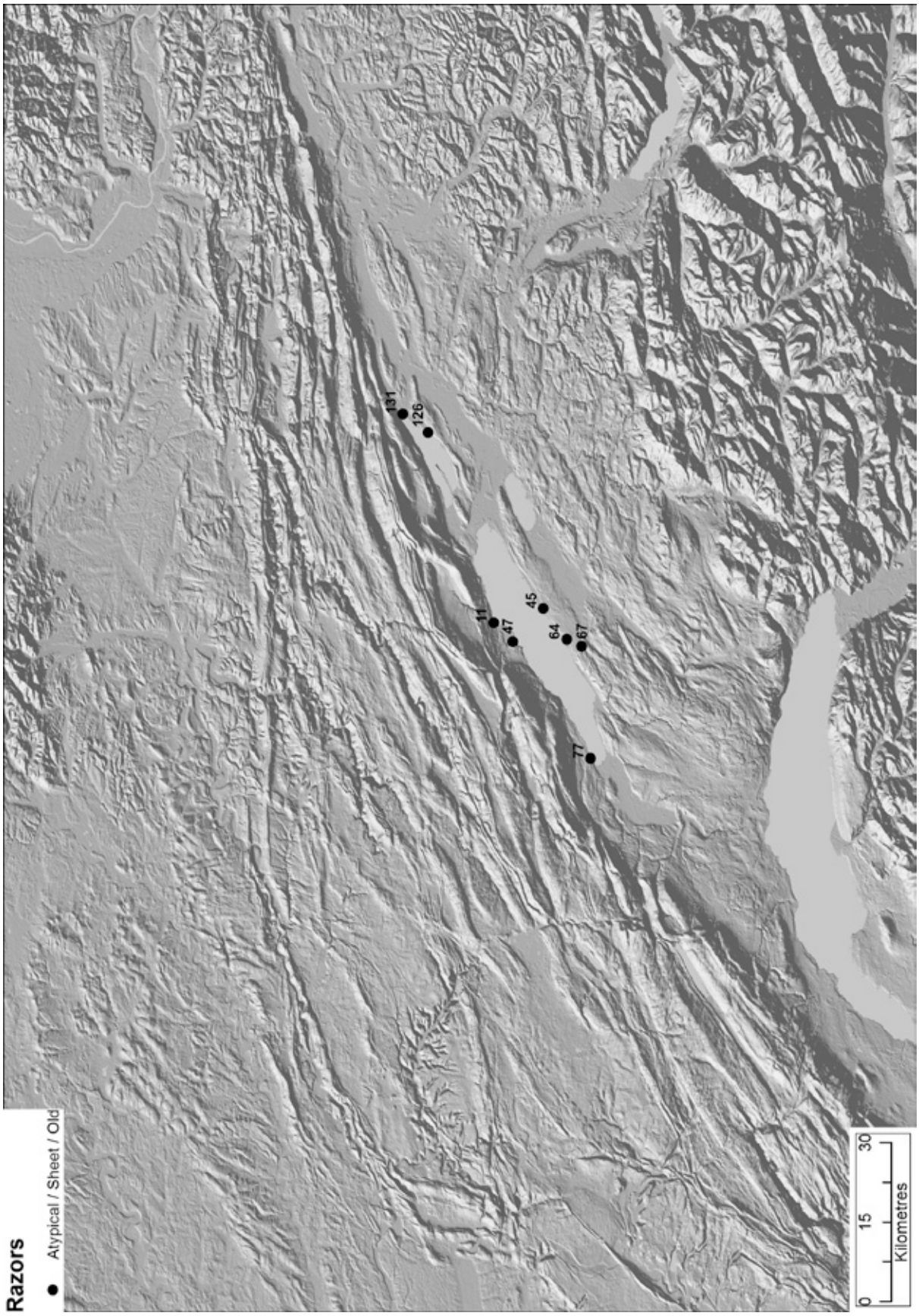
No.	Site	Qty	Country	References
11	Auvernier	3	CH	(Jockenhövel 1971; Rychner 1979)
28	Bodensee*	1	D	(Jockenhövel 1971)
46	Concise	1	CH	(Jockenhövel 1971)
64	Estavayer-le-Lac	3	CH	(Jockenhövel 1971)
74	Genève-Eaux Vives	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	9	CH	(Jockenhövel 1971)
79	Grésine	8	FR	(Jockenhövel 1980)
100	Künzing	1	D	(Schopper 1995)
104	Lake Bourget*	2	FR	(Jockenhövel 1980)
126	Mörigen	6	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
131	Nidau-Steinberg	2	CH	(Jockenhövel 1971)
175	St. Yrieix	1	FR	(Jockenhövel 1980)
192	Überlingen	1	D	(Schöbel 1996)



Map 63: European distribution of Trapezoid razors without handle.

Map 64

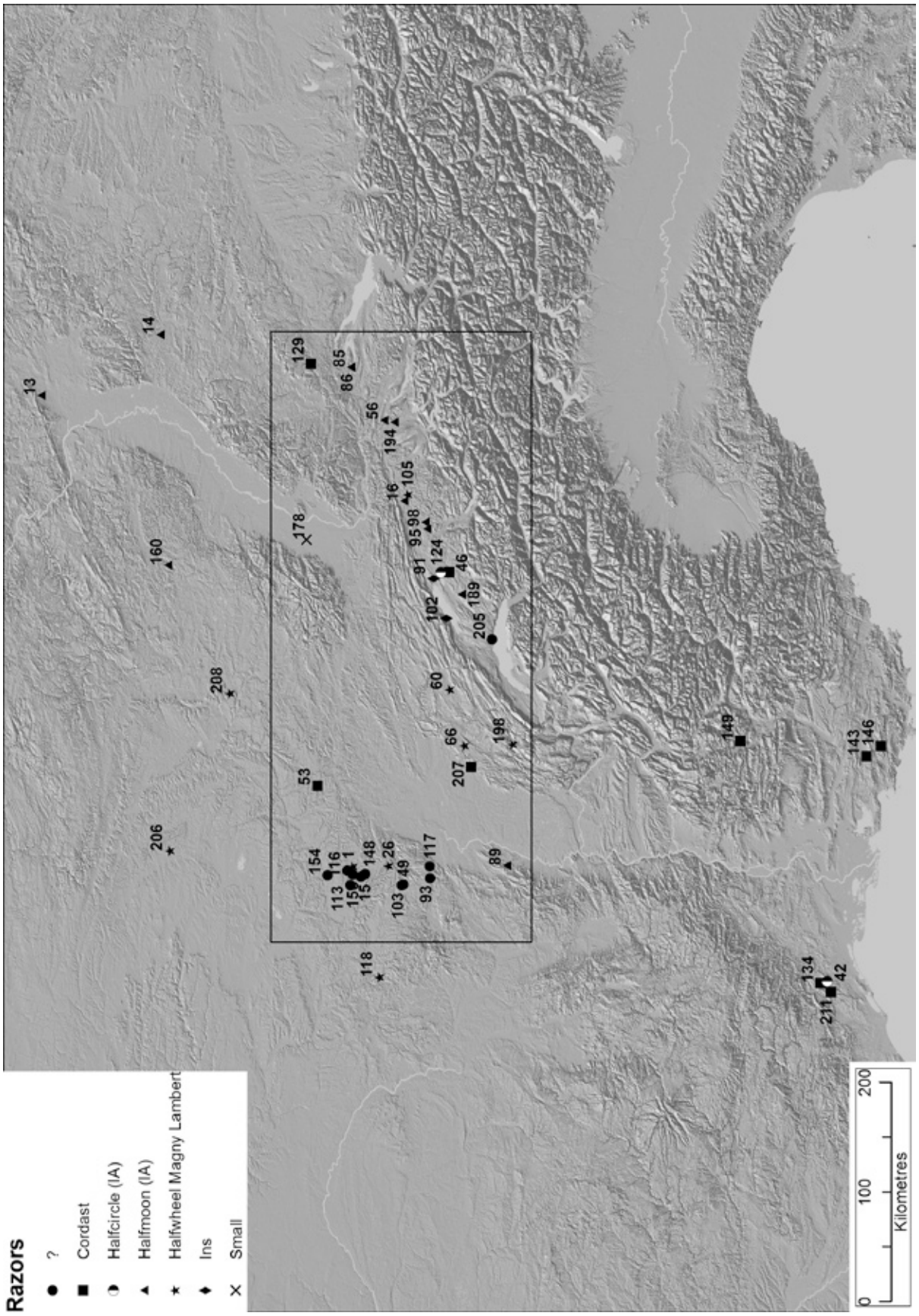
No.	Site	Qty	Country	References
11	Auvernier	1	CH	(Jockenhövel 1971)
45	Chevroux	1	CH	(Jockenhövel 1971)
47	Cortaillod	1	CH	(Jockenhövel 1971)
64	Estavayer-le-Lac	2	CH	(Jockenhövel 1971)
67	Font	1	CH	(Jockenhövel 1971)
77	Grandson-Corcelettes	3	CH	(Jockenhövel 1971)
126	Mörigen	5	CH	(Bernatzky-Goetze 1987; Jockenhövel 1971)
131	Nidau-Steinberg	2	CH	(Jockenhövel 1971)



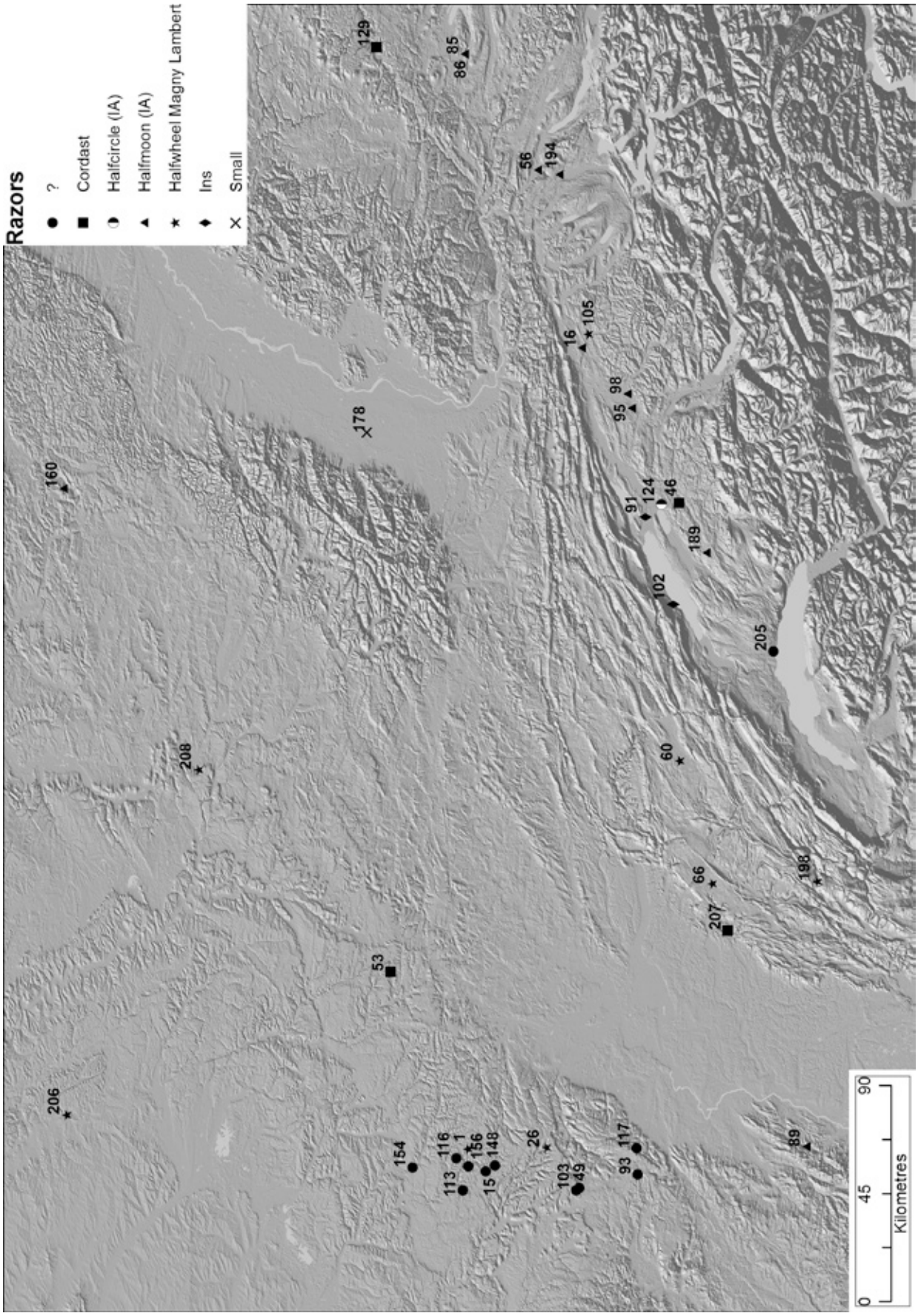
Map 64: Distribution of un-typed and atypical razor forms in western Switzerland.

Maps 65 & 66

No.	Site	Qty	Country	References
Un-typed (?)				
15	Baigneux-les-Juifs	1	FR	(Gerdsen 1986)
49	Créancey	1	FR	(Gerdsen 1986)
93	Ivry-en-Montagne	1	FR	(Gerdsen 1986)
103	La Roche Pot	1	FR	(Gerdsen 1986)
113	Magny-Lambert	6	FR	(Gerdsen 1986)
116	Mauvilly	1	FR	(Gerdsen 1986)
117	Meloisey	1	FR	(Gerdsen 1986)
148	Poiseul-la-Ville-et-Laperrière	3	FR	(Gerdsen 1986)
154	Prusly-sur-Ource	1	FR	(Gerdsen 1986)
156	Quemigny-sur-Seine	2	FR	(Gerdsen 1986)
205	Vidy-Chavannes	1	CH	(Moinat and David-Elbiali 2003)
Cordast				
46	Cordast	1	CH	(Jockenhövel 1971)
53	Dampièrre	1	FR	(Jockenhövel 1980)
129	Nendingen	1	D	(Jockenhövel 1971)
134	Notre-Dame-de-Londres	2	FR	(Jockenhövel 1980)
143	Peynier	1	FR	(Jockenhövel 1980)
146	Plan-d'Aups	1	FR	(Jockenhövel 1980)
149	Pont-de-Chabestan	2	FR	(Jockenhövel 1980)
207	Villeneuve-sous-Pymont	1	FR	(Jockenhövel 1980)
211	Viols-le-Fort	2	FR	(Jockenhövel 1980)
Halfcircle (IA)				
42	Cazevieille	1	FR	(Gerdsen 1986)
124	Morat Löwenberg	1	CH	(Boisaubert and Bugnon 2008)
Halfmoon (IA)				
13	Bad Homburg	1	D	(Gerdsen 1986)
14	Bad Rappenau	1	D	(Gerdsen 1986)
16	Bannwil	1	CH	(Drack 1973b)
56	Dietikon	1	CH	(Drack 1973b)
85	Hemishofen	1	CH	(Drack 1973b)
86	Hemishofen	1	CH	(Drack 1973b)
89	Igé	1	FR	(Gerdsen 1986)
95	Jegenstorf	1	CH	(Drack 1973b)
98	Kernenried, Oberholz	1	CH	(Ramstein 2012)
160	Rubenheim	1	D	(Gerdsen 1986)
189	Torny-le-Grand	1	CH	(Drack 1973b; Jockenhövel 1971)
194	Unterlunkhofen	1	CH	(Drack 1973b)
Halfwheel Magny Lambert				
1	Aignay-le-Duc	1	FR	(Jockenhövel 1980)
26	Blaisy-Bas	1	FR	(Jockenhövel 1980)
42	Cazevieille	1	FR	(Jockenhövel 1980)
60	Dompierre-les-Tilleuls	1	FR	(Jockenhövel 1980)
66	Fay-en-Montagne	1	FR	(Jockenhövel 1980)
105	Langenthal	1	CH	(Drack 1973b; Jockenhövel 1971)
113	Magny-Lambert	2	FR	(Jockenhövel 1980)
118	Ménades	1	FR	(Jockenhövel 1980)
198	Vaux-les-Saint-Claude	1	FR	(Jockenhövel 1980)
206	Vienne-la-Ville	1	FR	(Jockenhövel 1980)
208	Villers-les-Nancy	1	FR	(Jockenhövel 1980)
Ins				
72	Gdansk	1	PL	(Gedl 1981)
76	Gorszewice	1	PL	(Gedl 1981)
91	Ins	1	CH	(Drack 1973b; Jockenhövel 1971)
102	La Béroche	1	CH	(Drack 1973b; Jockenhövel 1971)
Small				
178	Sundhoffen	1	FR	(Gerdsen 1986)



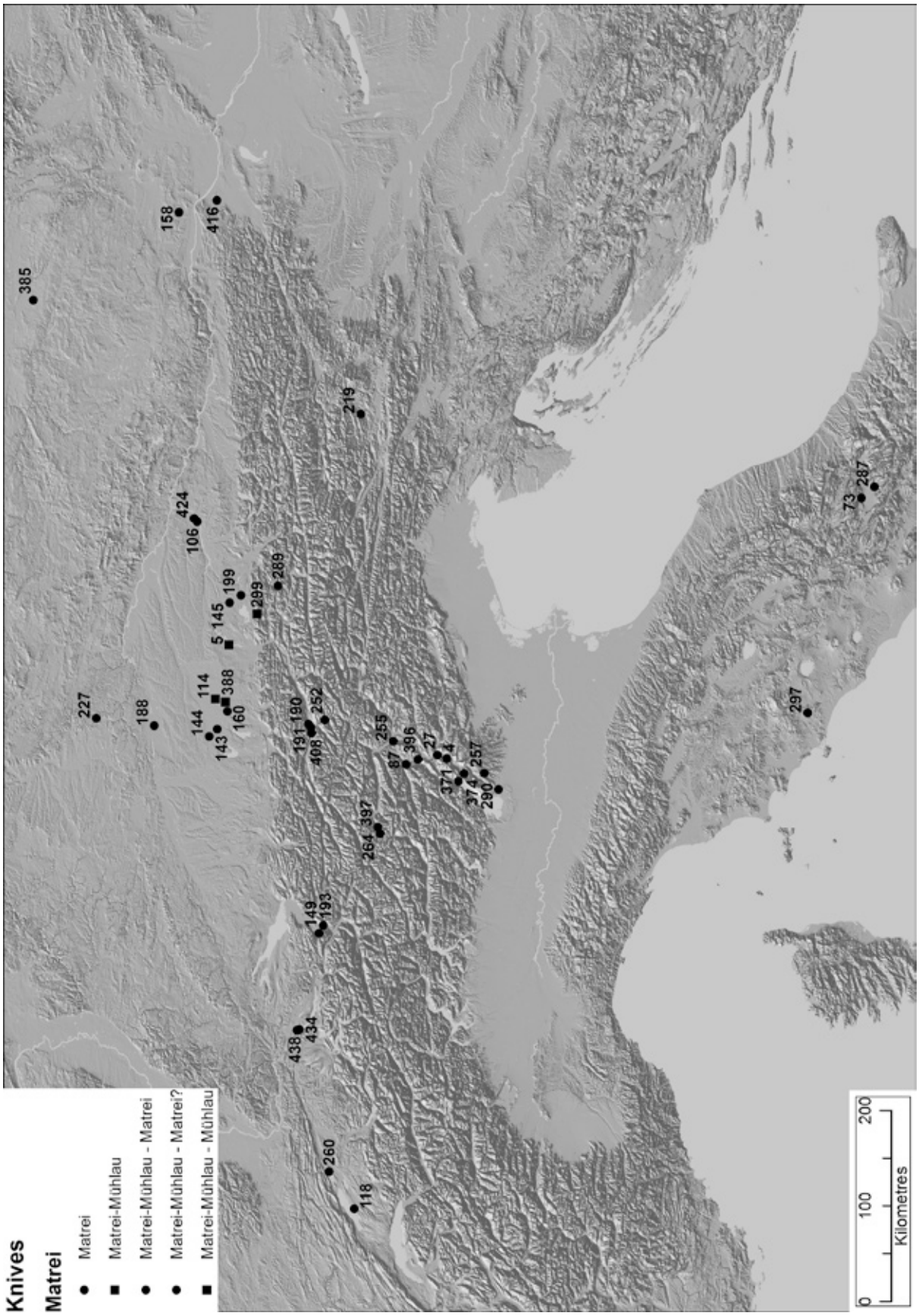
Map 65: Distribution of Iron Age razors. For inset region see Map 66.



Map 66: Distribution of Iron Age razors in Central Europe.

Map 67

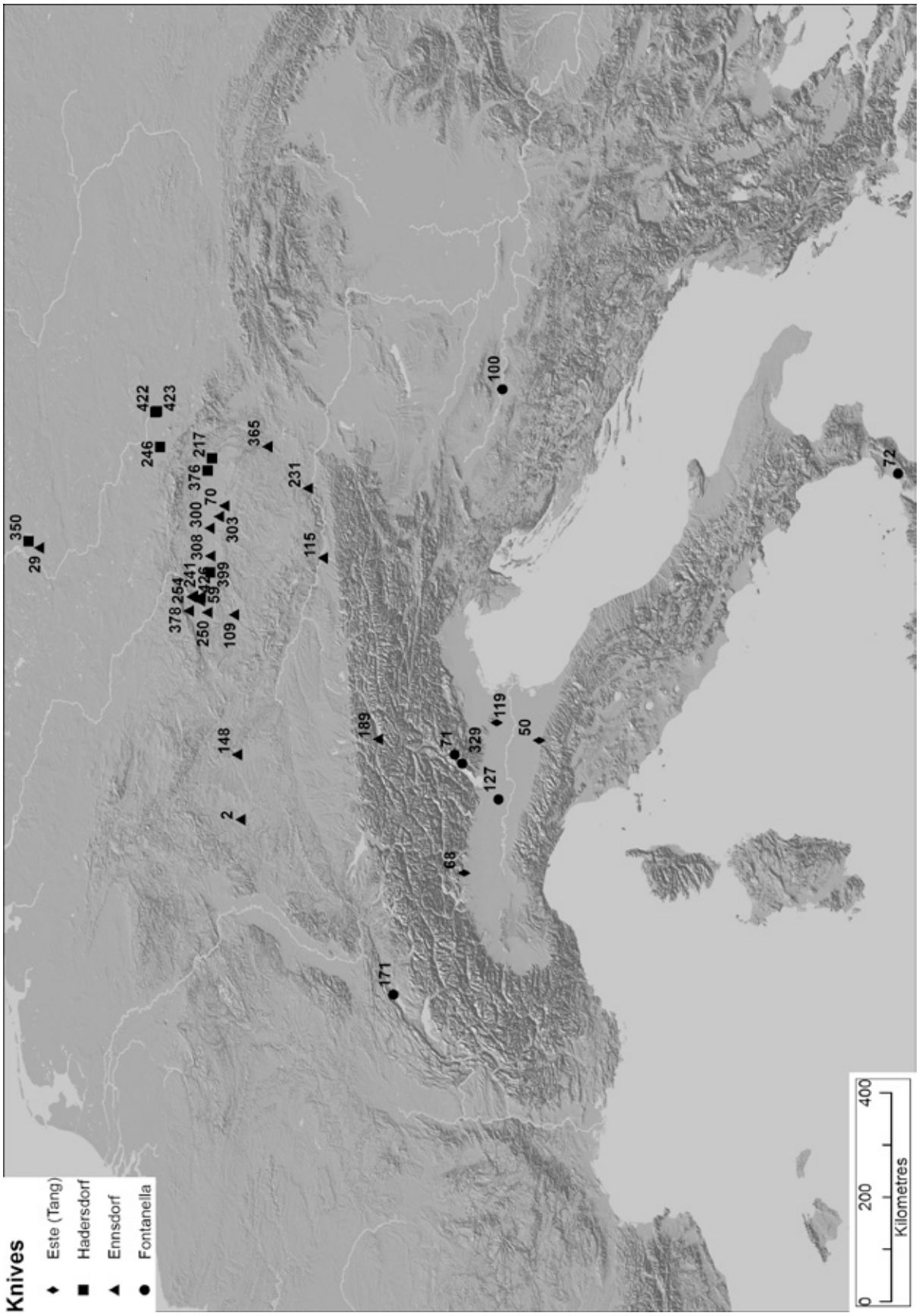
No.	Site	Qty	Country	References
Matrei				
4	Aldeno	1	IT	(Bianco Peroni 1976)
27	Banco (Trento)	1	IT	(Bianco Peroni 1976)
73	Celano	2	IT	(Bianco Peroni 1976)
87	Cles	1	IT	(Bianco Peroni 1976)
106	Egglfing	1	D	(Hansen, S 1994)
118	Estavayer-le-Lac	1	CH	(Bernatzky-Goetze 1987; Vogt 1952)
149	Grabs	1	CH	(Rychner and Kläntschi 1995)
158	Großmugl	1	AT	(Hansen, S 1994)
193	Iragell, Vaduz	1	LI	(Hansen, S 1994)
219	Kraig	1	AT	(Říhovský 1972)
252	Matrei	1	AT	(Hansen, S 1994)
255	Missiano	1	IT	(Bianco Peroni 1976)
257	Monte Tesoro	1	IT	(Bianco Peroni 1976)
260	Mörigen	2	CH	(Bernatzky-Goetze 1987)
264	Münstertal	1	CH	(Hansen, S 1994)
287	Ortucchio	3	IT	(Bianco Peroni 1976)
289	Pass Luftenstein	1	AT	(Hansen, S 1994)
290	Pastrengo	1	IT	(Bianco Peroni 1976)
297	Piano di Tallone	1	IT	(Bianco Peroni 1976)
371	Torbole	1	IT	(Bianco Peroni 1976)
374	Tragno (Brentonico)	1	IT	(Bianco Peroni 1976)
385	Tupadly	1	CZ	(Jiráň 2002)
396	Val di Non	1	IT	(Bianco Peroni 1976)
416	Wien X	1	AT	(Říhovský 1972)
434	Zürich-Alpenquai	1	CH	(Bernatzky-Goetze 1987; Mäder 2001a)
438	Zürich-Limmat	2	CH	(Sperber 2004)
Matrei-Mühlau				
388	Unterhaching	1	D	(Hohlbein 2008a)
143	Germering	1	D	(Hohlbein 2008a)
144	Gernlinden	1	D	(Hohlbein 2008a)
145	Getzing	1	D	(Hohlbein 2008a)
188	Ingolstadt-Hundszell	1	D	(Hohlbein 2008a)
199	Kaltenbach	1	D	(Hohlbein 2008a)
227	Labersricht	1	D	(Hohlbein 2008a)
Matrei-Mühlau - Matrei?				
160	Grünwald	1	D	(Hohlbein 2008a)
190	Innsbruck-Mühlau	5	AT	(Wagner 1943)
191	Innsbruck-Wilten	2	AT	(Wagner 1943)
388	Unterhaching	1	D	(Hohlbein 2008a)
397	Val Mora	1	CH	(Société suisse de préhistoire 1932)
408	Völs bei Innsbruck	1	AT	(Wagner 1943)
424	Würding	1	D	(Hohlbein 2008a)
Matrei-Mühlau - Mühlau				
5	Allmannberg	1	D	(Hohlbein 2008a)
114	Englschalking	1	D	(Hohlbein 2008a)
299	Piesenhausen	1	D	(Hohlbein 2008a)



Map 67: Distribution of *Matrei-Mühlau* type knives.

Map 68

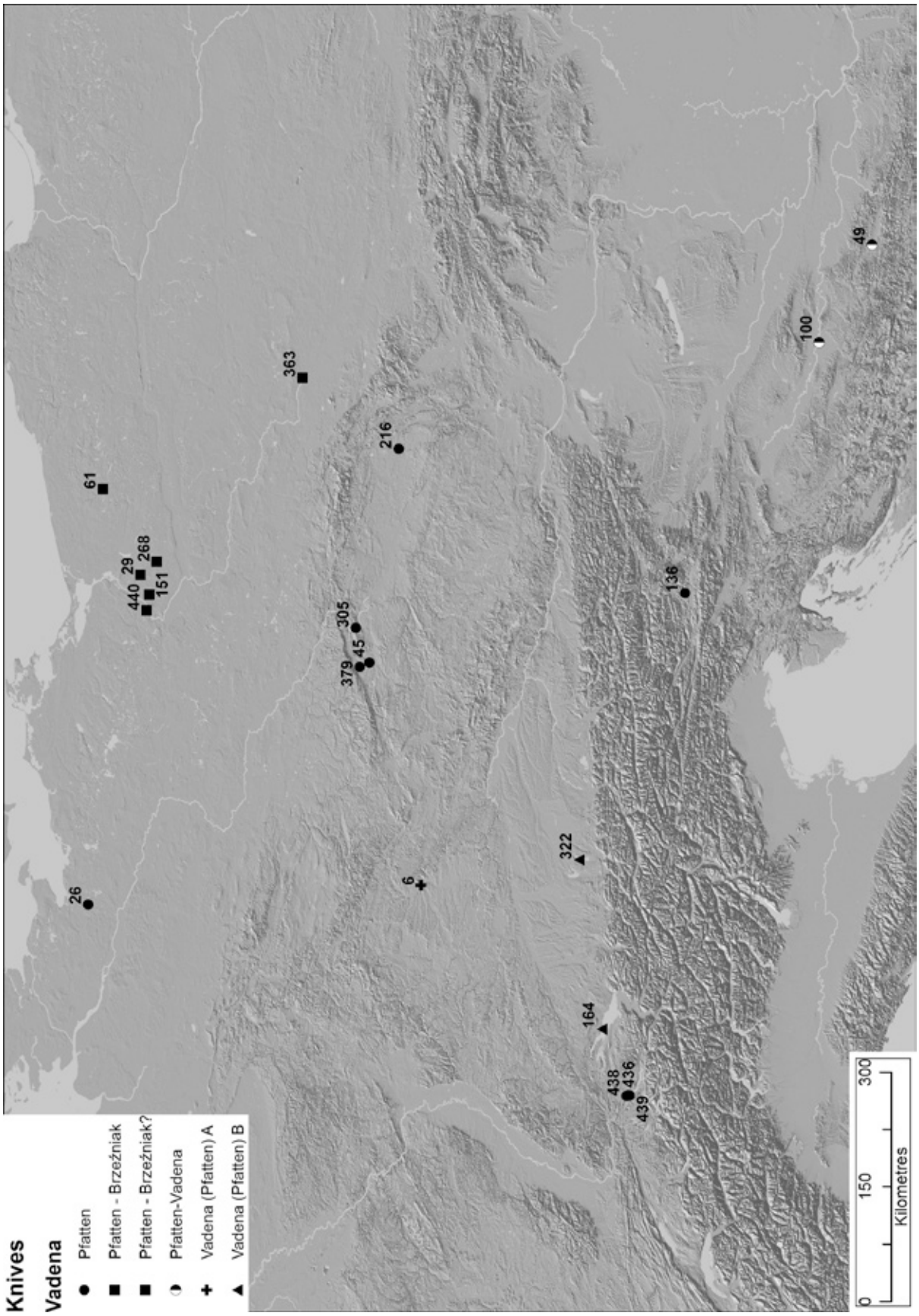
No.	Site	Qty	Country	References
Ennsdorf				
2	Acholshausen	1	D	(Jiráň 2002)
29	Banie	1	PL	(Gedl 1984)
59	Brloh	1	CZ	(Jiráň 2002)
70	Káslav	1	CZ	(Jiráň 2002; Tackenberg 1971)
109	Ejpovice	1	CZ	(Jiráň 2002)
115	Ennsdorf	1	AT	(Říhovský 1972)
148	Gosberg	1	D	(Jiráň 2002)
189	Innsbruck-Hötting I	1	AT	(Jiráň 2002)
231	Langenlois	1	AT	(Říhovský 1972)
241	Libceves	1	CZ	(Jiráň 2002)
250	Malá Cernoc	1	CZ	(Jiráň 2002)
254	Merunice	1	CZ	(Jiráň 2002)
300	Písty	1	CZ	(Jiráň 2002)
303	Polepy	1	CZ	(Jiráň 2002)
308	Praha-Cakovice	1	CZ	(Jiráň 2002)
365	Tetcice	1	CZ	(Říhovský 1972)
378	Trebušice	2	CZ	(Jiráň 2002)
426	Zemechy	1	CZ	(Jiráň 2002)
Este				
50	Bologna	1	IT	(Bianco Peroni 1976)
68	Ca' Morta	1	IT	(Bianco Peroni 1976)
119	Este	8	IT	(Bianco Peroni 1976)
Fontanella				
71	Castel Beseno	1	IT	(Bianco Peroni 1976)
72	Castellace	1	IT	(Bianco Peroni 1976)
100	Donja Dolina	1	BA	(Gavranović 2011)
127	Fontanella Grazioli	3	IT	(Bianco Peroni 1976)
171	Hauterive-Champréveyres	1	CH	(Rychner-Faraggi 1993)
374	Tragno (Brentonico)	1	IT	(Bianco Peroni 1976)
Hadersdorf				
217	Kostelec nad Orlicí	1	CZ	(Jiráň 2002)
246	Lusina	1	PL	(Gedl 1984)
350	Stare Czarnowo	1	PL	(Gedl 1984)
376	Trebechovice pod Orebem	1	CZ	(Jiráň 2002)
399	Velké Cícovice	1	CZ	(Sprockhoff 1956)
422	Wroclaw-Grabiszyn	2	PL	(Gedl 1984)
423	Wroclaw-Wojszyce	1	PL	(Gedl 1984)



Map 68: Distribution of *Fontanella*, *Hadersdorf*, *Ennsdorf* and *Este* (tang) type knives.

Map 69

No.	Site	Qty	Country	References
Pfatten				
26	Bäk	1	D	(Prüssing, P 1982)
45	Blažim	1	CZ	(Jiráň 2002)
136	Freudenberg	1	AT	(Říhovský 1972)
216	Korunka Jelení	1	CZ	(Jiráň 2002)
305	Porta Bohemica	1	CZ	(Jiráň 2002)
379	Trebušice	1	CZ	(Jiráň 2002)
436	Zürich-Grosser-Hafner	1	CH	(Primas and Ruoff 1981)
438	Zürich-Limmat	1	CH	(Sperber 2004)
439	Zürich-Wollishofen	1	CH	(Sperber 2004)
Pfatten Brzezniak				
29	Banie	1	PL	(Gedl 1984)
61	Brzezniak	1	PL	(Gedl 1984)
151	Graniczna	1	PL	(Gedl 1984)
268	Nawrocko	1	PL	(Gedl 1984)
Pfatten Brzezniak?				
363	Swiniary	1	PL	(Gedl 1984)
440	Zützen	2	D	(Gedl 1984; Sprockhoff 1937)
Pfatten Vadena				
49	Bokavic	1	BA	(König 2004)
100	Donja Dolina	1	BA	(Gavranović 2011)
Vadena (Pfatten) A				
6	Altendorf	1	D	(Hohlbein 2008b)
Vadena (Pfatten) B				
164	Hagnau-Burg	1	D	(Hohlbein 2008b; Schöbel 1996)
322	Roseninsel	1	D	(Hohlbein 2008b)

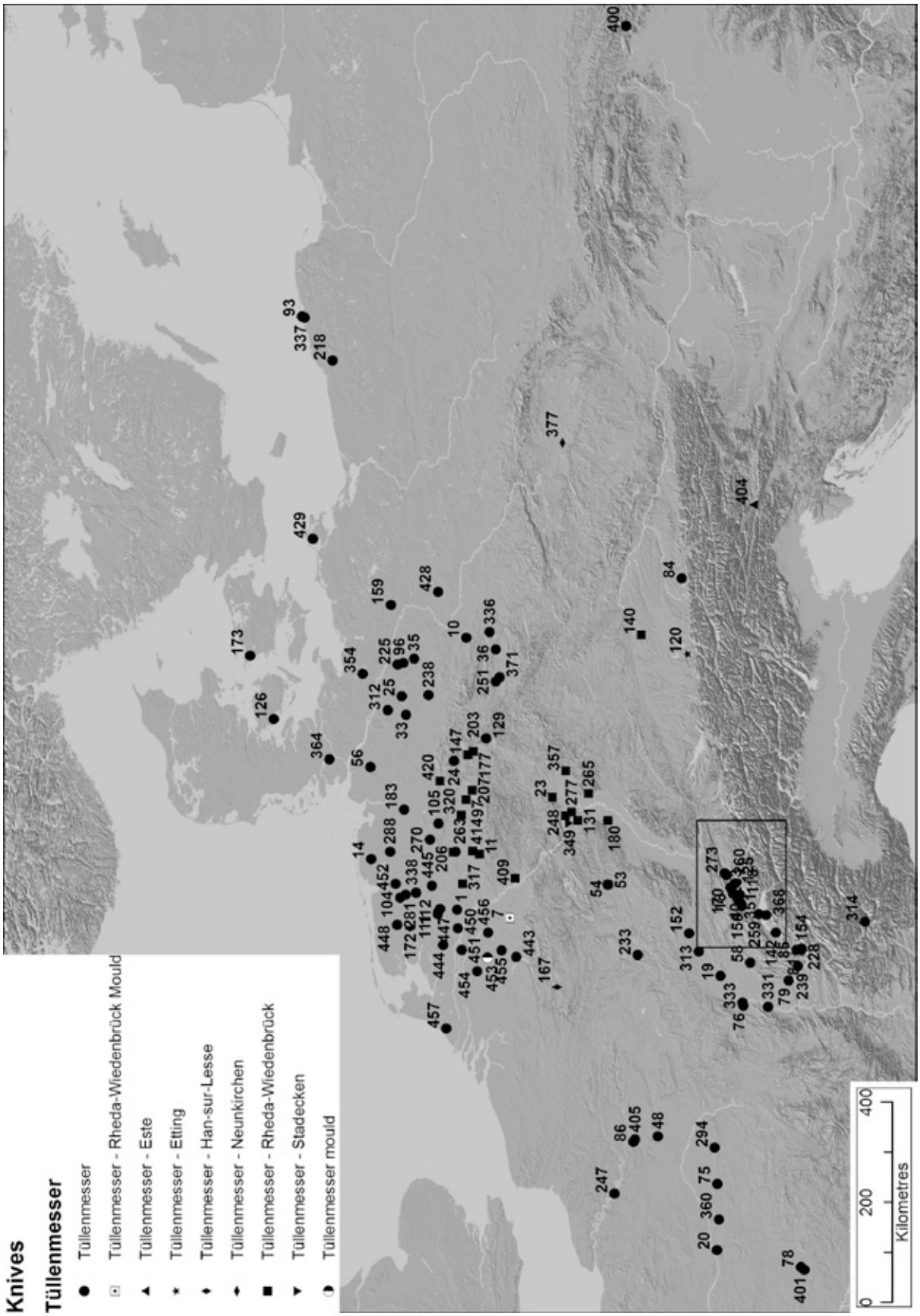


Map 69: Distribution of *Pfatten* type knives.

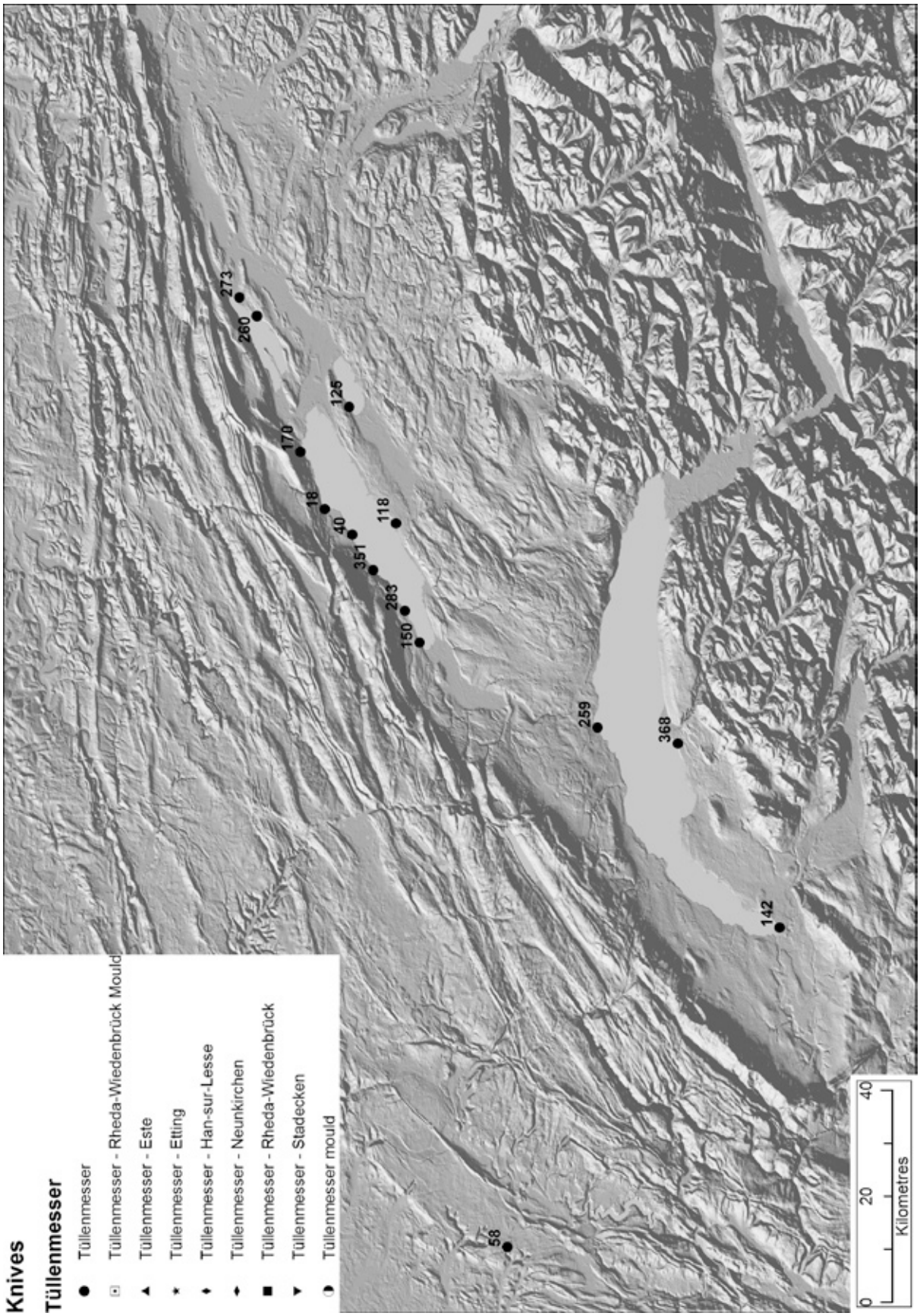
Maps 70 & 71 (locations/lakes marked with * have no further context information available).

No.	Site	Qty	Country	References
Tüllenmesser				
1	Aalten	1	NL	(Sprockhoff 1956)
10	Aschersleben	1	D	(Sprockhoff 1956)
14	Aurich	1	D	(Prüssing, P 1982; Sprockhoff 1956)
18	Auvernier-Nord	2	CH	(Rychner 1979; Thrane 1972)
19	Auxonne	1	FR	(Thrane 1972)
20	Azay-le-Rideau	1	FR	(Thrane 1972)
24	Bad Pyrmont	1	D	(Prüssing, P 1982)
25	Bahnsen	1	D	(Prüssing, P 1982; Sprockhoff 1956)
33	Baven	1	D	(Prüssing, P 1982)
35	Beetzendorf	1	D	(Sprockhoff 1956)
36	Beichlingen	1	D	(Sprockhoff 1956)
40	Bevaix	1	CH	(Thrane 1972)
48	Boissy aux Cailles	1	FR	(Thrane 1972)
53	Brebach	1	D	(Thrane 1972)
56	Bremervörde	1	D	(Prüssing, P 1982)
58	Briod	1	FR	(Thrane 1972)
75	Chabris	1	FR	(Cordier and Bourhis 1996)
76	Chalon-sur-Saône	1	FR	(Thrane 1972)
78	Charente	1	FR	(Thrane 1972)
79	Château-Gaillard	1	FR	(Thrane 1972)
84	Chieming	1	D	(Thrane 1972)
85	Chindrieux-Châtillon	1	FR	(Billaud 2013)
86	Choisy-le-Roi	1	FR	(Gaucher 1981)
93	Czolpino	1	PL	(Gedl 1984)
96	Darsekau	1	D	(Sprockhoff 1956)
104	Drouwen	1	NL	(Butler *et al.* 2012; Butler and Steegstra 2005)
105	Düstrup	1	D	(Prüssing, P 1982; Sprockhoff 1956)
111	Elsenerveen	1	NL	(Butler *et al.* 2012; Butler and Steegstra 2005)
112	Elzen	1	NL	(Sprockhoff 1956)
118	Estavayer-le-Lac	1	CH	(Thrane 1972)
125	Ferrages/Vallamand	1	CH	(Thrane 1972)
126	Flenstofte	1	DK	(Sprockhoff 1956; Thrane 1972)
129	Forst Kattenbühl	2	D	(Sprockhoff 1956)
142	Genève-Eaux Vives	4	CH	(Rychner and Kläntschi 1995)
150	Grandson-Corcelettes	1	CH	(Colomb and Muyden 1896; Thrane 1972)
152	Grasere	1	FR	(Thrane 1972)
154	Grésine	2	FR	(Kerouanton 2002; Thrane 1972)
159	Groß-Pankow	1	D	(Sprockhoff 1956)
170	Hauterive	1	CH	(Thrane 1972)
173	Hedvigslyst	1	DK	(Butler. *et al.* 2012; Sprockhoff 1956)
183	Holzhausen	1	D	(Prüssing, P 1982)
203	Kattenbühl	2	D	(Prüssing, P 1982)
218	Kösternitz (Kosciernica)	1	PL	(Gedl 1984; Sprockhoff 1956)
225	Kukate	1	D	(Prüssing, P 1982; Sprockhoff 1956)
228	Lake Bourget*	28	FR	(Kerouanton 2002)
233	Lay-Saint-Remy	1	FR	(Reboul and Millotte 1975)
238	Leiferde	1	D	(Prüssing, P 1982; Sprockhoff 1956)
239	L'Epineuse	1	FR	(Kimmig 1954)
247	Macon Ile St. Jean	1	FR	(Thrane 1972)
251	Marolterode	1	D	(Sprockhoff 1956)
259	Morges-Grand Cité	1	CH	(Butler *et al.* 2012; Fischer, V 2012; Thrane 1972)
260	Mörigen	3	CH	(Bernatzky-Goetze 1987; Thrane 1972)
263	Münster	1	D	(Thrane 1972)
270	Neuenkirchen	1	D	(Prüssing, P 1982)
273	Nidau	1	CH	(Thrane 1972)
281	Odoorn	1	NL	(Sprockhoff 1956)
283	Onnens	1	CH	(Colomb and Muyden 1896; Thrane 1972)
288	Ostrhauderfehn	1	D	(Prüssing, P 1982; Sprockhoff 1956)
294	Petit Villatte	2	FR	(Cordier and Bourhis 1996; Thrane 1972)
312	Raven	1	D	(Sprockhoff 1956)
313	Ray-sur-Saône	1	FR	(Thrane 1972)
314	Réallon	1	FR	(Audouze and Courtois 1970; Thrane 1972)
331	Sancé	1	FR	(Thrane 1972)
333	Saône	1	FR	(Thrane 1972)
336	Schmon	1	D	(Götze *et al.* 1909; Sprockhoff 1956)
337	Scholpin (Smoldzino)	1	PL	(Gedl 1984; Sprockhoff 1956)
338	Schoonebeek	2	NL	(Butler *et al.* 2012; Butler and Steegstra 2005; Sprockhoff 1956)

351	St-Aubin	1	CH	(Thrane 1972)
354	Sterley	1	D	(Prüssing, P 1982; Sprockhoff 1956)
360	Sublaines	1	FR	(Cordier 1985; Thrane 1972)
364	Tellingstedt	1	D	(Prüssing, P 1982)
368	Thonon-les-Bains	1	FR	(Thrane 1972)
371	Tottleben	1	D	(Sprockhoff 1956)
400	Velky Berezny	1	UA	(Thrane 1972)
401	Vénat	4	FR	(Coffyn *et al.* 1981)
405	Villeneuve St. Georges	1	FR	(Thrane 1972)
428	Ziesar	1	D	(Sprockhoff 1956)
429	Zubzow	1	D	(Sprockhoff 1956)
443	Amby	1	NL	(Butler *et al.* 2012)
444	Bruggelen	1	NL	(Butler *et al.* 2012)
445	Denekamp	1	NL	(Butler *et al.* 2012)
447	Goor	1	NL	(Butler *et al.* 2012)
448	Haule/Weper	1	NL	(Butler *et al.* 2012)
450	Montferland	1	NL	(Butler *et al.* 2012)
451	Nijmegen	1	NL	(Butler *et al.* 2012)
452	Onstwedde	1	NL	(Butler *et al.* 2012)
454	St. Oedenrode	1	NL	(Butler *et al.* 2012)
455	Stevensweert	1	NL	(Butler *et al.* 2012)
456	Venlo	1	NL	(Butler *et al.* 2012)
457	Voorschoten	1	NL	(Butler *et al.* 2012)
Rheda-Wiedenbrück				
11	Asseln	1	D	(Hohlbein 2008a)
23	Bad Homburg	1	D	(Hohlbein 2008a; Thrane 1972)
54	Brebach-Fechingen	1	D	(Hohlbein 2008a)
97	Delbrück	1	D	(Hohlbein 2008a; Sprockhoff 1956)
131	Framersheim	1	D	(Hohlbein 2008a)
140	Gambach - Friedberg	1	D	(Hohlbein 2008a; Thrane 1972)
147	Godelheim	1	D	(Hohlbein 2008a; Sprockhoff 1956)
177	Herstelle	1	D	(Hohlbein 2008a; Sprockhoff 1956)
180	Hochstadt	2	D	(Butler *et al.* 2012; Hohlbein 2008a; Thrane 1972)
206	Kinderhaus	1	D	(Hohlbein 2008a)
207	Kirchborchen	1	D	(Hohlbein 2008a)
248	Mainz	1	D	(Hohlbein 2008a)
265	Nächstenbach-Weinheim	1	D	(Hohlbein 2008a; Thrane 1972)
277	Nierstein	1	D	(Hohlbein 2008a)
317	Reken	1	D	(Hohlbein 2008a; Sprockhoff 1956)
320	Rheda	1	D	(Hohlbein 2008a; Sprockhoff 1956)
357	Stockstadt	1	D	(Hohlbein 2008a)
409	Wahn	1	D	(Hohlbein 2008a; Thrane 1972)
414	Werne	1	D	(Hohlbein 2008a; Sprockhoff 1956)
420	Wittenhusen	1	D	(Hohlbein 2008a; Sprockhoff 1956)
Este				
404	Villach	1	AT	(Říhovský 1972; Thrane 1972)
Han-sur-Lesse				
167	Han-sur-Lesse	1	BE	(Butler *et al.* 2012; Hohlbein 2008a)
172	Havelte	1	NL	(Butler and Steegstra 2005; Hohlbein 2008a; Thrane 1972)
180	Hochstadt	1	D	(Butler *et al.* 2012; Hohlbein 2008a)
Stadecken				
349	Stadecken	1	D	(Hohlbein 2008a)
Moulds				
7	Ameln	1	D	(Hohlbein 2008a)
81	Châtillon	1	FR	(Thrane 1972)
228	Lake Bourget*	1	FR	(Thrane 1972)
260	Mörigen	2	CH	(Bernatzky-Goetze 1987; Thrane 1972; Wyss 1967a,b)
453	Someren	1	NL	(Butler *et al.* 2012)



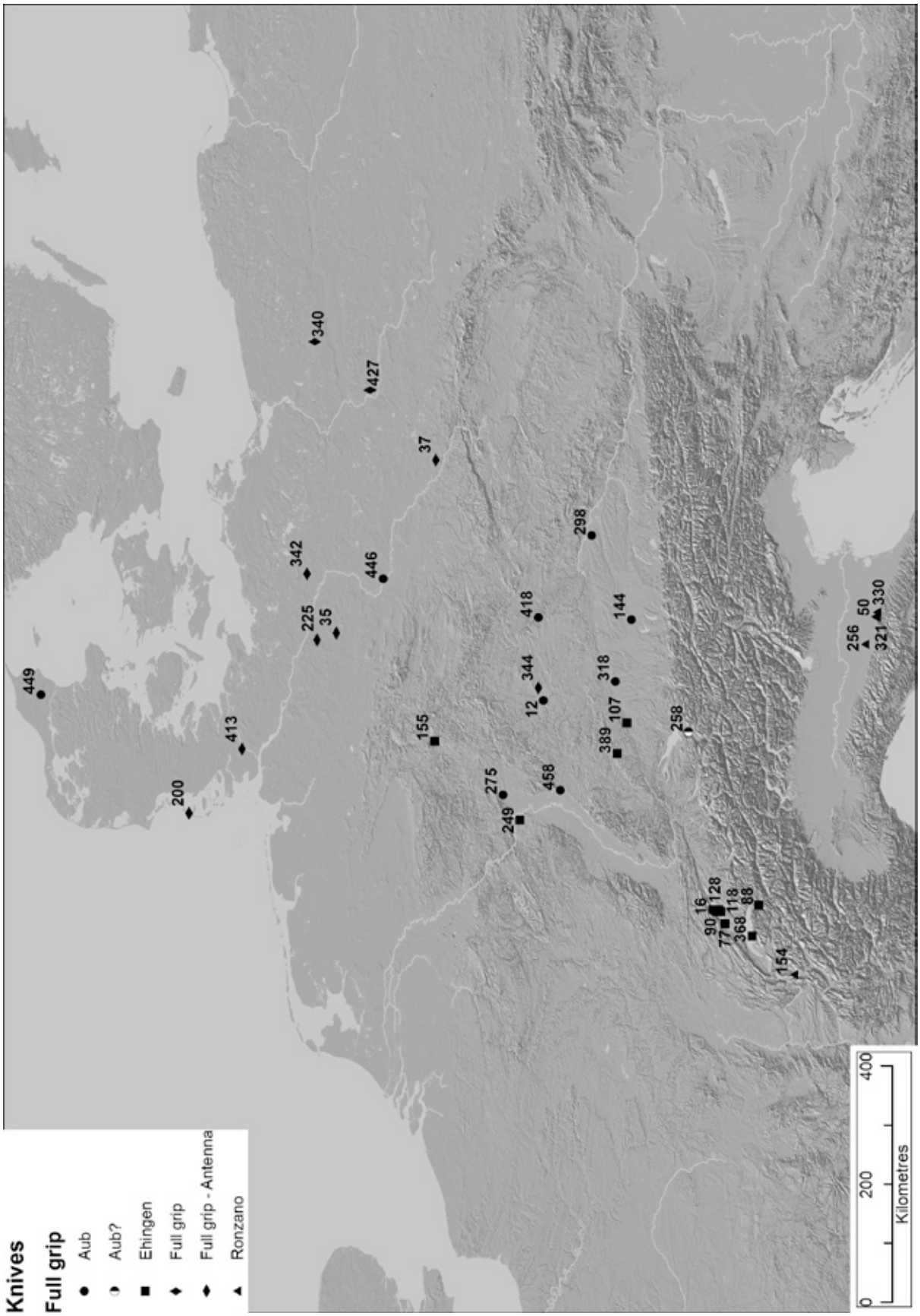
Map 70: European distribution of Socketed type knives (*Tüllenmesser*). For inset region see Map 71.



Map 71: Distribution of Socketed type knives in eastern France and the Three Lakes region of Switzerland.

Map 72

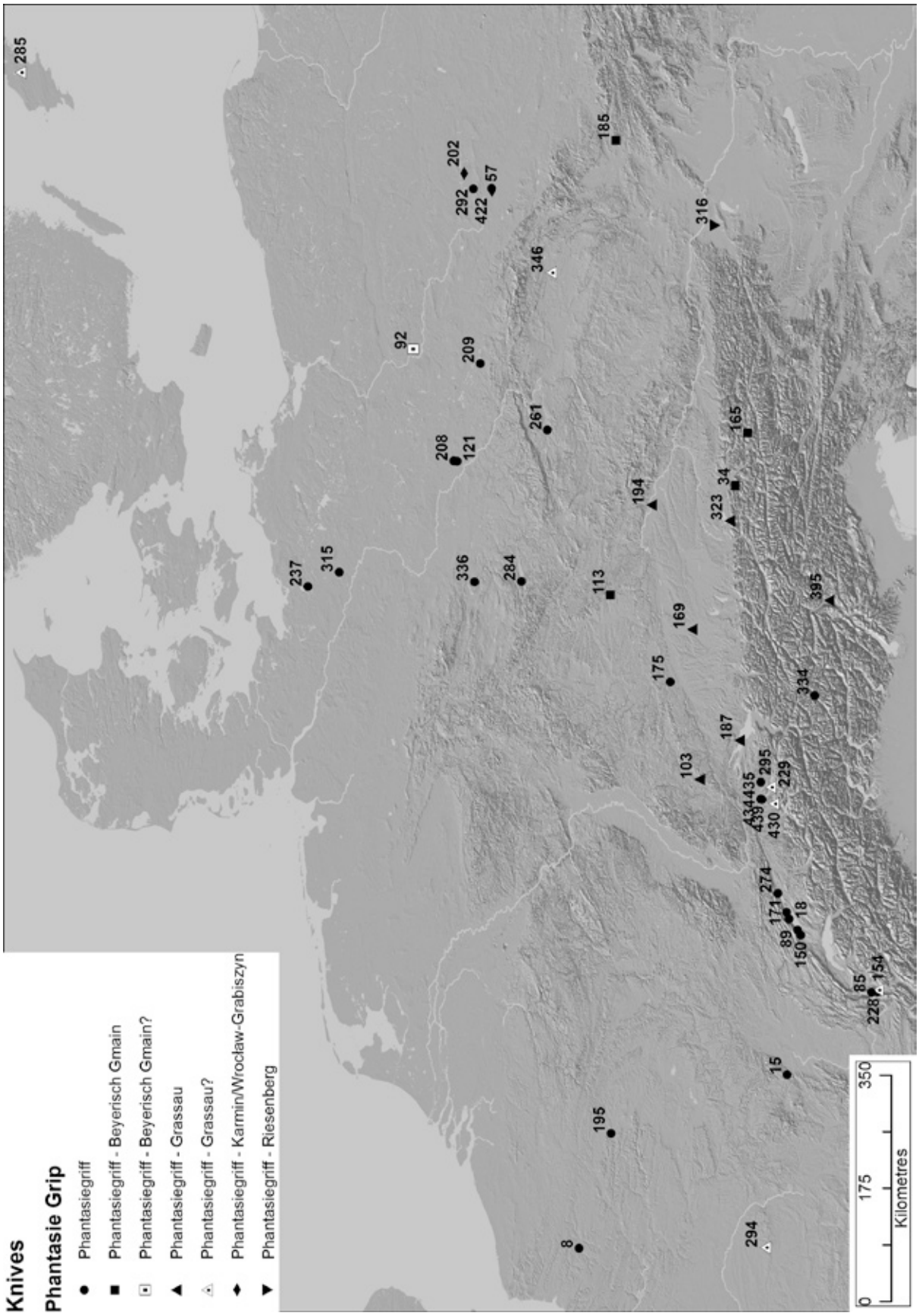
No.	Site	Qty	Country	References
Aub				
12	Aub	1	D	(Hohlbein 2008a,b)
90	Cortaillod	1	CH	(Hohlbein 2008a,b)
144	Gernlinden	1	D	(Hohlbein 2008a,b)
275	Niederursel	1	D	(Hohlbein 2008a,b)
298	Piering	1	D	(Hohlbein 2008a,b)
318	Rettenbach	1	D	(Hohlbein 2008a,b)
418	Winterstein	1	D	(Hohlbein 2008a,b)
446	Gödnitz	1	D	(Butler *et al.* 2012)
449	Klokkerholm	1	DK	(Butler *et al.* 2012)
458	Wiesloch	1	D	(Butler *et al.* 2012; Hohlbein 2008a,b)
Aub?				
258	Montlingerberg	1	CH	(Steinhauser-Zimmermann 1989)
Ehingen				
16	Auvernier	1	CH	(Hohlbein 2008a,b)
77	Champittet	1	CH	(Hohlbein 2008a,b)
88	Collombey	1	CH	(Rychner and Kläntschi 1995)
107	Ehingen	1	D	(Hohlbein 2008a,b)
118	Estavayer-le-Lac	1	CH	(Hohlbein 2008a,b)
128	Forel	1	CH	(Hohlbein 2008a,b)
155	Grifte	1	D	(Hohlbein 2008a,b)
249	Mainz-Ebersheim	1	D	(Hohlbein 2008a,b)
368	Thonon-les-Bains	1	FR	(Hohlbein 2008a,b)
389	Unterhausen	1	D	(Hohlbein 2008a,b)
Full grip				
340	Schwachenwalde (Chlopowo)	1	PL	(Sprockhoff 1956)
427	Ziebingen (Gmina Cybinka)	1	PL	(Sprockhoff 1956)
Full grip - Antenna				
35	Beetzendorf	1	D	(Sprockhoff 1956)
37	Berbisdorf	1	D	(Sprockhoff 1956)
200	Kampen	1	D	(Sprockhoff 1956)
225	Kukate	1	D	(Prüssing, P 1982; Sprockhoff 1956)
342	Seddin	1	D	(Jockenhövel and Smolla 1975; Kromer 1956; Sprockhoff 1956)
344	Seinsheim Bullenheimer Berg	1	D	(Falkenstein *et al.* 2011)
413	Wennbüttel	1	D	(Sprockhoff 1956)
Ronzano				
50	Bologna	2	IT	(Bianco Peroni 1976)
154	Grésine	1	FR	(Kerouanton 2002)
256	Modena	1	IT	(Bianco Peroni 1976)
321	Ronzano	1	IT	(Bianco Peroni 1976)
330	San Lazzaro di Savena	1	IT	(Bianco Peroni 1976)



Map 72: Distribution of Late Bronze Age full grip knives.

Map 73 (locations/lakes marked with * have no further context information available).

No.	Site	Qty	Country	References
Phantasiegriff				
8	Amiens	1	FR	(Gaucher 1981; Jockenhövel and Smolla 1975; Kromer 1956)
15	Auvenay	1	FR	(Jockenhövel and Smolla 1975; Kromer 1956)
18	Auvernier-Nord	1	CH	(Rychner 1979)
57	Breslau-Gräbschen	1	PL	(Jockenhövel and Smolla 1975; Kromer 1956)
85	Chindrieux-Châtillon	1	FR	(Billaud 2013)
89	Concise	1	CH	(Jockenhövel and Smolla 1975)
121	Falkenberg	1	D	(Jockenhövel and Smolla 1975; Kromer 1956)
150	Grandson-Corcelettes	4	CH	(Colomb and Muyden 1896; Jockenhövel and Smolla 1975; Kromer 1956)
171	Hauterive-Champréveyres	2	CH	(Rychner-Faraggi 1993)
175	Herbrechtingen	1	D	(Kromer 1956)
195	Juvincourt	1	FR	(Jockenhövel and Smolla 1975)
208	Kleinrössen	1	D	(Kromer 1956)
209	Klein-Saubernitz	1	D	(Jockenhövel and Smolla 1975; Kromer 1956)
228	Lake Bourget*	7	FR	(Kerouanton 2002)
237	Leezen	1	D	(Jockenhövel and Smolla 1975; Kromer 1956)
261	Mradice	1	CZ	(Filip 1948; Jiráň 2002; Jockenhövel and Smolla 1975; Kromer 1956)
274	Nidau-Steinberg	1	CH	(Jockenhövel and Smolla 1975; Kromer 1956)
284	Öpitz	1	D	(Kromer 1956)
292	Pawellau (Pawlów Trzebnicki)	1	PL	(Kromer 1956)
295	Pfäffikon	1	CH	(Altorfer 2010; Hauser-Fischer 1990; Jockenhövel and Smolla 1975)
315	Reckenzin	1	D	(Kromer 1956; Sprockhoff 1956)
334	S-Chanf	1	CH	(Jockenhövel and Smolla 1975; Rychner and Kläntschi 1995)
336	Schmon	1	D	(Götze *et al.* 1909; Jockenhövel and Smolla 1975; Kromer 1956)
434	Zürich-Alpenquai	1	CH	(Jockenhövel and Smolla 1975; Mäder 2001a)
435	Zürich-Bauschanze	1	CH	(Kromer 1956; Müller-Karpe 1966)
439	Zürich-Wollishofen	1	CH	(Jockenhövel and Smolla 1975; Kromer 1956; Mäder 2001a)
Beyerisch Gmain				
34	Bayerisch Gmain	4	D	(Hohlbein 2008a; Müller-Karpe 1957)
113	Engelthaler Forst	1	D	(Hohlbein 2008a)
165	Hallstatt	1	AT	(Hohlbein 2008a; Kromer 1956)
185	Hostýn	1	CZ	(Hohlbein 2008a)
92	Cybinka	1	PL	(Gedl 1984; Hohlbein 2008a)
Grassau				
103	Dotternhausen-Plettenberg	1	D	(Biel 1987; Hohlbein 2008a; Kromer 1956)
169	Haunstetten	1	D	(Hohlbein 2008a; Wirth 1998)
187	Immenstaad am Bodensee	1	D	(Hohlbein 2008a; Schöbel 1996)
194	Ittling	1	D	(Hohlbein 2008a)
323	Rottau	1	D	(Hohlbein 2008a; Jockenhövel and Smolla 1975; Kromer 1956)
395	Vadena	1	IT	(Bianco Peroni 1976; Hohlbein 2008a; Wirth 2004)
154	Grésine	1	FR	(Jockenhövel and Smolla 1975; Kerouanton 2002; Kromer 1956)
229	Lake Zurich	1	CH	(Hohlbein 2008a)
285	Oppuse	1	SE	(Thrane 1972)
294	Petit Villatte	1	FR	(Cordier and Bourhis 1996; Hohlbein 2008a)
346	Skalice	1	CZ	(Hohlbein 2008a)
430	Zug-Sumpf	1	CH	(Bauer *et al.* 2004; Hohlbein 2008a)
Karmin/ Wroclaw-Grabiszyn				
202	Karmin	1	PL	(Gedl 1984; Jockenhövel and Smolla 1975; Kromer 1956)
422	Wroclaw-Grabiszyn	1	PL	(Gedl 1984)
Riesenberg				
316	Reisenberg	1	AT	(Kromer 1956; Říhovský 1972)

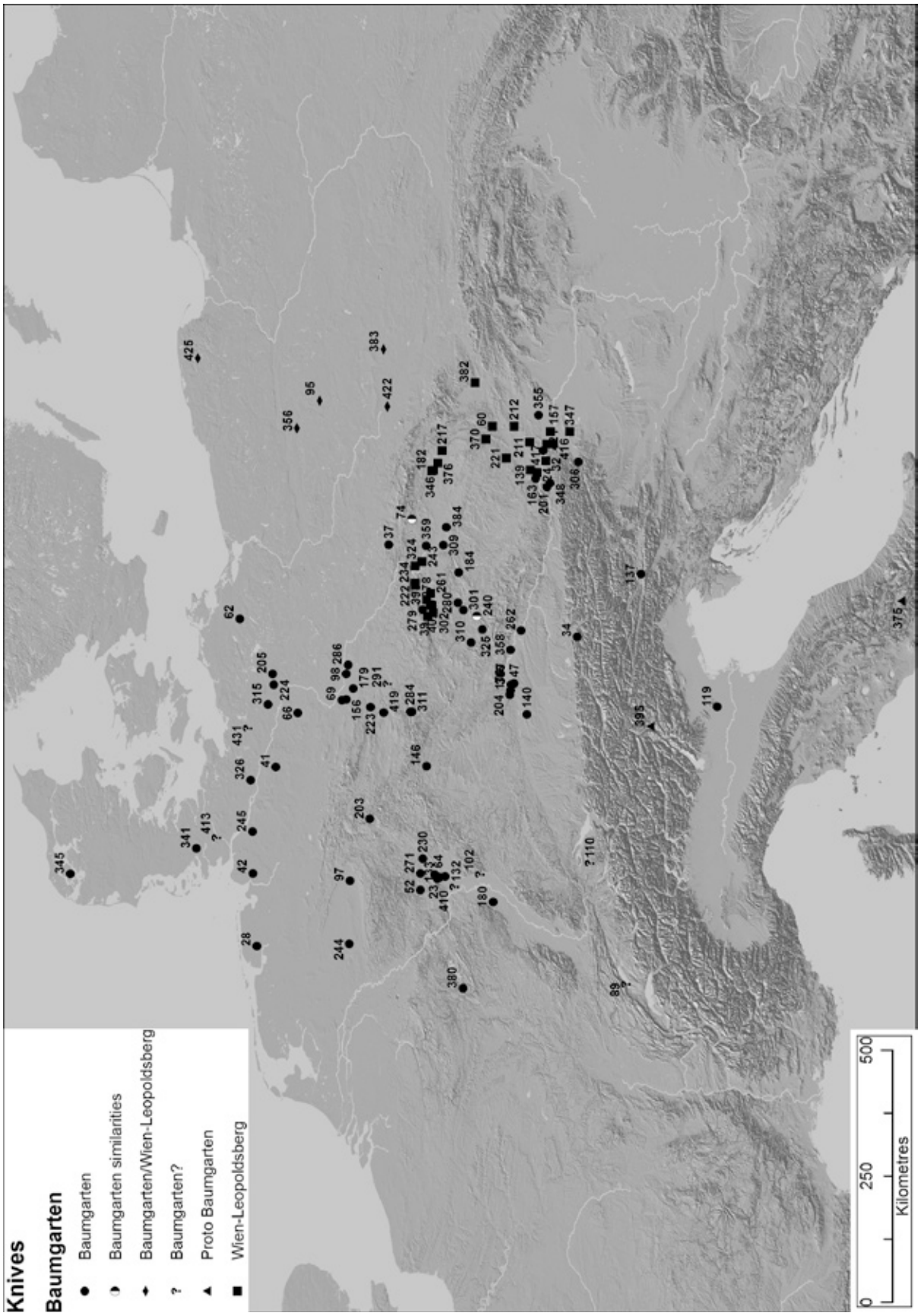


Map 73: LBA *Phantasie* handle knife distribution in Europe.

Map 74

No.	Site	Qty	Country	References
Baumgarten				
23	Bad Homburg	7	D	(Tackenberg 1971)
28	Bangstede	1	D	(Prüssing, P 1982)
32	Baumgarten am Tullnerfeld	2	AT	(Říhovský 1972)
34	Bayerisch Gmain	3	D	(Müller-Karpe 1957)
37	Beiersdorf	1	D	(Tackenberg 1971)
41	Bevensen	1	D	(Tackenberg 1971)
42	Bexhövede	1	D	(Prüssing, P 1982)
47	Böhmhartsberg	1	D	(Pfauth 1998)
52	Braunfels	1	D	(Tackenberg 1971)
62	Buchar	1	D	(Tackenberg 1971)
64	Burgholzhausen	1	D	(Tackenberg 1971)
66	Büste	1	D	(Tackenberg 1971)
69	Calbe	1	D	(Prüssing, P 1982; Tackenberg 1971; von Brunn 1953)
97	Delbrück	1	D	(Prüssing, P 1982; Tackenberg 1971)
98	Dessau	1	D	(Tackenberg 1971; von Brunn 1953)
119	Este	5	IT	(Bianco Peroni 1976)
132	Frankfurter Stadtwald	1	D	(Tackenberg 1971)
133	Frankfurt-Niederursel	1	D	(Herrmann 1966; Tackenberg 1971)
137	Frög	1	AT	(Říhovský 1972)
140	Gambach - Friedberg	1	D	(Tackenberg 1971)
146	Gleichberg bei Römhild	1	D	(Tackenberg 1971)
156	Grimschleben	1	D	(Tackenberg 1971)
163	Hadersdorf am Kamp	2	AT	(Říhovský 1972)
176	Herrnsaal	1	D	(Pfauth 1998)
179	Hilgenstein	1	D	(Tackenberg 1971)
180	Hochstadt	1	D	(Tackenberg 1971)
184	Hostomitz	2	CZ	(Jiráň 2002)
201	Karlstetten	1	AT	(Říhovský 1972)
203	Kattenbühl	1	D	(Prüssing, P 1982)
204	Kelheim	2	D	(Pfauth 1998)
205	Kemnitz	1	D	(Tackenberg 1971)
211	Klement	1	AT	(Říhovský 1972)
223	Kuckenburg	1	D	(Tackenberg 1971)
224	Kuhsdorf	1	D	(Tackenberg 1971)
230	Langd	2	D	(Tackenberg 1971)
244	Lüdinghausen	1	D	(Tackenberg 1971)
245	Lühnenspecken	1	D	(Prüssing, P 1982)
262	Mühlham	1	D	(Pfauth 1998)
271	Neuhof	1	D	(Tackenberg 1971)
279	Nové Sedlo nad Bílinou	1	CZ	(Jiráň 2002)
280	Nynice	4	CZ	(Jiráň 2002; Tackenberg 1971)
284	Öpitz	1	D	(Kromer 1956; Tackenberg 1971)
286	Oranienbaum	1	D	(Tackenberg 1971; von Brunn 1953)
301	Plzen	1	CZ	(Jiráň 2002)
306	Pottschach	1	AT	(Müller-Karpe 1957; Říhovský 1972)
309	Praha-Hloubetín	1	CZ	(Jiráň 2002)
310	Přes	1	CZ	(Jiráň 2002; Tackenberg 1971)
311	Ranis	1	D	(Tackenberg 1971)
315	Reckenzin	2	D	(Tackenberg 1971)
325	Rýzmberk	1	CZ	(Jiráň 2002; Tackenberg 1971)
326	Sachsenwald	1	D	(Tackenberg 1971)
341	Schwesing	1	D	(Prüssing, P 1982)
345	Sindbjerg	1	DK	(Tackenberg 1971)
346	Skalice	1	CZ	(Jiráň 2002)
348	St Pölten	1	AT	(Říhovský 1972)
355	Stillfried	4	AT	(Říhovský 1972)
358	Straubing-Sand	1	D	(Neudert 2003)
359	Střednice	1	CZ	(Jiráň 2002)
367	Teugn	1	D	(Neudert 2003; Primas 2008)
369	Thronhofen	2	D	(Pfauth 1998)
380	Trier	1	D	(Tackenberg 1971)
384	Tuchoraz	1	CZ	(Jiráň 2002)
419	Wischroda	1	D	(Tackenberg 1971)
421	Wördern	1	AT	(Říhovský 1972)

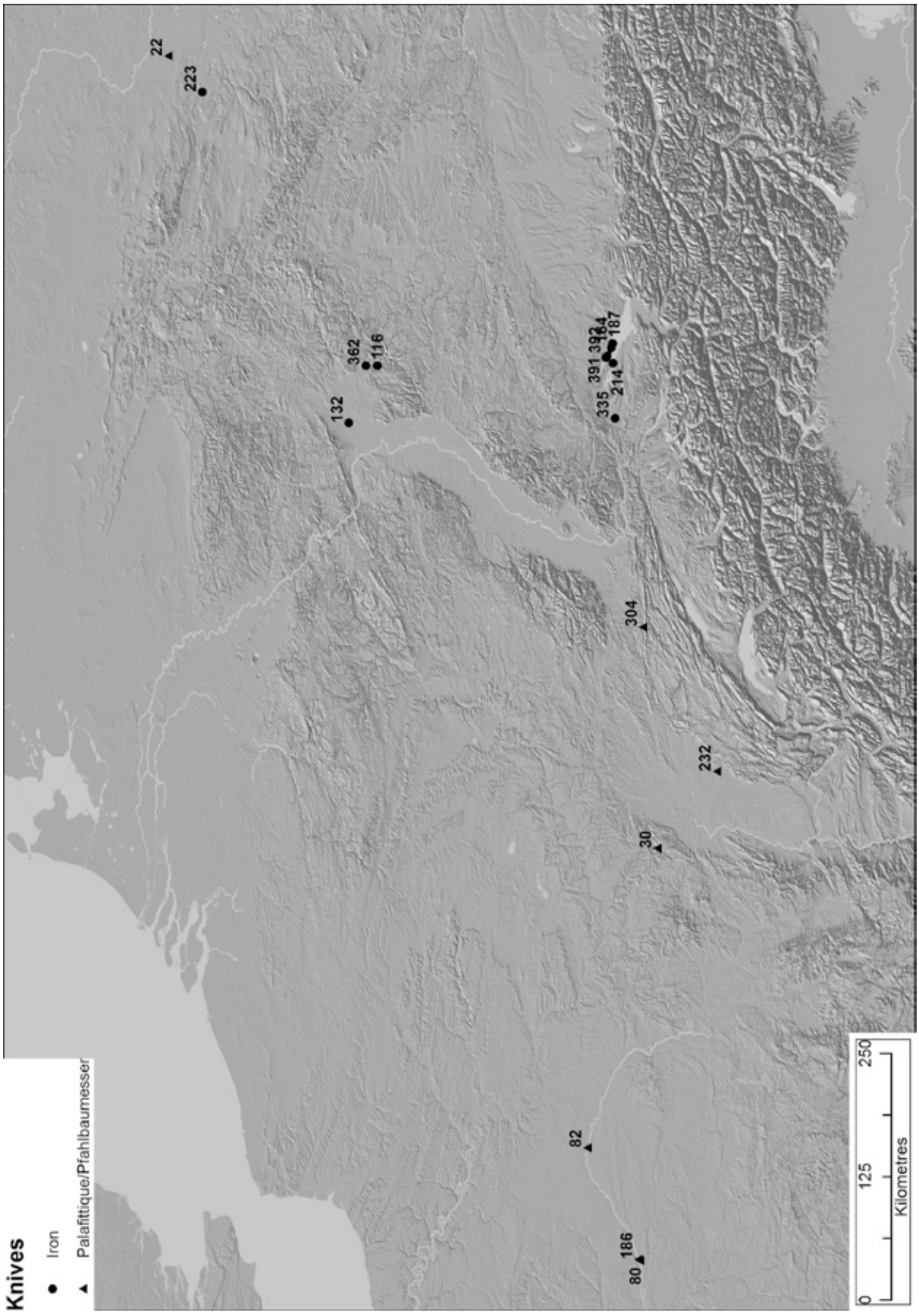
Baumgarten similarities				
74	Ceský Dub	1	CZ	(Jiráň 2002)
240	Lhovice	1	CZ	(Jiráň 2002)
Baumgarten/Wien-Leopoldsburg				
95	Dachowa	1	PL	(Gedl 1984)
356	Stobnica	1	PL	(Gedl 1984)
383	Trzcinica Mala	1	PL	(Gedl 1984)
422	Wroclaw-Grabiszyn	1	PL	(Gedl 1984)
425	Zakrzewo	1	PL	(Gedl 1984)
Baumgarten?				
89	Concise	1	CH	(Prüssing, P 1982)
102	Dossenheim	1	D	(Verger 1991)
110	Elgg-Ettenbühl	1	CH	(Mäder 2002; Ruoff 1974)
291	Pavelau	1	D	(Montelius 1913; Neudert 2003)
410	Wallerstädten	1	D	(Herrmann 1966)
413	Wennbüttel	1	D	(Montelius 1913; Neudert 2003)
431	Zülow	1	D	(Montelius 1913)
Proto Baumgarten				
375	Trasacco	1	IT	(Bianco Peroni 1976)
395	Vadena	1	IT	(Bianco Peroni 1976; Lunz 1974)
Wien-Leopoldsberg				
32	Baumgarten am Tullnerfeld	1	AT	(Říhovský 1972)
39	Běšice	1	CZ	(Jiráň 2002)
60	Brno – Obrany	1	CZ	(Říhovský 1972)
124	Fels am Wagram	2	AT	(Říhovský 1972)
139	Gaindorf	1	AT	(Říhovský 1972)
157	Groß-Enzersdorf	1	AT	(Říhovský 1972)
182	Holohlavy	1	CZ	(Jiráň 2002)
211	Klement	1	AT	(Říhovský 1972)
212	Klentnice	2	CZ	(Říhovský 1972)
217	Kostelec nad Orlicí	1	CZ	(Jiráň 2002)
221	Křepice	1	CZ	(Říhovský 1972)
222	Křrmýž	1	CZ	(Jiráň 2002)
234	Lbín	1	CZ	(Jiráň 2002)
243	Lounky	1	CZ	(Jiráň 2002)
261	Mradice	1	CZ	(Jiráň 2002)
278	Nové Sedlo	1	CZ	(Jiráň 2002)
302	Podlesice	1	CZ	(Jiráň 2002)
324	Rýdeč	1	CZ	(Jiráň 2002)
346	Skalice	1	CZ	(Jiráň 2002)
347	St Georgen	1	AT	(Říhovský 1972)
370	Tišnov	1	CZ	(Říhovský 1972)
376	Třebechovice pod Orebem	1	CZ	(Jiráň 2002; Tackenberg 1971)
382	Tršice	1	CZ	(Říhovský 1972)
398	Velemyšleves	1	CZ	(Jiráň 2002)
402	Větrušice	1	CZ	(Jiráň 2002)
416	Wien X	1	AT	(Říhovský 1972)
417	Wien XIX	4	AT	(Říhovský 1972)



Map 74: European distribution of Late Bronze Age *Baumgarten* type knives.

Map 75

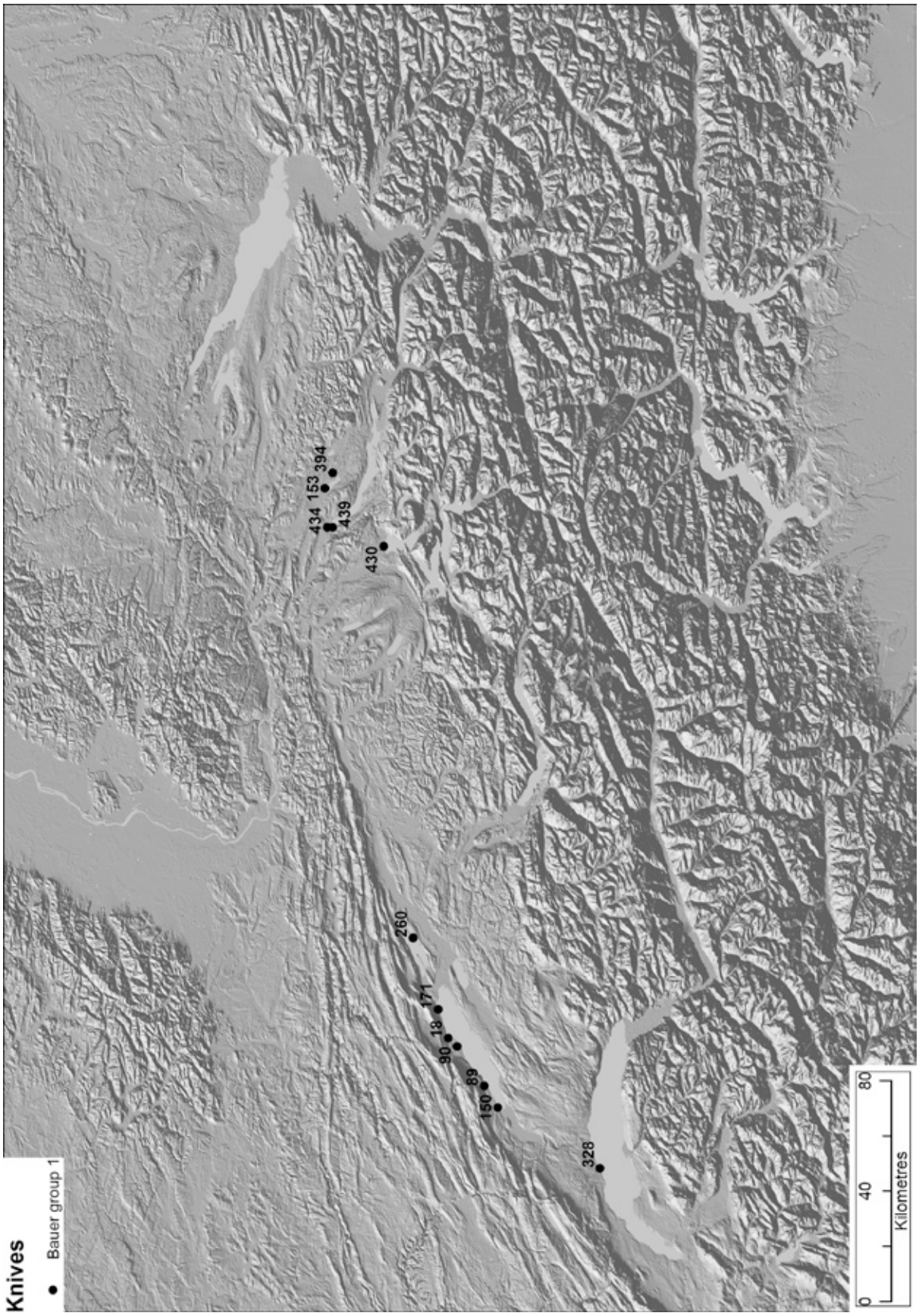
No.	Site	Qty	Country	References
Iron				
116	Erlenbach	1	D	(Hohlbein 2008a; Wilbertz 1982)
132	Frankfurter Stadtwald	1	D	(Schauer 1971)
164	Hagnau-Burg	1	D	(Schöbel 1996)
187	Immenstaad am Bodensee	3	D	(Schöbel 1996)
214	Konstanz-Rauenegg	1	D	(Schöbel 1996)
223	Kuckenburg	1	D	(Drescher 1958)
335	Schlossberg-Rudolfingen	2	CH	(Bauer *et al.* 1992)
362	Sulzbach	1	D	(Hohlbein 2008a; Wilbertz 1982)
391	Unteruhldingen-Stollenwiesen	3	D	(Schöbel 1996)
Palafittique				
22	Baasdorf	1	D	(Sprockhoff 1956; Wüstemann 2004)
30	Barbiery-Ouche	1	FR	(Cordier 2002; l'Abbé and Joly 1959)
80	Châtelliers à Amboise	1	FR	(Cordier 1985, 2002)
82	Chécy	1	FR	(Cordier 1985)
186	Île aux Mouettes - Amboise	1	FR	(Cordier 1985)
232	Larnaud	1	FR	(Cordier 2002)
304	Pont-de-Roide	1	FR	(Cordier 2002)
392	Unteruhldingen-Unterösch	1	D	(Schöbel 1996)



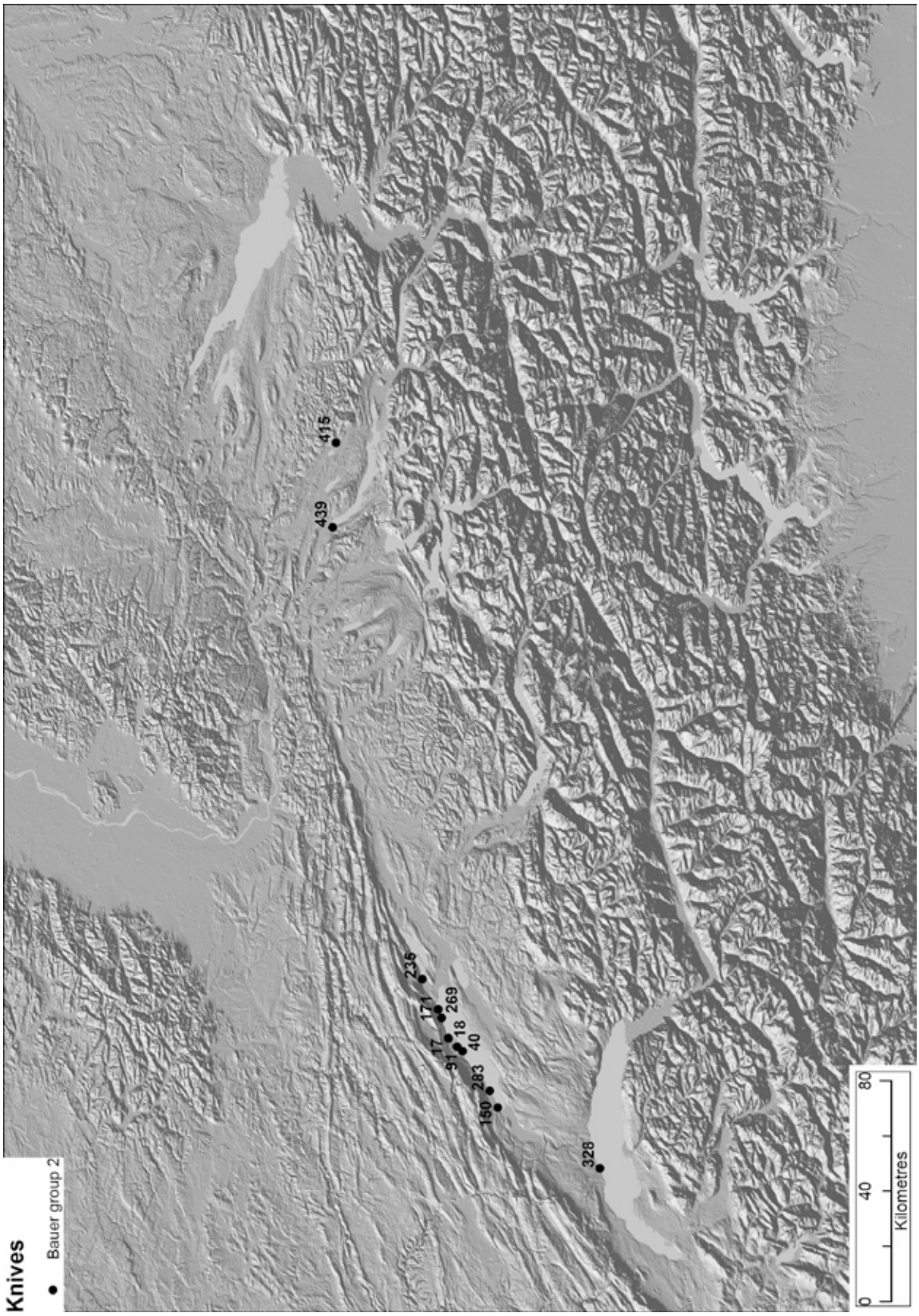
Map 75: Distribution of LBA Iron knives, and knives termed as "*Palafittique*" or "*Pfahlbau*".

Map 76 – 80 (all sites in Switzerland).

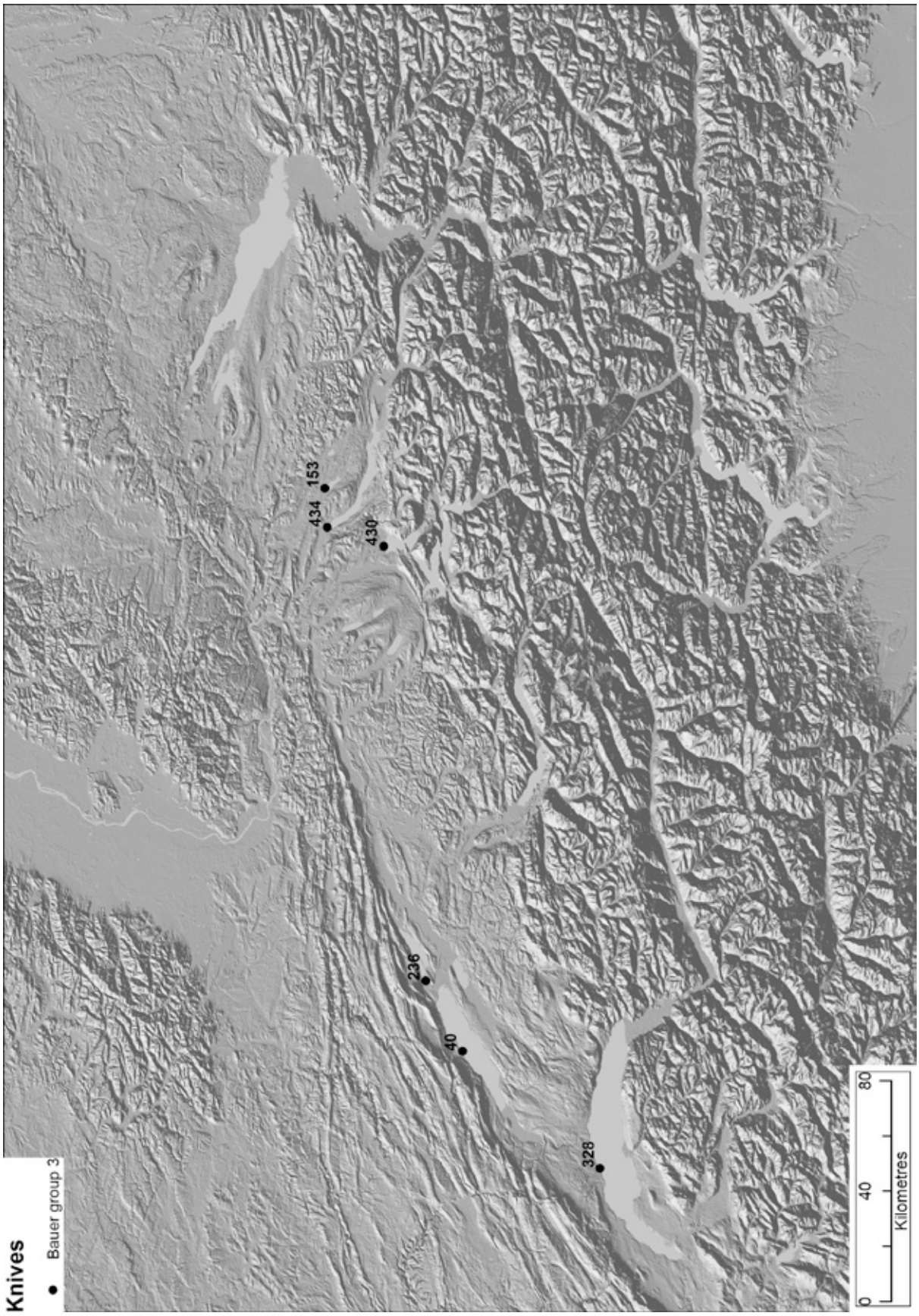
No.	Site	Qty	References
Map 71: Group 1			
18	Auvernier-Nord	7	(Rychner 1979)
89	Concise	2	(Colomb and Muyden 1896)
90	Cortaillod	1	(Hohlbein 2008b)
150	Grandson-Corcelettes	5	(Colomb and Muyden 1896)
153	Greifensee-Böschen	5	(Eberschweiler *et al.* 2007)
171	Hauterive-Champréveyres	14	(Rychner-Faraggi 1993)
260	Mörigen	16	(Bernatzky-Goetze 1987)
328	Saint-Prex La Moraine	1	(David-Elbiali and Moinat 2005)
394	Uster-Nänikon	1	(Eberschweiler *et al.* 2007)
430	Zug-Sumpf	22	(Bauer *et al.* 2004; Seifert 1997a)
434	Zürich-Alpenquai	5	(Künzler Wagner 2005; Mäder 2001a)
439	Zürich-Wollishofen	2	(Heierli 1886; Rychner and Kläntschi 1995)
Map 72: Group 2			
17	Auvernier-Bréna	1	(Rychner 1979)
18	Auvernier-Nord	46	(Rychner 1979)
40	Bevaix	1	(Arnold and Langenegger 2012)
91	Cortaillod-Est	2	(Arnold 1986)
150	Grandson-Corcelettes	3	(Colomb and Muyden 1896)
171	Hauterive-Champréveyres	13	(Rychner-Faraggi 1993)
235	Le Landeron	1	(Hofmann Rognon and Doswald 2005)
269	Neuchâtel "Le Crêt"	1	(Rychner 1979)
283	Onnens	1	(Colomb and Muyden 1896)
328	Saint-Prex La Moraine	1	(David-Elbiali and Moinat 2005)
415	Wetzikon-Kempten	1	(Altorfer 2010)
439	Zürich-Wollishofen	5	(Heierli 1886; Rychner and Kläntschi 1995)
Map 73: Group 3			
40	Bevaix	1	(Arnold and Langenegger 2012)
153	Greifensee-Böschen	4	(Eberschweiler *et al.* 2007)
236	Le Landeron - Grand Marais	2	(Schwab 2002)
328	Saint-Prex La Moraine	1	(David-Elbiali and Moinat 2005)
430	Zug-Sumpf	9	(Bauer *et al.* 2004; Seifert 1997a)
434	Zürich-Alpenquai	7	(Künzler Wagner 2005; Mäder 2001a)
Map 74: Group 4			
9	Arbon	1	(Hochuli, Stefan 1991)
18	Auvernier-Nord	6	(Rychner 1979)
83	Chevroux	1	(Colomb and Muyden 1896)
110	Elgg-Ettenbühl	1	(Mäder 2001a; Ruoff 1974)
138	Fully	1	(Rychner and Kläntschi 1995)
142	Genève-Eaux Vives	3	(Rychner and Kläntschi 1995)
150	Grandson-Corcelettes	3	(Colomb and Muyden 1896)
171	Hauterive-Champréveyres	3	(Rychner-Faraggi 1993)
192	Eschenz-Insel Werd	3	(Brem *et al.* 1987)
258	Montlingerberg	1	(Steinhauser-Zimmermann 1989)
260	Mörigen	39	(Bernatzky-Goetze 1987)
406	Vinelz	2	(Gross, E 1986)
430	Zug-Sumpf	3	(Bauer *et al.* 2004; Seifert 1997a)
434	Zürich-Alpenquai	46	(Künzler Wagner 2005; Mäder 2001a)
439	Zürich-Wollishofen	7	(Heierli 1886; Rychner and Kläntschi 1995)
Map 75: Group 5			
18	Auvernier-Nord	1	(Rychner 1979)
89	Concise	2	(Colomb and Muyden 1896)
142	Genève-Eaux Vives	2	(Rychner and Kläntschi 1995)
150	Grandson-Corcelettes	10	(Colomb and Muyden 1896)
171	Hauterive-Champréveyres	6	(Rychner-Faraggi 1993)
174	Heidenburg, Seegräben-Aathal	1	(Altorfer 2010)
192	Eschenz-Insel Werd	1	(Brem *et al.* 1987)
229	Lake Zurich	1	(Hohlbein 2008a)
258	Montlingerberg	3	(Steinhauser-Zimmermann 1989)
273	Nidau	4	(Rychner and Kläntschi 1995)
274	Nidau-Steinberg	1	(Jockenhövel and Smolla 1975)
283	Onnens	1	(Colomb and Muyden 1896)
295	Pfäffikon	1	(Altorfer 2010)
327	Saillon	1	(Rychner and Kläntschi 1995)
334	S-Chanf	1	(Rychner and Kläntschi 1995)
351	St-Aubin NE	1	(Speck 1981a)
361	Sugiez	1	(Rychner and Kläntschi 1995)
393	Ürschhausen-Horn	1	(Nagy 1999)
430	Zug-Sumpf	6	(Bauer *et al.* 2004; Seifert 1997a)
432	Zürich	1	(Drescher 1958)
434	Zürich-Alpenquai	1	(Künzler Wagner 2005; Mäder 2001a)
435	Zürich-Bauschanze	1	(Kromer 1956)
439	Zürich-Wollishofen	5	(Heierli 1886; Rychner and Kläntschi 1995)



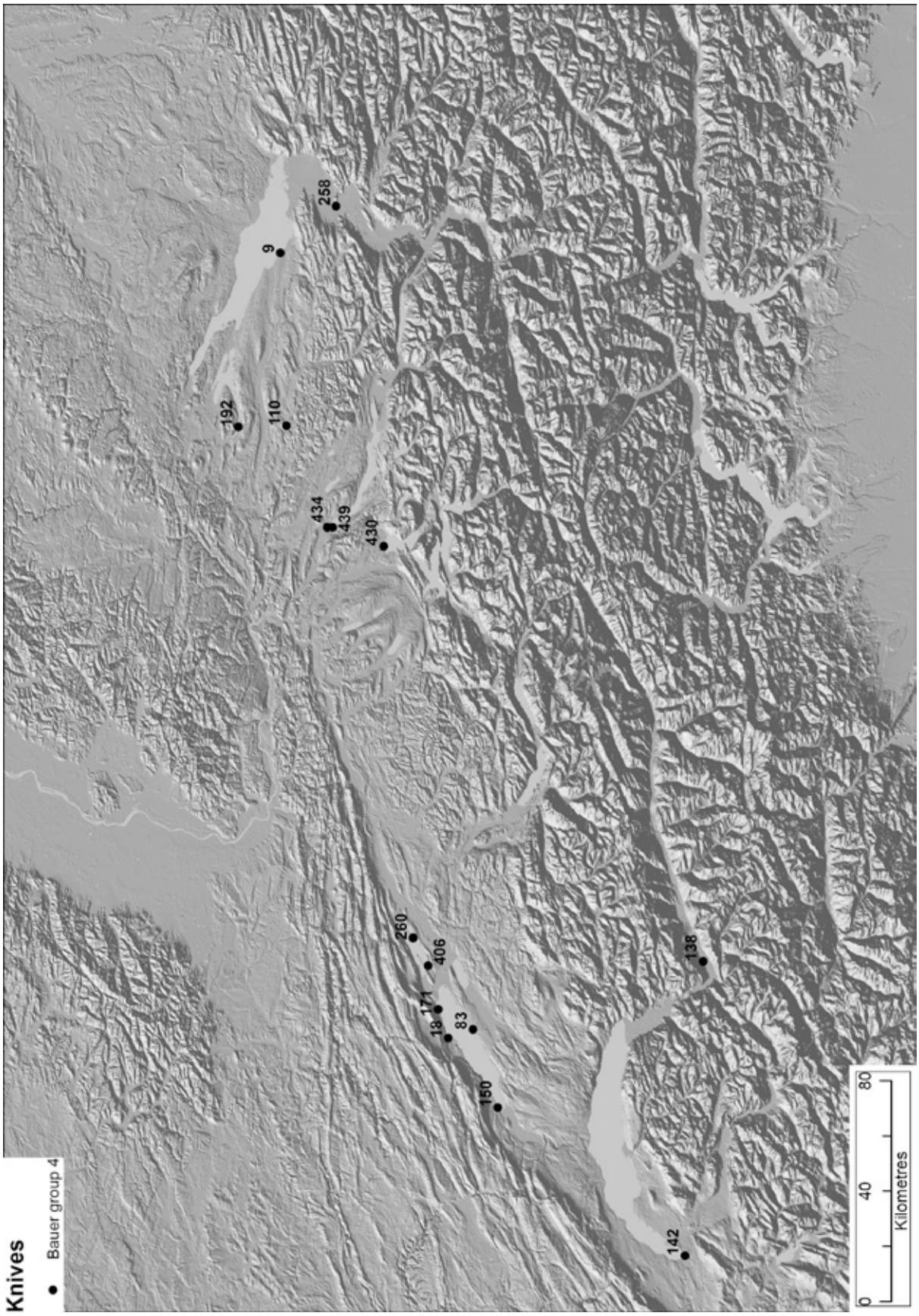
Map 76: Distribution of Group 1 (after Bauer et al 2004) knives in Switzerland.



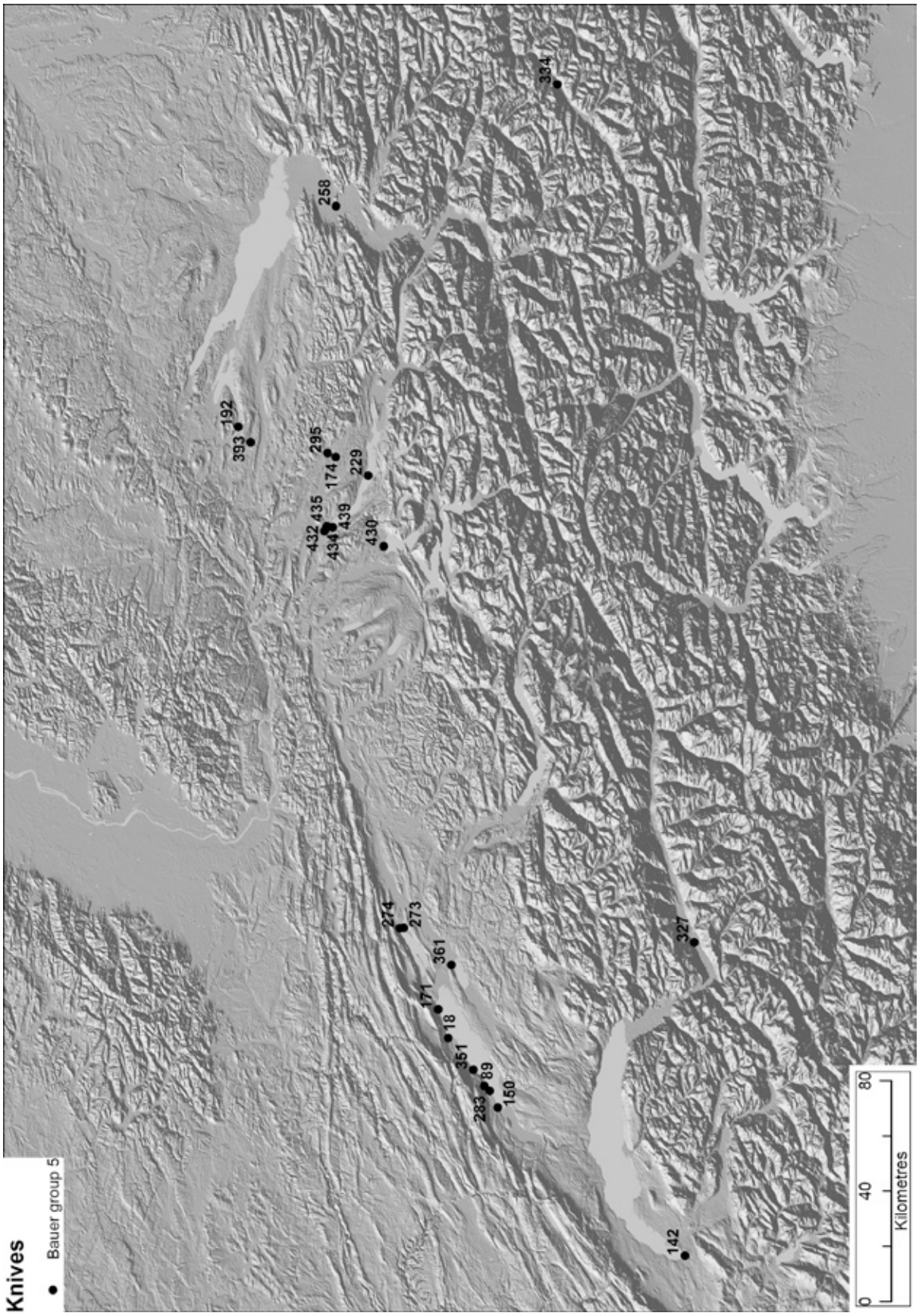
Map 77: Distribution of Group 2 (after Bauer et al 2004) knives in Switzerland.



Map 78: Distribution of Group 3 (after Bauer et al 2004) knives in Switzerland.



Map 79: Distribution of Group 4 (after Bauer et al 2004) knives in Switzerland.

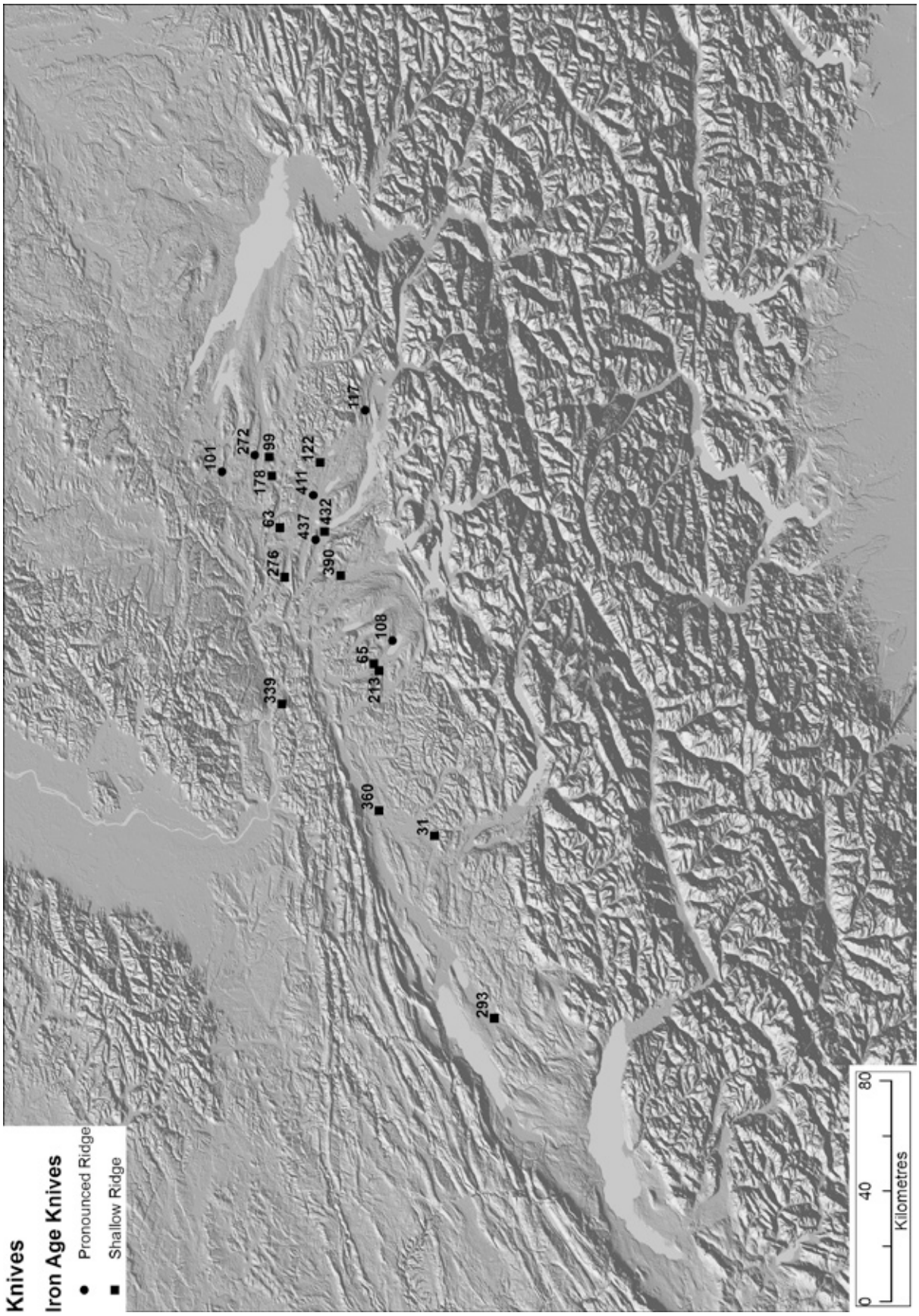


Map 80: Distribution of Group 5 (after Bauer et al 2004) knives in Switzerland.

Map 81 (all sites in Switzerland).

All references (Drack 1973b).

No.	Site	Qty
Pronounced Ridge		
101	Dörflingen	1
108	Eich-Schenkon	1
117	Eschenbach	1
272	Neunforn	1
390	Unterlunkhofen	2
411	Wangen-Brüttisellen	1
437	Zürich-Höngg	1
Shallow Ridge		
31	Bäriswil	1
63	Bülach	2
65	Büron	1
99	Dinhard	1
122	Fehraltorf	1
178	Hettlingen	2
213	Knutwil	1
276	Niederweningen	2
293	Payerne	1
339	Schupfart	1
360	Subingen	2
390	Unterlunkhofen	2
432	Zürich	1



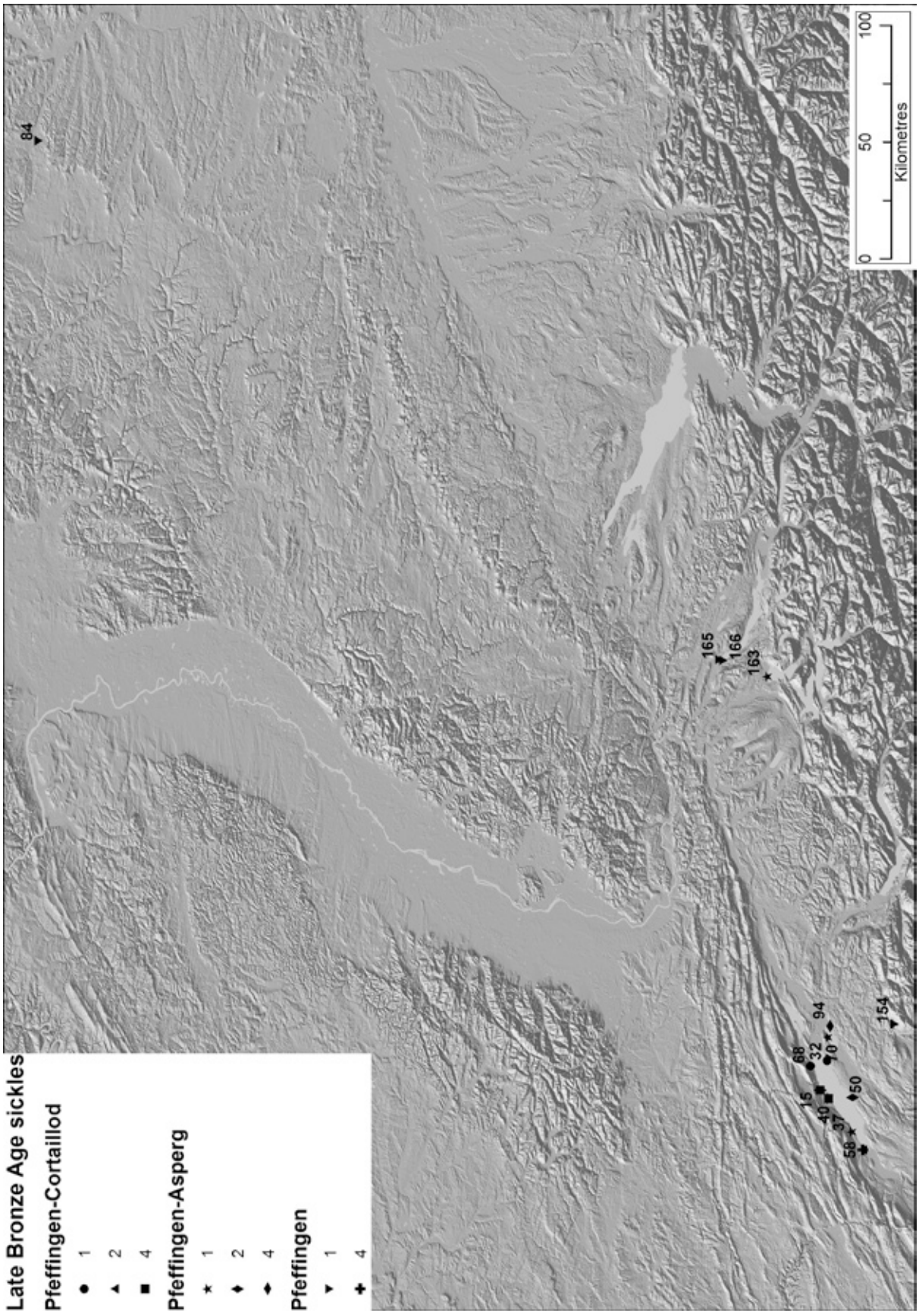
Map 81: Distribution of early Iron Age knives in northern Switzerland.

Maps 82 – 99 (locations/lakes marked with * have no further context information available).

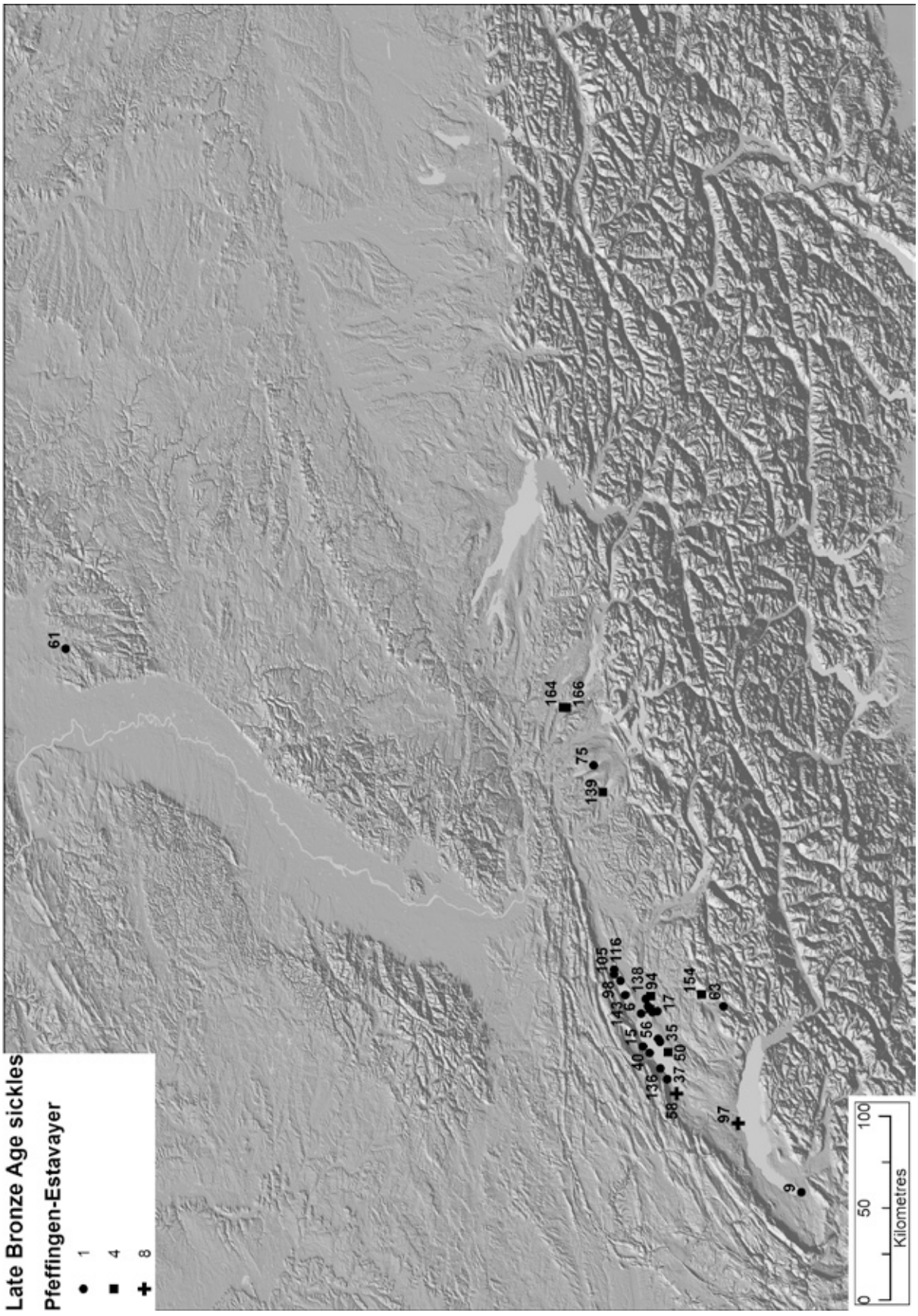
All sites referenced to Primas 1986 unless specified below. a) = (Hagl 2008); b) = (Rychner and Kläntschi 1995); c) = (Mäder 2001a).

No.	Site	Country	References
1	Frankfurt-Niederrad	D	
2	Frankfurt-Niederursel	D	a)
3	Fridingen	D	
4	Friedberg-Ockstadt	D	
5	Gals-Zihlbrücke	CH	
6	Gampelen/Witzwil	CH	
7	Gars am Kamp-Thunau	AT	
8	Genève	CH	
9	Genève-Eaux Vives	CH	
10	Aigle	CH	
11	Altusried-Ottenstall	D	
12	Asparn-Michelstetten	AT	
13	Asperg	D	
14	Autavaux - La Crasaz	CH	
15	Auvernier	CH	
16	Auvernier-Nord	CH	
17	Avenches "Eau Noire"	CH	
18	Bad Homburg	D	a)
19	Basel-Elisabethenschanze	CH	
20	Bas-Vully/Sugiez	CH	
21	Belmbrach	D	
22	Beuron	D	
23	Bevaix	CH	
24	Bielersee	CH	
25	Bingen	D	
26	Blaubeuren	D	
27	Bodensee	D	
28	Broye	CH	
29	Bruck an der Mur	AT	
30	Burladingen	D	
31	Bürstadt	D	
32	Chabrey	CH	
33	Chardonne	CH	
34	Cheseaux-Noréaz	CH	
35	Chevroux	CH	
36	Colombier	CH	
37	Concise	CH	
38	Corcelles	CH	
39	Corsier	CH	
40	Cortaillod	CH	
41	Cudrefin	CH	
42	Dachau	D	
43	Dächingen	D	
44	Dossenheim	D	
45	Drassburg	AT	
46	Ehingen	D	
47	Enderndorf-Stockheim	D	
48	Erbach-Ringingen	D	
49	Eschlkam	D	
50	Estavayer-le-Lac	CH	
51	Ettlingen	D	
52	Font - La Pianta	CH	
53	Forel	CH	
54	Frankfurt-Grindbrunnen/Westhafen	D	a)
55	Gerolfingen-Hesselberg	D	
56	Gletterens	CH	
57	Grandson	CH	
58	Grandson-Corcelettes	CH	
59	Granges	CH	
60	Greifensee-Böschen	CH	
61	Groß Bieberau	D	
62	Grünwald	D	
63	Gruyères	CH	
64	Guévaux	CH	
65	Hallstatt	AT	
66	Hanau	D	
67	Haslau-Regelsbrunn	AT	
68	Hauterive	CH	
69	Haut-Vully "Fischilling"	CH	
70	Haut-Vully "Môtier"	CH	
71	Heilbronn Neckargartach	D	a)
72	Henfenfeld	D	
73	Hermance	CH	
74	Herrnbaumgarten	AT	
75	Hitzkirch - Moos I	CH	
76	Hochstadt	D	
77	Hohenaschau-Weidachwies	D	
78	Hohenhewen	D	
79	Horgauergreut	D	
80	Insel Werd	CH	
81	Irnsing	D	
82	Karlstein	D	
83	Kerzers	CH	
84	Knetzgau	D	
85	Langengeisling	D	
86	Linz-Freinberg	AT	
87	Linz-St. Peter	AT	
88	Mainz	D	
89	Marin-Epagnier	CH	
90	Marzoll-Türk	D	
91	Mimmenhausen-Banzenreuthe	D	
92	Mintraching	D	
93	Möckmühl	D	
94	Montilier	CH	
95	Montlingerberg	CH	
96	Morges - l'Eglise	CH	
97	Morges-Grand Cité	CH	
98	Mörigen	CH	
99	Murtensee	CH	
100	Muttenz-Wartenberg	CH	
101	Nächstenbach bei Weinheim	D	
102	Nagold	D	
103	Neuchâtel "Le Crêt"	CH	
104	Neuenbergersee	CH	
105	Nidau	CH	
106	Nidau-Büren-Kanal	CH	
107	Nürnberg	D	
108	Nürtingen	D	
109	Nyon	CH	
110	Oberkulm-Birch	CH	
111	Onnens	CH	
112	Osterburken	D	
113	Osterhofen-Anning	D	
114	Pfeffingen - Albstadt	D	
115	Pischelsdorf-Kulm	AT	
116	Port	CH	
117	Port-Alban	CH	
118	Prinzendorf	AT	
119	Prinzersdorf	AT	
120	Pullach	D	
121	Reichenberg-Fuchsstadt	D	
122	Reupelsdorf	D	
123	Reutlingen-Altenburg	D	
124	Riedlingen	D	
125	Rottenburg	D	
126	Rüdesheim-Eibingen	D	
127	Saalfelden	AT	

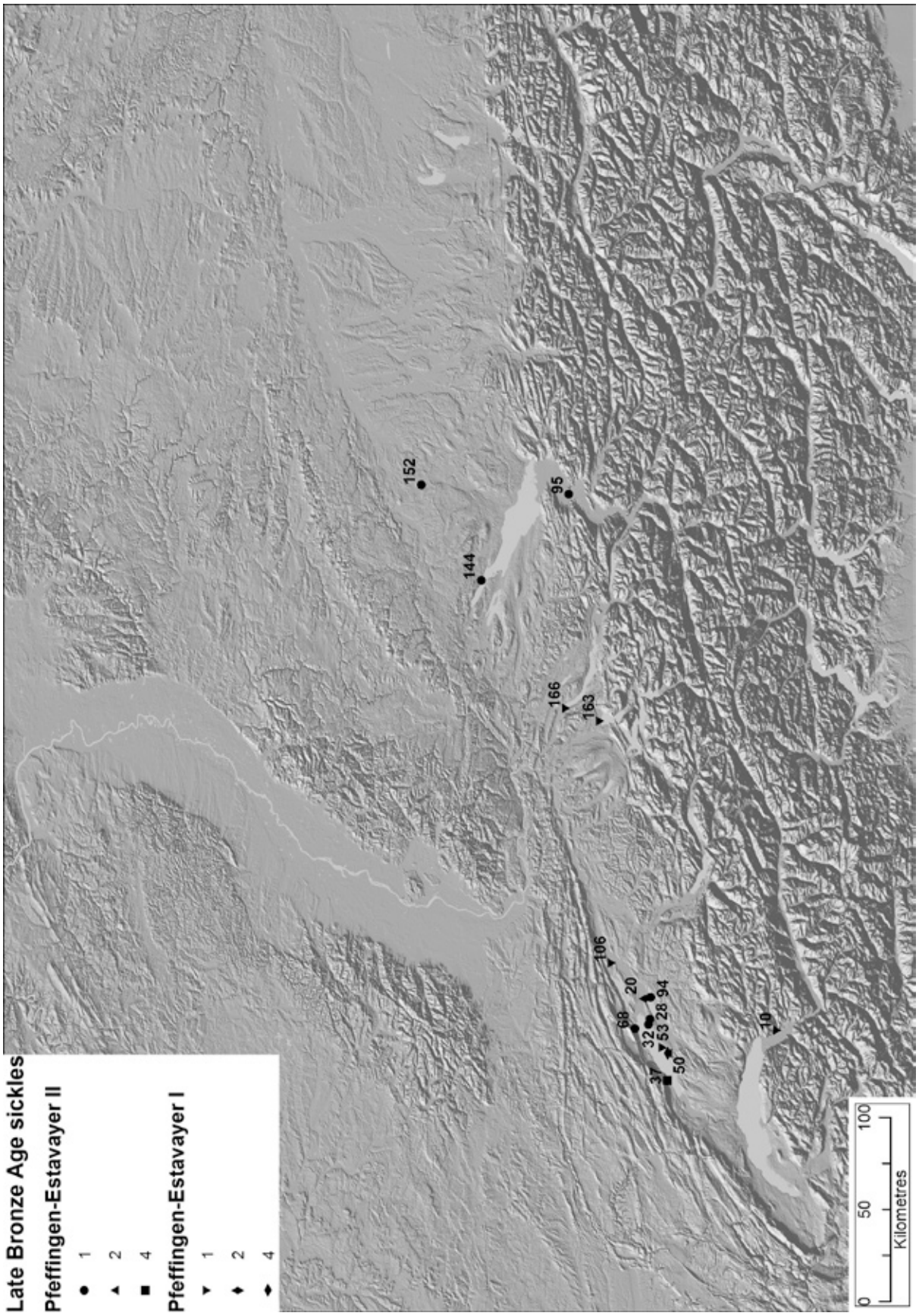
128	Safnern	CH	
129	Scheer-Jakobsthal	D	
130	Seefelden	D	
131	Seinsheim Bullenheimer Berg	D	a)
132	Seligenstadt	D	
133	Sempachersee	CH	
134	Sissach	CH	
135	St. Gilgen-Oberburgau	AT	
136	St-Aubin NE	CH	
137	Straubing-Sand	D	
138	Sugiez	CH	b)
139	Sursee - Landzunge	CH	
140	Sutz-Lattrigen	CH	
141	Thun	CH	
142	Töging	D	
143	Twann Petersinsel	CH	
144	Überlingen	D	
145	Uhingen	D	
146	Unterägeri	CH	
147	Unteruhldingen	D	
148	Vallamand	CH	
149	Villingen	D	
150	Wallis	CH	
151	Wangen an der Aare	CH	
152	Wasserburg Buchau	D	
153	Weisenau	D	a)
154	West Switzerland	CH	
155	Wildon	AT	
156	Windsbach	D	
157	Winklsass	D	
158	Winterlingen	D	a)
159	Wolfsdorf	D	
160	Wölsau	D	
161	Wörschach	AT	
162	Zeilitzheim	D	
163	Zug-Sumpf	CH	
164	Zürich-Alpenquai	CH	c)
165	Zürich-Grosser-Hafner	CH	
166	Zürich-Wollishofen	CH	



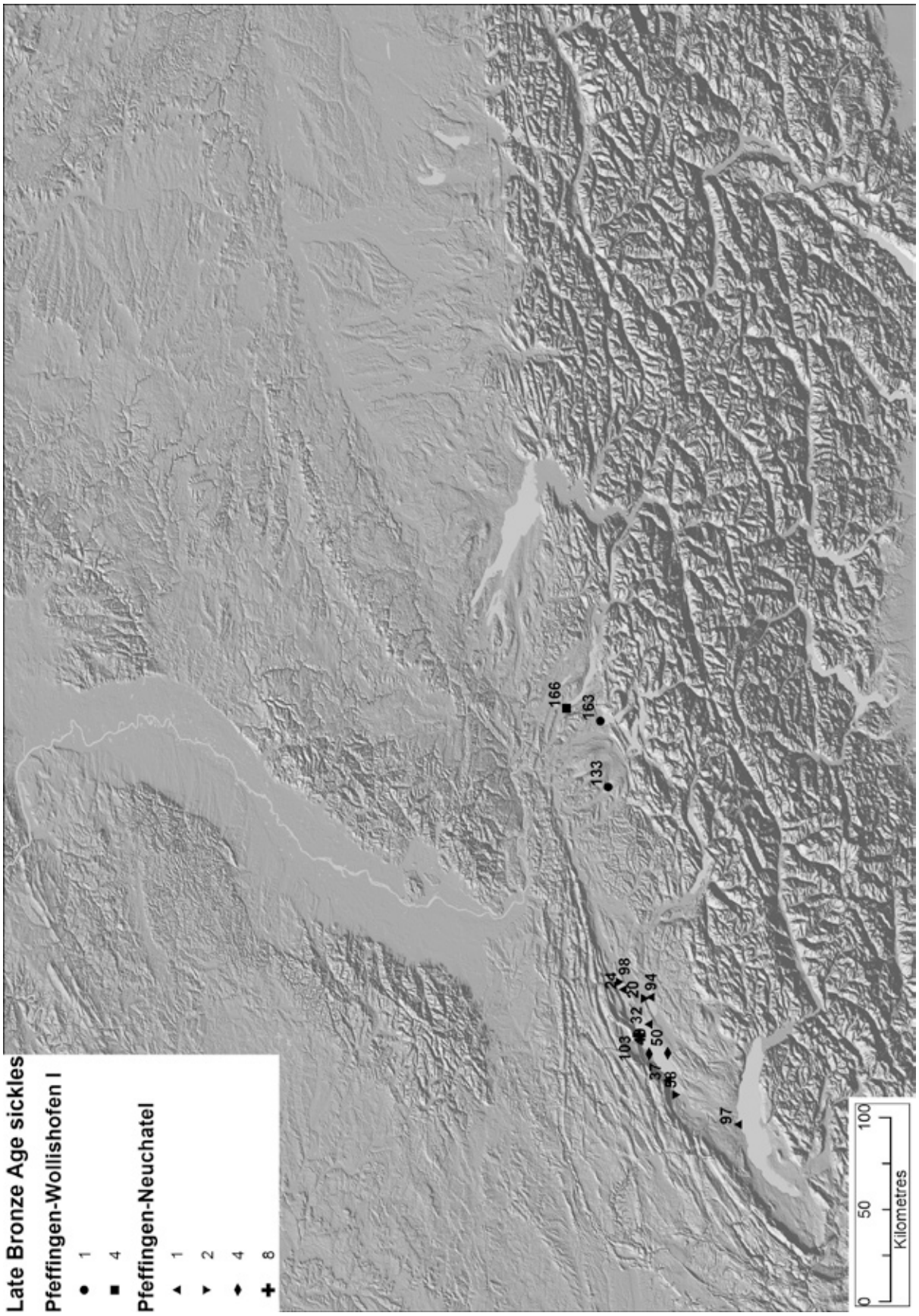
Map 82: Distribution of *Pfeffingen*, *Pfeffingen-Asperg*, and *Pfeffingen-Cortaillod* sickles.



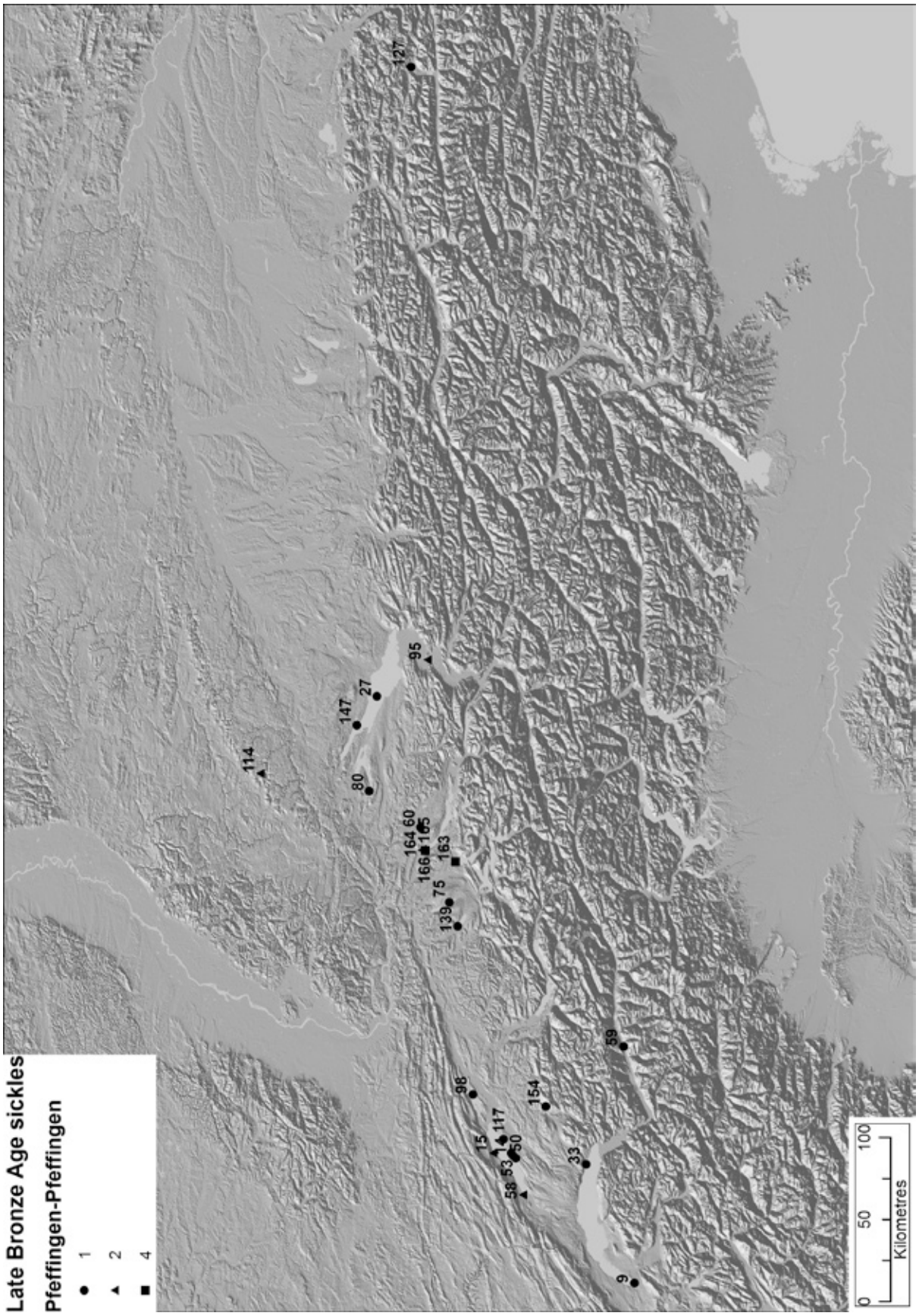
Map 83: Distribution of *Pfeffingen-Estavayer* type sickles without further variant information.



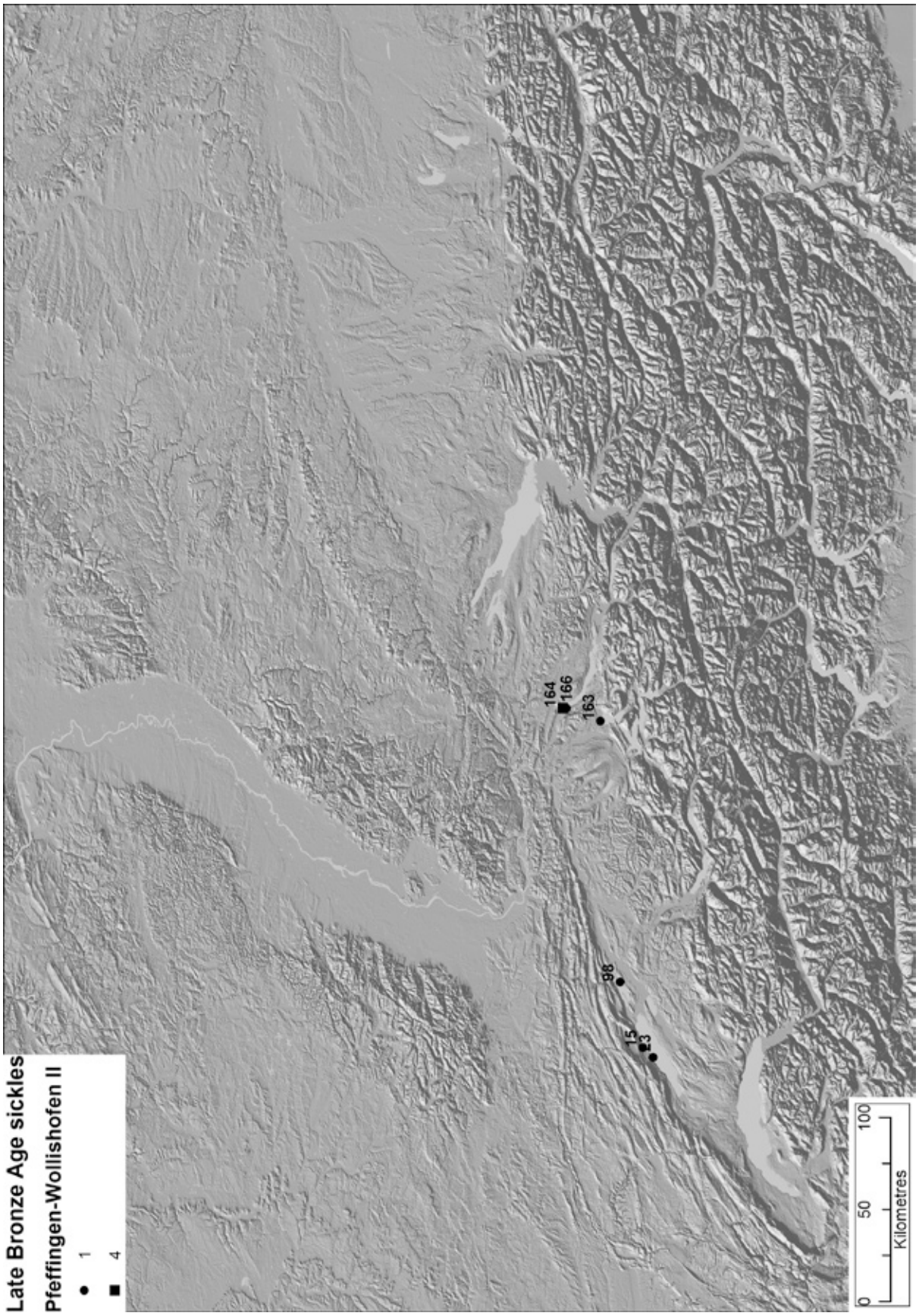
Map 84: Distribution of *Pfeffingen-Estavayer I* and *Pfeffingen-Estavayer II* type sickles.



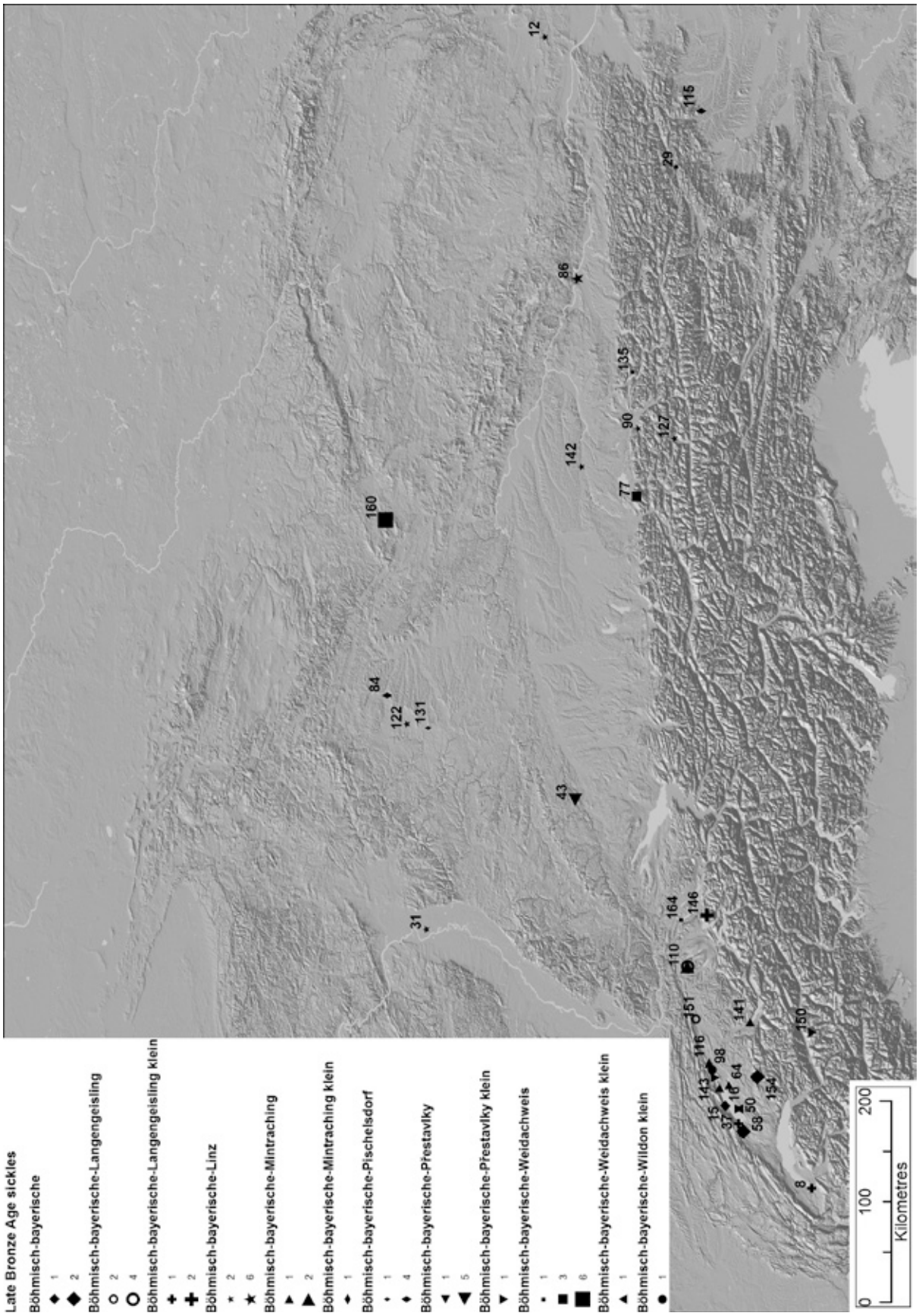
Map 85: Distribution of *Pfeffingen-Neuchâtel* and *Pfeffingen-Wollishofen I* type sickles.



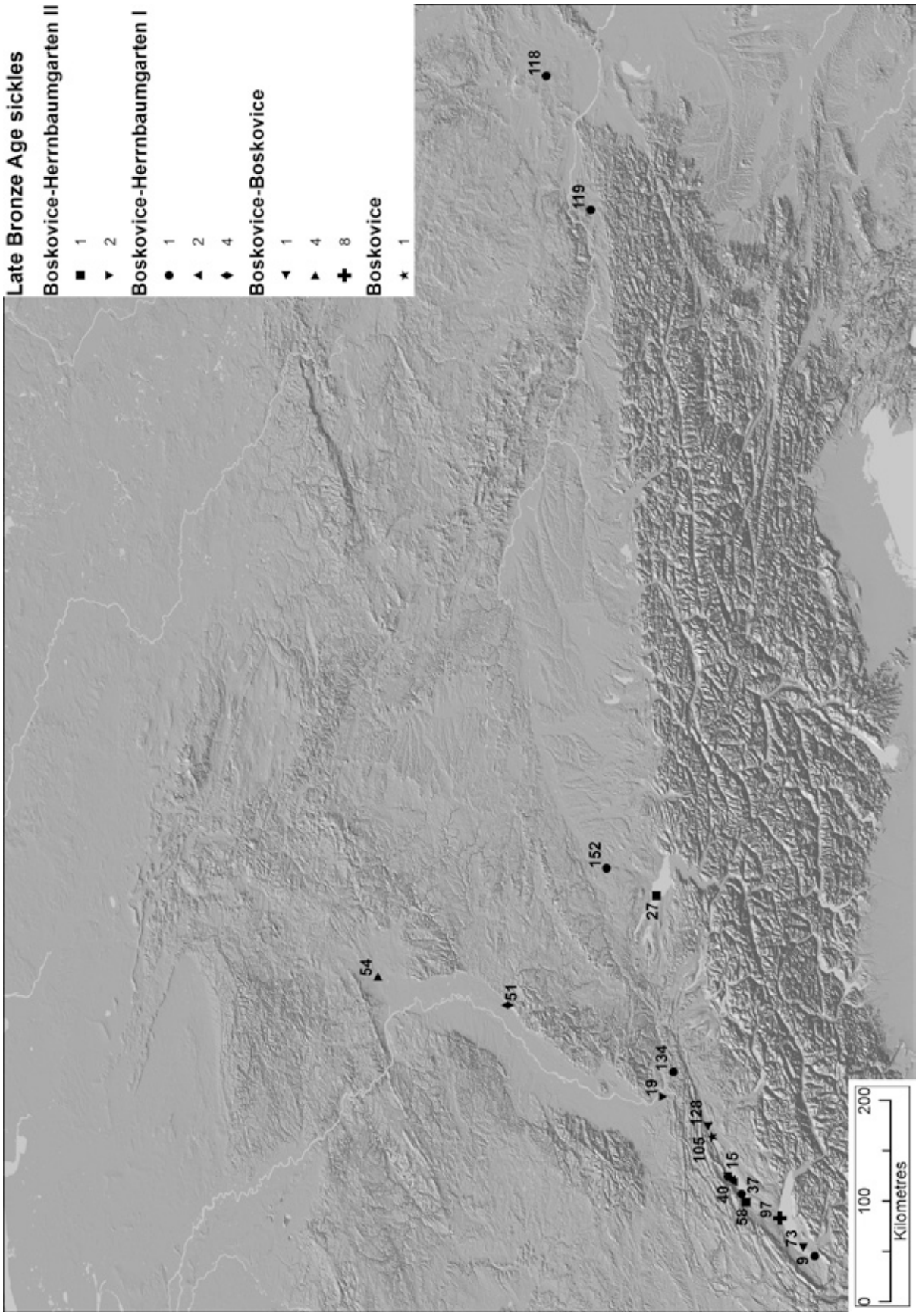
Map 86: Distribution of *Pfeffingen-Pfeffingen* type sickles.



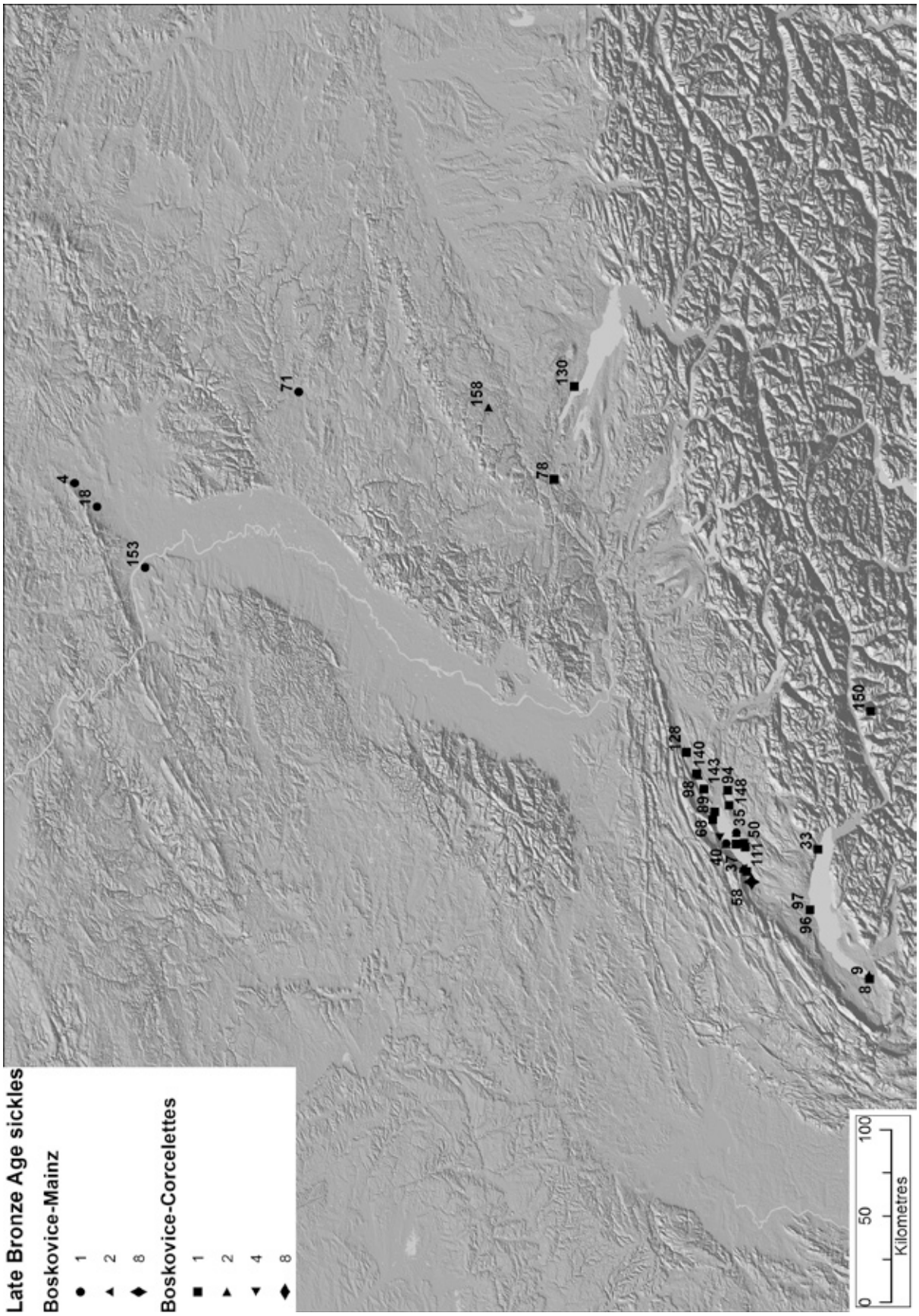
Map 87: Distribution of *Pfeffingen-Wollishofen II* type sickles.



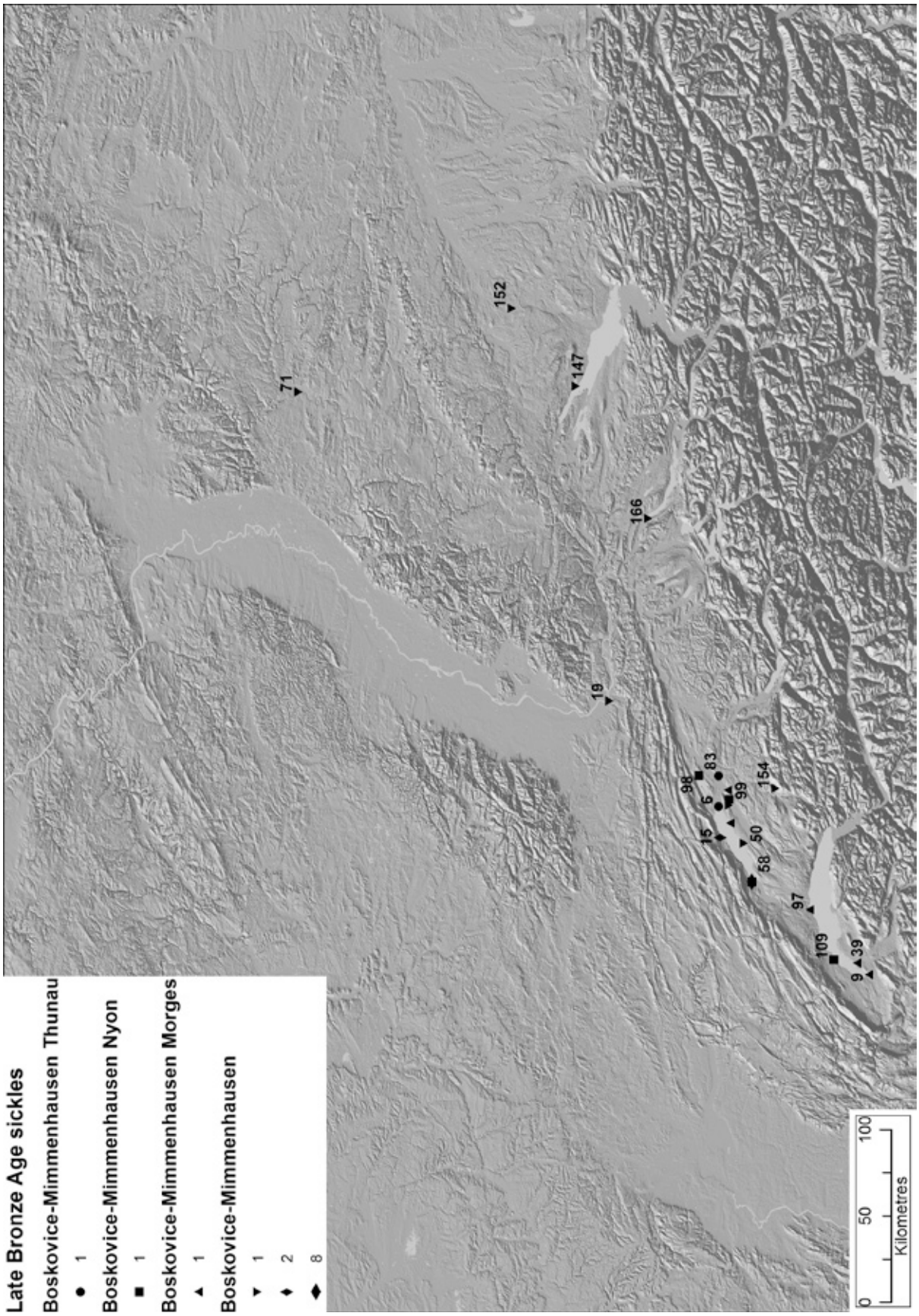
Map 88: Distribution of *Böhmisch-Bayerische* group sickle types in the northern Circum-Alpine region.



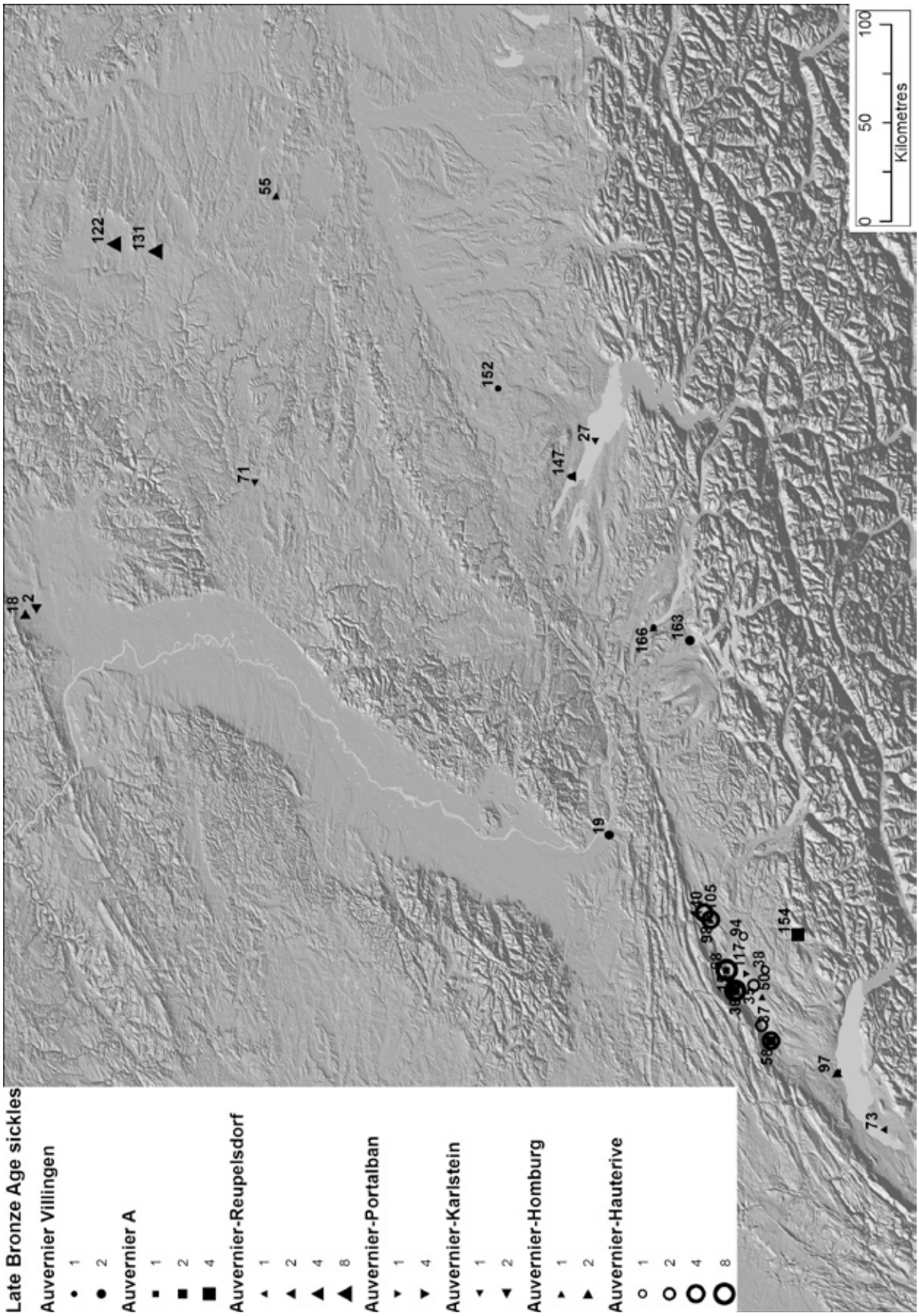
Map 89: Distribution of *Boskovice*, *Boskovice-Boskovice*, *Boskovice-Herrnbaumgarten I*, and *Boskovice-Herrnbaumgarten II* type sickles.



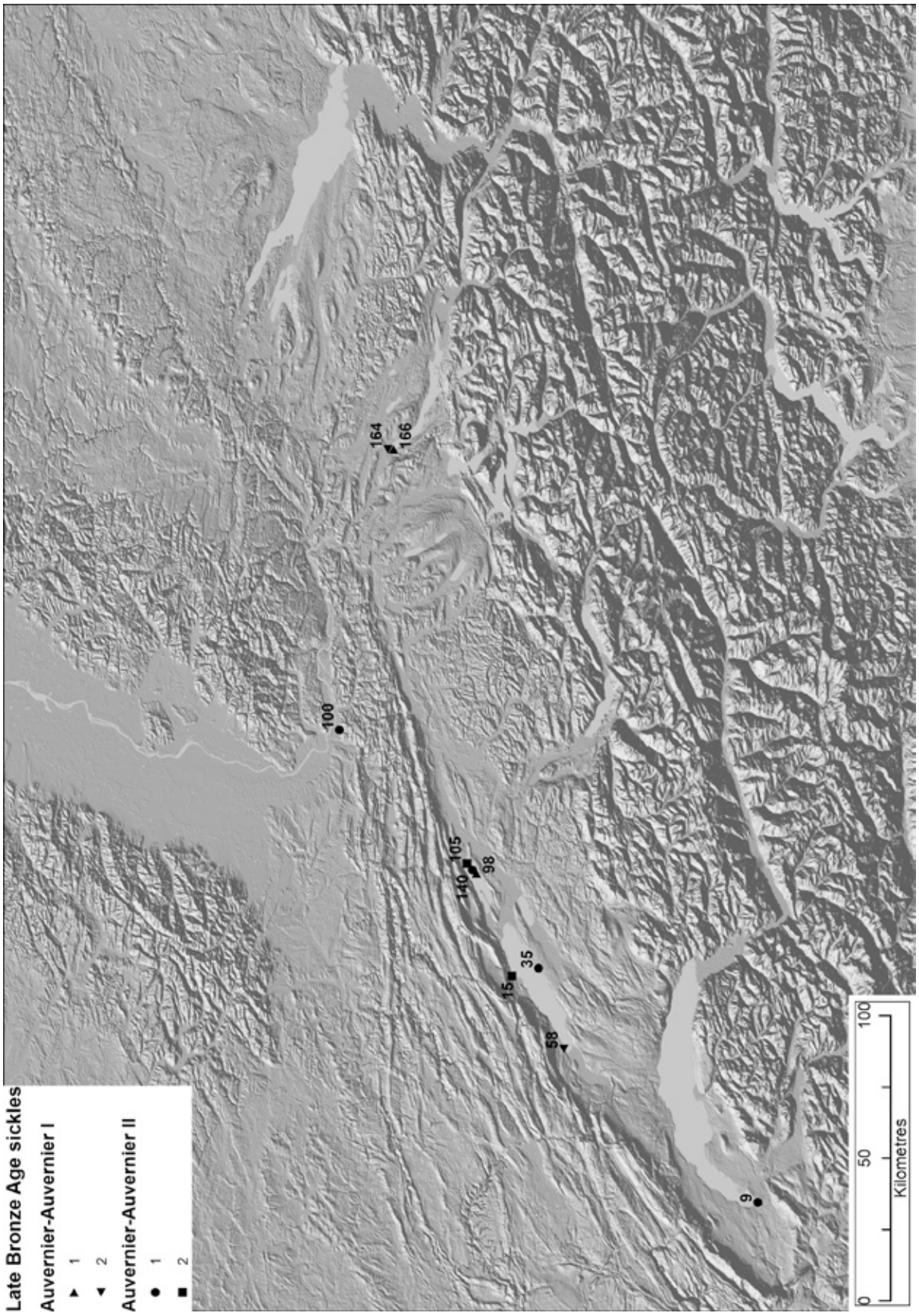
Map 90: Distribution of *Boskovice-Corcelettes* and *Boskovice-Mainz* type sickles.



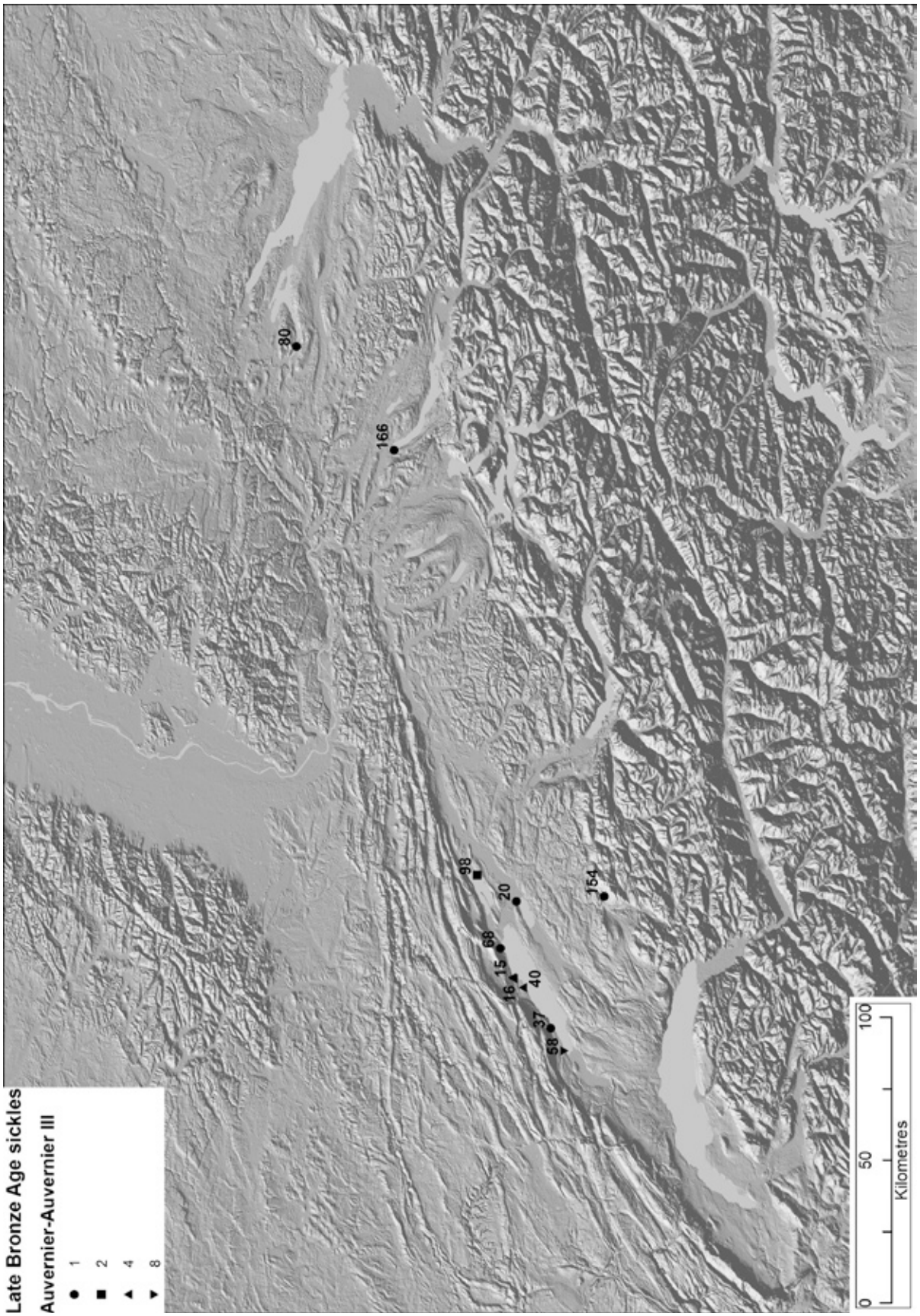
Map 91: Distribution of *Boskovice-Mimmenhausen* variant sickles.



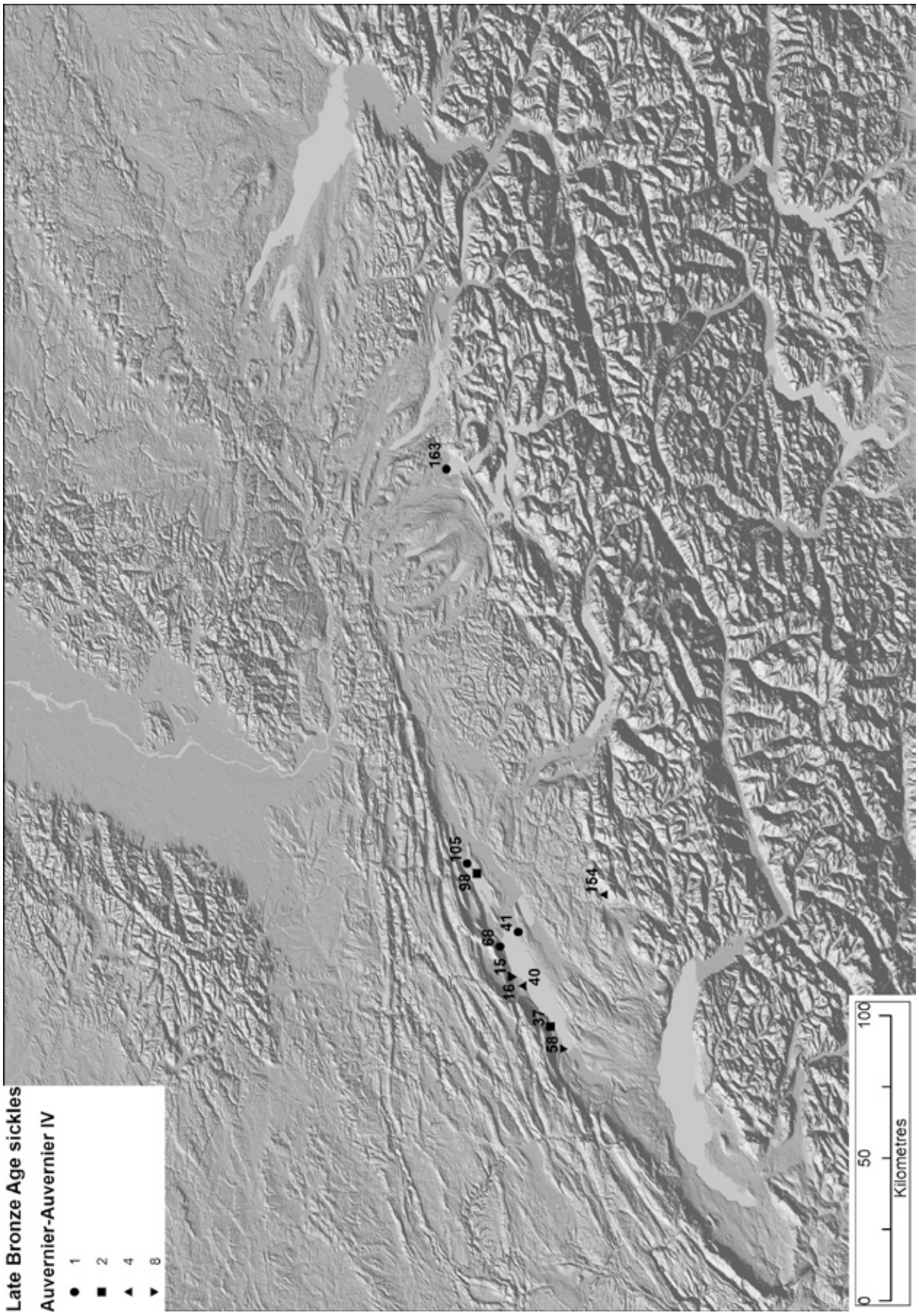
Map 92: Distribution of *Auvernier-Villingen*, *Auvernier goup A* without further identification, *Auvernier-Reupelsdorf*, *Auvernier-Portalban*, *Auvernier-Karlstein*, *Auvernier-Homburg*, and *Auvernier-Hauterive* type sickles.



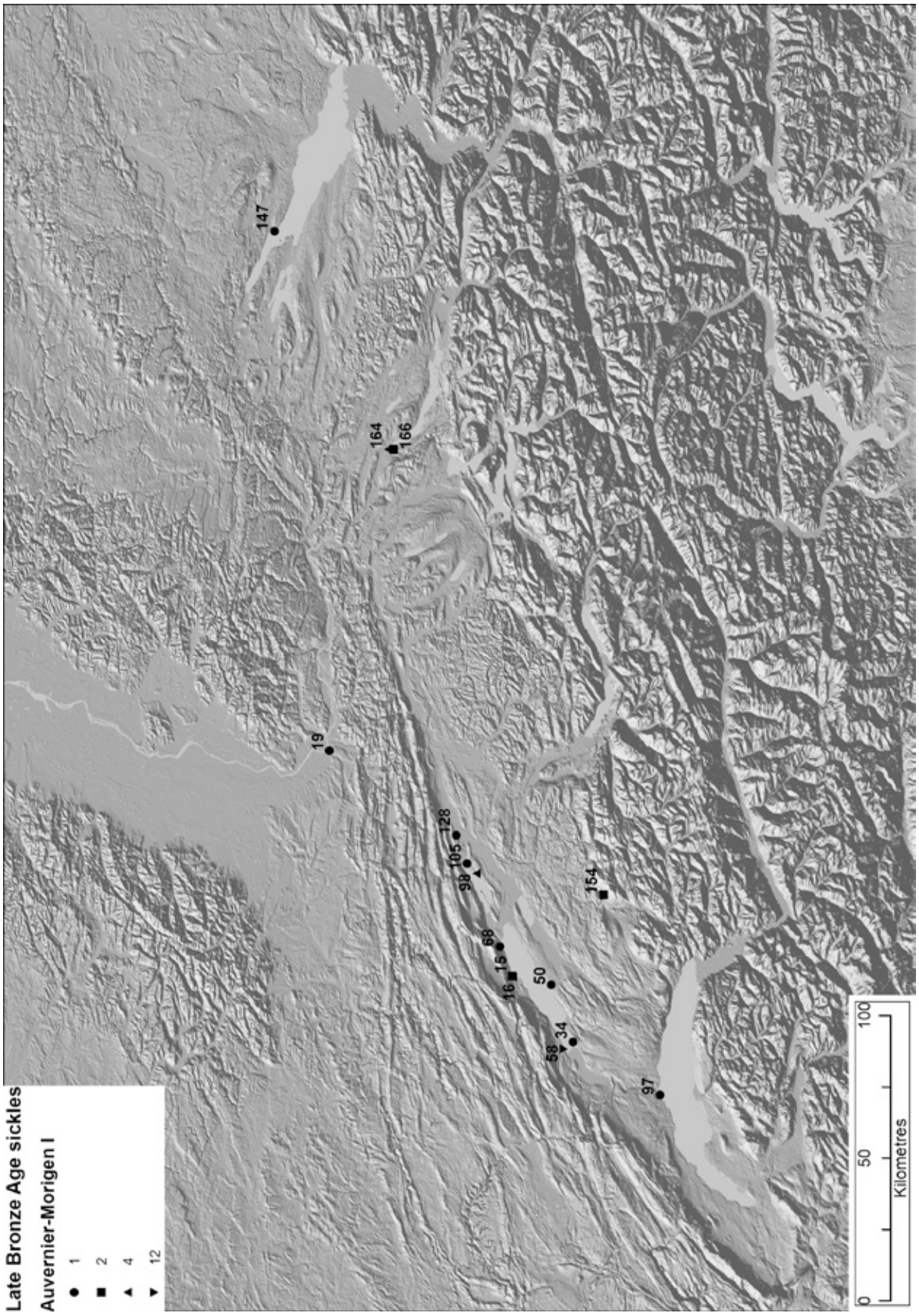
Map 93: Distribution of *Auvernier-Auvernier I* and *Auvernier-Auvernier II* type sickles.



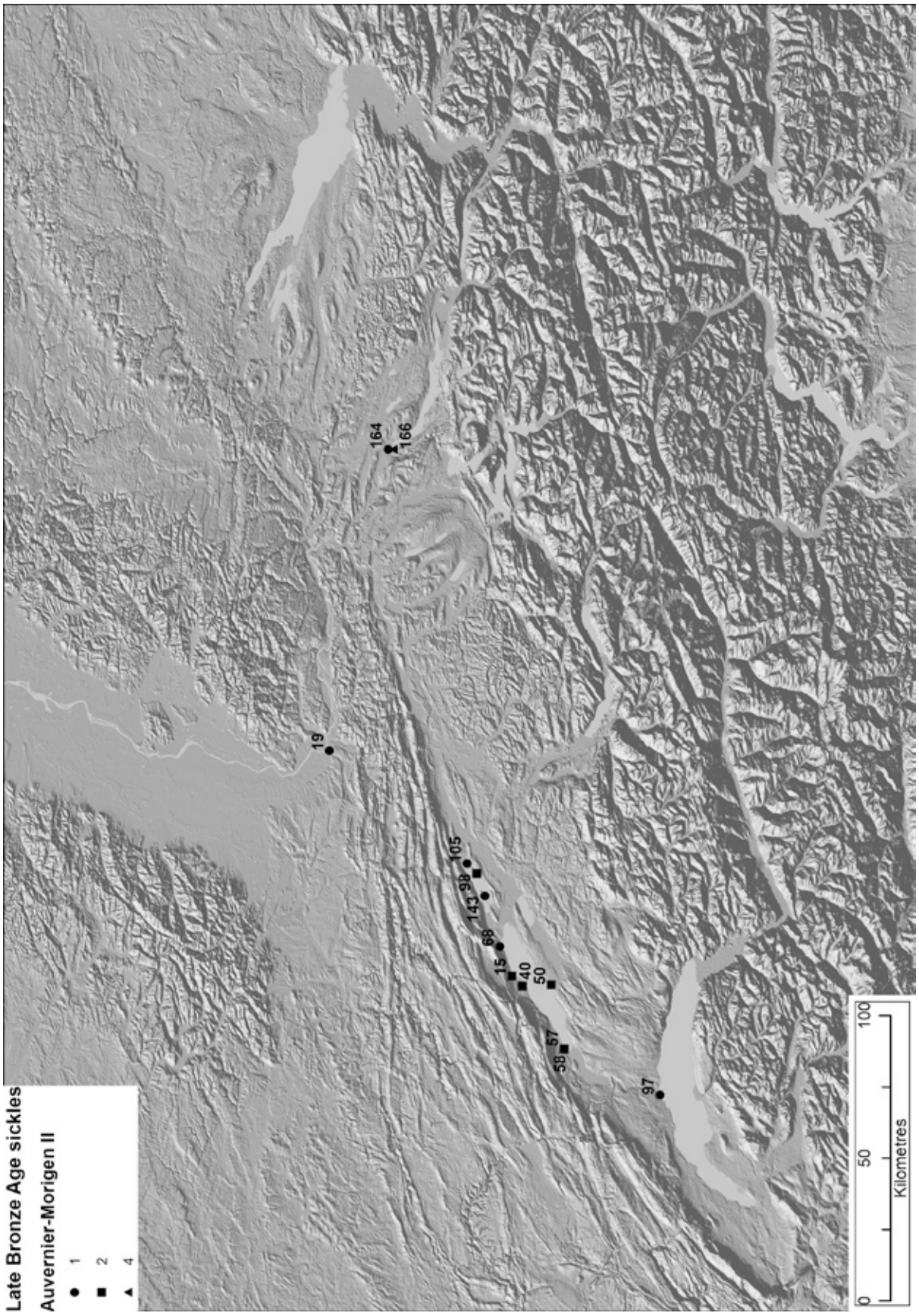
Map 94: Distribution of *Auvernier-Auvernier III* type sickles.



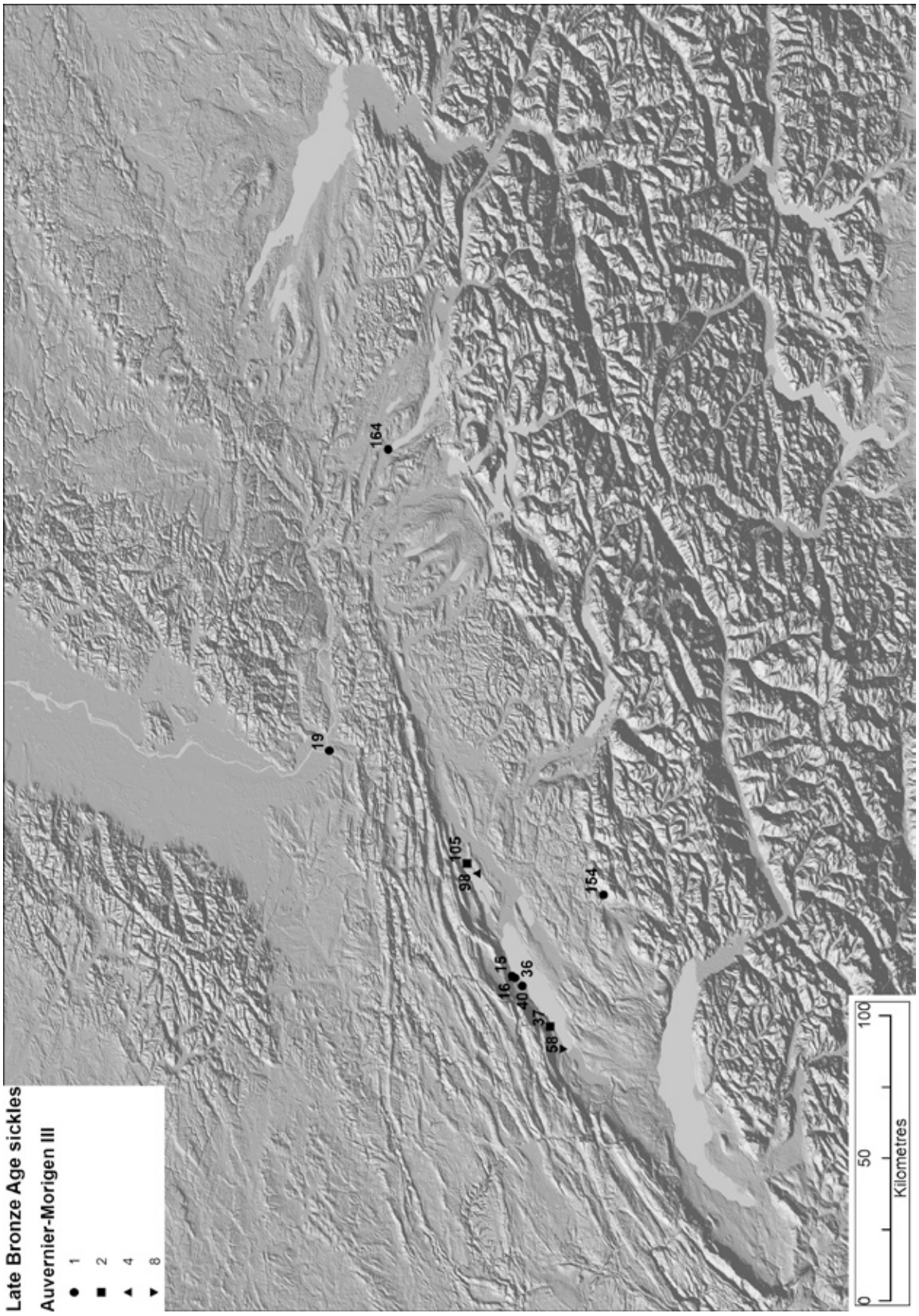
Map 95: Distribution of *Auvernier-Auvernier IV* type sickles.



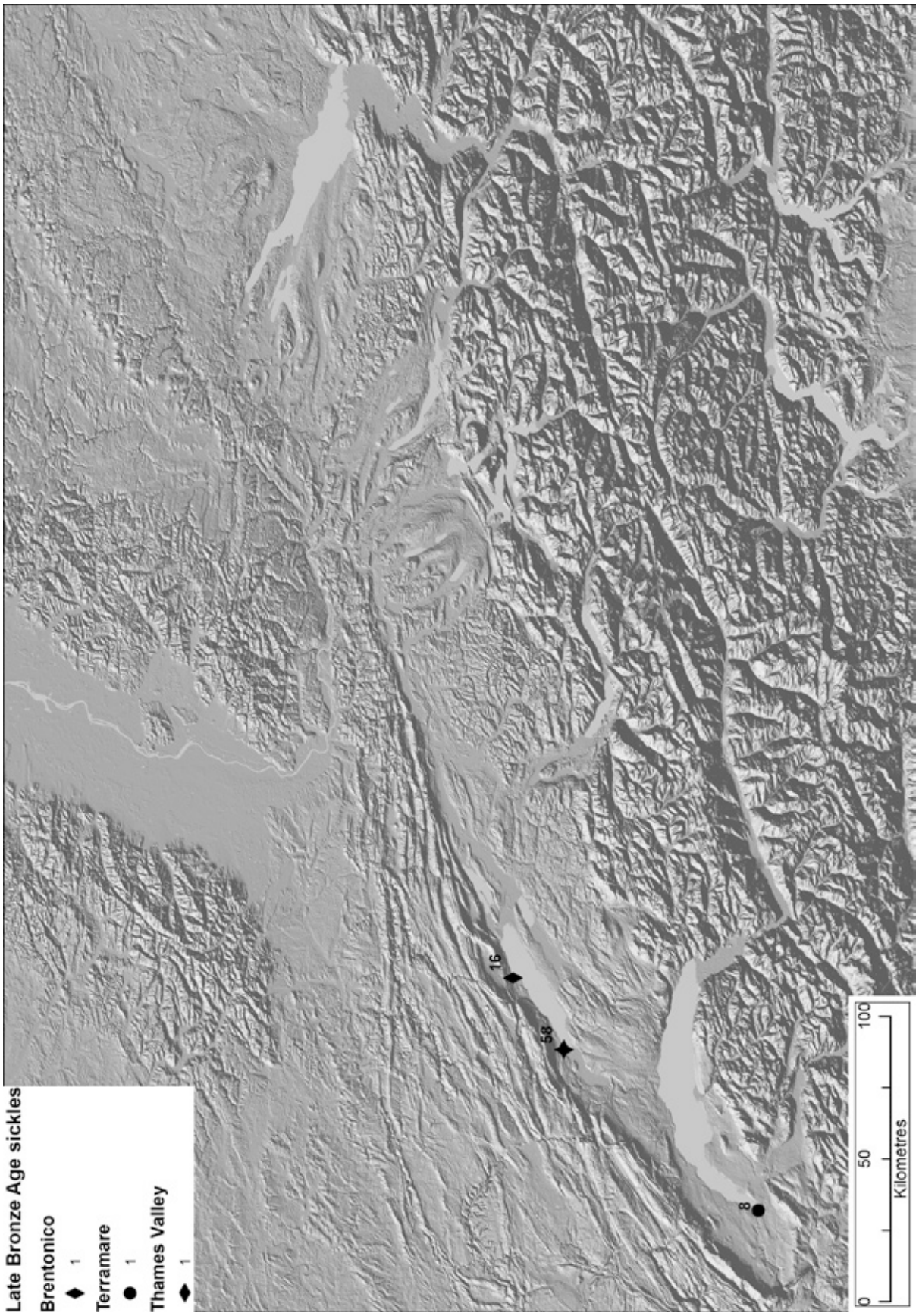
Map 96: Distribution of *Auvernier-Mörigen I* type sickles.



Map 97: Distribution of Auvernier-*Mörigen type II* sickles.



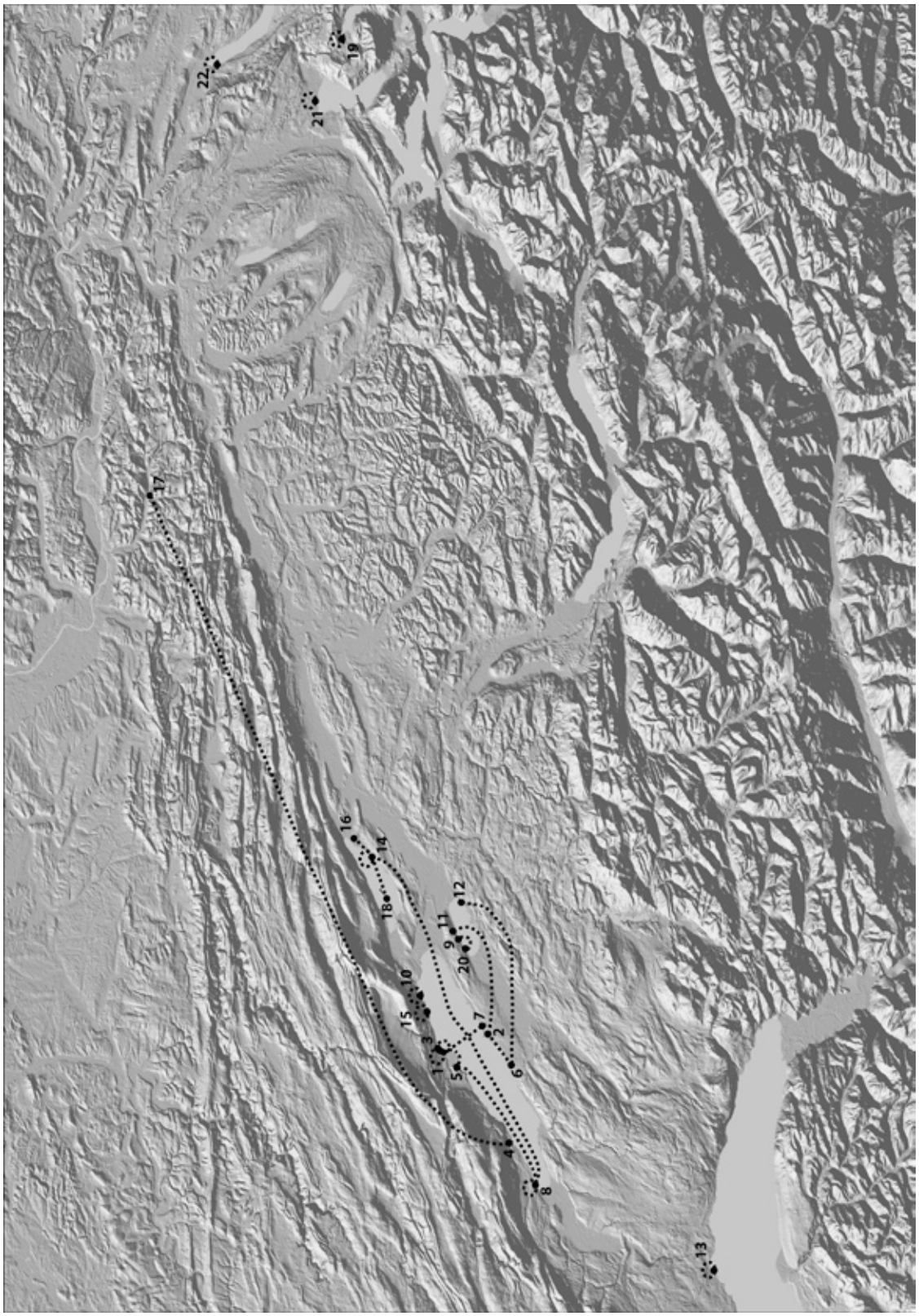
Map 98: Distribution of *Auvernier-Mörigen III* type sickles.



Map 99: Distribution of Late Bronze Age imported sickle types in the northern Circum-Alpine region.

Map 100 (all sites in Switzerland; data from Primas 1986).

No.	Site
1	Auvernier
2	Chevroux
3	Colombier
4	Concise
5	Cortaillod
6	Estavayer-le-Lac
7	Gletterens
8	Grandson-Corcelettes
9	Guevaux
10	Hauterive-Champréveyres
11	Haut-Vully
12	Montilier
13	Morges Grande Cité
14	Mörigen
15	Neuchâtel Le Crêt
16	Nidau
17	Sissach
18	Twann – Petersinsel
19	Unterägeri
20	Vallamand
21	Zug-Sumpf
22	Zürich-Wollishofen



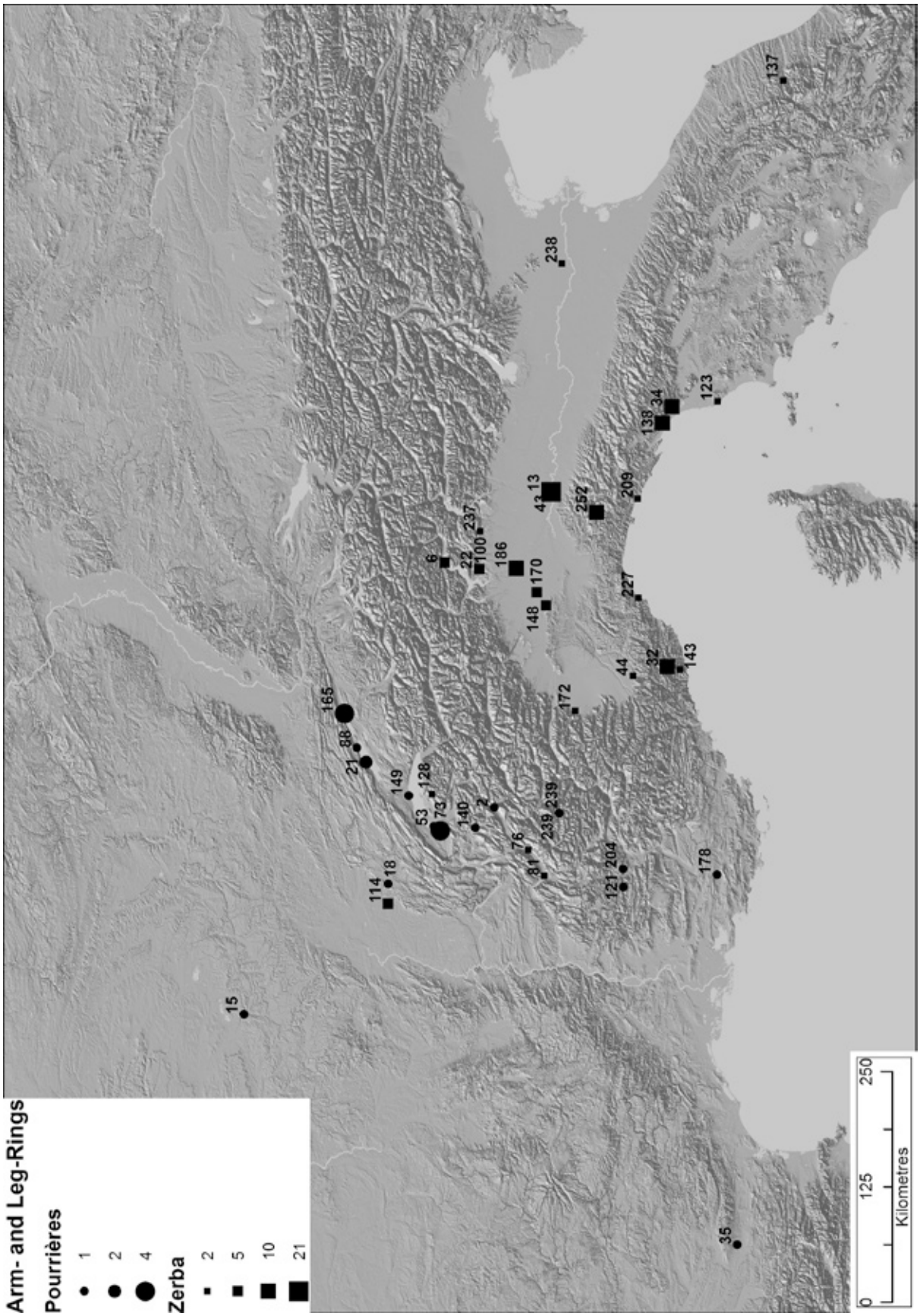
Map 100: Distribution of 'sibling' sickles in the northern Circum-Alpine region. Dashed circles represent intra-site 'sibling' sickles (Data from Primas, 1986).

Maps 101 – 117 (locations/lakes marked with * have no further context information available).

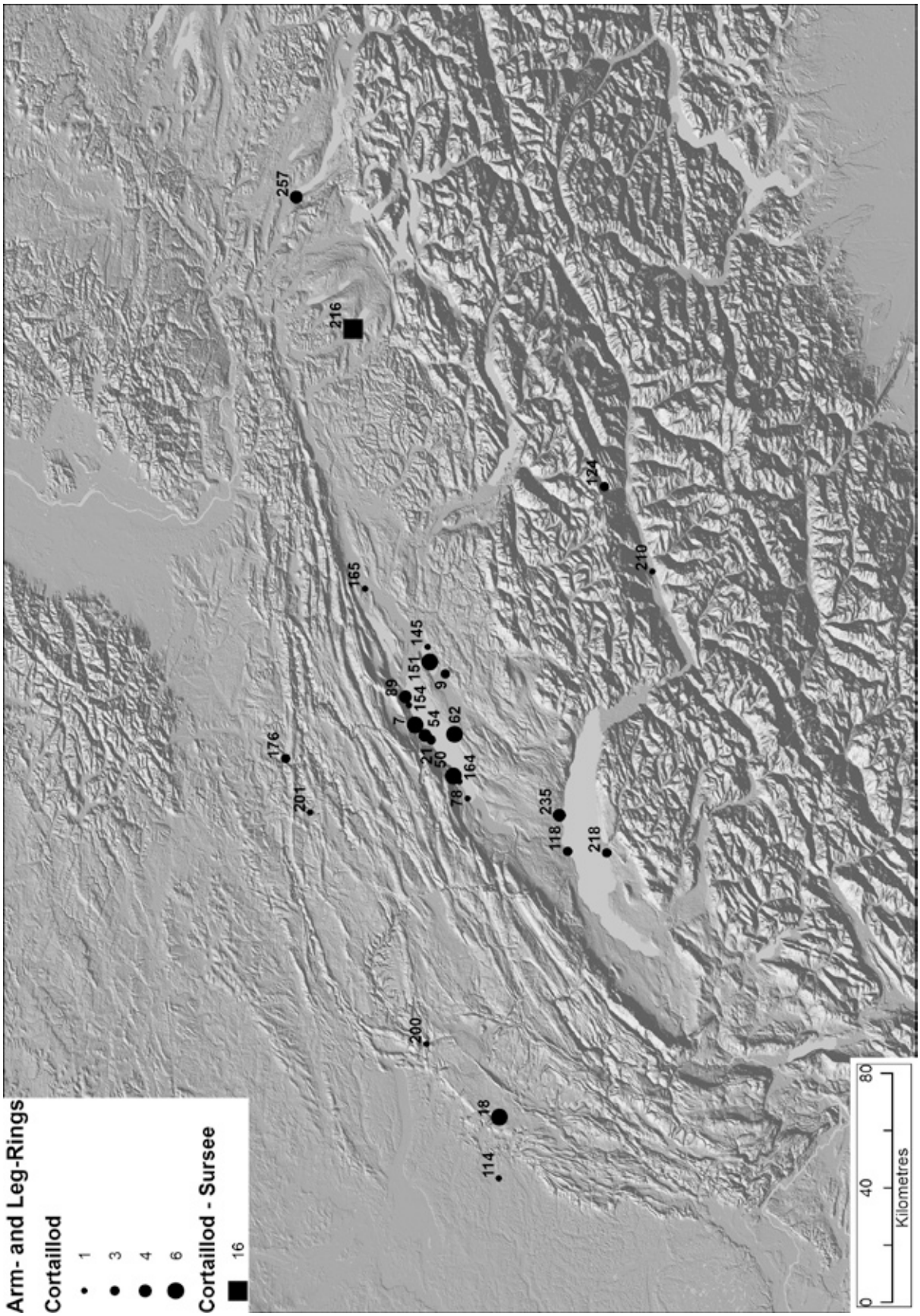
All references (Pászthory 1985) unless specified below. a) = (Richter 1970); b) = (Coffyn *et al.* 1981); c) = (Cordier and Bourhis 1996); d) = (Eberschweiler *et al.* 2007); e) (David-Elbiali and Moinat 2005); f) = (Hagl 2008); g) = (Hohlbein 2008a); h) = (Kaenel and Klausener 1990); i) (Kimmig 1992); j) = (O'Connor 1980); k) = (Paltineri and Rubat Borel 2008); l) = (Pearce 1994); m) = (Rychner 1979); n) = (Rychner-Faraggi 1993); o) = (Schmid-Sikimić 1996); p) = (Schöbel 1996); q) = (Schwab 2002); r) = (Stein 1979); s) = (Weidmann 1983); t) = (Wilbertz 1982); u) = (Briard 1966); v) = (Gaucher 1981); w) = (Reboul and Millotte 1975); x) = (Abauzit 1973); y) = (Badens 1935); z) = (Cordier *et al.* 1960); +) = (Pászthory 1985).

No.	Site	Country	References
1	Aigle	CH	
2	Albertville	FR	
3	Allendorf	D	a)
4	Amiens	FR	v; +)
6	Ascona	CH	k)
7	Auvernier	CH	
8	Auvernier-Nord	CH	
9	Avenches	CH	
10	Azay-le-Rideau	FR	b; c; m)
11	Bachzimmern	D	
12	Bad Homburg	D	a; +)
13	Badia Pavese	IT	l)
14	Balingen	D	
15	Bar-sur-Seine	FR	
16	Basel-Elisabethenschanze	CH	
17	Basse Yutz	FR	w; +)
18	Baume-les-Messieurs	FR	b)
19	Belp	CH	o)
20	Bern	CH	o)
21	Bevaix	CH	
22	Biandronno	IT	l)
23	Bielersee *	CH	
24	Bingen	D	a)
25	Blödesheim	D	a)
26	Bodensee *	D	p)
27	Bofflens	CH	o)
28	Boissy-aux-Cailles	FR	c; u)
29	Brebach-Fechingen	D	g)
30	Brügg	CH	
31	Brugg - Zihl	CH	
32	Buco del Diavolo, Triora	IT	k)
33	Calden	D	a; +)
34	Camaiore	IT	l)
35	Carlipa	FR	
36	Chabrey	CH	
37	Chabris	FR	c)
38	Chamery	FR	b)
39	Champigneulles	FR	c)
40	Charroux	FR	b; x; +)
41	Chens-sur-Léman	FR	m)
42	Chevroux	CH	
43	Chignolo Po	IT	k)
44	Chiusa Pesio	IT	k)
45	Choisy-le-Roi	FR	c; u)
46	Choussy	FR	b; c)
47	Civry-la-Forêt	FR	c; u)
48	Colombier	CH	
49	Combon	FR	
50	Concise	CH	
51	Cordast	CH	o)
52	Corsalettes	CH	
53	Corsier-La Gabiule	CH	
54	Cortaillod	CH	
55	Cressier/Cornaux	CH	o)
56	Cudrefin	CH	
57	Déville-lès-Rouen	FR	b; j; +)
58	Digne	FR	m)
59	Dreuil-lès-Amiens	FR	c; u)
60	Dromersheim	D	a; +)
61	Epervans	FR	b)
62	Estavayer-le-Lac	CH	
63	Esvres	FR	c)
64	Fahrwangen	CH	o)
65	Font	CH	
66	Font - La Pianta	CH	
67	Frankfurt an der Oder	D	
68	Frankfurt-Grindbrunnen/Westhafen	D	a)
69	Fridingen	D	
70	Frouard	FR	w; +)
71	Gampelen/Witzwil	CH	
72	Gartz	D	
73	Genève-Eaux Vives	CH	
74	Genève-Paquis	CH	
75	Gletterens	CH	
76	Goncelin	FR	k)
77	Gorgier	CH	o)
78	Grandson-Corcelettes	CH	
79	Graville-Sainte-Honorine	FR	b)
80	Greifensee-Böschen	CH	d)
81	Grenoble	FR	k)
82	Grésine	FR	m)
83	Guévaux	CH	
84	Gündlingen	D	
85	Hagnau-Burg	D	p)
86	Haimbach	D	a)
87	Hanau	D	a; +)
88	Hauterive	CH	
89	Hauterive-Champréveyres	CH	n)
90	Hemishofen	CH	o)
91	Hemmenhofen	D	p)
92	Herrlisheim	FR	
93	Hilterfingen	CH	o)
94	Hochstadt	D	a; +)
95	Hohenstoffeln	D	y; +)
96	Homburg	D	c)
97	Illingen	D	
98	Ilôt de Nihen en Belz	FR	b)
99	Ins	CH	o)
100	Isolino Virginia	IT	l)
101	Issoudun	FR	c)
102	Juvincourt	FR	c; u)
103	Kaiserlautern	D	c)
104	Kelheim	D	
105	Kerzers	CH	
106	Konstanz-Rauenegg	D	p)
107	Konstanz-Staad	D	p)
108	Kuckenburg	D	
109	La Béroche	CH	o)
110	La Ferté-Hauterive	FR	b; x; +)
111	Lake Bourget *	FR	m; +)
112	Lake Geneva *	CH	m)
113	Langenthal	CH	o)
114	Larnaud	FR	k)
115	Laubenheim	D	m; +)
116	Lausanne	CH	o)

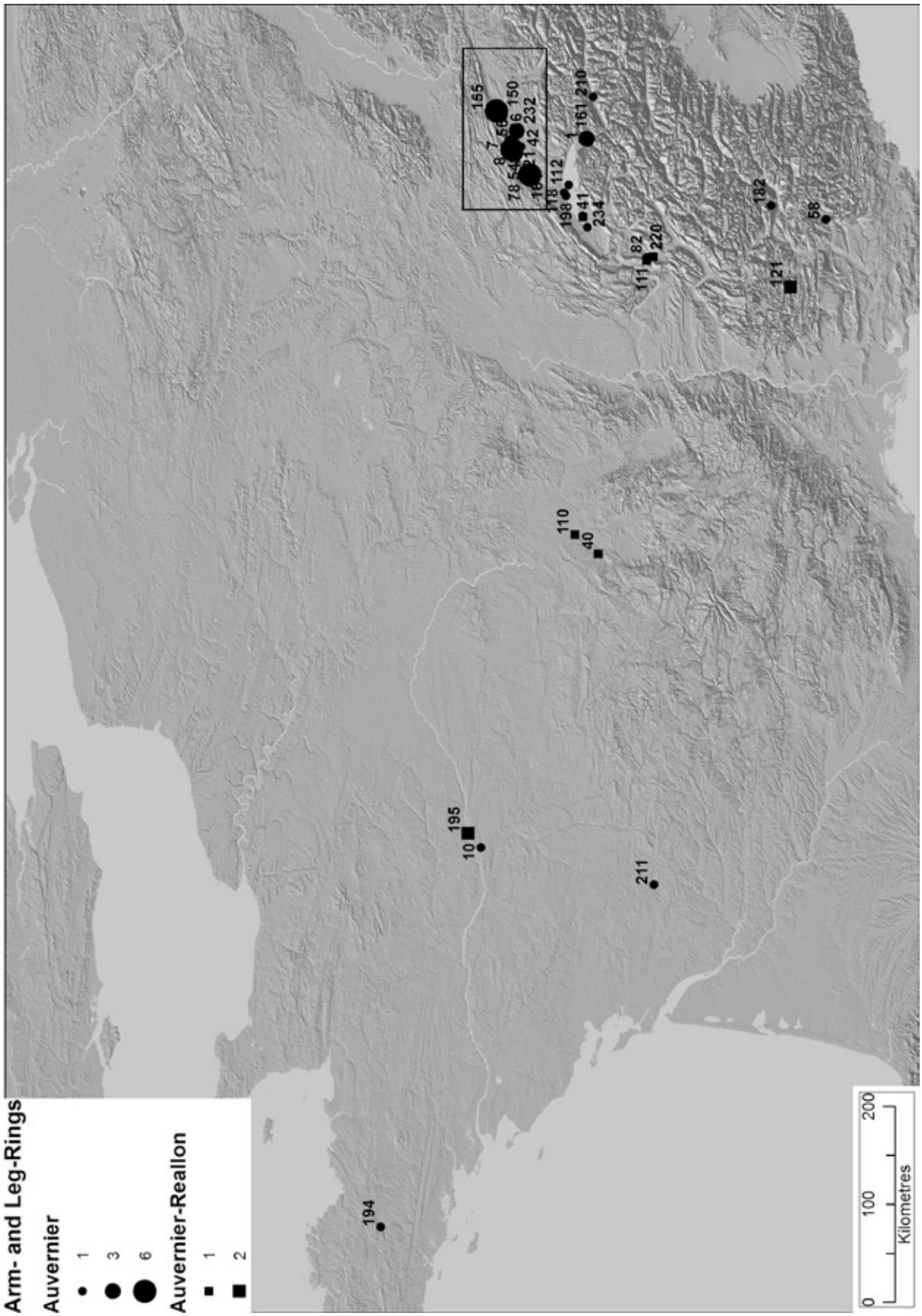
117	Lay-Saint-Remy	FR	c; w)
118	Le Boiron	CH	
119	Le Quéroy	FR	b)
120	Lens	CH	o)
121	L'Épine	FR	m; +)
122	Lessay	FR	
123	Limone	IT	l)
124	Loéche-les-Bains	CH	
125	Longy, Guernsey	UK	b)
126	Loupian	FR	
127	Lübbersdorf	D	
128	Lullin	FR	k)
129	Lyssach	CH	o)
130	Mainz	D	a)
131	Mändlfeld	D	
132	Mannheim-Wallstadt	D	
133	Manson	FR	b; c)
134	Marin-Epagnier	CH	q)
135	Marlers	FR	c; u)
136	Marnay	FR	c)
137	Marsia	IT	k)
138	Massa	IT	l)
139	Mauves-sur-Loire	FR	b; c; u)
140	Menthon	FR	
141	Minnis Bay	UK	c)
142	Möggingen-Mindelsee	D	p)
143	Monte Bignone	IT	k)
144	Montet	CH	
145	Montilier	CH	
146	Montlingerberg	CH	
147	Montreux	CH	
148	Morano sur Po	IT	k)
149	Morges	CH	
150	Mörigen	CH	
151	Murtensee	CH	
152	Nächstenbach Weinheim	D	r)
153	Neftenbach	CH	o)
154	Neuchâtel "Le Crêt"	CH	
155	Nidau	CH	
156	Nidau-Steinberg	CH	
157	Nyon	CH	
158	Ockstadt	D	a; +)
159	Oensingen	CH	o)
160	Oermingen	FR	c)
161	Ollon	CH	
162	Ollon-Charpigny	CH	c)
163	Olten	CH	o)
164	Onnens	CH	
165	Orpund	CH	
166	Otelfingen	CH	o)
167	Pantin	FR	j)
168	Petit Villatte	FR	b; c)
169	Peyriac-Minervois	FR	
170	Pezzana	IT	l)
171	Pfedelbach	D	
172	Pinerolo	IT	k)
173	Plainseau a Amiens	FR	b)
174	Planig	D	a; +)
175	Plestlin	D	
176	Pont-de-Roide	FR	
177	Port	CH	
178	Pourrières	FR	
179	Pruntrut	CH	
180	Quinta de Ervedal	PT	b)
181	Ray-sur-Saône	FR	
182	Réallon	FR	m; +)
183	Reinheim	D	
184	Rhein bei Mainz-Kastel	D	a; +)
185	Rolampont	FR	
186	Romentino	IT	l)
187	Romont	CH	o)
188	Roseninsel	D	
189	Rosières-aux-Salines	FR	c)
190	Rüdesheim-Eibingen	D	a; +)
191	Saalfeld	D	
192	Saarlautern	D	
193	Sablière	FR	b)
194	Saint-Aignan	FR	m)
195	Saint-Genouph	FR	z; +)
196	Saint-Prex En Coulet	CH	e; +)
197	Saint-Prex En Fribourg	CH	e; +)
198	Saint-Prex La Moraine	CH	e)
199	Saint-Roch a Amiens	FR	b)
200	Salins-les-Bains	FR	s)
201	Sancey-le-Long	FR	s)
202	Sarrelouis	D	c)
203	Savognin - Padnal	CH	
204	Savournon	FR	
205	Saxon	CH	
206	Schafisheim	CH	o)
207	Schötz	CH	o)
208	Seinsheim Bullenheimer Berg	D	f)
209	Sestri Levante	IT	l)
210	Sion	CH	o)
211	St. Yrieix	FR	b; c; o; +)
212	St-Aubin NE	CH	
213	Subingen	CH	o)
214	Sugiez	CH	
215	Sursee	CH	
216	Sursee – Landzunge	CH	s)
217	Tacherting	D	
218	Thonon-les-Bains	FR	s)
219	Tougues	FR	
220	Tresserve Le-Saut	FR	
221	Twann Petersinsel	CH	
222	Unadingen	D	
223	Unterlunkhofen	CH	o)
224	Unteruhldingen-Stollenwiesen	D	p)
225	Unteruhldingen-Unterösch	D	p)
226	Urtenen	CH	o)
227	Vado Ligure	IT	k)
228	Vaires-sur-Marne	FR	c)
229	Valais *	CH	
230	Valangin	CH	o)
231	Valeyres-sous-Rances	CH	o)
232	Vallamand	CH	
233	Vernay La Crasaz	CH	
234	Versoix	CH	
235	Vidy-Chavannes	CH	h)
236	Vietkow (Wicewo)	PL	
237	Villa Nesi	IT	l)
238	Villamarzana	IT	k)
239	Villar-d'Arêne	FR	k)
240	Villers-sous-Prény	FR	c)
241	Vinelz	CH	
242	Wallstadt	D	
243	Wasserburg Buchau	D	i)
244	Weisenau	D	a; +)
245	Wendorf	D	
246	Wernigerode	D	
247	Wiesbaden	D	a; +)
248	Wiesentheid-Reupelsdorf	D	t)
249	Xermaménil	FR	c; w)
250	Yverdon	CH	
251	Yverdon Champittet	CH	
252	Zerba	IT	l)
253	Zug-Sumpf	CH	
254	Zürich Kleiner-Hafner	CH	
255	Zürich-Alpenquai	CH	
256	Zürich-Grosser-Hafner	CH	
257	Zürich-Wollishofen	CH	



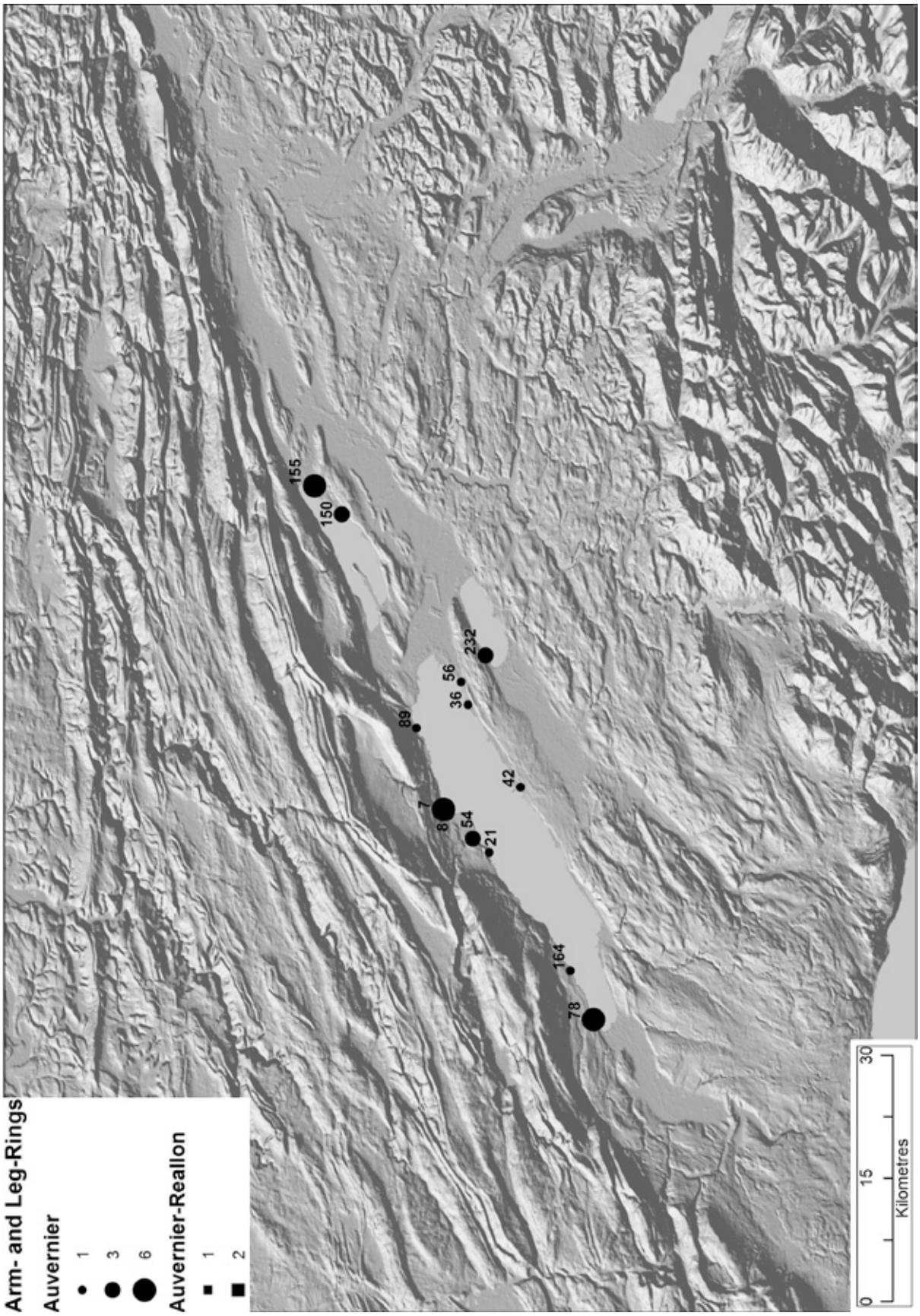
Map 101: Distribution of *Zerba* and *Pourrières* type arm-rings.



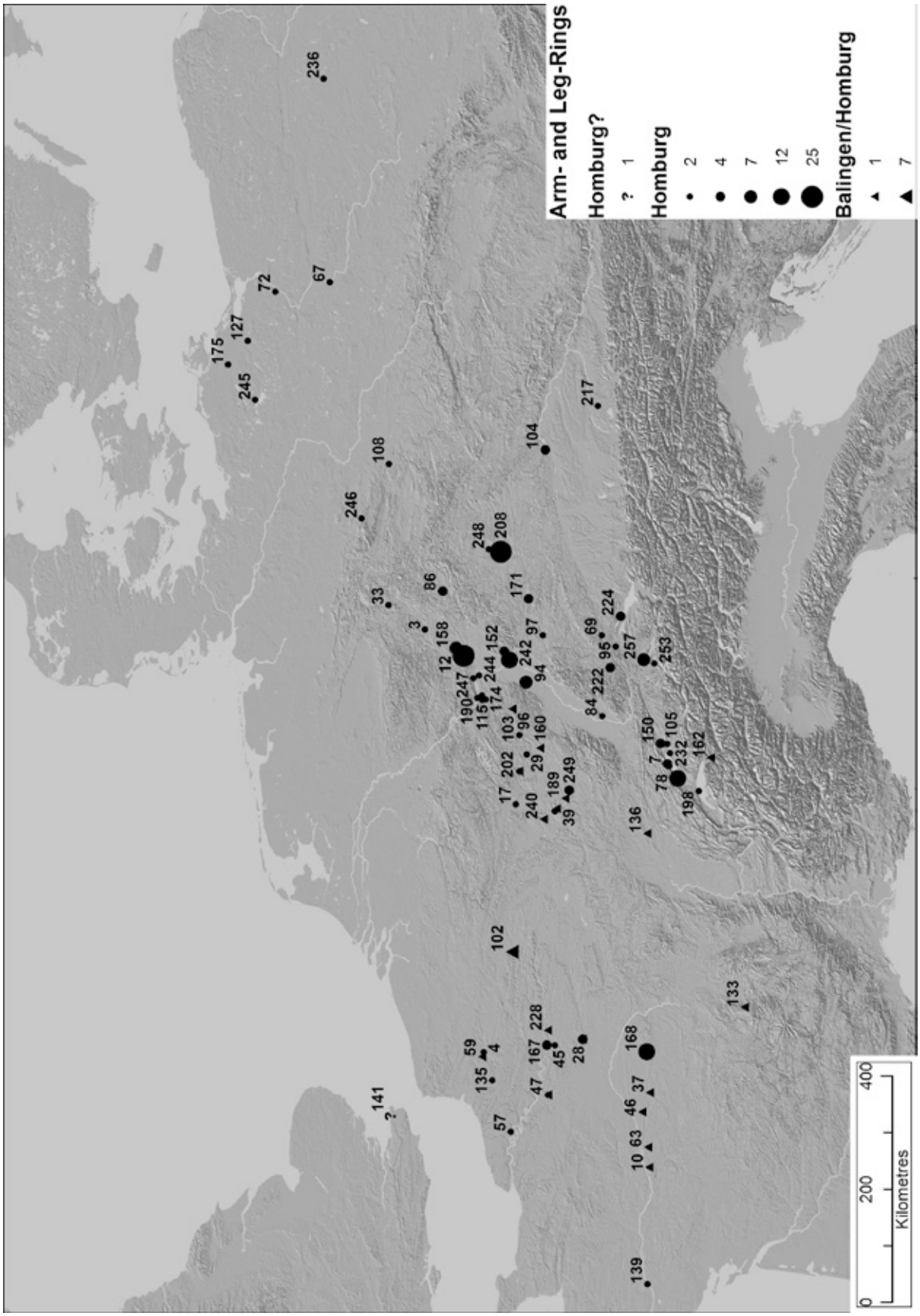
Map 102: Distribution of the *Cortaillod* type and *Cortaillod-Sursee* variant arm-rings.



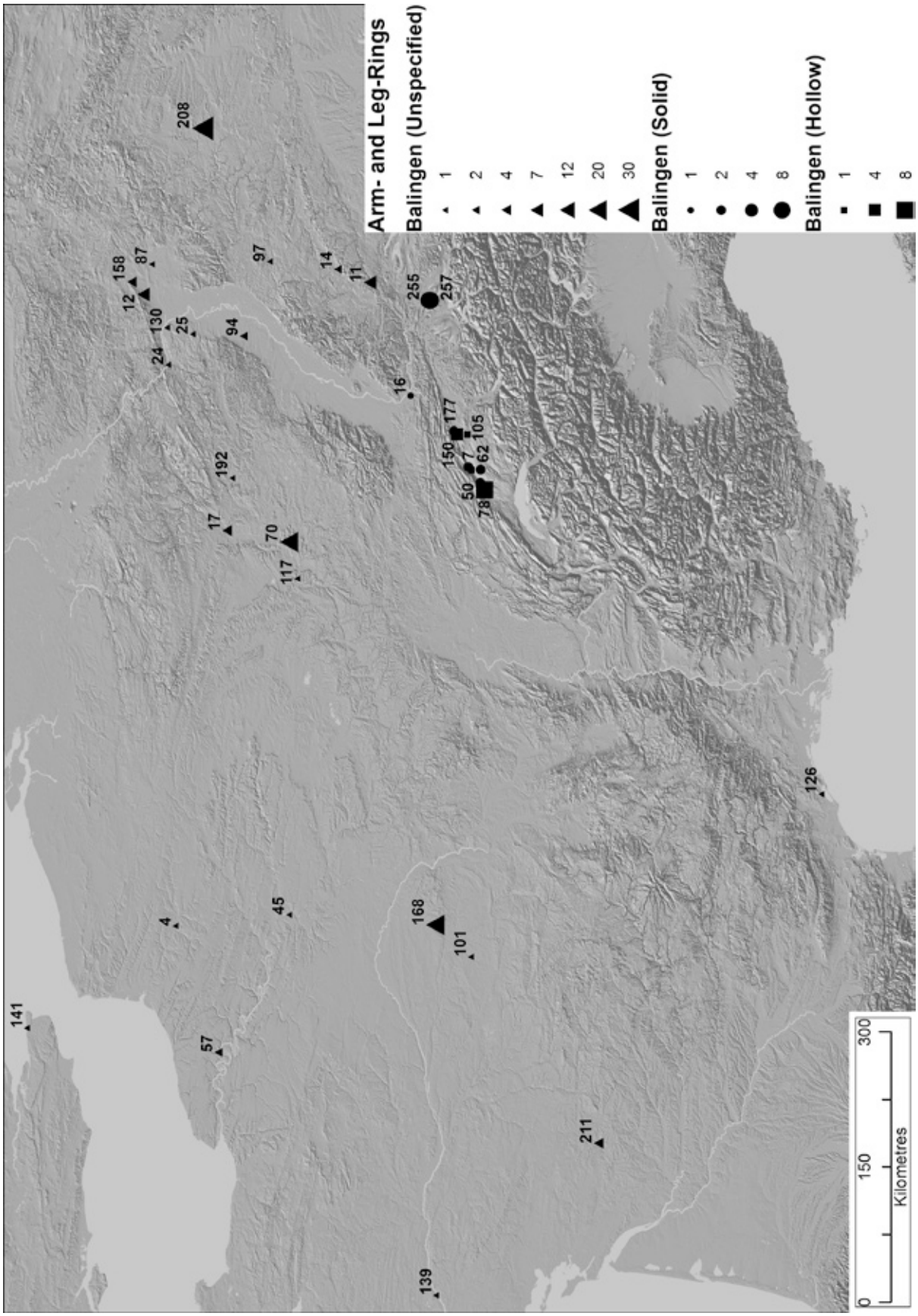
Map 103: European distribution of *Auvernier* and *Réallon* type ring jewellery. For inset region see Map 104.



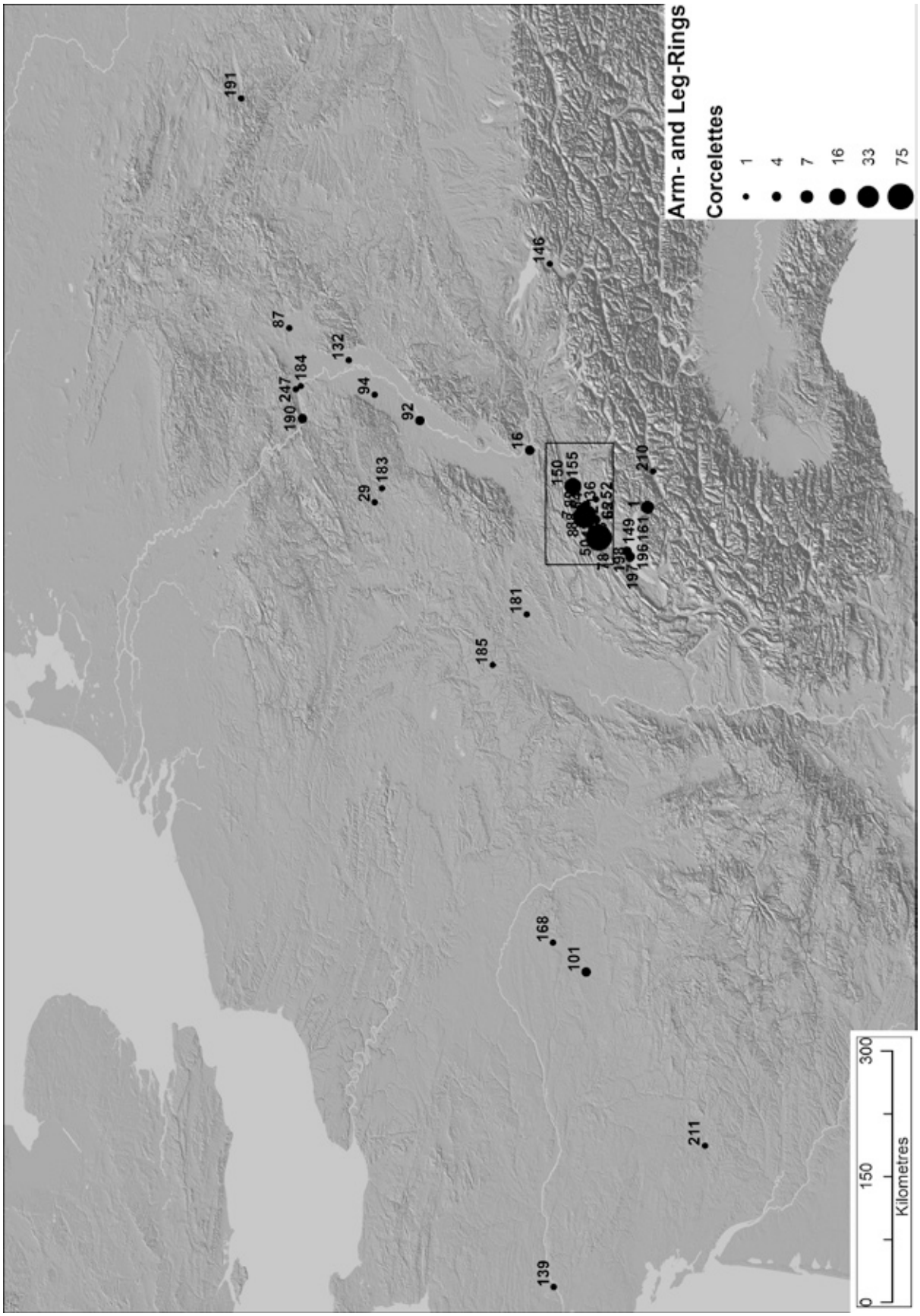
Map 104: Distribution of *Auvernier* and *Réallon* type ring jewellery in western Switzerland.



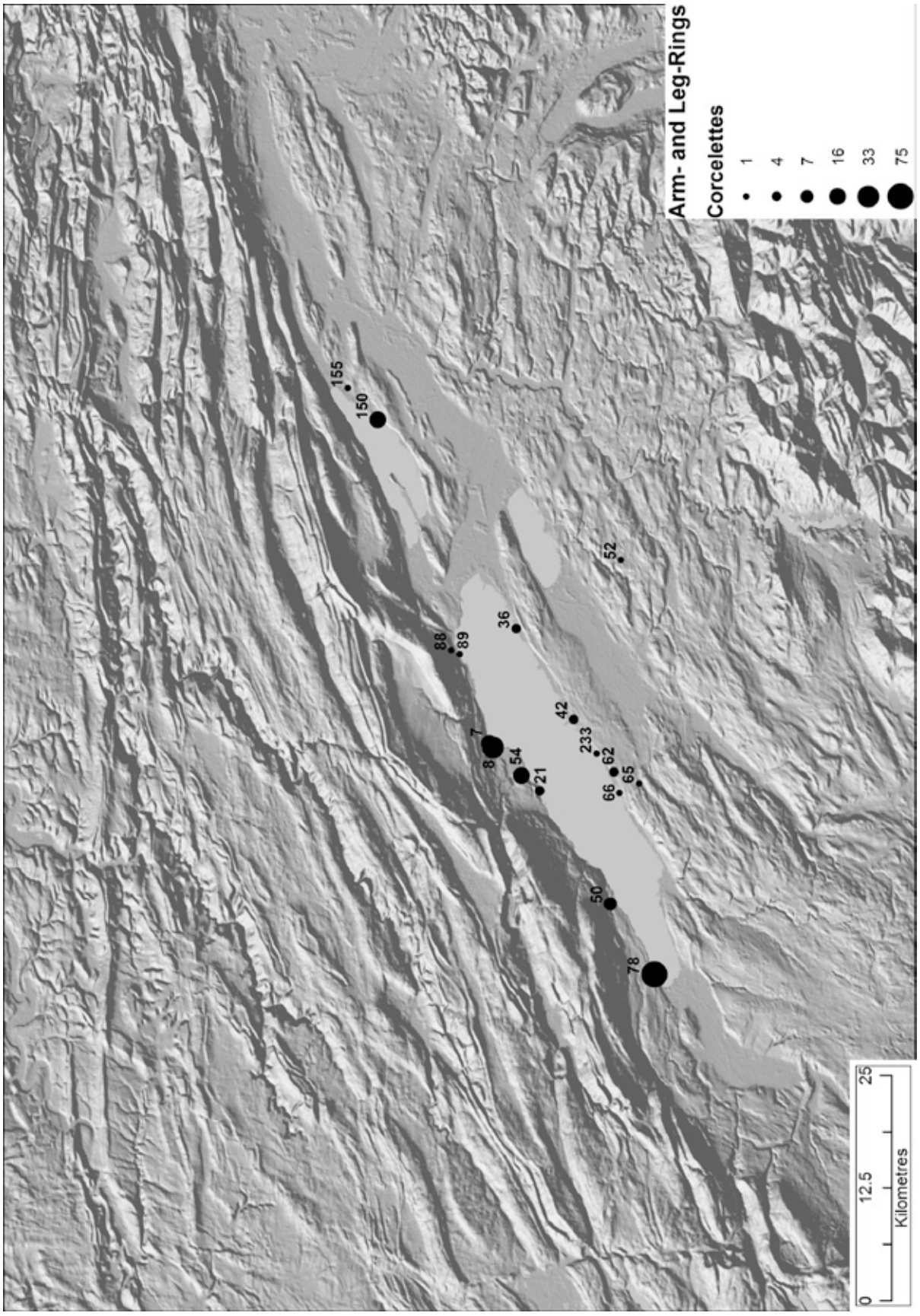
Map 105: Distribution of the *Homburg* type arm-/leg-ring, possible *Homburg* rings (Homburg?), and rings listed as *Homburg* or *Balingen* type (Homburg/Balingen).



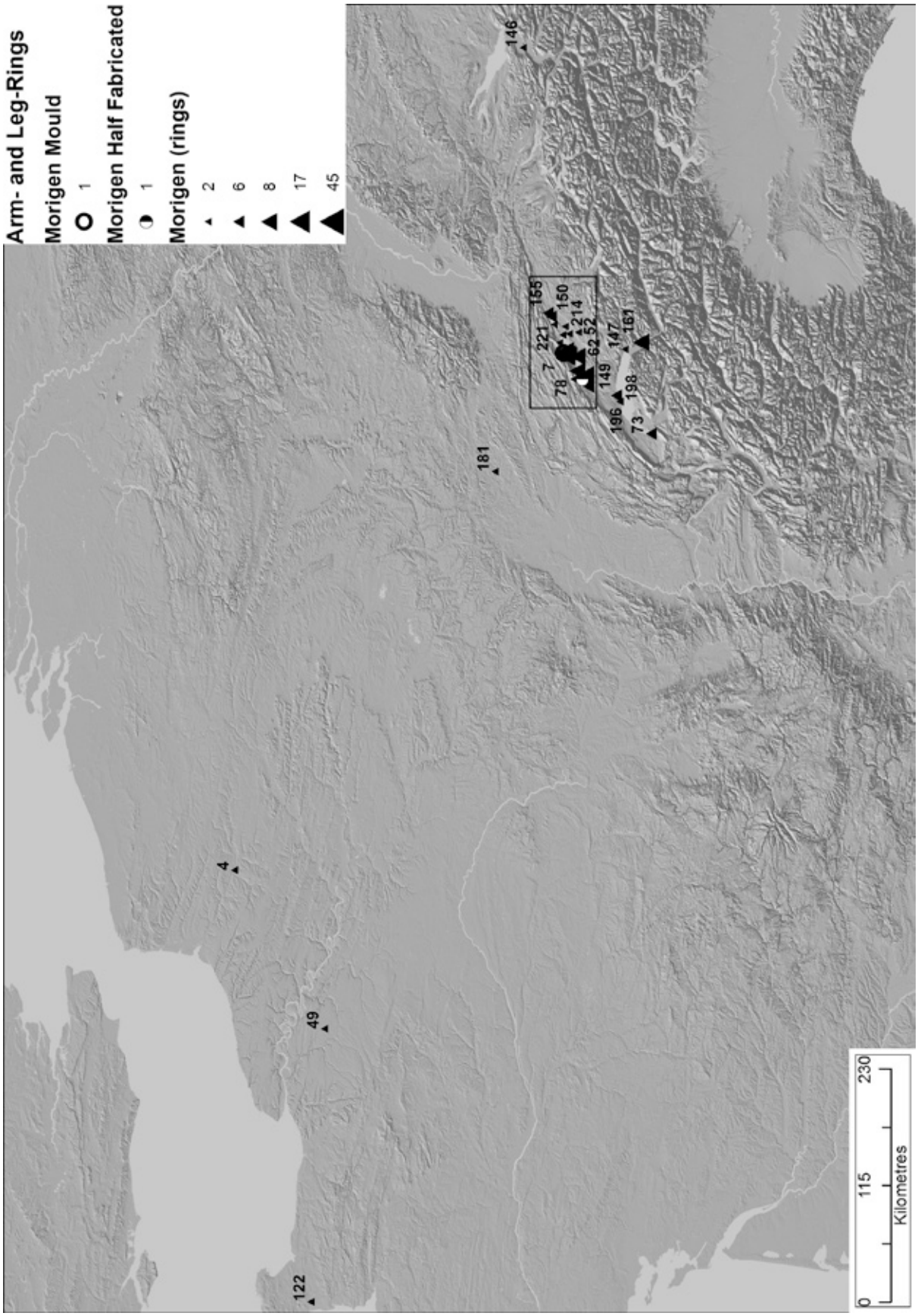
Map 106: Distribution of the *Balingen* type arm-/leg-ring.



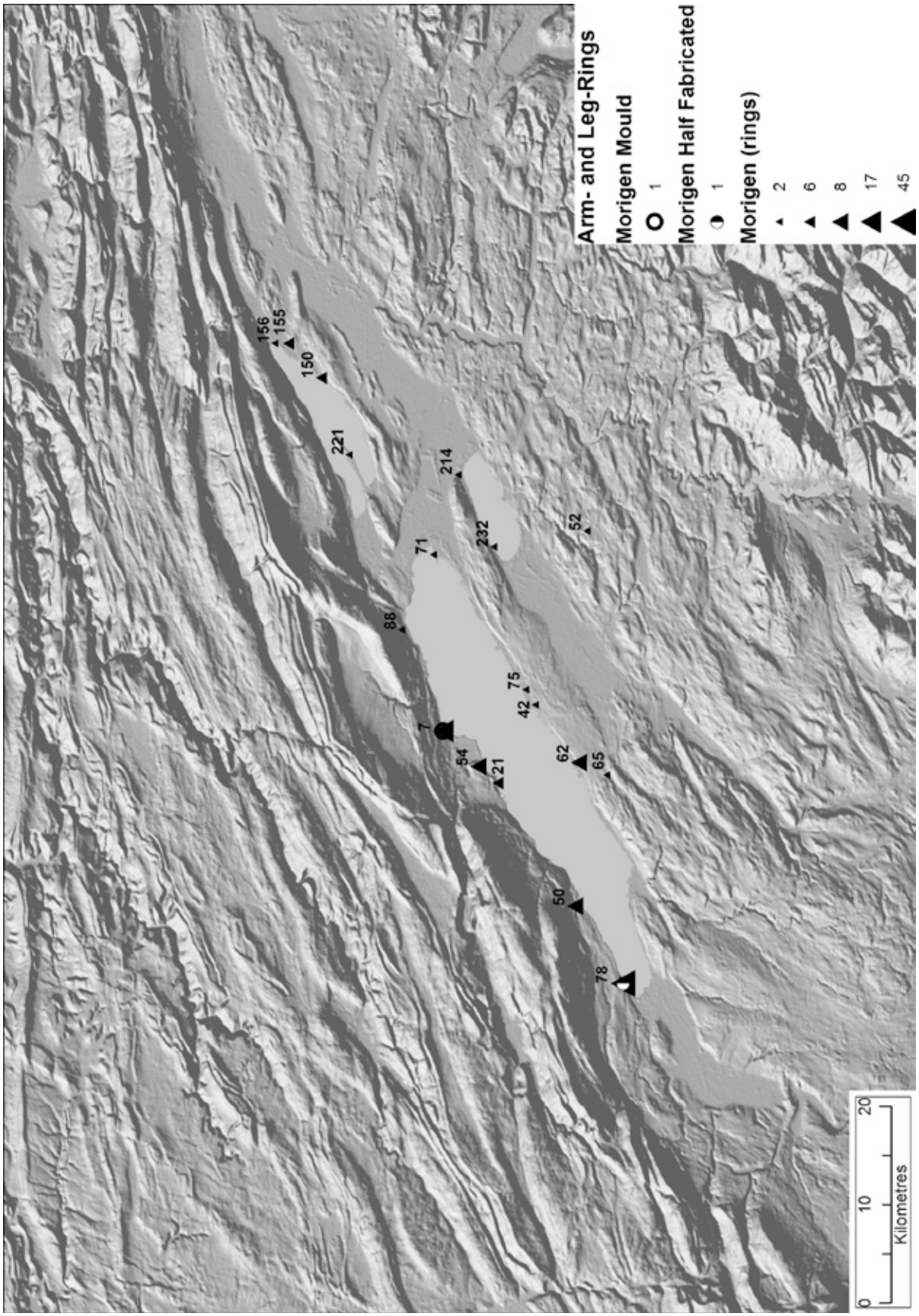
Map 107: European distribution of the *Corcelettes* type arm-/leg-ring. For inset region see Map 108.



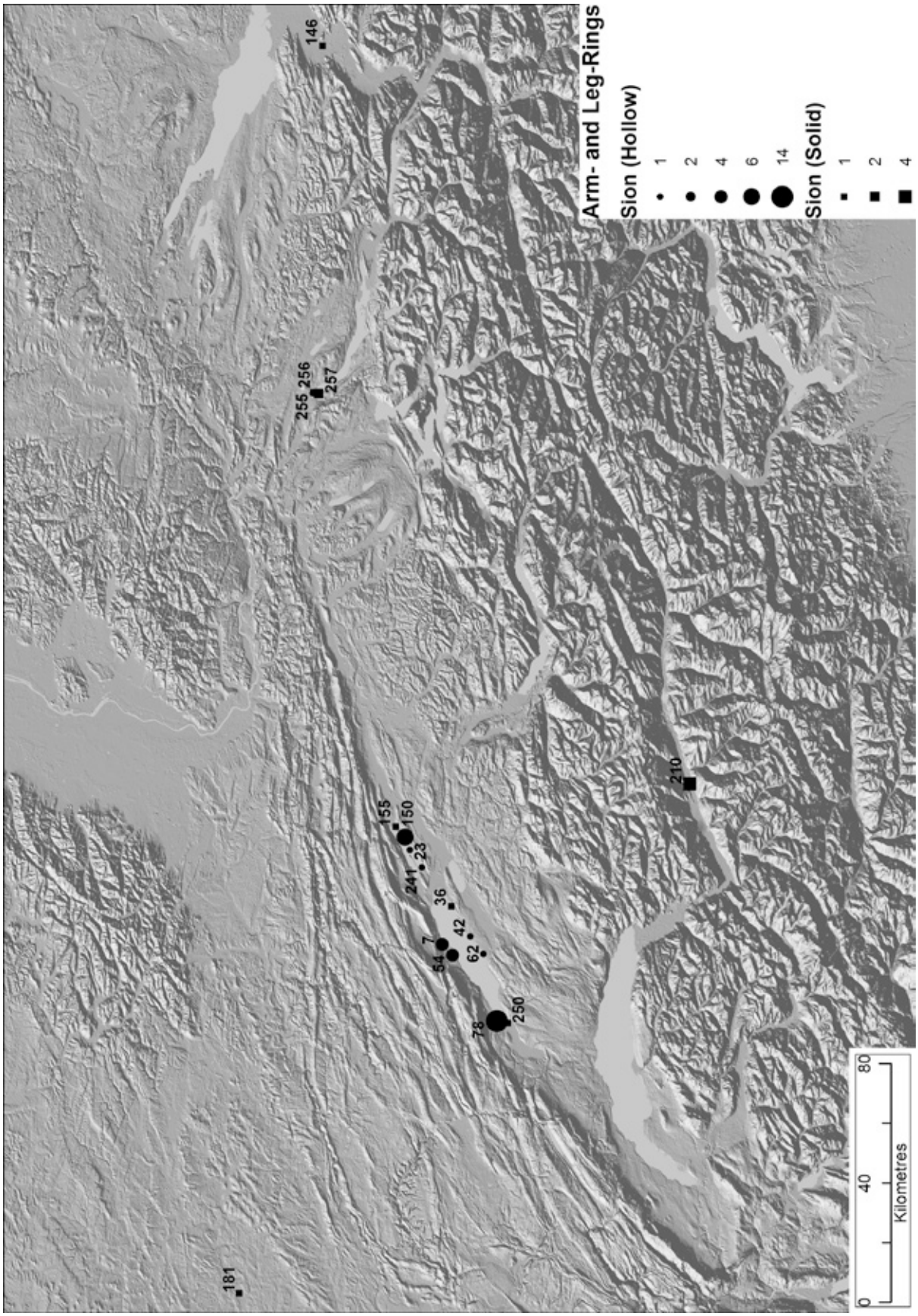
Map 108: Distribution of *Corcelettes* type arm-/leg-ring in western Switzerland.



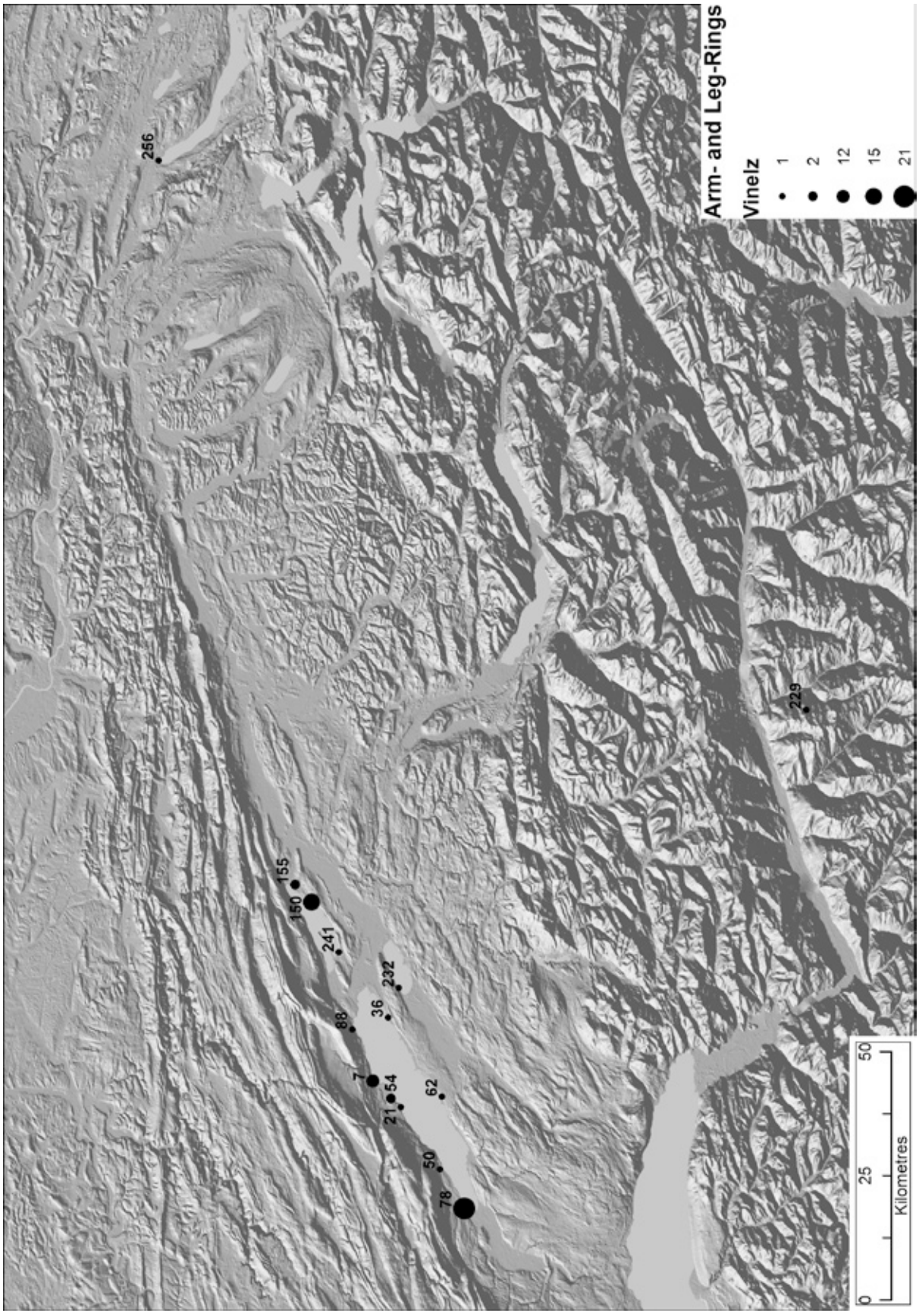
Map 109: European distribution of *Mörigen* type arm-/leg-rings. For inset region see Map 110.



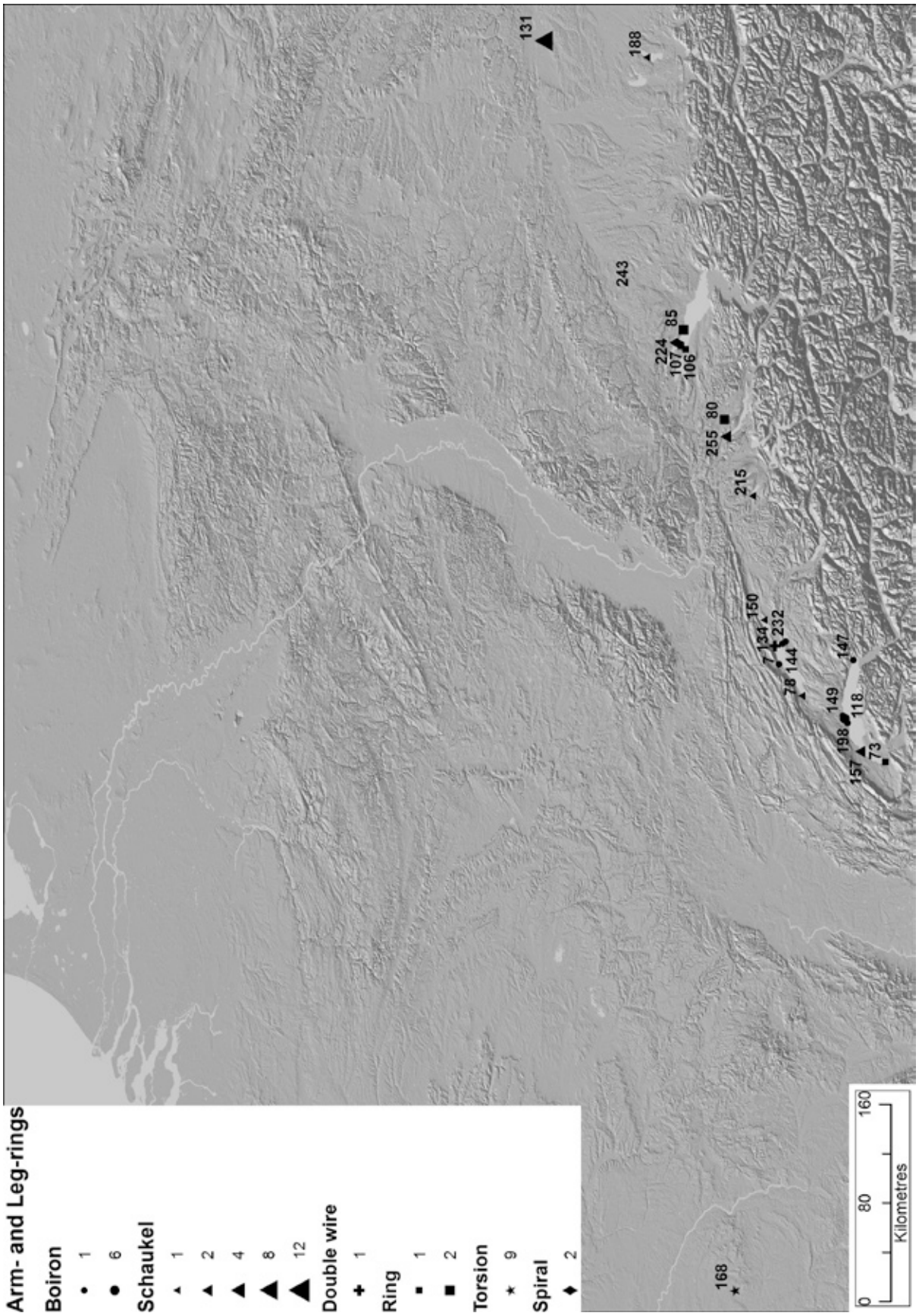
Map 110: Distribution of *Mörigen* type arm-/leg-ring in western Switzerland.



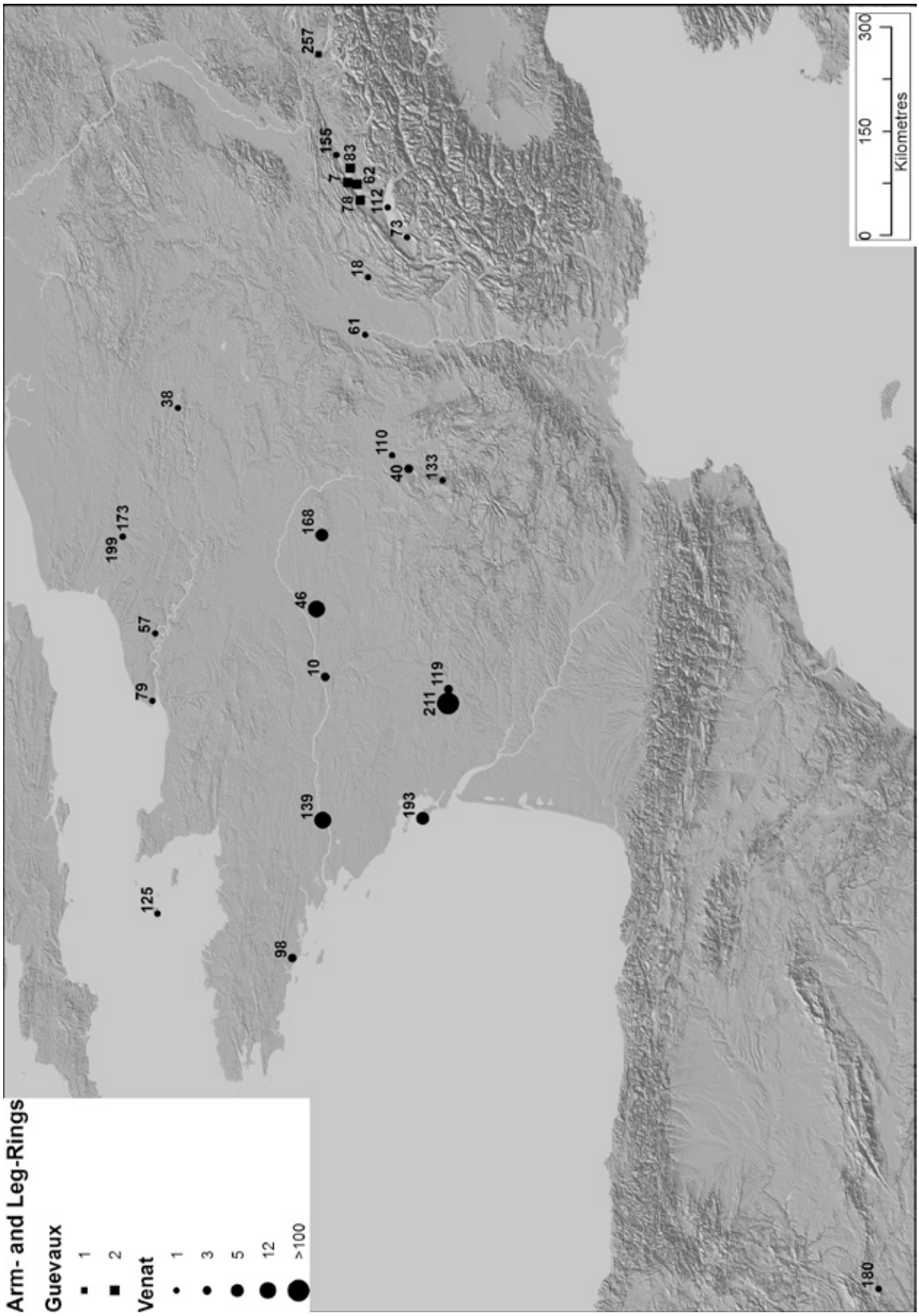
Map 111: Distribution of *Sion* type arm-ring.



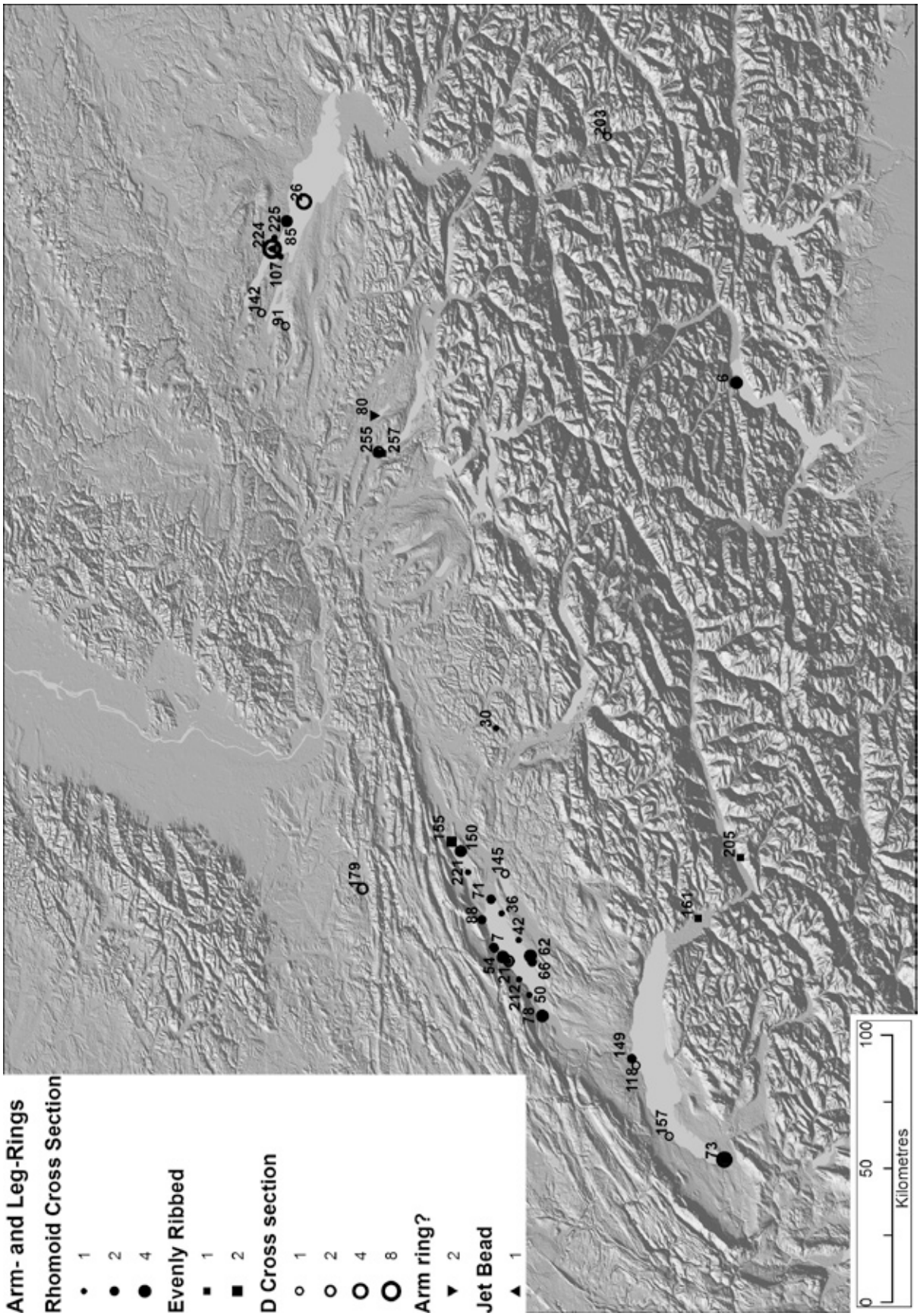
Map 112: Distribution of the *Vinelz* type ring jewellery.



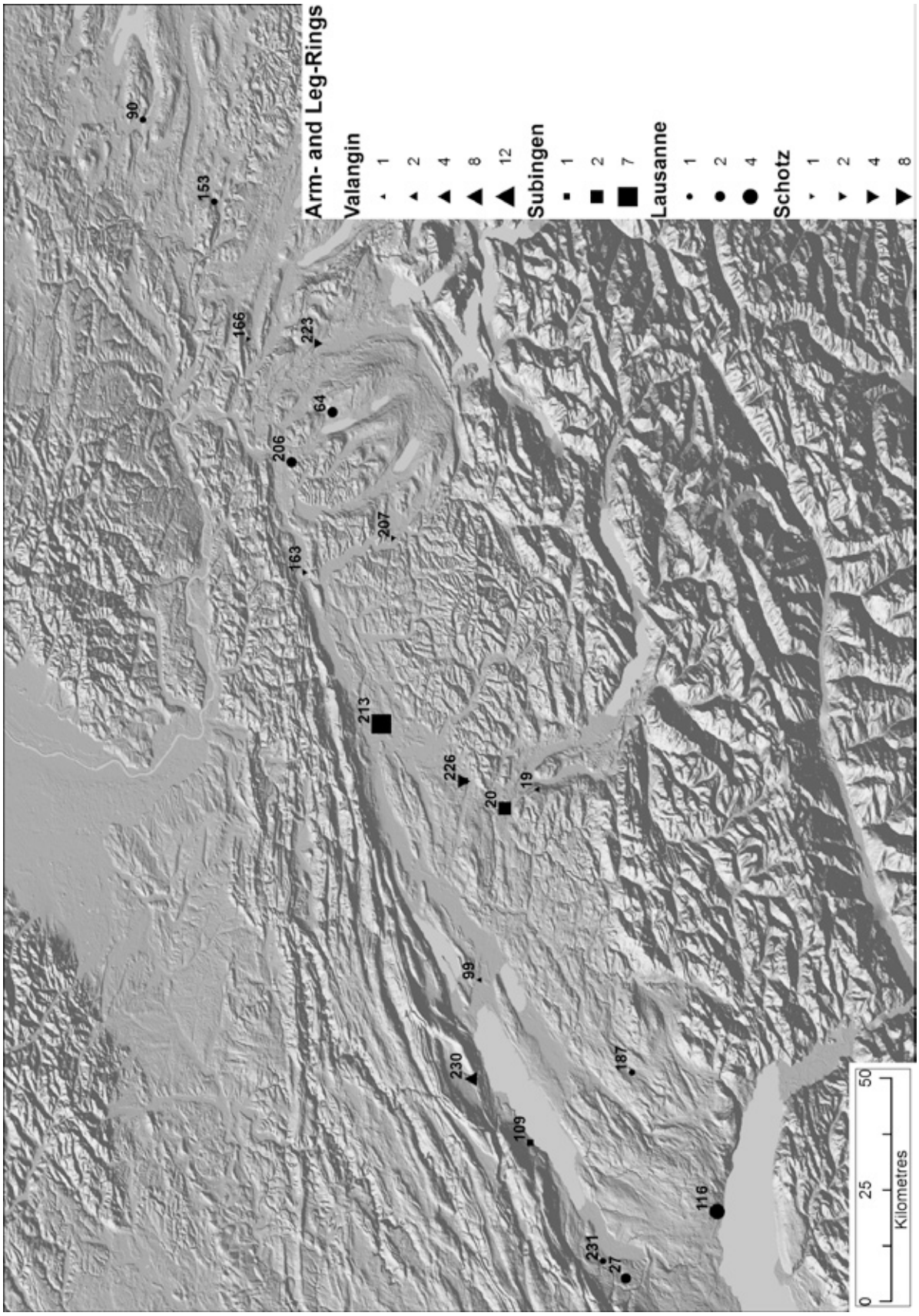
Map 113: Distribution of *Boiron* type arm-bands, and various forms.



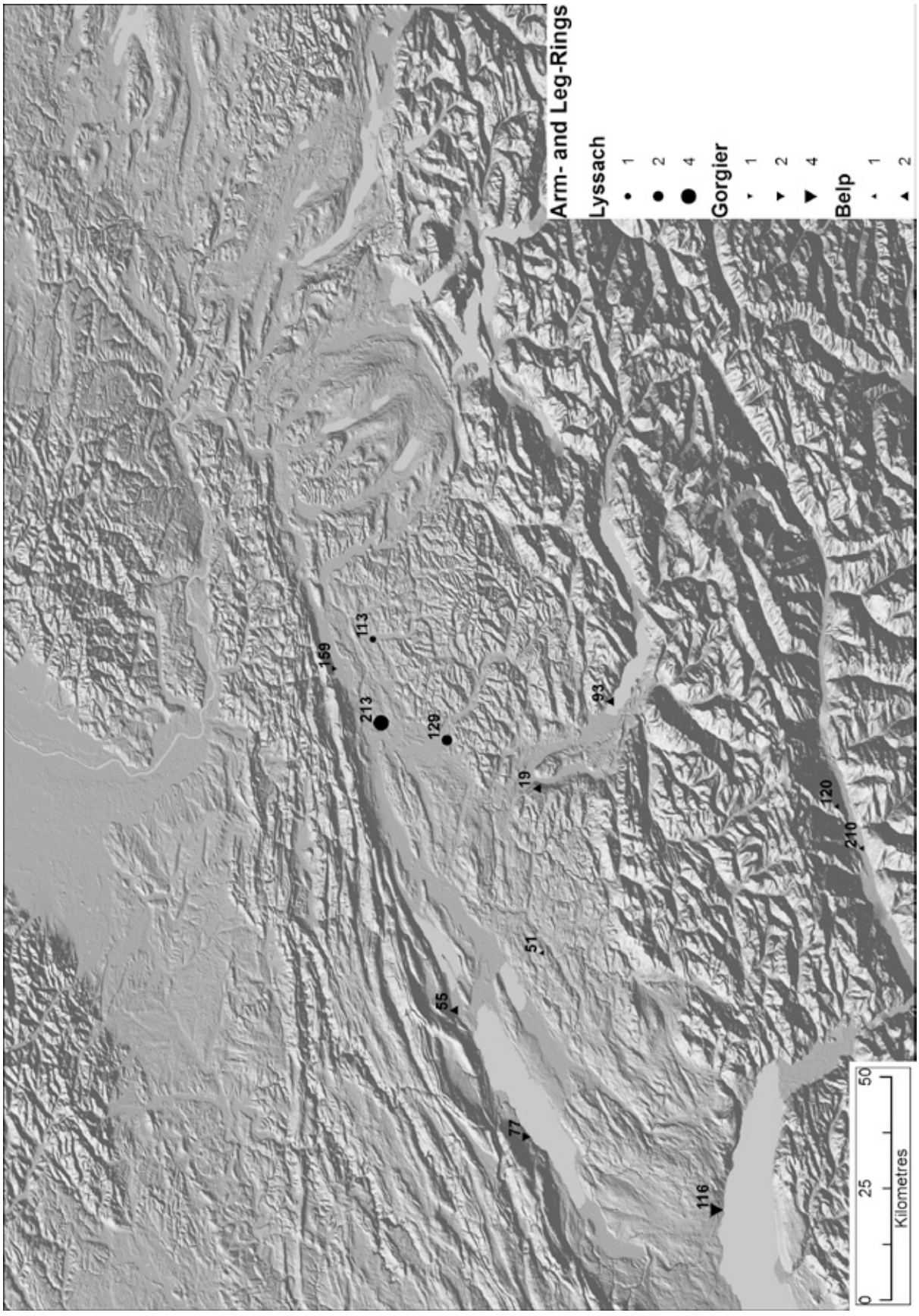
Map 114: Distribution of *Guévaux* and *Vénat* type arm-/leg-rings.



Map 115: Distribution of various Late Bronze Age forms of un-typed arm-rings in Switzerland.



Map 116: Distribution of early Iron Age *Schötz*, *Valangin*, *Subingen* and *Lausanne* type arm-rings.



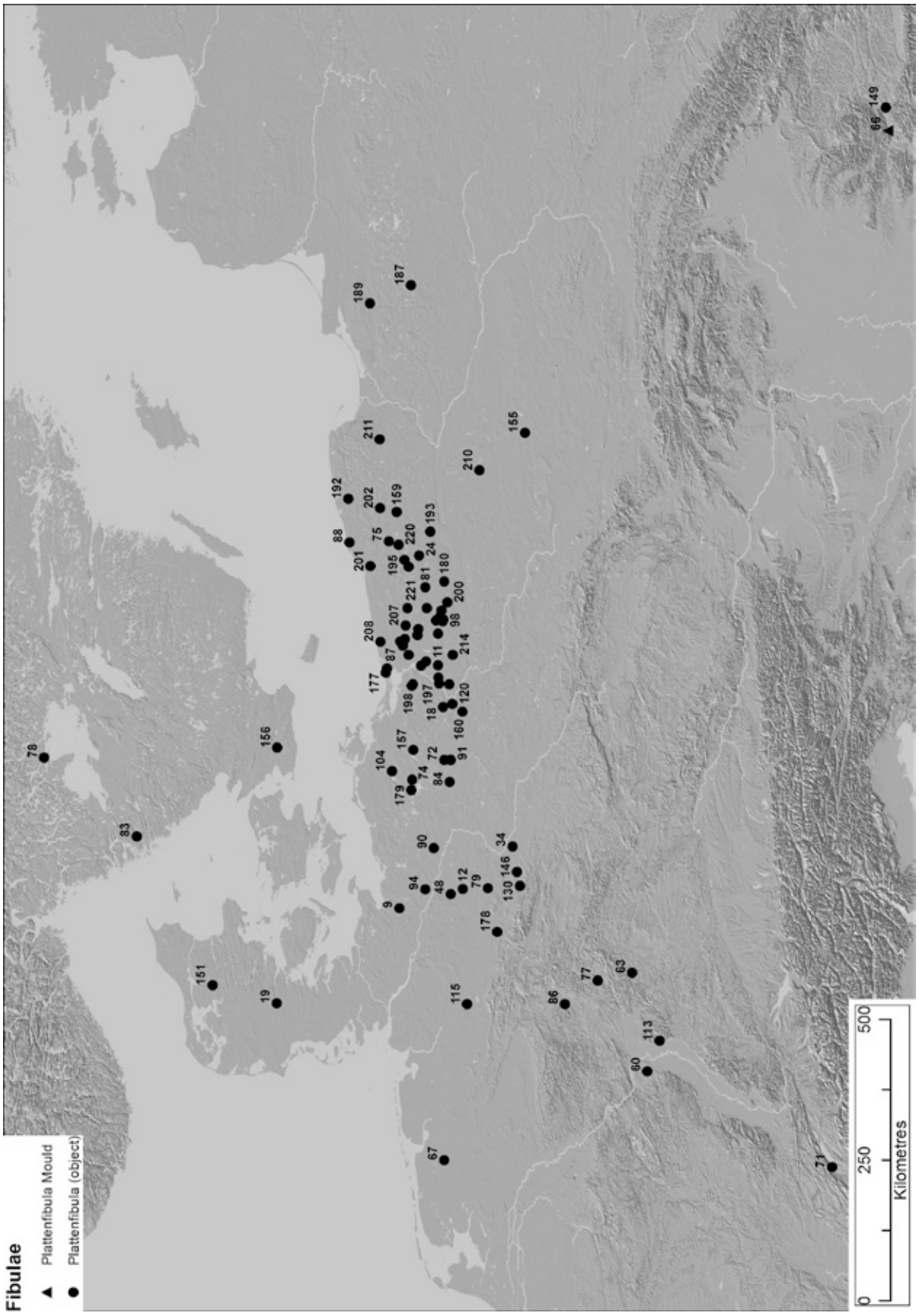
Map 117: Distribution of early Iron Age *Gorgier*, *Lyssach* and *Belp* type arm-rings.

Map 118

Contexts: L-D = Lake-Dwelling; N/A = not available or not recorded; Sgl = Single find.

No.	Site	Context	Qty	Country	References
Platten fibula					
9	Bäk	Hoard	3	D	(Prüssing, P 1982)
11	Banie	Burial	1	PL	(Gedl 1984)
12	Beetzendorf	Hoard	1	D	(Sprockhoff 1956)
18	Biesenbrow (Angermünde)	Hoard	2	D	(Sprockhoff 1956)
19	Bindeballe	Hoard	1	DK	(Sprockhoff and Höckmann 1979)
24	Borkendorf (Dobrzyca)	Hoard	1	PL	(Sprockhoff 1956)
34	Calbe	Hoard	1	D	(Sprockhoff 1956)
48	Darsekau	Hoard	1	D	(Sprockhoff 1956)
60	Framersheim	Hoard	1	D	(Hohlbein 2008a)
63	Gambach	Hoard	1	D	(Betzler 1974; Hansen, S 1991)
67	Gieten	N/A	1	NL	(Sprockhoff 1966)
71	Grandson-Corcelettes	L-D Hoard?	1	CH	(Betzler 1974; Sprockhoff 1966)
72	Gransee	Hoard	1	D	(Sprockhoff 1956)
74	Gross Dratow	Hoard	3	D	(Sprockhoff 1956)
75	Grumsdorf (Grabczyn)	Hoard	2	PL	(Sprockhoff 1956)
77	Haimbach	Hoard	3	D	(Betzler 1974; Hansen, S 1991)
78	Hjärpetan	Hoard	2	SE	(Ling *et al.* 2013)
79	Hödingen – Handelsleben	Hoard	1	D	(Sprockhoff and Höckmann 1979)
81	Kallies (Kalisz Pomorski)	Hoard	2	PL	(Sprockhoff 1956)
83	Kareby	N/A	1	SE	(Sprockhoff 1966)
84	Katerbrow (Neuruppin)	Hoard	4	D	(Sprockhoff 1956)
86	Klein-Englis	Burial	1	D	(Betzler 1974)
87	Kodram (Kodrab)	Hoard	1	PL	(Sprockhoff 1956)
88	Körlin (Korlino)	Hoard	2	PL	(Sprockhoff 1956)
90	Lenzersilge (Karstädt)	Hoard	1	D	(Sprockhoff 1956)
91	Löwenberg	Hoard	3	D	(Sprockhoff and Höckmann 1979)
94	Lübtheen	Hoard	1	D	(Sprockhoff 1956)
98	Mandelkow (Bedargowiec)	Hoard	2	PL	(Gedl 2004; Sprockhoff 1956)
104	Metschow	Hoard	1	D	(Sprockhoff 1956)
113	Nächstenbach – Weinheim	Hoard	2	D	(Betzler 1974; Hansen, S 1991)
115	Nienburg	Hoard	3	D	(Sprockhoff 1956)
120	Oderberg	Hoard	2	D	(Sprockhoff 1956)
130	Quedlinburg	Hoard	2	D	(Martin 2009; Thrane 1965, 1975)
146	Schadeleben	Hoard	1	D	(Sprockhoff and Höckmann 1979)
147	Schönebeck (Dzwonowo)	Hoard	2	PL	(Gedl 2004; Sprockhoff 1956)
148	Schwachenwalde (Chlopowo)	Hoard	3	PL	(Gedl 2004; Sprockhoff 1956)
149	Sebeş	Hoard	1	RO	(Bader 1983)
151	Simested	Hoard	1	DK	(Sprockhoff and Höckmann 1979)
155	Staffelde (Staw)	Hoard	1	PL	(Gedl 2004; Hänsel and Hänsel 1997)
156	Stare Dalby	Hoard	1	SE	(Sprockhoff 1966)
157	Stargard	Hoard	2	D	(Gedl 2004; Sprockhoff 1956)
159	Stegers (Rzeczenica)	Hoard	1	PL	(Sprockhoff 1956)
160	Steinbeck	Hoard	3	D	(Sprockhoff 1956)
177	Warnow (Warnowo)	Hoard	2	PL	(Gedl 2004; Sprockhoff 1956)
178	Watenstedt	Hoard	2	D	(Busch 1976)
179	Wendorf	Hoard	2	D	(Sprockhoff 1956)
180	Wierzchowo (Wurchow)	Hoard	3	PL	(Gedl 2004; Sprockhoff 1956)
187	Jedwabno	Sgl	1	PL	(Gedl 2004)
188	Węgorza	Burial	1	PL	(Gedl 2004)
189	Workiejmy	Burial	1	PL	(Gedl 2004)
190	Zamęcin	Moor	1	PL	(Gedl 2004)
191	Będargowo	Hoard	1	PL	(Gedl 2004)
192	Damno	Hoard	1	PL	(Gedl 2004)
193	Dobrzyca	Hoard	1	PL	(Gedl 2004)
194	Drahimek	N/A	1	PL	(Gedl 2004)
195	Komorze	Hoard	1	PL	(Gedl 2004)
196	Glinna	Tumulus	1	PL	(Gedl 2004)
197	Ognica	River	1	PL	(Gedl 2004)
198	Rzędziny	Hoard	4	PL	(Gedl 2004)
199	Wyszomierz	Burial	1	PL	(Gedl 2004)
200	Chomętowo	Hoard	1	PL	(Gedl 2004)
201	Koszalin-Rokosowo	Hoard	1	PL	(Gedl 2004)
202	Piaszczyna	Hoard	1	PL	(Gedl 2004)
203	Stara Dąbrowa	Hoard	1	PL	(Gedl 2004)
204	Gardziec	Moor	1	PL	(Gedl 2004)

205	Goleniów	Burial	1	PL	(Gedl 2004)
206	Mętno Małe	N/A	1	PL	(Gedl 2004)
207	Bienice	Hoard	1	PL	(Gedl 2004)
208	Niedysz	Hoard	1	PL	(Gedl 2004)
209	Szczecin-Klęskowo	Hoard	1	PL	(Gedl 2004)
210	Vietkow (Wicewo)	Hoard	1	PL	(Gedl 2004)
211	Pommern	Area	1	PL	(Gedl 2004)
212	Granowo	Hoard	1	PL	(Gedl 2004)
213	Krzywin	Hoard	2	PL	(Gedl 2004)
214	Pszczelnik	Hoard	1	PL	(Gedl 2004)
215	Wielgoszcz	Hoard	1	PL	(Gedl 2004)
216	Cieszyce	Hoard	1	PL	(Gedl 2004)
217	Ogorzele	Sgl	1	PL	(Gedl 2004)
218	Buk	Hoard	1	PL	(Gedl 2004)
219	Stara Rudnica	N/A	1	PL	(Gedl 2004)
220	Parsęcko	Hoard	1	PL	(Gedl 2004)
221	Lesięcin	N/A	1	PL	(Gedl 2004)
Casting Mould					
66	Geoagiu	Sgl	1	RO	(Bader 1983)
Dörmte					
8	Bahrendorf	Hoard	1	D	(Laux 1973)
31	Buendorf	Hoard	1	D	(Laux 1973)
51	Dörmte	Hoard	3	D	(Laux 1973)
52	Dötzingen	Hoard	2	D	(Laux 1973)
85	Klein Hesebeck	Hoard	1	D	(Laux 1973)
135	Rethwisch-Goldenstedt	Hoard	1	D	(Laux 1973)
164	Tüschau	Hoard	1	D	(Laux 1973)
Oerel					
49	Deinstedt	Hoard	1	D	(Laux 1973)
54	Emmendorf	Hoard	1	D	(Laux 1973)
61	Franzensburg	Hoard	1	D	(Laux 1973)
121	Oerel	Hoard	1	D	(Laux 1973)
124	Osnabrück	Area	1	D	(Laux 1973)
135	Rethwisch-Goldenstedt	Hoard	1	D	(Laux 1973)
139	Rosdorf	Settlement	1	D	(Laux 1973)
178	Watenstedt	Hoard	2	D	(Laux 1973)

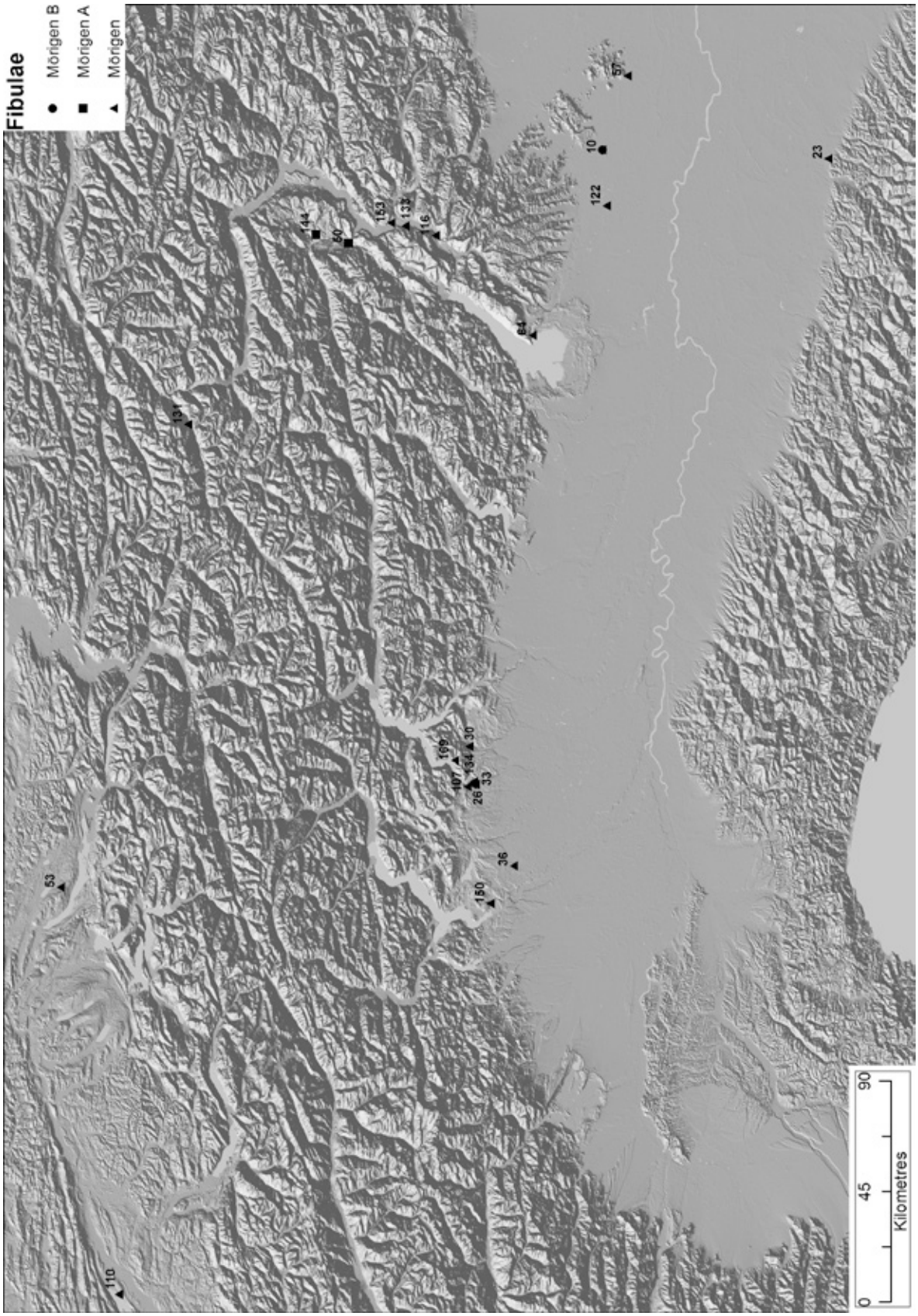


Map 118: European distribution of Late Bronze Age *Platten* fibula.

Map 119

Contexts: N/A = not available.

No.	Site	Context	Qty	Country	References
10	Baldaria	Burial	5	IT	(Eles Masi 1986)
23	Bologna-San Vitale	Burial	2	IT	(Müller-Karpe 1959)
26	Breccia	Burial	3	IT	(Eles Masi 1986)
30	Buccinigo	Burial	1	IT	(Eles Masi 1986)
33	Ca' Morta	Burial	2	IT	(Eles Masi 1986)
36	Cardano	Burial	1	IT	(Eles Masi 1986)
50	Dercolo	Hoard	1	IT	(Eles Masi 1986)
53	Egg-Stirzental	N/A	1	CH	(Betzler 1974; Primas 1970)
57	Este	Burial	1	IT	(Eles Masi 1986)
64	Garda	Burial	1	IT	(Eles Masi 1986)
107	Moncucco	Burial	1	IT	(Eles Masi 1986)
110	Mörigen	Lake-Dwelling	5	CH	(Bernatzky-Goetze 1987; Betzler 1974)
116	Nomi	Burial	1	IT	(Eles Masi 1986)
122	Oppeano	Burial	1	IT	(Eles Masi 1986)
131	Ramosch	Settlement	1	CH	(Betzler 1974)
133	Ravina	Burial	1	IT	(Eles Masi 1986)
134	Rebbio	Burial	1	IT	(Eles Masi 1986)
144	Sanzeno	Settlement	1	IT	(Eles Masi 1986)
150	Sesto Calende	Burial	4	IT	(Eles Masi 1986)
153	Solteri	N/A	1	IT	(Eles Masi 1986)
169	Val di Vico	Burial	2	IT	(Eles Masi 1986)

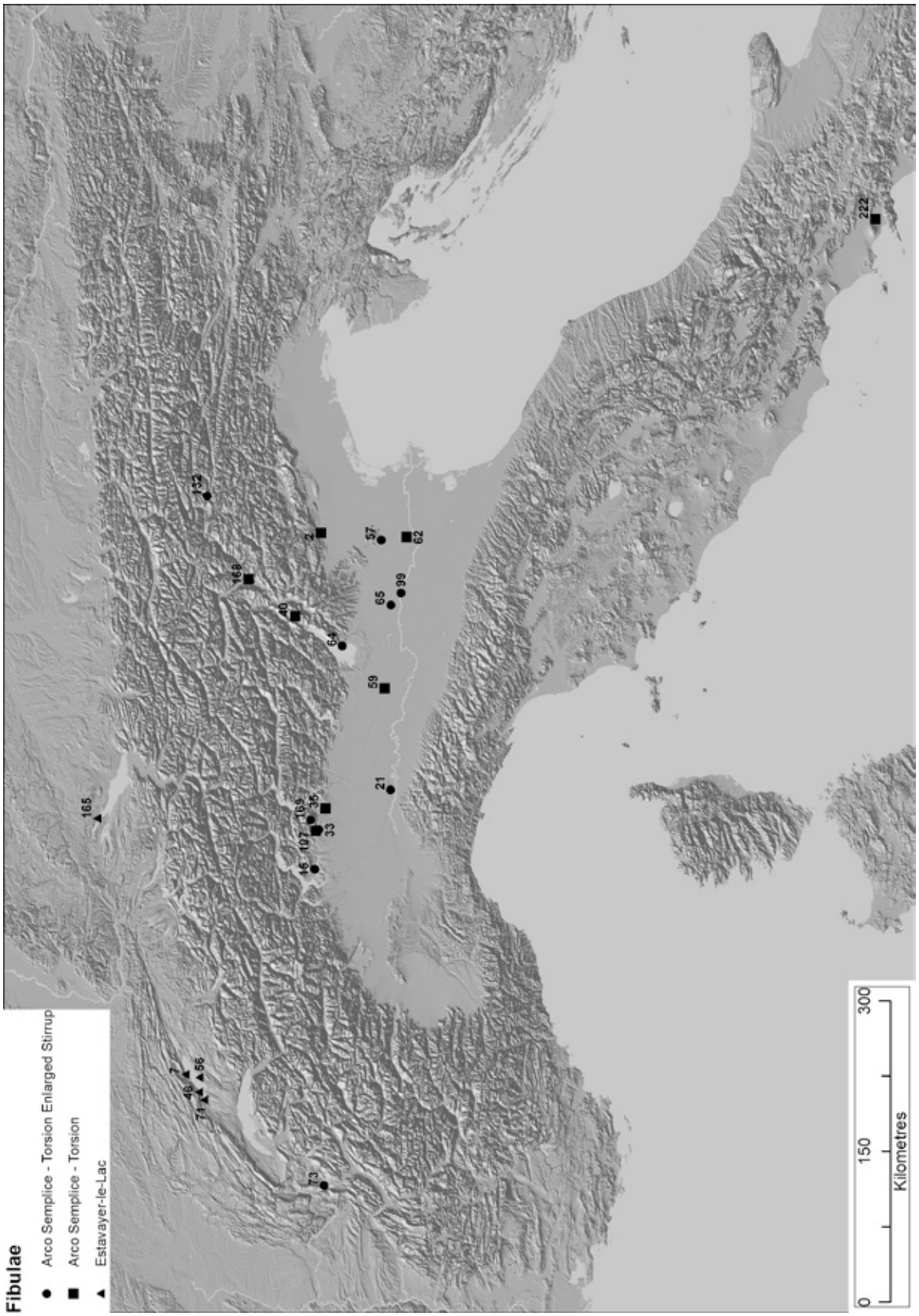


Map 119: Distribution of *Mörigen* type fibula, and variants *Mörigen A* and *Mörigen B* (where specified in source literature).

Map 120

Contexts: L-D = Lake-Dwelling; N/A = Not available.

No.	Site	Context	Qty	Cty	References
Arco Semplice - Torsion					
2	Angarano	Burial	1	IT	(Eles Masi 1986)
35	Capriano	Hoard	1	IT	(Eles Masi 1986)
40	Cavedine	N/A	1	IT	(Eles Masi 1986)
59	Fontanella Grazioli	Burial	1	IT	(Eles Masi 1986)
62	Frattesina	Burial	7	IT	(Colonna *et al.* 2010)
62	Frattesina	Settlement	1	IT	(Eles Masi 1986)
107	Moncucco	N/A	1	IT	(Eles Masi 1986)
168	Vadena	Burial	2	IT	(Eles Masi 1986)
222	Poggiomarino	Settlement	1	IT	(Cicirelli and Albore Livadie 2012)
Arco Semplice - Torsion Englarged Stirrup					
2	Angarano	Burial	5	IT	(Eles Masi 1986)
15	Biandronno	Burial	1	IT	(Eles Masi 1986)
21	Bissone Pavese	Burial	8	IT	(Eles Masi 1986)
33	Ca' Morta	Burial	1	IT	(Eles Masi 1986)
57	Este	Burial	1	IT	(Eles Masi 1986)
62	Frattesina	Burial	1	IT	(Eles Masi 1986)
62	Frattesina	Hoard	1	IT	(Eles Masi 1986)
64	Garda	Burial	4	IT	(Eles Masi 1986)
65	Gazzo Veronese	Burial	1	IT	(Eles Masi 1986)
73	Grésine	L-D	1	FR	(Mohen *et al.* 1974)
99	Mariconda di Melara	Settlement	1	IT	(Eles Masi 1986)
107	Moncucco	Burial	1	IT	(Eles Masi 1986)
132	Rasuns	Burial	1	IT	(Eles Masi 1986)
168	Vadena	Burial	3	IT	(Eles Masi 1986)
169	Val di Vico	Burial	1	IT	(Eles Masi 1986)
Estavayer-le-Lac					
7	Auvernier	L-D	1	CH	(Betzler 1974)
46	Concise	L-D	2	CH	(Betzler 1974)
56	Estavayer-le-Lac	L-D	1	CH	(Betzler 1974)
71	Grandson-Corcelettes	L-D	1	CH	(Betzler 1974)
165	Überlingen	Area	1	D	(Betzler 1974; Schöbel 1996)

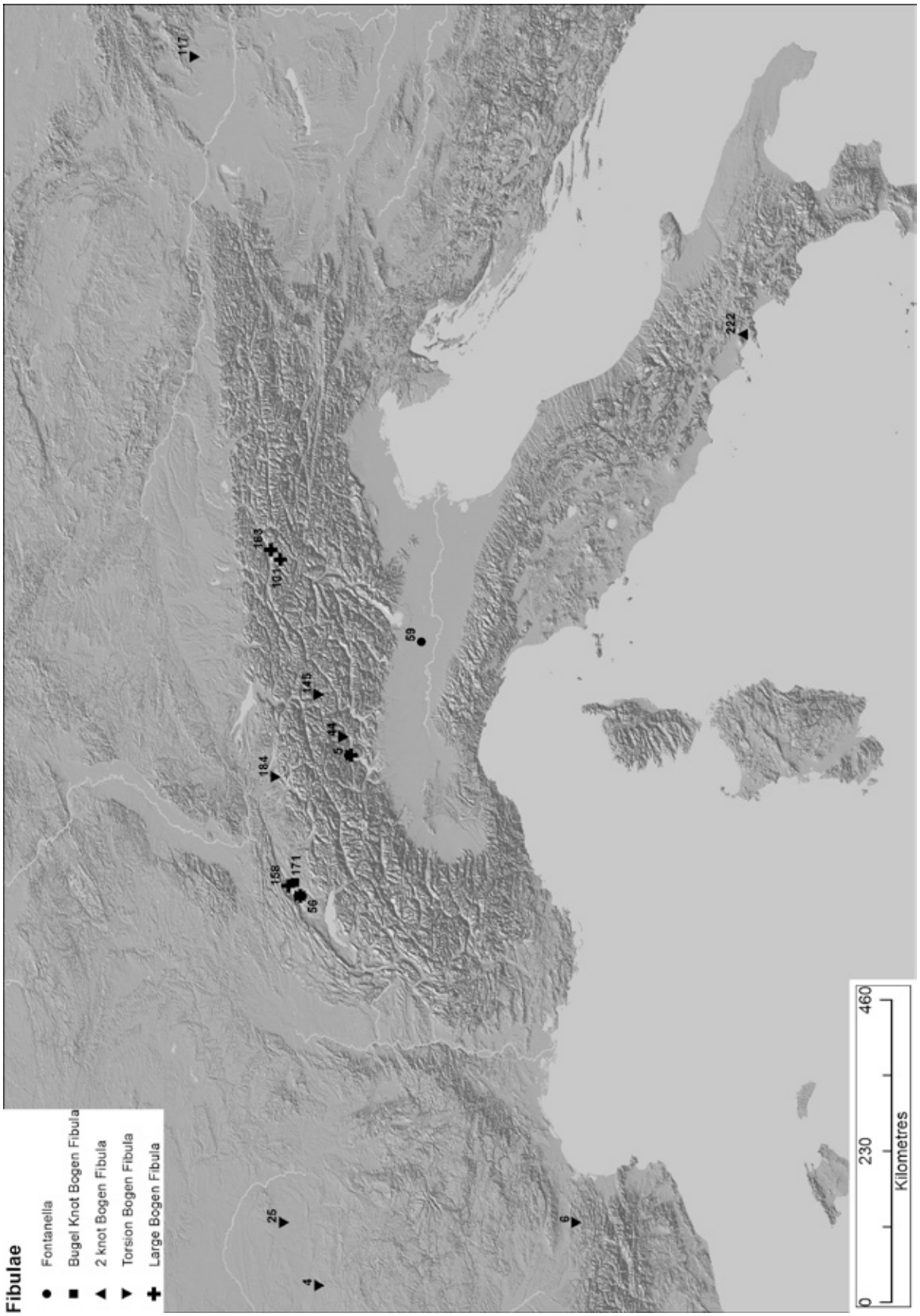


Map 120: Distribution of Late Bronze Age *Estavayer-le-Lac* and *Arco-Semplice – Torsion* type fibula.

Map 121

Contexts: N/A = Not available.

No.	Site	Context	Quantity	Country	References
2 knot Bogen Fibula					
56	Estavayer-le-Lac	Lake-Dwelling	1	CH	(Betzler 1974)
222	Poggiomarino	Settlement	1	IT	(Cicirelli and Albore Livadie 2012)
Bugel Knot Bogen Fibula					
171	Vallamand - Dessous / Lake Morat	Lake	1	CH	(Betzler 1974)
Fontanella					
59	Fontanella Grazioli	Burial	1	IT	(Eles Masi 1986)
Large Bogen Fibula					
5	Ascona	Burial	1	CH	(Betzler 1974)
56	Estavayer-le-Lac	Lake-Dwelling	1	CH	(Betzler 1974)
101	Matrei	Area	1	AT	(Betzler 1974)
158	St-Blaise	Lake-Dwelling	1	CH	(Betzler 1974)
163	Tirol	Area	1	AT	(Betzler 1974)
Torsion Bogen Fibula					
4	Argenton-sur-Creuse	Hoard	1	FR	(Mohen *et al.* 1974)
5	Ascona	Burial	3	CH	(Betzler 1974)
6	Aude	Area	1	FR	(Mohen *et al.* 1974)
25	Bourges	N/A	1	FR	(Mohen *et al.* 1974)
44	Claro	Burial	1	CH	(Betzler 1974)
56	Estavayer-le-Lac	Lake-Dwelling	1	CH	(Betzler 1974)
117	Nová Ves nad Žitavou	Settlement	1	SK	(Novotná 2001)
145	Savognin - Padnal	Highland settlement	1	CH	(Betzler 1974)
184	Zug-Sumpf	Lake-Dwelling Hoard	1	CH	(Bauer *et al.* 2004; Betzler 1974)

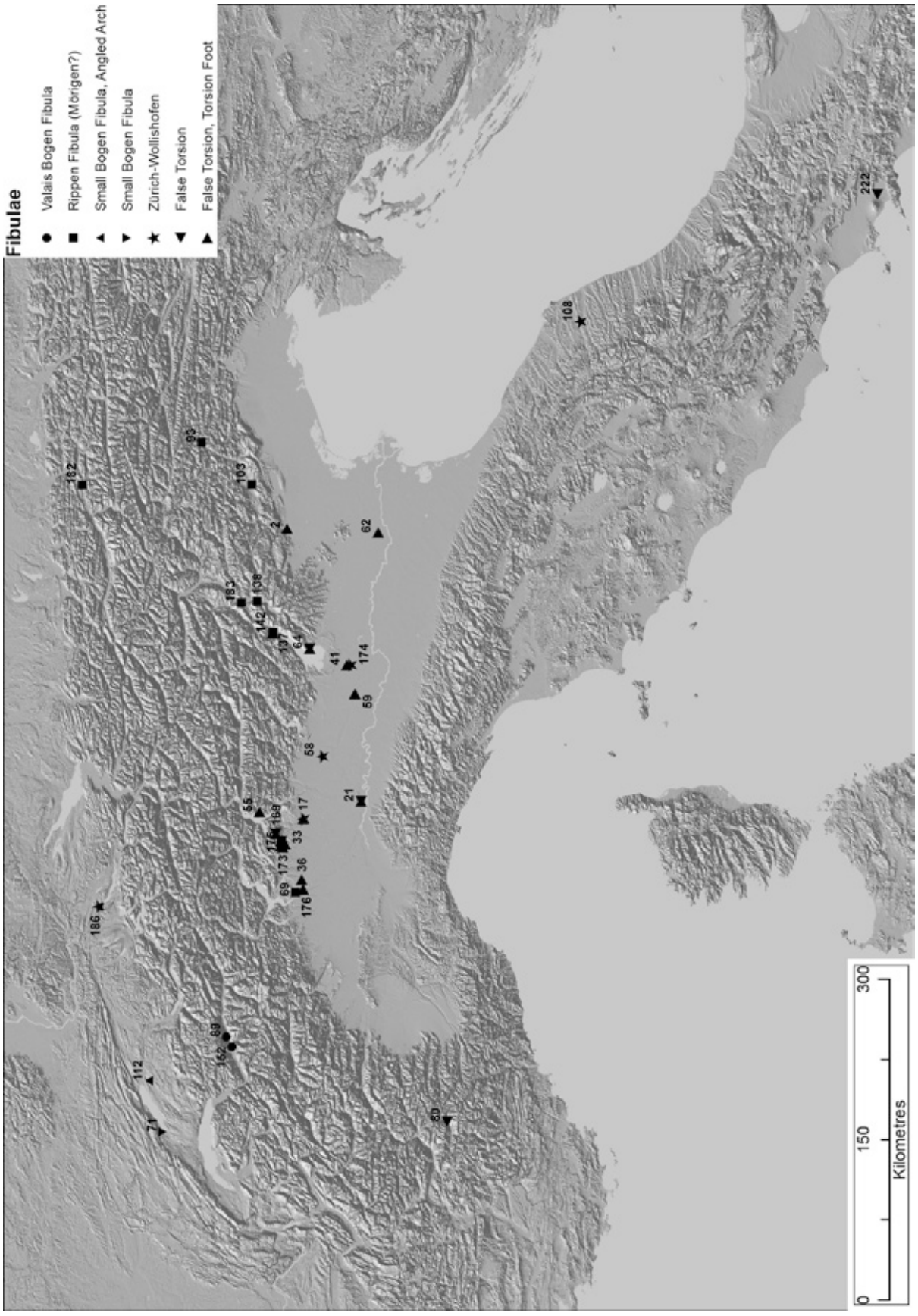


Map 121: Distribution of various Late Bronze Age fibula types.

Map 122

Contexts: L-D = Lake-Dwelling; N/A = Not available.

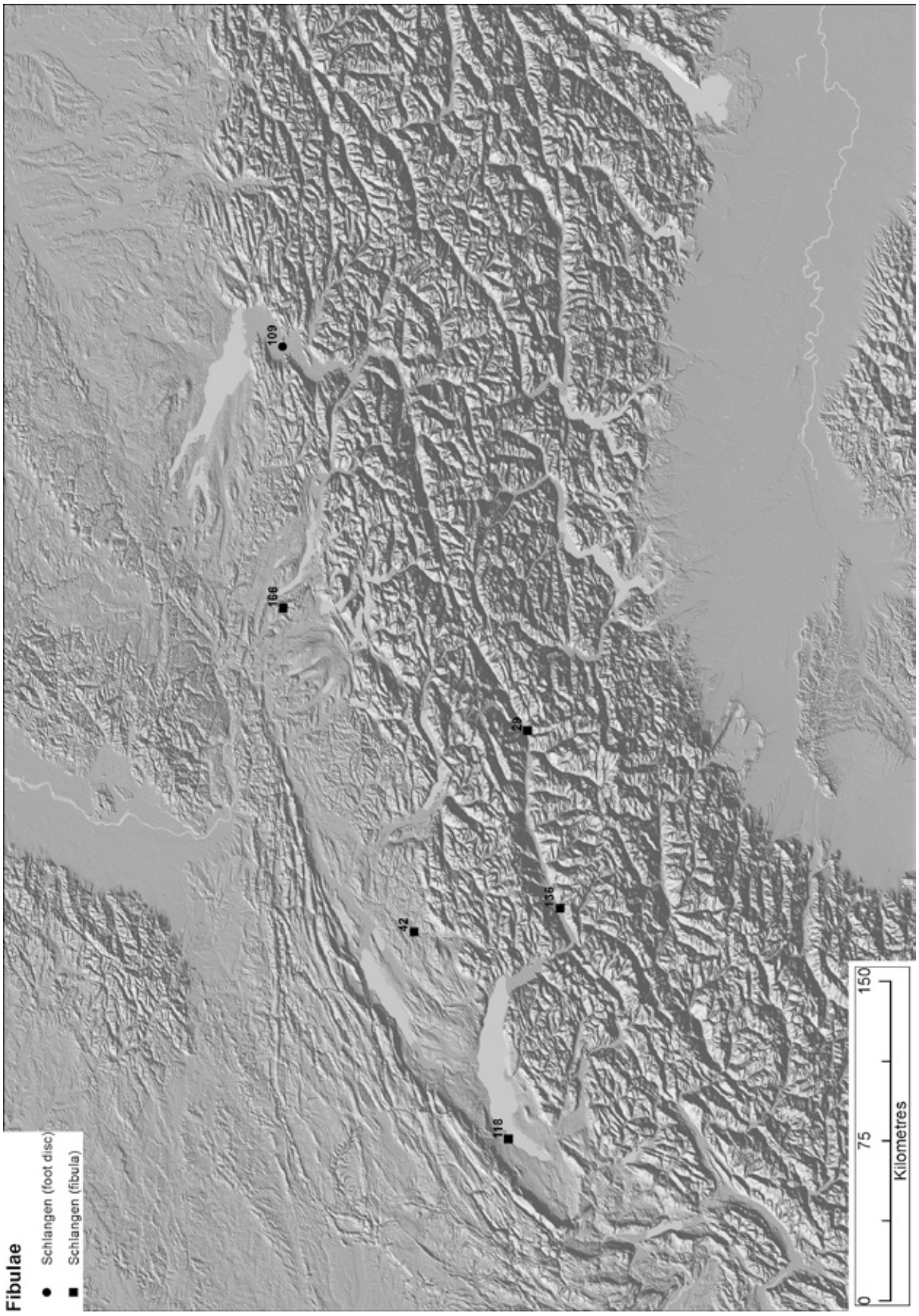
No.	Site	Context	Qty	Cty	References
False Torsion					
21	Bissone Pavese	Burial	2	IT	(Eles Masi 1986)
45	Como	Burial	1	IT	(Eles Masi 1986)
64	Garda	Burial	1	IT	(Eles Masi 1986)
80	Jausiers	N/A	1	FR	(Mohen *et al.* 1974)
169	Val di Vico	Burial	1	IT	(Eles Masi 1986)
222	Poggiomarino	Settlement	1	IT	(Cicirelli and Albore Livadie 2012)
False Torsion, Torsion Foot					
2	Angarano	Burial	1	IT	(Eles Masi 1986)
16	Biassono	Burial	1	IT	(Eles Masi 1986)
21	Bissone Pavese	Burial	1	IT	(Eles Masi 1986)
33	Ca' Morta	Burial	2	IT	(Eles Masi 1986)
36	Cardano	Burial	3	IT	(Eles Masi 1986)
41	Ceresara	Settlement	1	IT	(Eles Masi 1986)
45	Como	Burial	1	IT	(Eles Masi 1986)
55	Esino Lario	N/A	1	IT	(Eles Masi 1986)
59	Fontanella Grazioli	Burial	13	IT	(Eles Masi 1986)
62	Frattesina	Settlement	1	IT	(Eles Masi 1986)
64	Garda	Burial	3	IT	(Eles Masi 1986)
107	Moncucco	Burial	1	IT	(Eles Masi 1986)
142	San Giacomo di Riva	Burial	1	IT	(Eles Masi 1986)
169	Val di Vico	Burial	2	IT	(Eles Masi 1986)
173	Vergosa	Burial	1	IT	(Eles Masi 1986)
176	Vizzola Ticino	Burial	1	IT	(Eles Masi 1986)
Rippenfibeln (Mörigen?)					
69	Golasecca	N/A	1	IT	(Lunz 1974)
93	Lozzo nel Cadore	N/A	1	IT	(Lunz 1974)
103	Mel	N/A	1	IT	(Lunz 1974)
137	Riva	N/A	1	IT	(Lunz 1974)
138	Romagnano	N/A	1	IT	(Lunz 1974)
175	Villa Nesi	N/A	1	IT	(Lunz 1974; Primas 1970)
182	Wörgl-Egerndorfer Wald	N/A	1	AT	(Lunz 1974)
183	Zambana	N/A	1	IT	(Lunz 1974)
Small Bogen Fibula					
71	Grandson-Corcelettes	L-D	1	CH	(Betzler 1974)
Small Bogen Fibula, Angled Arch					
112	Murtensee	Lake	1	CH	(Betzler 1974)
186	Zürich-Wollishofen	L-D	1	CH	(Betzler 1974)
Valais Bogen Fibula					
89	Lens	Burial	1	CH	(Betzler 1974)
152	Sion	Burial	1	CH	(Betzler 1974)
Zürich-Wollishofen					
17	Biassono – Monza	Burial	1	IT	(Betzler 1974; Müller-Karpe 1959)
58	Fontanella	Burial	1	IT	(Betzler 1974)
108	Monte Primo	Hoard	1	IT	(Betzler 1974)
140	S. Fermo	Burial	1	IT	(Betzler 1974)
174	Villa Capella	Burial	1	IT	(Betzler 1974)
Zürich-Wollishofen - Torsion Decoration					
186	Zürich-Wollishofen	L-D	1	CH	(Betzler 1974)



Map 122: Distribution of various Late Bronze Age fibula types.

Map 123

No.	Site	Context	Qty	Country	References
Schlangen					
29	Brig-Glis Waldmatte	Settlement	3	CH	(Curdy *et al.* 1993)
42	Châtillon-sur-Glâne	Fürstensitz	1	CH	(Lüscher 1991)
118	Nyon	Lake-Dwelling	1	CH	(Betzler 1974)
136	Riddes	N/A	1	CH	(Betzler 1974)
166	Üetliberg	Fürstensitz	1	CH	(Bauer *et al.* 1991; Lüscher 1991)
Schlangen foot disc					
109	Montlingerberg	'Highland' settlement	1	CH	(Betzler 1974; Steinhauser-Zimmermann 1989)

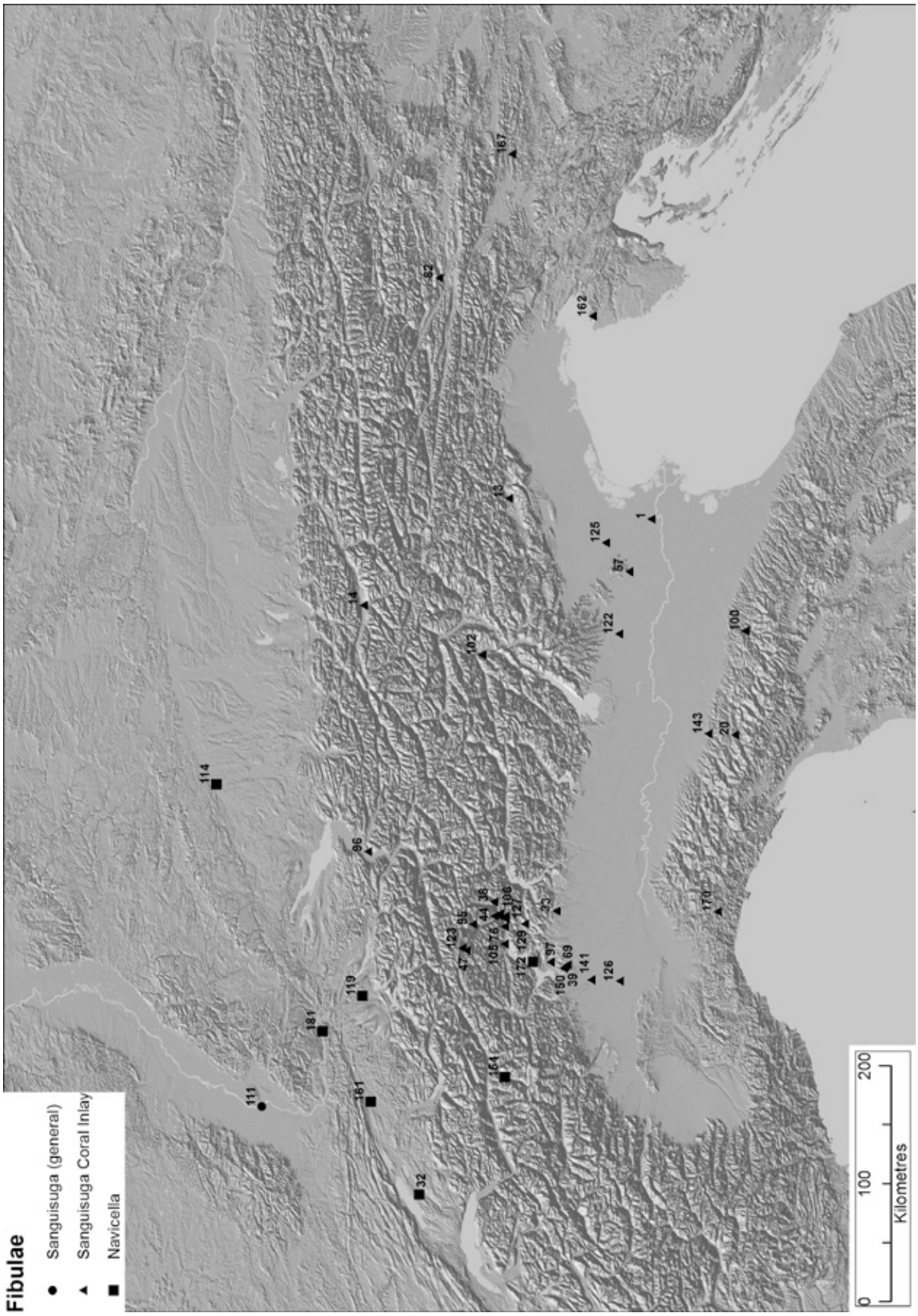


Map 123: Distribution of early Iron Age *Schlangen* fibula in the northern Circum-Alpine region.

Map 124

Contexts: N/A = Not available.

No.	Site	Context	Qty	Country	References
Navicella					
32	Bussy-Pré de Fond	Settlement	1	CH	(Boisaubert *et al.* 2008)
114	Neu-Ulm	Burial	1	D	(Trachsel 2004)
119	Obfelden	Burial	1	CH	(Schmid-Sikimić 1996)
154	St Niklaus	Burial	2	CH	(Pugin 1984; Schmid-Sikimić 1996)
161	Subingen	Burial	1	CH	(Schmid-Sikimić 1996)
172	Valtravaglia	Burial	1	IT	(Schmid-Sikimić 1996)
181	Wil	Burial	1	CH	(Schmid-Sikimić 1996)
Sanguisuga					
32	Bussy-Pré de Fond	Settlement	1	CH	(Boisaubert *et al.* 2008)
111	Münsterberg	Settlement	2	D	(Balzer 2009)
Sanguisuga Coral Inlay					
1	Adria	N/A	1	IT	(Primas 1970)
3	Arbedo-Castione	Burial	4	CH	(Primas 1970)
3	Arbedo-Cerinasca	Burial	23	CH	(Primas 1970)
13	Belluno	N/A	1	IT	(Primas 1970)
14	Berg Isel	N/A	1	AT	(Primas 1970)
20	Bismantova	N/A	1	IT	(Primas 1970)
33	Ca' Morta	Burial	2	IT	(Eles Masi 1986; Primas 1970)
38	Castaneda	Burial	2	CH	(Primas 1970)
39	Castelletto Ticino	N/A	1	IT	(Primas 1970)
44	Claro	N/A	1	CH	(Primas 1970)
47	Dalpe	Burial	4	CH	(Primas 1970)
57	Este	Burial	1	IT	(Primas 1970)
68	Giubiasco	Burial	9	CH	(Primas 1970)
69	Golasecca	N/A	1	IT	(Primas 1970)
70	Gorduno	Burial	9	CH	(Primas 1970)
76	Gudo	N/A	2	CH	(Primas 1970)
82	Kanzianberg - Villach	N/A	1	AT	(Primas 1970)
95	Ludiano	Burial	2	CH	(Primas 1970)
96	Malanser	N/A	1	AT	(Primas 1970)
97	Malgesso	N/A	1	IT	(Primas 1970)
100	Marzabotto	N/A	1	IT	(Primas 1970)
102	Mechel	N/A	1	IT	(Primas 1970)
105	Minusio	Burial	6	CH	(Primas 1970)
106	Molinazzo d'Arbedo	N/A	1	CH	(Primas 1970)
122	Oppeano	N/A	1	IT	(Primas 1970)
123	Osco	Burial	2	CH	(Primas 1970)
125	Padova	N/A	1	IT	(Primas 1970)
126	Palestro	N/A	1	IT	(Primas 1970)
127	Pianezzo	Burial	2	CH	(Primas 1970)
129	Pregassona	Burial	2	CH	(Primas 1970)
141	San Bernardino di Briona	N/A	1	IT	(Primas 1970)
143	Sanpolo d'Enza	N/A	1	IT	(Primas 1970)
150	Sesto Calende	N/A	1	IT	(Primas 1970)
162	Sv. Lucija	N/A	1	SI	(Primas 1970)
167	Vace	N/A	1	SI	(Primas 1970)
170	Valbrevenna	N/A	1	IT	(Primas 1970)

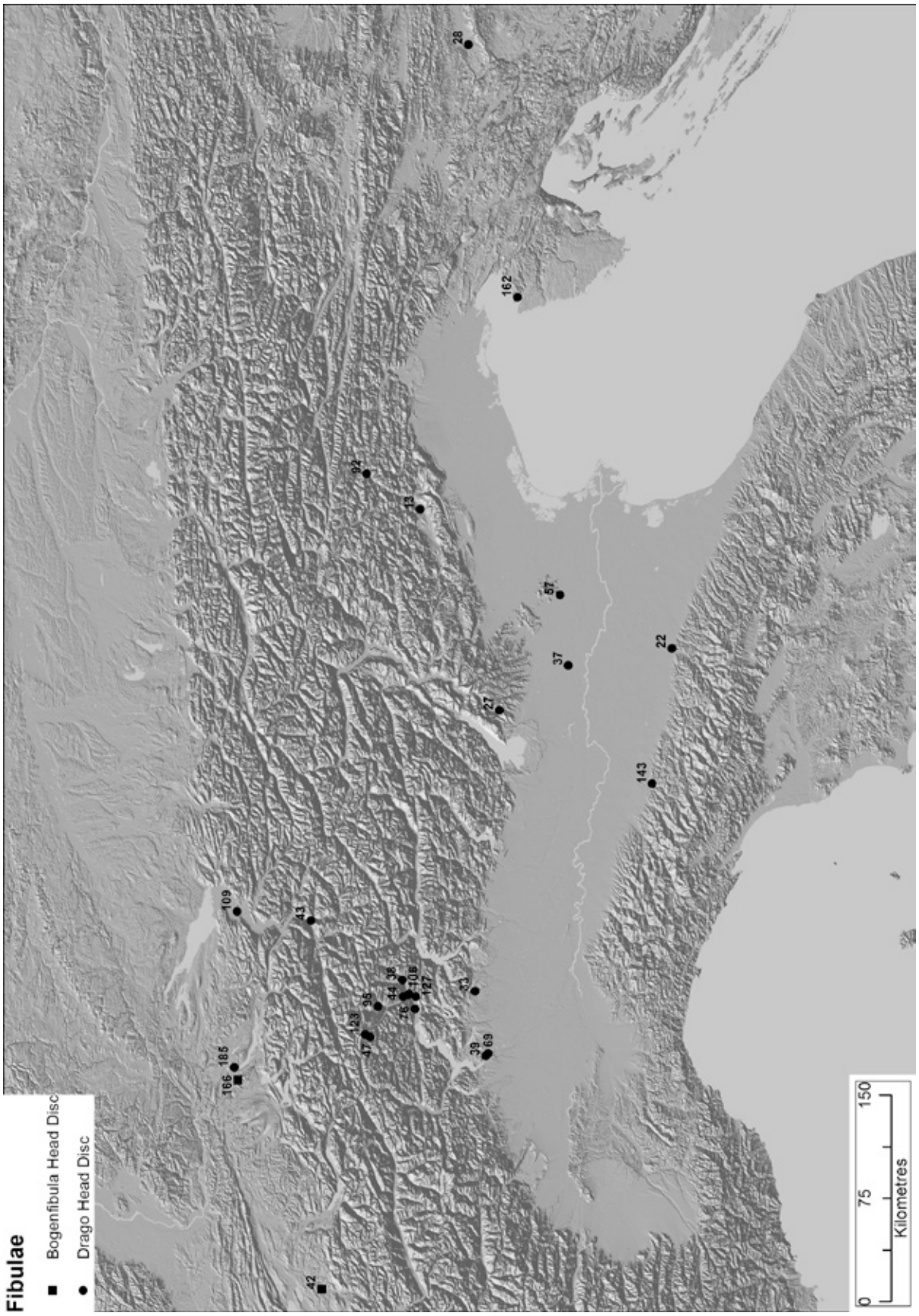


Map 124: Distribution of Iron Age *Sanguisuga*, *Sanguisuga* with coral inlay decoration, and *Navicella* type fibula north of the Alps and selected instances from the Italian peninsula.

Map 125

Contexts: N/A = Not available.

No.	Site	Context	Qty	Country	References
Bogenfibula Head Disc					
42	Üetliberg	Fürstensitz	3	CH	(Lüscher 1991)
166	Châtillon-sur-Glâne	Fürstensitz	1	CH	(Lüscher 1991)
Drago Head Disc					
3	Arbedo-Cerinasca	Burial	1	CH	(Primas 1970)
13	Belluno	N/A	1	IT	(Primas 1970)
22	Bologna Stradello della Certosa	Burial	1	IT	(Primas 1970)
27	Breonio	N/A	1	IT	(Primas 1970)
28	Brezje	N/A	1	SI	(Primas 1970)
33	Ca' Morta	Burial	3	IT	(Primas 1970)
37	Casaleone	N/A	1	IT	(Primas 1970)
38	Castaneda	Burial	2	CH	(Primas 1970)
39	Castelletto Ticino	N/A	1	IT	(Primas 1970)
43	Chur-Mittenberg	N/A	1	CH	(Primas 1970)
44	Claro	Burial	1	CH	(Primas 1970)
47	Dalpe	Burial	1	CH	(Primas 1970)
57	Este	N/A	1	IT	(Primas 1970)
69	Golasecca	N/A	1	IT	(Primas 1970)
76	Gudo	Burial	2	CH	(Primas 1970)
92	Lozzo	N/A	1	IT	(Primas 1970)
95	Ludiano	Burial	1	CH	(Primas 1970)
106	Molinazzo d'Arbedo	N/A	1	CH	(Primas 1970)
109	Montlingerberg	‘Highland’ settlement	1	CH	(Primas 1970)
123	Osco	Burial	1	CH	(Primas 1970)
127	Pianezzo	Burial	1	CH	(Primas 1970)
143	Sanpolo d'Enza	N/A	1	IT	(Primas 1970)
162	Sv. Lucija	N/A	1	SI	(Primas 1970)
185	Zürich-Burghölzli	N/A	1	CH	(Primas 1970)

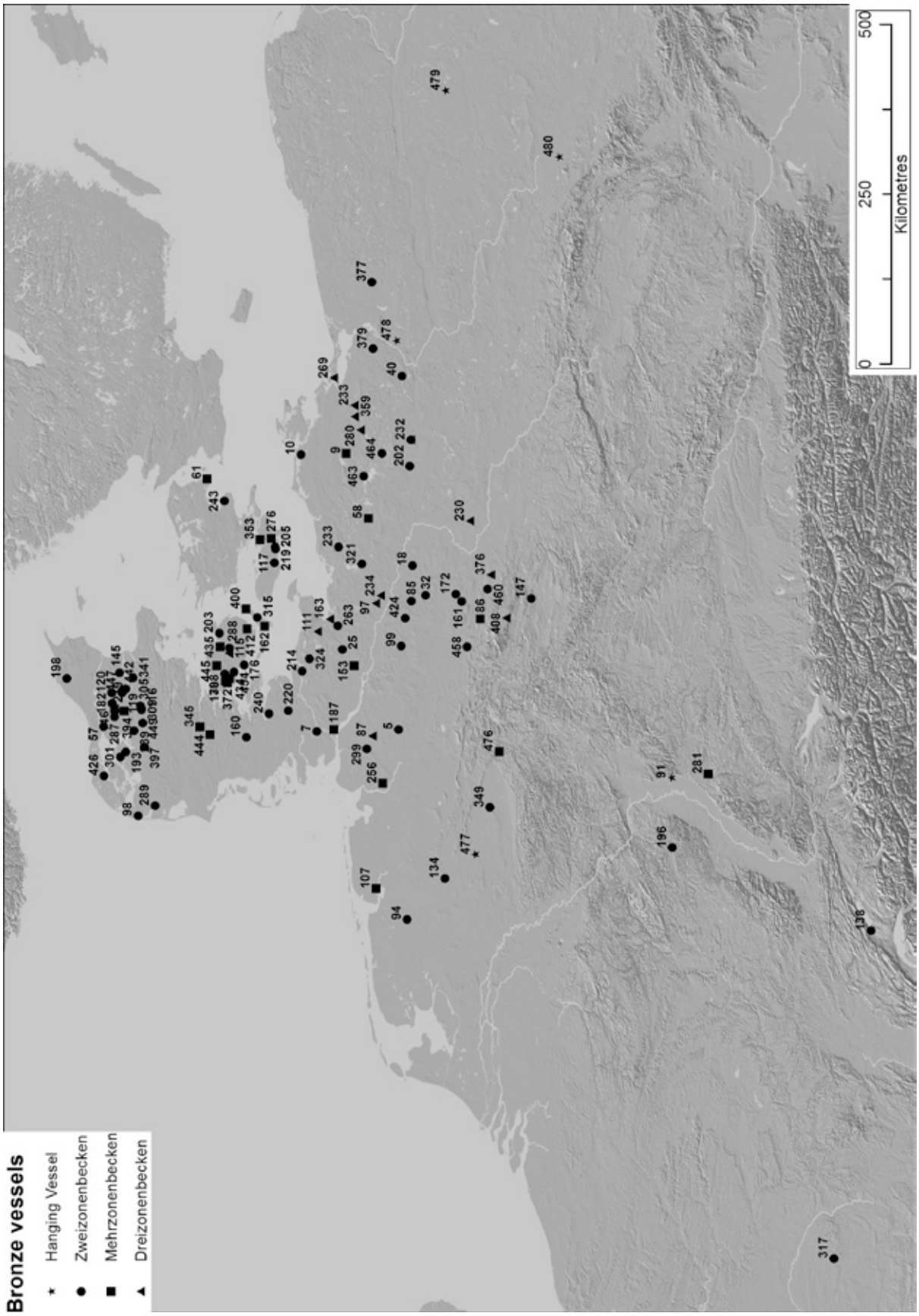


Map 125: Distribution of Iron Age *Drago head disc* and fragmentary head disc fibula north of the Alps and selected instances in northern Italy.

Map 126

Contexts: L-D = Lake-Dwelling; N/A = Not available; Sgl = Single find. All site references (Sprockhoff and Höckmann 1979) in addition to those listed below, unless marked with >. a) = (Sprockhoff 1956); b) = (Höckmann 2012); c) = (Gedl 2004); d) = (Krausse-Steinberger 1990); e) = (Thrane 1975)

Site		Context	Qty	Country	References
Dreizonenbecken					
87	Deinstedt	Burial	2	D	
97	Düssin	Hoard	1	D	
111	Eutin	Moor	1	D	
115	Fangel Torp	Hoard	1	DK	
163	Hemmelsdorf	Lake	1	D	
230	Loburg	N/A	1	D	a)
232	Löwenberg	Hoard	1	D	
233	Lübbersdorf	Hoard	1	D	
234	Lübtheen	Hoard	1	D	
269	Morgenitz	Hoard	1	D	
280	Neubrandenburg	N/A	4	D	
359	Roga	Hoard	1	D	
376	Schadeleben	Hoard	1	D	
408	Sophienhof	Burial?	1	D	
Hanging vessel					
91	Dossenheim	Hoard	1	D	
477	Münster-Gittrup	Sgl	1	P	> b)
478	Krzywin	Hoard	1	PL	> c)
479	Vietkow (Wicewo)	Hoard	1	PL	> c)
480	Cieszyce	Hoard	1	PL	> c)
Mehrzonenbecken					
9	Alt Kentzlin	Hoard	1	D	
58	Broock	Hoard	1	D	
61	Budsene	Hoard	1	DK	
86	Deersheim	Hoard	1	D	
107	Emden	Hoard	1	D	
153	Hamburg-Volksdorf	Burial	1	D	
162	Helsned	Hoard	1	DK	
170	Hjaerup	Hoard	1	DK	
187	Iloher Heide	Moor	1	D	
256	Meyenburg	Moor	1	D	
276	Nagelsti	Hoard	1	DK	
279	Nedergård	Hoard	2	DK	
281	Neulingen	Hoard	2	D	
345	Ravning	Hoard	1	DK	
353	Riserup	Hoard	1	DK	
372	Sandager	Sgl	1	DK	
394	Simested	Hoard	1	DK	
400	Snøde	N/A	1	DK	
412	Stevneskov	Hoard	1	DK	
434	Turup	Hoard	1	DK	
435	Tybrind Hovedgård	Hoard	1	DK	
444	Veerst	Hoard	1	DK	
445	Veflinge	Hoard	1	DK	
476	Bad Driburg	Sgl	1	D	>b; d)
Zweizonenbecken					
5	Ahausen	Moor	1	D	
7	Albersdorf	Tumulus	2	D	
10	Altenpleen	Hoard	1	D	
18	Arendsee	Hoard	1	D	
25	Bad Oldesloe	Moor	2	D	
32	Beetzendorf	Hoard	1	D	a)
40	Biesenbrow (Angermünde)	Hoard	1	D	a)
57	Brøndum Mose	Hoard	1	DK	
85	Darsekau	Hoard	1	D	a)
94	Drouwen	Burial?	1	NL	
98	Dybe	Hoard	1	DK	
99	Ebstorf	N/A	1	D	
116	Fårdal	Hoard	2	DK	
117	Femø	Area	1	DK	
119	Finnerup	Hoard	1	DK	
120	Fløe	Hoard	1	DK	
134	Gleesen	Tumulus	1	D	
138	Grandson-Corcelettes	L-D Hoard	2	CH	
145	Glerup	Hoard	2	DK	
146	Gundestrup	Hoard	1	DK	
147	Günserode	Hoard	1	D	
160	Hellevad	Hoard	1	DK	
161	Helmstedt	Tumulus	1	D	
172	Hödingen – Handelsleben	Hoard	1	D	
176	Horne	Hoard	1	DK	
182	Hyldal	Hoard	2	DK	
193	Jebjerg	Hoard	2	DK	
196	Kaiserlautern	Hoard	2	D	
198	Kalstruplund	N/A	1	DK	
202	Katerbrow (Neuruppin)	Hoard	1	D	a)
203	Kertinge	Hoard	4	DK	
205	Kettinge	Hoard	1	DK	
214	Kronshagen	Burial?	3	D	
219	Lågerup	Hoard	1	DK	
220	Landesteil Schleswig	Area	5	D	
232	Löwenberg	Hoard	1	D	
233	Lübberstorf	Hoard	2	D	
239	Lynderup	Hoard	1	DK	
240	Maasbüll	Tumulus	1	D	
243	Magleby Nørrekjaer	Hoard	1	DK	e)
263	Mönkhof	Moor	1	D	
287	Nordjütland	N/A	1	DK	
288	Nørre Lyndelse	Hoard	1	DK	
289	Nørre Vosborg	Hoard	1	DK	
299	Oerel	Burial	2	D	
301	Ømarkgårde	Hoard	1	DK	
305	Ørum	Hoard	1	DK	
309	Over Viskum	Hoard	1	DK	
315	Pederstrup	Hoard	1	DK	
317	Petit Villatte	Hoard	3	FR	
321	Plate	Sgl	1	D	
324	Pohnsdorf	Moor	1	D	
341	Randrup	Hoard	2	DK	
349	Rheda	Hoard	1	D	
377	Schönebeck (Dzwonowo)	Hoard	1	PL	a)
379	Schwennenz	Hoard	1	D	
397	Sjørup	Hoard	1	DK	
398	Skydebjerg	Hoard	1	DK	
424	Teyendorf	N/A	1	D	
426	Thisted	Hoard	1	DK	
442	Valsgård	Hoard	1	DK	
447	Vester Doense	Hoard	1	DK	
449	Viborg-Snorren	Hoard	1	DK	
454	Voldtofte	Hoard	1	DK	
458	Watenstedt	Hoard	2	D	
460	Wegeleben	Tumulus	1	D	
463	Wendorf	Hoard	1	D	a)
464	Wesenberg	Burial?	1	D	

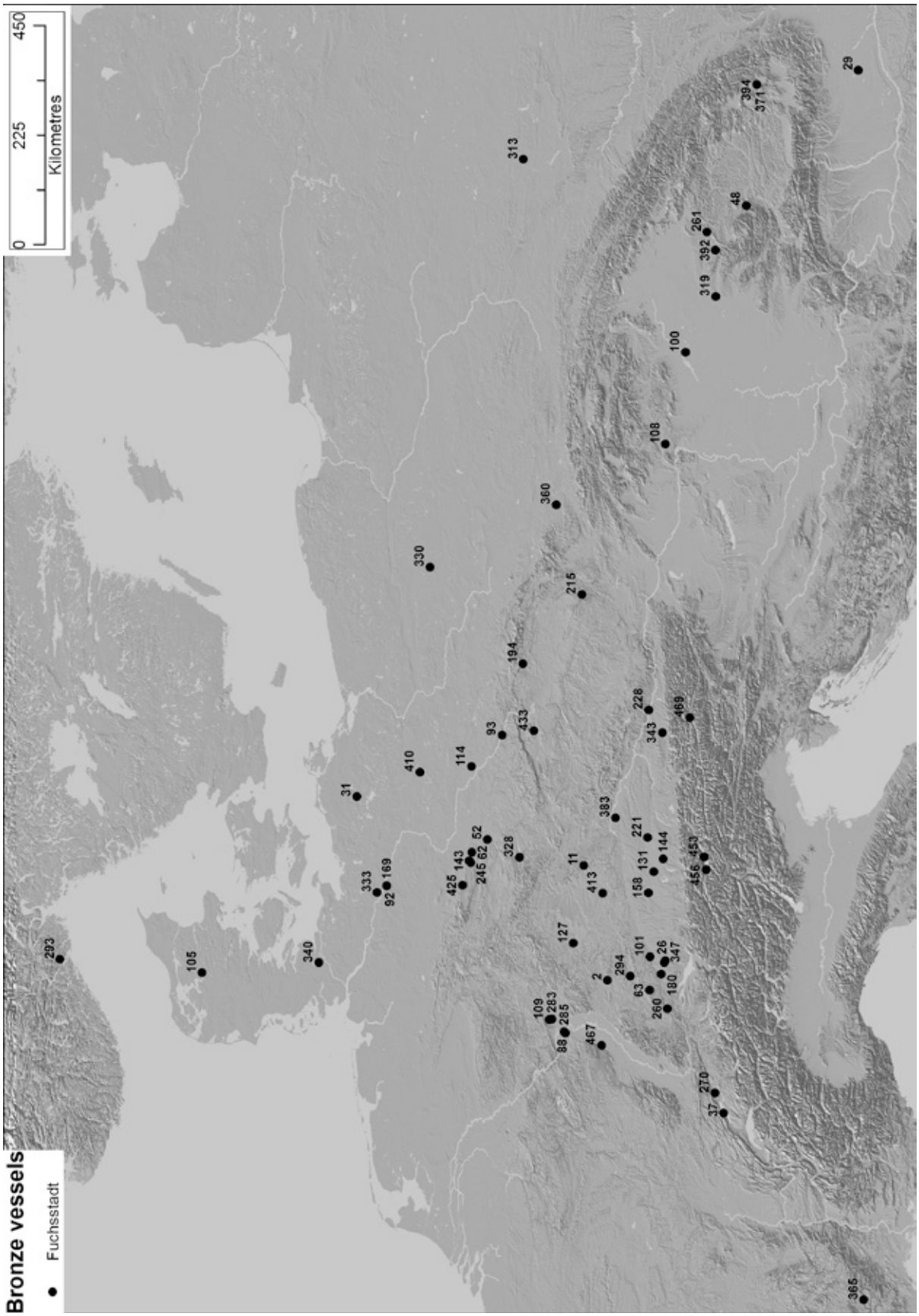


Map 126: European distribution of Late Bronze Age *Hanging vessels*.

Map 127

Contexts: L-D = Lake-Dwelling; N/A = Not available; Sgl = Single find.

No.	Site	Context	Qty	Country	References
2	Abstatt	Burial	1	D	(Jacob 1995; Thrane 1965)
11	Altensittenbach	Burial	1	D	(Jacob 1995)
26	Bad Schussenried	Burial	1	D	(Thrane 1965)
29	Banat	Sgl	1	RO	(Martin 2009)
31	Basedow	Hoard	1	D	(Jacob 1995; Martin 2009; Thrane 1965)
37	Bevaix	L-D	1	CH	(Jacob 1995)
48	Borev (Buru)	Hoard	2	RO	(Martin 2009; Thrane 1965)
52	Braunsbedra	Hoard	5	D	(Jacob 1995; Martin 2009; Thrane 1965)
62	Burgsdorf	Hoard	2	D	(Jacob 1995; Martin 2009; Thrane 1965)
63	Burladingen	Burial	1	D	(Jacob 1995; Thrane 1965)
88	Dexheim	N/A	1	D	(Jacob 1995; Thrane 1965)
92	Dötzingen	Hoard	4	D	(Jacob 1995; Thrane 1965)
93	Dresden-Dobritz	Hoard	3	D	(Jacob 1995; Martin 2009; Thrane 1965)
100	Egyek	Hoard	1	HU	(Patay and Petres 1990)
101	Ehingen	Burial	1	D	(Jacob 1995; Thrane 1965)
105	Ejstrup	Hoard	1	DK	(Jacob 1995; Thrane 1965)
108	Érsekvadkert	Hoard	1	HU	(Patay and Petres 1990)
109	Eschborn	Burial	2	D	(Jacob 1995; Thrane 1965)
114	Falkenberg	Tumulus	1	D	(Martin 2009)
127	Fuchsstadt	Burial	1	D	(Jacob 1995; Thrane 1965)
131	Gernlinden	Burial	1	D	(Jacob 1995; Thrane 1965)
143	Großörner	Hoard	8	D	(Martin 2009)
144	Grünwald	Burial	1	D	(Jacob 1995)
158	Haunstetten	Burial	1	D	(Jacob 1995)
169	Hitzacker	N/A	1	D	(Thrane 1965)
180	Hundersingen	Tumulus	1	D	(Jacob 1995)
194	Jenšovice	Hoard	1	CZ	(Thrane 1965)
215	Krtno	Hoard	1	CZ	(Thrane 1965)
221	Langengeisling	Burial	1	D	(Jacob 1995; Thrane 1965)
228	Linz an der Donau	Hoard	1	AT	(Prüssing, G 1991; Thrane 1965)
245	Mansfeld	Hoard	1	D	(Jacob 1995; Martin 2009; Thrane 1965)
260	Möhringen	Burial	1	D	(Jacob 1995; Thrane 1965)
261	Moigrad	Hoard	1	RO	(Martin 2009; Thrane 1965)
270	Mörigen	L-D	1	CH	(Bernatzky-Goetze 1987; Martin 2009)
283	Nied	Sgl	1	D	(Jacob 1995)
285	Nierstein	Burial	1	D	(Jacob 1995; Thrane 1965)
293	Nystad	Hoard	1	NO	(Thrane 1965)
294	Oberboihingen	N/A	1	D	(Jacob 1995)
313	Pavlovka	Hoard	1	UA	(Thrane 1965)
319	Pisolt bei Oradea	Hoard	1	RO	(Jacob 1995)
328	Pößneck-Schlettwein	Hoard	1	D	(Jacob 1995; Martin 2009)
330	Poznan-Wielka Staroleka	Hoard	3	PL	(Gedl 2001; Thrane 1965)
333	Preten	N/A	1	D	(Thrane 1965)
340	Ramsdorf	Burial	1	D	(Jacob 1995)
343	Rassing	Hoard	2	AT	(Martin 2009)
347	Reichenbach	Sgl	1	D	(Jacob 1995)
360	Rohow (Rohov)	Hoard	1	PL	(Gedl 2001; Thrane 1965)
365	Saint-Chély-du-Tarn	Hoard	1	FR	(Jacob 1995)
371	Sâncraieni	Hoard	1	RO	(Martin 2009)
383	Sengkofen	Burial	1	D	(Jacob 1995)
392	Sîg	Hoard	1	RO	(Jacob 1995)
394	Sîncraieni I	N/A	1	RO	(Jacob 1995; Thrane 1965)
410	Staaken	Hoard	3	D	(Jacob 1995; Martin 2009; Thrane 1965)
413	Stockheim	Hoard	1	D	(Jacob 1995)
425	Thale	Hoard	1	D	(Jacob 1995; Martin 2009; Thrane 1965)
433	Třtěno	Hoard	1	CZ	(Kytlicová 1991; Martin 2009)
453	Volders	Burial	1	AT	(Prüssing, G 1991)
456	Völs bei Innsbruck	Burial	1	AT	(Prüssing, G 1991; Thrane 1965)
467	Wollmesheim	Burial	1	D	(Jacob 1995)
469	Wörschach	Burial	1	AT	(Prüssing, G 1991; Thrane 1965)



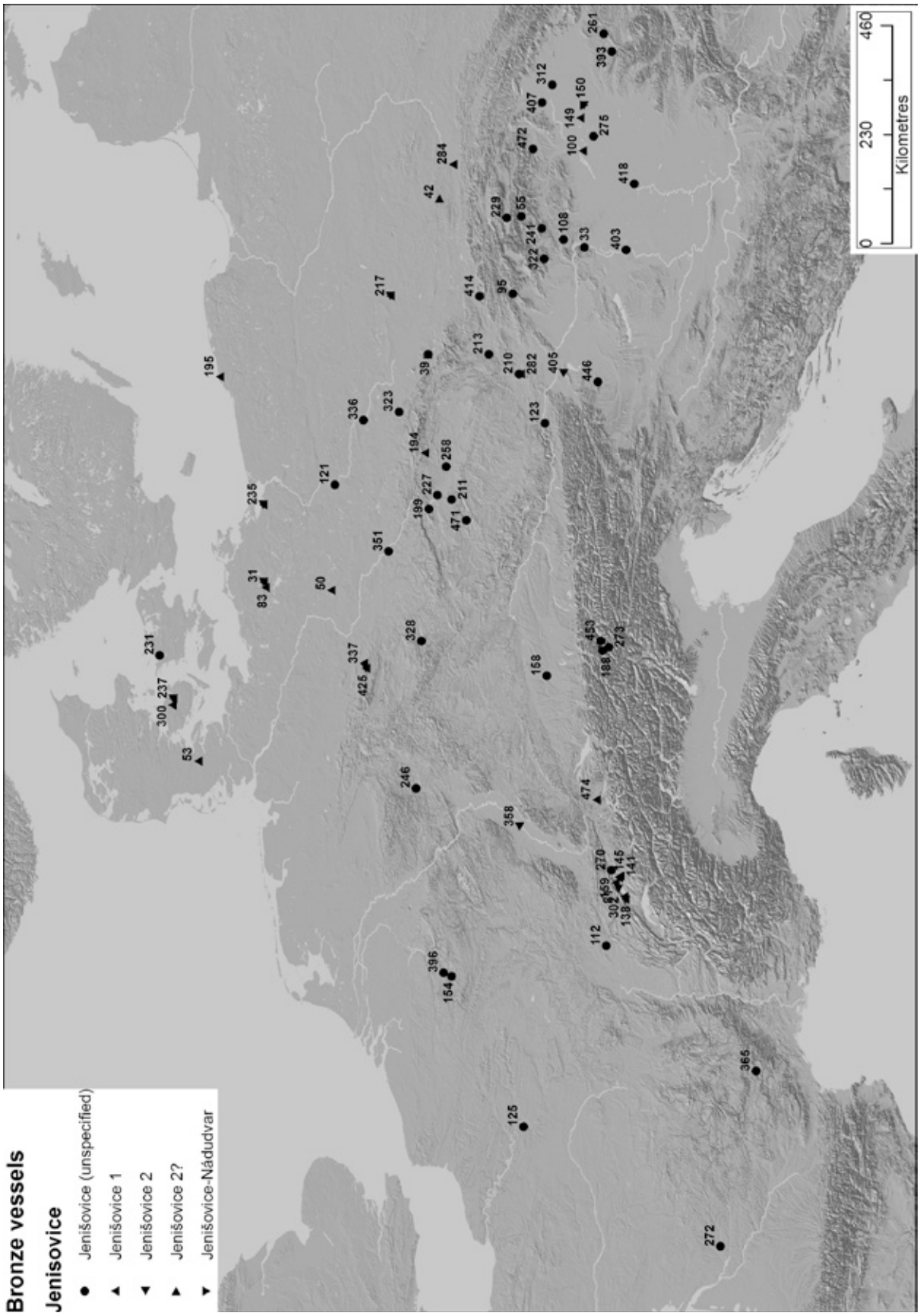
Map 127: Distribution of Late Bronze Age *Fuchsstadt* type bronze cups.

Map 128

Contexts: L-D = Lake-Dwelling; N/A = Not available; Sgl = Single find.

No.	Site	Context	Qty	Country	References
Jenišovice					
33	Békásmegyer	Burial	1	HU	(Patay and Petres 1990)
39	Biernacice	Hoard	1	PL	(Gedl 2001; Thrane 1965)
55	Brezno - Hronom	Hoard	2	SK	(Novotná 1991)
95	Dubnica - Váhom	Sgl	1	SK	(Novotná 1991)
108	Érsekvadkert	Hoard	1	HU	(Patay and Petres 1990)
112	Évans	Hoard	4	FR	(Martin 2009; Piningre 2002)
121	Frankfurt - Oder	Burial	1	D	(Martin 2009)
123	Franzhausen	Burial	1	AT	(Prüssing, G 1991)
125	Fresnes	Hoard	3	FR	(Martin 2009)
154	Han-sur-Lesse	Hoard	1	BE	(Martin 2009)
158	Haunstetten	Burial	1	D	(Martin 2009)
188	Innsbruck-Wilten	Burial	2	AT	(Prüssing, G 1991)
199	Kamýk	Hoard	1	CZ	(Kytlicová 1991)
210	Klentnice	Burial	1	CZ	(Nekvasil and Podborský 1991)
211	Kneževes	Sgl	1	CZ	(Kytlicová 1991)
213	Krenuvky	Hoard	4	CZ	(Nekvasil and Podborský 1991)
227	Libkovice - Rípem	Hoard	1	CZ	(Kytlicová 1991)
229	Liptovský Mikuláš	Hoard	8	SK	(Novotná 1991)
231	Løgtved Møse	Hoard	3	DK	(Thrane 1965, 1975)
241	Madacka	Hoard	1	SK	(Novotná 1991)
246	Marburg	Burial	1	D	(Martin 2009)
258	Milovice	Burial	1	CZ	(Nekvasil and Podborský 1991)
261	Moigrad	Hoard	1	RO	(Martin 2009)
270	Mörigen	L-D	1	CH	(Bernatzky-Goetze 1987; Jacob 1995; Thrane 1965)
272	Moulin Neuf	Hoard	1	FR	(Martin 2009)
273	Mühlbachl	Burial	1	AT	(Prüssing, G 1991)
275	Nádudvar	Hoard	1	HU	(Patay and Petres 1990)
312	Pap	Hoard	1	HU	(Patay and Petres 1990)
322	Pocúvadlo	Sgl	1	SK	(Novotná 1991)
323	Podgórnik	Hoard	4	PL	(Gedl 2001)
328	Pößneck-Schlettwein	Hoard	1	D	(Martin 2009)
336	Przyborów	Burial	1	PL	(Gedl 2001)
351	Riesa-Gröba	Hoard	1	D	(Martin 2009)
365	Saint-Chély-du-Tarn	Hoard	2	FR	(Martin 2009)
393	Sîg	Hoard	5	RO	(Martin 2009)
396	Sinsin	Burial	1	NL	(Martin 2009)
403	Solt	River	1	HU	(Patay and Petres 1990)
407	Somotor	Hoard	4	SK	(Novotná 1991)
414	Štramberk	Hoard	12	CZ	(Nekvasil and Podborský 1991; Říhovský 1989)
418	Szentes	Hoard	1	HU	(Patay and Petres 1990; Thrane 1965)
446	Velem	Hoard	1	HU	(Patay and Petres 1990; Thrane 1965)
453	Volders	Burial	2	AT	(Prüssing, G 1991)
471	Záluží	Hoard	2	CZ	(Kytlicová 1991)
472	Žarnov	N/A	1	SK	(Novotná 1991)
Jenišovice 1					
31	Basedow	Hoard	2	D	(Martin 2009; Thrane 1965, 1975)
50	Brandenburg	Burial	1	D	(Martin 2009; Thrane 1965, 1975)
53	Bredmose	Hoard	2	DK	(Thrane 1976)
83	Dahmen	Hoard	1	D	(Martin 2009; Thrane 1965)
100	Egyek	Hoard	3	HU	(Patay and Petres 1990; Thrane 1965)
138	Grandson-Corcelettes	L-D	1	CH	(Thrane 1965, 1975)
141	Greng	N/A	1	CH	(Thrane 1975)
145	Guévaux	L-D	2	CH	(Thrane 1965, 1975)
149	Hajdúböszörmény	Hoard	1	HU	(Patay and Petres 1990; Thrane 1965)
159	Hauterive-Champréveyres	L-D	1	CH	(Thrane 1965, 1975)
194	Jenšovice	Hoard	14	CZ	(Kytlicová 1991; Thrane 1965)
195	Jezierzany	Hoard	1	PL	(Gedl 2001; Martin 2009; Thrane 1965, 1975)
217	Kuznica Skakawska	Hoard	1	PL	(Gedl 2001; Thrane 1965)
235	Luckow	Hoard	1	D	(Martin 2009; Thrane 1965, 1975)
237	Lunden	Burial	2	DK	(Thrane 1965, 1975)
282	Nicholsburg	Burial	1	CZ	(Thrane 1965)
284	Niedzieliska	Hoard	1	PL	(Gedl 2001; Thrane 1965)
300	Øgemosen	Hoard	3	DK	(Thrane 1965)
302	Onnens	L-D	1	CH	(Thrane 1965)

337	Quedlinburg	Hoard	1	D	(Martin 2009; Thrane 1965, 1975)
425	Thale	Hoard	1	D	(Martin 2009; Thrane 1965, 1975)
474	Zürich-Alpenquai	L-D	2	CH	(Mäder 2001a; Thrane 1965, 1975)
Jenišovice 2					
31	Basedow	Hoard	2	D	(Martin 2009; Thrane 1965, 1975)
81	Cortaillod	L-D	1	CH	(Thrane 1965, 1975)
138	Grandson-Corcelettes	L-D	2	CH	(Thrane 1965, 1975)
150	Hajdúsámson	Hoard	2	HU	(Patay and Petres 1990; Thrane 1965, 1975)
188	Innsbruck-Wilten	Burial	1	AT	(Thrane 1965)
217	Kuznica Skakawska	Hoard	3	PL	(Gedl 2001; Thrane 1965)
235	Luckow	Hoard	2	D	(Martin 2009; Thrane 1965, 1975)
237	Lunden	Hoard	1	DK	(Thrane 1965, 1975)
358	Roeschwoog	Sgl	1	FR	(Thrane 1965, 1975)
405	Sommerein am Lithagebirge	Sgl	1	AT	(Prüssing, G 1991; Thrane 1965)
425	Thale	Hoard	1	D	(Thrane 1965, 1975)
39	Biernacice	Hoard	1	PL	(Gedl 2001; Thrane 1965)
42	Biskupice	Hoard	1	PL	(Gedl 2001)
Jenišovice?					
44	Bokavic	Hoard	1	BA	(König 2004)
Jenišovice-Nádudvar					
150	Hajdúsámson	Hoard	1	HU	(Patay and Petres 1990)

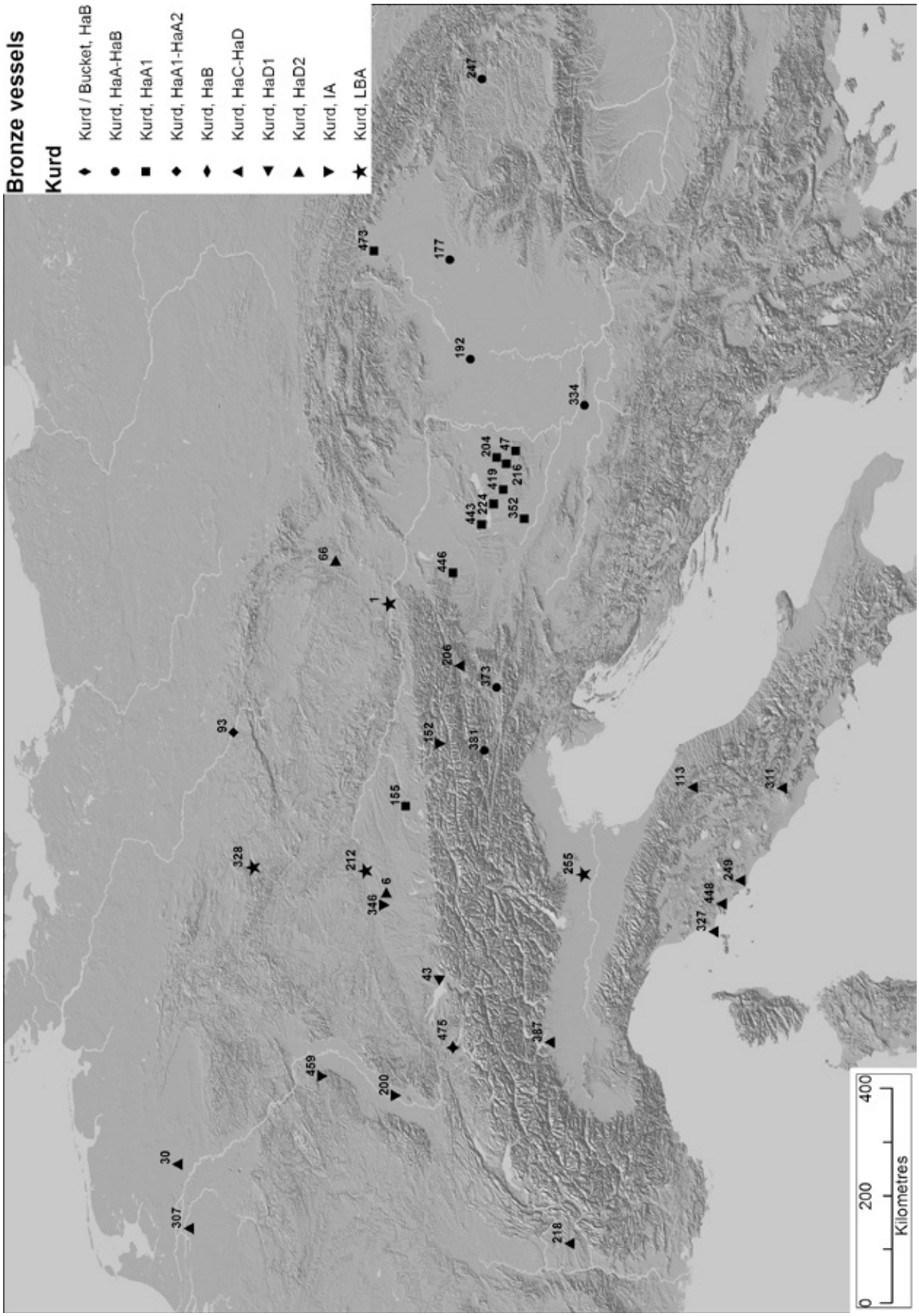


Map 128: Distribution of Late Bronze Age *Jenišovice* type bronze cups.

Map 129

Contexts: N/A = Not available.

No.	Site	Context	Qty	Country	References
1	Absberg-Bierbaum	N/A	1	AT	(Merhart 1952; Prüssing, G 1991)
6	Aichach	Tumulus	1	D	(Jacob 1995; Merhart 1952)
30	Barloo	N/A	1	NL	(Merhart 1952)
43	Bodolz	Tumulus	1	D	(Jacob 1995)
47	Bonyhád	Area	1	HU	(Patay and Petres 1990)
66	Býcí Skála Cave	Cave	1	CZ	(Nekvasil and Podborský 1991)
93	Dresden-Dobritz	Hoard	1	D	(Jacob 1995; Martin 2009; Thrane 1965)
113	Fabriano	N/A	1	IT	(Merhart 1952)
152	Hallstatt	Burial	3	AT	(Merhart 1952)
155	Hart an der Alz	Burial	1	D	(Jacob 1995)
177	Hosszúpályi	N/A	1	HU	(Merhart 1952)
192	Jászkarajenö	N/A	1	HU	(Merhart 1952)
200	Kappel	Tumulus	1	D	(Jacob 1995)
204	Keszohidegkút	Hoard	1	HU	(Patay and Petres 1990)
206	Klein Glein	N/A	2	AT	(Merhart 1952)
212	Kösching	Burial	1	D	(Jacob 1995)
216	Kurd	Hoard	2	HU	(Merhart 1952; Patay and Petres 1990)
218	La Côte Saint André	N/A	1	FR	(Merhart 1952)
224	Lengyeltóti	Hoard	1	HU	(Patay and Petres 1990)
247	Marosvécs	N/A	1	RO	(Merhart 1952)
249	Marsiliana	N/A	1	IT	(Merhart 1952)
255	Merlara	N/A	2	IT	(Merhart 1952)
307	Oss	N/A	1	NL	(Merhart 1952)
311	Palestrina	Burial	1	IT	(Merhart 1952)
327	Populonia	Burial	1	IT	(Merhart 1952)
328	Pößneck-Schlettwein	Hoard	1	D	(Martin 2009)
334	Privina Glava	N/A	1	RS	(Merhart 1952)
346	Rehling	Tumulus	1	D	(Jacob 1995)
352	Rinyaszentkirály	Hoard	1	HU	(Merhart 1952; Patay and Petres 1990)
373	Sankt Kanzian	Cave	1	AT	(Merhart 1952)
381	Seeboden	N/A	1	AT	(Merhart 1952)
387	Sesto Calende	Burial	2	IT	(Merhart 1952)
419	Szentgáloskér	Hoard	1	HU	(Patay and Petres 1990)
443	Várvölgy	Hoard	1	HU	(Patay and Petres 1990)
446	Velem	N/A	1	HU	(Patay and Petres 1990)
448	Vetulonia	Burial	1	IT	(Merhart 1952)
459	Wattenheim	Hoard	1	D	(Jacob 1995)
473	Žbince	Hoard	1	SK	(Novotná 1991)
475	Zürich-Wollishofen	Lake-Dwelling	3	CH	(Primas 1990, 2004)

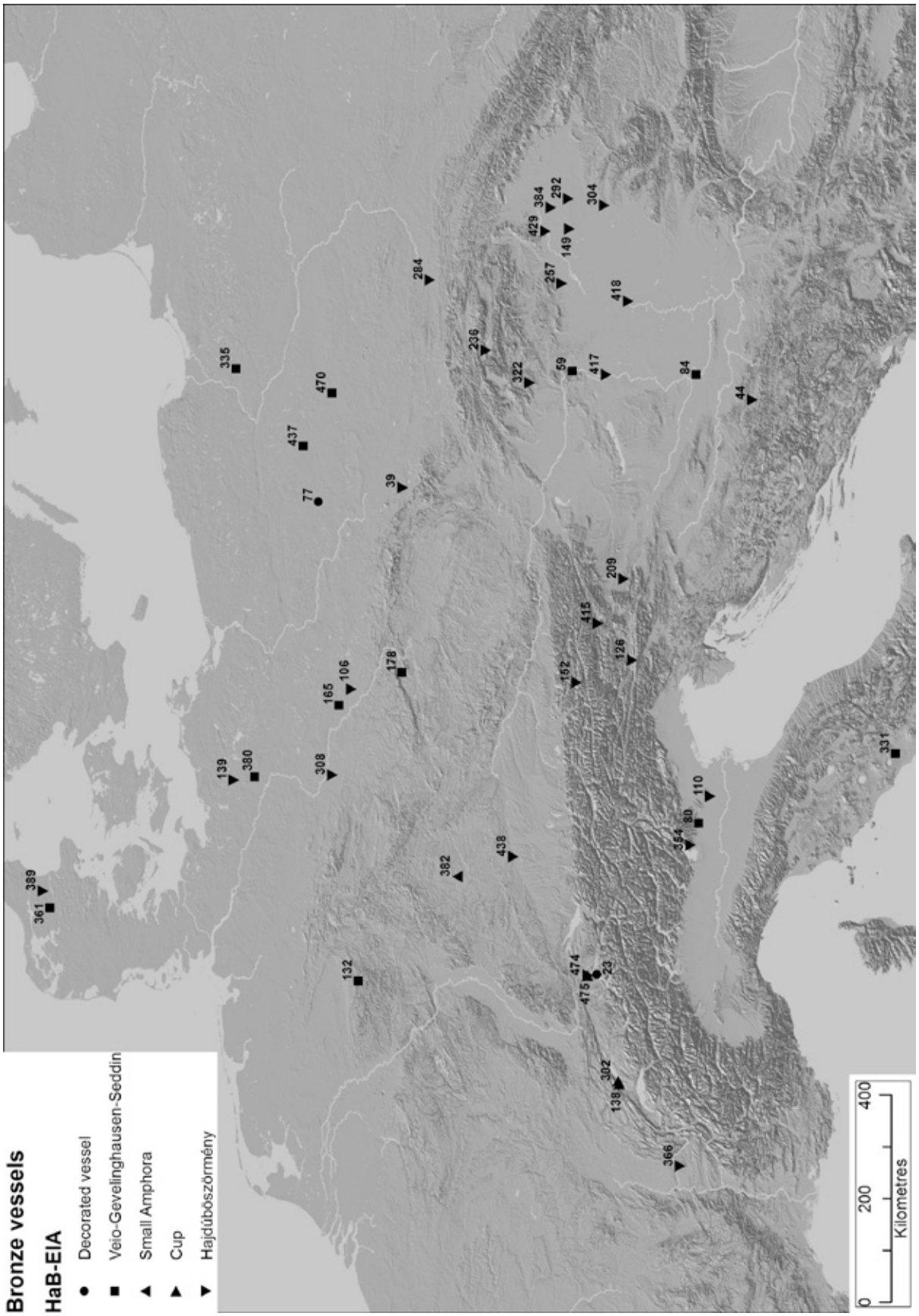


Map 129: Distribution of Late Bronze Age and Iron Age *Kurd* type bronze buckets.

Map 130

Contexts: L-D = Lake-Dwelling; N/A = Not available; Sett = Settlement.

No.	Site	Context	Qty	Country	References
Cup					
138	Grandson-Corcelettes	L-D	1	CH	(Mäder 2001a)
302	Onnens	L-D	1	CH	(Mäder 2001a)
474	Zürich-Alpenquai	L-D	1	CH	(Mäder 2001a)
Decorated vessel					
23	Baarburg	Sett	1	CH	(Stöckli 2000)
77	Choryn	Hoard	1	PL	(Gedl 2001)
Hajdúböszörmény					
39	Biernacice	Hoard	1	PL	(Gedl 2001; Jacob 1995; Merhart 1969)
44	Bokavic	Hoard	1	BA	(König 2004)
106	Elsterwerda	Hoard	1	D	(Martin 2009)
110	Este	Burial	2	IT	(Merhart 1969)
126	Frög	N/A	3	AT	(Merhart 1969; Prüssing, G 1991)
139	Granzin	Hoard	2	D	(Jacob 1995; Martin 2009)
149	Hajdúböszörmény	Hoard	3	HU	(Jacob 1995; Merhart 1952; Patay and Petres 1990)
152	Hallstatt	Burial	4	AT	(Prüssing, G 1991)
209	Klein-Klein	N/A	3	AT	(Prüssing, G 1991)
236	Lúcky	Hoard	1	SK	(Merhart 1952; Novotná 1991)
257	Mezokövesd	Hoard	1	HU	(Jacob 1995; Patay and Petres 1990)
284	Niedzieliska	Hoard	1	PL	(Gedl 2001; Jacob 1995)
292	Nyírlugos-Szenneyespuszta	Hoard	1	HU	(Jacob 1995; Patay and Petres 1990)
304	Oradea Mare	N/A	1	RO	(Jacob 1995; Merhart 1969)
308	Osternienburg	Burial	1	D	(Jacob 1995; Martin 2009)
322	Pocúvadlo	Hoard	1	SK	(Novotná 1991)
354	Rivoli-Veronese	N/A	1	IT	(Martin 2009; Merhart 1969)
366	Saint-Romain-de-Jalionas	Burial	1	FR	(Martin 2009)
384	Sényo	Singlefind	1	HU	(Jacob 1995; Merhart 1952; Patay and Petres 1990)
389	Siem	N/A	2	DK	(Jacob 1995; Merhart 1952)
415	Strettweg	N/A	1	AT	(Prüssing, G 1991)
417	Szennyespuszta	N/A	1	HU	(Merhart 1952)
418	Szentes	Hoard	1	HU	(Novotná 1991; Patay and Petres 1990)
429	Tiszanagyfalu	Hoard	1	HU	(Patay and Petres 1990)
438	Unterglauheim	Hoard	1	D	(Jacob 1995; Martin 2009; Merhart 1952)
475	Zürich-Wollishofen	L-D	5 (Frags)	CH	(Merhart 1952; Primas 1990, 2004)
Small Amphora					
382	Seinsheim Bullenheimer Berg	Hoard	1	D	(Hagl 2008)
Veio-Gevelinghausen-Seddin					
59	Budakalász-Pomáz	Area	1	HU	(Jockenhövel 1974a; Schumacher-Matthäus 2008)
80	Colognola ai Colli	N/A	1	IT	
84	Dalj	N/A	1	HR	(Jockenhövel 1974a; Schumacher-Matthäus 2008)
132	Gevelinghausen	Burial	1	D	(Jacob 1995; Jockenhövel 1974a; Schumacher-Matthäus 2008)
165	Herzberg	Hoard	1	D	(Jockenhövel 1974a; Martin 2009; Schumacher-Matthäus 2008)
178	Hostomice	Burial	1	CZ	(Kytlicová 1991)
331	Pozzo	Burial	1	IT	(Jockenhövel 1974a; Schumacher-Matthäus 2008)
335	Przeslawice	Hoard	1	PL	(Gedl 2001; Jockenhövel 1974a; Schumacher-Matthäus 2008)
361	Rørbaek	Moor	1	DK	(Jockenhövel 1974a; Schumacher-Matthäus 2008)
380	Seddin	Burial	1	D	(Jockenhövel 1974a; Martin 2009; Schumacher-Matthäus 2008)
437	Unia	Burial	1	PL	(Gedl 2001; Jockenhövel 1974a; Schumacher-Matthäus 2008)
470	Zakrzew	Sett	1	PL	(Gedl 2001)



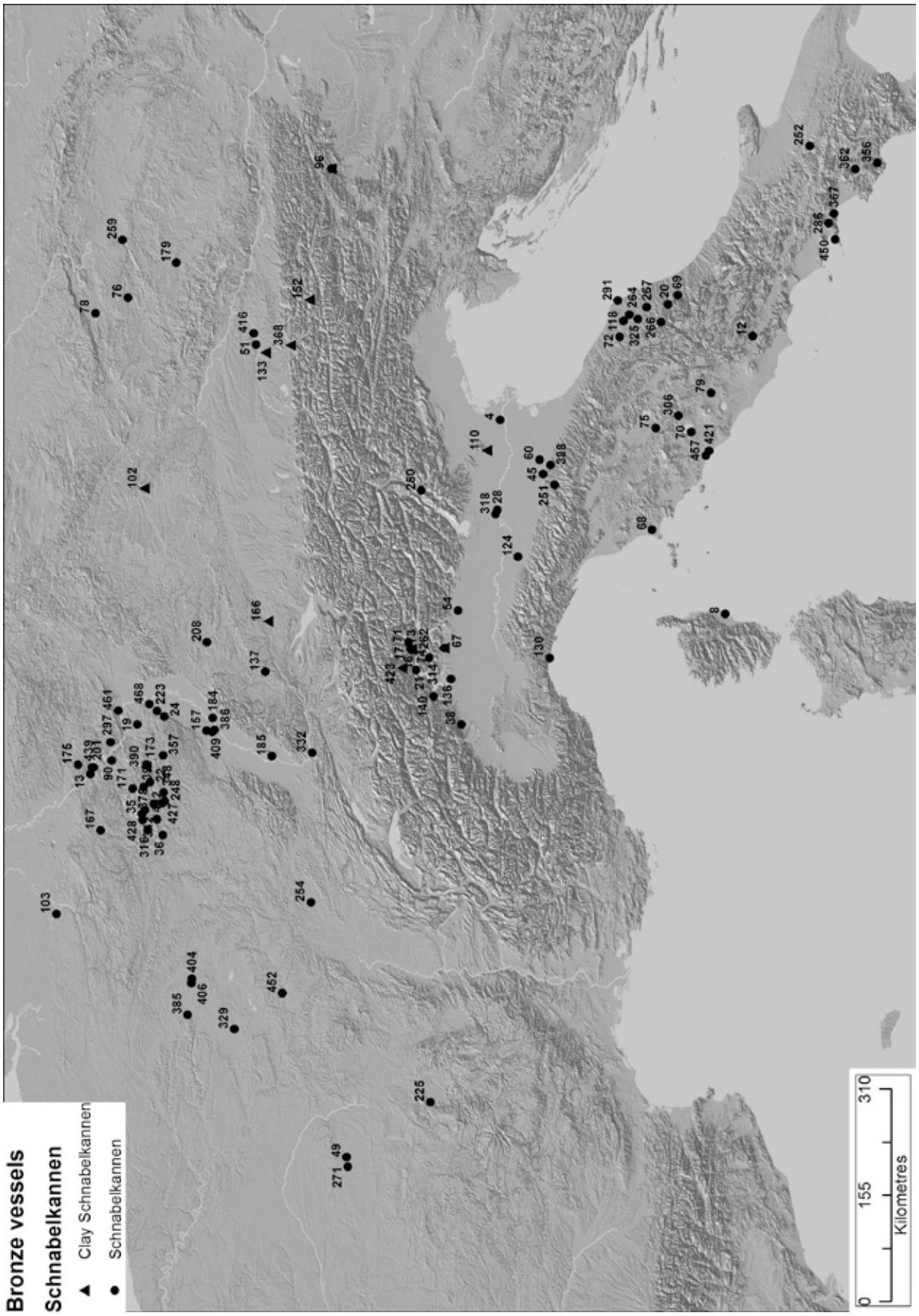
Map 130: Distribution of *Hajdúböszörmény* type and other Late Bronze Age – early Iron Age bronze vessels.

Map 131

Contexts: N/A = Not available; S = Settlement; Sgl = Single find.

All site references (Vorlauf 1997) in addition to those specified below, unless marked with >. a) = (Kimmig and Gersbach 1971); b) = (Ebels 1992); c) = (Pauli, L 1971); d) = (Primas 1971); e) = (Balzer 2009).

No.	Site.	Context	Qty	Cty	References
Clay Schnabelkannen					
17	Arbedo-Cerinasca	N/A	2	CH	> a)
67	Ca' Morta	N/A	2	IT	> a)
96	Dürrnberg	Burial	24	AT	> b)
102	Ehrenbürg	Burial	1	D	> b)
110	Este	Burial	1	IT	> b)
133	Gilgenberg	S	1	AT	> b)
152	Hallstatt	Burial	7	AT	> b)
166	Heuneburg	S	1	D	> a)
262	Molinazzo d'Arbedo	N/A	2	CH	> a)
368	Salzburg	N/A	6	AT	> a)
390	Sien	Burial	1	D	> b)
423	Tessin	N/A	1	CH	> a)
Bronze Schnabelkannen					
4	Adria	Burial	3	IT	
8	Aléria	Burial	3	FR	
12	Anagni	N/A	1	IT	
13	Andernach	Sgl	1	D	
16	Arbedo	Hoard	1	CH	c)
17	Arbedo-Cerinasca	Burial	2	CH	
19	Armsheim	Burial	1	D	
20	Ascoli Piceno	Sgl	1	IT	
21	Ascona	Sgl	1	CH	
22	Aulenbach	Tumulus	1	D	
24	Bad Dürkheim	Burial	1	D	
28	Bagnolo San Vito	Sgl	3	IT	
35	Bescheid	Burial	1	D	
36	Besseringen	Burial	1	D	
38	Biella	Burial	1	IT	
45	Bologna	Burial	7	IT	
49	Bourges	Burial	1	FR	
51	Braunau am Inn	Sgl	1	AT	
54	Brembate	Burial	1	IT	
60	Budrio	Burial	1	IT	
67	Ca' Morta	Burial	3	IT	
68	Campiglia Marittima	Burial	1	IT	
69	Campli	Burial	3	IT	
70	Capo di Monte-Bisenzio	Burial	6	IT	
71	Castaneda	Burial	3	CH	d)
72	Castelbellino	Burial	2	IT	
73	Castione	Burial	1	CH	
74	Castione-Bergámo	Burial	1	CH	
75	Chiusi	N/A	1	IT	
76	Chlum	Burial	1	CZ	
78	Cínov	N/A	1	CZ	
79	Civita Castellana	Burial	5	IT	
90	Dörth	Tumulus	1	D	
96	Dürrnberg	Burial	2	AT	> b)
103	Eigenbilzen	Burial	1	BG	
118	Filottrano	N/A	2	IT	
124	Fraore	Burial	1	IT	
130	Genua	Burial	3	IT	
136	Golasecca	N/A	1	IT	
137	Gosheim	Burial	1	D	
140	Gravellona Toce	Burial	1	IT	
157	Hatten	Burial	3	FR	c)
167	Hillesheim	Burial	1	D	
171	Hochscheid	Burial	2	D	
173	Hoppstädten	Burial	1	D	
175	Horhausen	Burial	1	D	
179	Hradiste	Burial	2	CZ	
184	Iffezheim	Burial	1	D	
185	Ihringen	Burial	2	D	> e)
201	Kärlich	Burial	2	D	
208	Kleinaspergle	Burial	1	D	> b)
223	Laumersheim	Burial	1	D	
225	Les Bercias	Sgl	1	FR	
248	Marpingen	Burial	1	D	
250	Martignano	N/A	1	IT	
251	Marzabotto	N/A	3	IT	
252	Melfi	Burial	2	IT	
254	Mercey-sur-Saône	Burial	1	FR	c)
259	Modrany	N/A	1	CZ	
262	Molinazzo d'Arbedo	Burial	5	CH	c)
264	Montecassiano	Sgl	3	IT	
266	Montefortino	Burial	1	IT	
267	Montegiorgio, Valle de Tenna	Burial	1	IT	
271	Morthomiers - Prunet	Burial	1	FR	
286	Nocera	N/A	1	IT	
291	Numana	Burial	5	IT	
297	Oberwallmenach	Burial	1	D	
306	Orvieto	Burial	1	IT	
314	Pazzallo	Burial	1	CH	
316	Pellingen	Burial	1	D	
318	Pietole Virgilio	N/A	2	IT	
325	Pollenza	N/A	1	IT	
329	Pouan	Sgl	1	FR	
332	Pratteln	Burial	1	CH	
342	Rascheid	Burial	1	D	
348	Remmesweiler	Burial	1	D	
356	Roccagloriosa	Burial	1	IT	
357	Rodenbach	Burial	1	D	
362	Roscigno	Burial	1	IT	
367	Salerno	Burial	1	IT	
378	Schwarzenbach	Burial	2	D	
385	Sept-Saulx	Burial	1	FR	
386	Sessenheim	Burial	1	FR	
388	Settefonti	Burial	2	IT	
391	Siesbach	Burial	1	D	
404	Somme-Bionne	Burial	1	FR	
406	Somme-Tourbe	Burial	1	FR	
409	Soufflenheim	Burial	1	FR	
416	Sunzing	Burial?	1	AT	
421	Tarquinia	Burial	5	IT	
427	Tholey	Burial	1	D	
428	Thomm	Burial	1	D	
439	Urmitz	Sgl	1	D	
450	Vico Equense	Burial	2	IT	
452	Vix	Burial	2	FR	c)
457	Vulci	Burial	35	IT	
461	Wiesbaden	Burial	1	D	
462	Weiskirchen	Burial	2	D	
468	Worms-Herrnsheim	Burial	2	D	



Map 131: Distribution of Schnabelkannen and emulative clay versions. (Data from Vorlauf, 1997).

Map 132

Contexts: N/A = Not available; S = Settlement; Sgl = Single find.

No.	Site	Context	Qty	Country	References
Bronze Bucket with Angenietetm Base (indented base)					
122	Frankfurter Stadtwald	Tumulus	1	D	(Jacob 1995)
295	Oberembt	Burial	1	D	(Jacob 1995)
Bronze Bucket with ribbed Handles					
459	Wattenheim	Hoard	1	D	(Jacob 1995)
Bronze Bucket with ribbed Shoulders					
344	Rauschendorf	Burial	1	D	(Martin 2009)
436	Uffing am Staffelsee	Tumulus	1	D	(Jacob 1995)
Cistern with handles					
14	Appiano	Hoard	1	IT	(Stjernquist 1967)
15	Aquileja	N/A	1	IT	(Stjernquist 1967)
27	Bagnarola	N/A	1	IT	(Stjernquist 1967)
45	Bologna	Burial	31	IT	(Stjernquist 1967)
46	Bologna Stradello della Certosa	Burial	5	IT	(Stjernquist 1967)
82	Cumae	Burial	1	IT	(Stjernquist 1967)
110	Este	Burial	2	IT	(Stjernquist 1967)
124	Fraore	Burial	1	IT	(Stjernquist 1967)
128	Galassina di Castelvetro	Burial	1	IT	(Stjernquist 1967)
152	Hallstatt	Burial	2	AT	(Stjernquist 1967)
166	Heuneburg	S	1	D	(Jacob 1995)
180	Hundersingen	Burial	1	D	(Jacob 1995)
226	Leutstetten	Burial	1	D	(Stjernquist 1967)
242	Magdalenska Gora	Burial	5	SI	(Stjernquist 1967)
244	Magny-Lambert	Burial	1	FR	(Stjernquist 1967)
251	Marzabotto	Burial	2	IT	(Stjernquist 1967)
262	Molinazzo d'Arbedo	Burial	1	CH	(Stjernquist 1967)
264	Montebelluna	N/A	2	IT	(Stjernquist 1967)
268	Monteveglio	Burial	1	IT	(Stjernquist 1967)
274	Mühltal-Oberbayern	Burial	1	D	(Jacob 1995)
278	Náklo	Hoard	1	CZ	(Nekvasil and Podborský 1991)
303	Opeano Veronese	N/A	1	IT	(Stjernquist 1967)
326	Pommerkogel	Burial	1	D	(Stjernquist 1967)
369	San Maurizio	Hoard	1	IT	(Stjernquist 1967)
370	San Zeno	N/A	2	IT	(Stjernquist 1967)
374	Savignano sul Panaro	Burial	1	IT	(Stjernquist 1967)
399	Słupca	Sgl	1	PL	(Gedl 2001)
402	Solinki	Burial?	1	PL	(Stjernquist 1967)
420	Tannheim	Burial	1	D	(Jacob 1995)
430	Toiano	Burial	1	IT	(Stjernquist 1967)
436	Uffing am Staffelsee	Hoard	1	D	(Jacob 1995)
440	Urtenen	Tumulus	1	CH	(Drack 1977)
441	Vace	N/A	1	SI	(Stjernquist 1967)
451	Vinica	Burial	1	SI	(Stjernquist 1967)
Cistern with swing handles					
191	Issersheilingen	Tumulus	1	D	(Martin 2009)
375	Schabernack	Cemetery	1	D	(Martin 2009)
Decorated vessel					
23	Baarburg	S	1	CH	(Stöckli 2000)
77	Choryn	Hoard	1	PL	(Gedl 2001)
Drinking Vessel					
65	Buza	Hoard	1	RO	(Schumacher-Matthäus 2008)
67	Ca' Morta	Burial	1	IT	(Schumacher-Matthäus 2008)
80	Colognola ai Colli	Burial	1	IT	(Schumacher-Matthäus 2008)
178	Hostomice	Burial	1	CZ	(Schumacher-Matthäus 2008)
320	Pizzo Pede bei Narce	Burial	1	IT	(Schumacher-Matthäus 2008)
Reiseneimer / Kurd?					
77	Choryn	Hoard	1	PL	(Gedl 2001; Merhart 1952)

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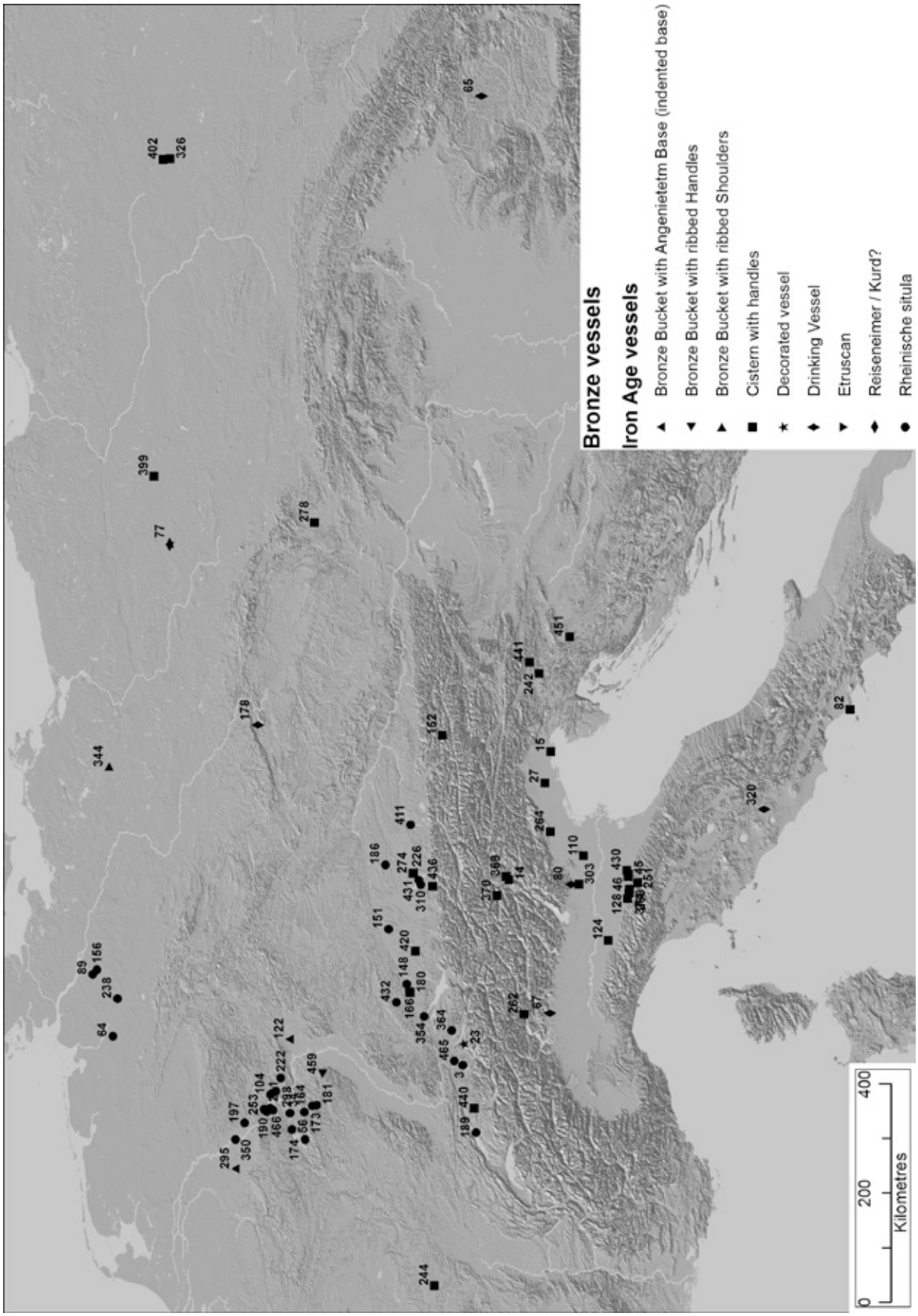
3	Adiswil	Burial	1	CH	(Drack 1977)
34	Bell	Burial	1	D	(Jacob 1995)
56	Briedel	Burial	1	D	(Jacob 1995)
64	Bürstel	Burial	1	D	(Jacob 1995)
89	Döhren	Burial	1	D	(Jacob 1995)
104	Eitelborn	Burial	1	D	(Jacob 1995)
142	Grosseibstadt	Burial	1	D	(Jacob 1995)
148	Hailtingen	Cemetery	1	D	(Jacob 1995)
151	Haldenwang	Burial	1	D	(Jacob 1995)
156	Hassel	Burial	1	D	(Jacob 1995)
164	Hennweiler	Burial	1	D	(Jacob 1995)
166	Heuneburg	S	1	D	(Jacob 1995)
173	Hoppstädten	Burial	1	D	(Jacob 1995)
174	Horath	Burial	2	D	(Jacob 1995)
181	Hundheim	Burial	1	D	(Jacob 1995)
186	Ilmmünster	Burial	1	D	(Jacob 1995)
189	Ins	Burial	1	CH	(Drack 1977)
190	Irlich	Burial	1	D	(Jacob 1995)
197	Kaldauen	Burial	1	D	(Jacob 1995)
201	Kärlich	Burial	1	D	(Jacob 1995)
201	Kärlich	Sgl	4	D	(Jacob 1995)
222	Laufenselden	Burial	1	D	(Jacob 1995)
238	Luttum	N/A	1	D	(Jacob 1995)
253	Melsbach	Burial	1	D	(Jacob 1995)
298	Oberwies	Burial	1	D	(Jacob 1995)
310	Pähl	Burial	1	D	(Jacob 1995)
350	Rhein bei Riehl	River	1	D	(Jacob 1995)
354	Risstorf	Burial	1	D	(Jacob 1995)
364	Russikon	Burial	1	CH	(Drack 1977)
411	Steppach	Burial	1	D	(Jacob 1995)
420	Tannheim	Burial	1	D	(Jacob 1995)
431	Traubing	Burial	3	D	(Jacob 1995)
432	Trochtelfingen	N/A	1	D	(Jacob 1995)
465	Wohlen	Burial	3	CH	(Drack 1977)
466	Wolken	Burial	1	D	(Jacob 1995)



Map 132: Distribution of selected Iron Age bronze vessels.

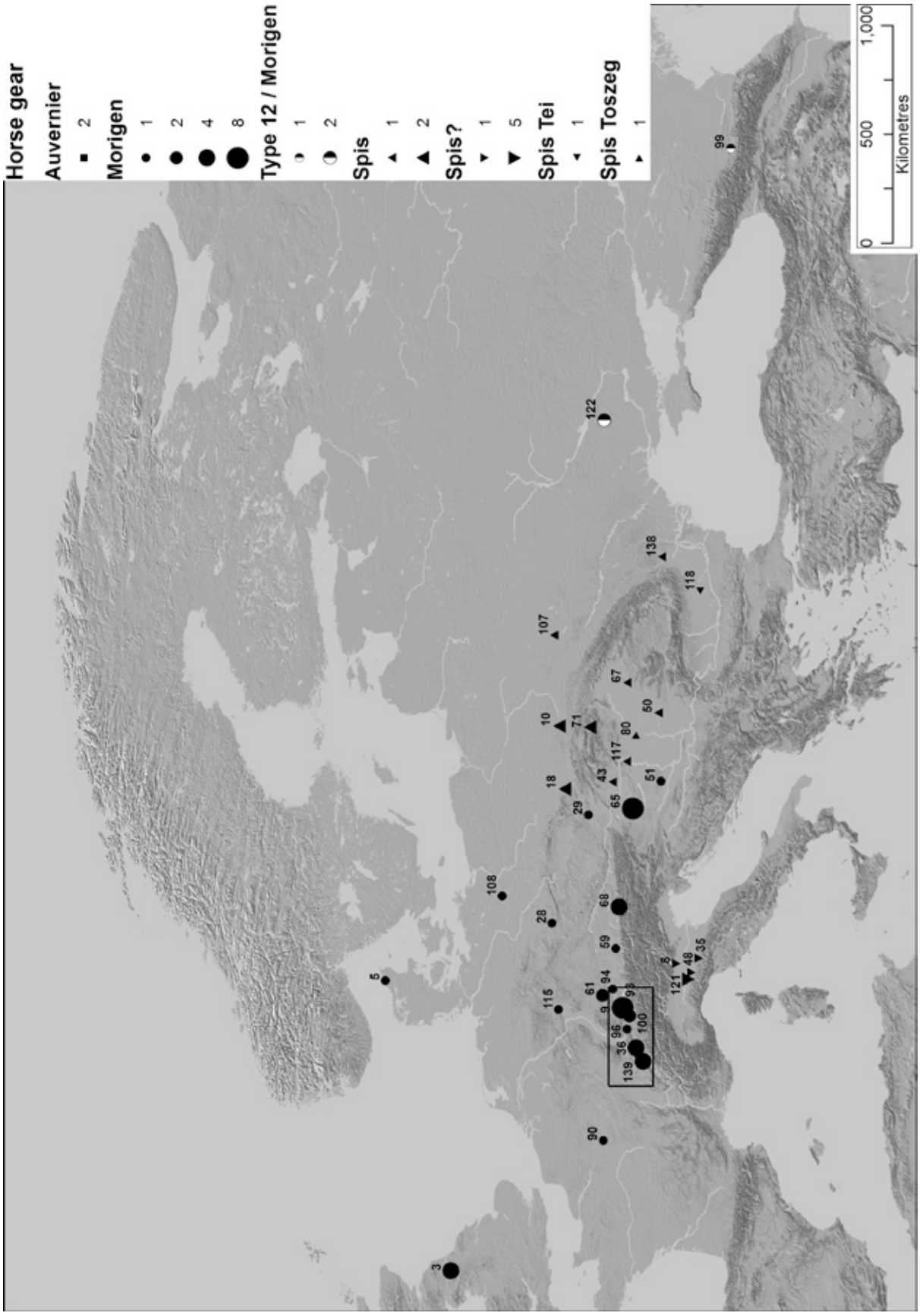
Maps 133 – 139

Contexts: A = Area; B = Burial; C = Cemetery; FS = Fortified settlement; H = Hoard; HS = 'highland' settlement; L = Lake; L-D = :Lake-Dwelling; M = Moor; N/A = Not available; R= River; S = Settlement; Sgl = Single find.

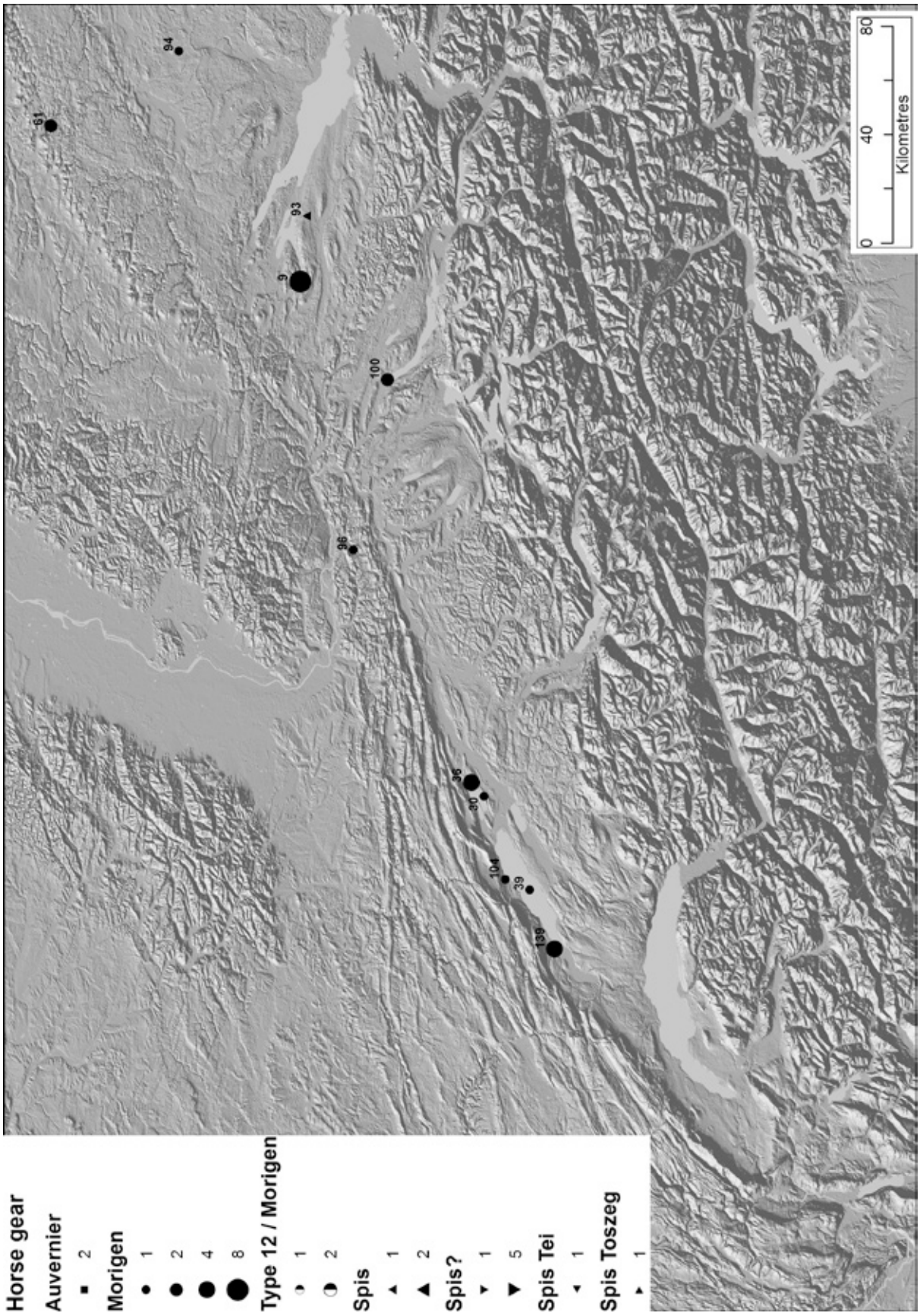
No.	Site	Context	Country	References
1	Gyöngyössolymos	H	HU	(Hüttel 1981)
2	Haslau-Regelsbrunn	H	AT	(Kossack 1954; Metzner-Nebelsick 1992)
3	Heathery Burn Cave	H?	UK	(Hüttel 1981)
4	Helmstedt	R	D	(Hüttel 1981)
5	Hjørtetak	M	DK	(Hüttel 1981)
6	Hohe Wand	N/A	AT	(Metzner-Nebelsick 1992)
7	Il'inskaja	N/A	RU	(Van Willigen and Mäder 2012)
8	Imboccatura del Mincio	S	IT	(Hüttel 1981)
9	Eschenz-Insel Werd	L-D	CH	(Brem *et al.* 1987)
10	Jakuszowice	S	PL	(Bąk 1992)
11	Janjevo	N/A	RS	(Van Willigen and Mäder 2012)
12	Kaisten	Sgl	CH	(Hüttel 1981)
13	Kamyševacha	B	UA	(Dietz 1998; Kossack 1954; Metzner-Nebelsick 1992)
14	Kamyšta-Fluss	N/A	RU	(Dietz 1998)
15	Karlstein	S	D	(Hüttel 1981)
16	Kazazovo	N/A	RU	(Van Willigen and Mäder 2012)
17	Keszthely	A	HU	(Hüttel 1981)
18	Kiertz	B	PL	(Bąk 1992)
19	Kisköszeg (Batina)	B/H	HR	(Kossack 1954)
20	Kislovodsk	N/A	RU	(Metzner-Nebelsick 1992)
21	Koban	C	RU	(Dietz 1998; Metzner-Nebelsick 1992)
22	Komitat Veszprém	A	HU	(Van Willigen and Mäder 2012)
23	Komitat Zólyom	H	SK	(Kossack 1954)
24	Königsbronn	B	D	(Hüttel 1981)
25	Kossovo Janjevo	N/A	RS	(Kossack 1954)
26	Krteno	N/A	CZ	(Kossack 1954; Metzner-Nebelsick 1992)
27	Larnaud	H	FR	(Hüttel 1981)
28	Lengenfeld	B	D	(Hüttel 1981; Kossack 1954)
29	Lovcicky	S	CZ	(Hüttel 1981)
30	Lüscherz	L-D	CH	(Hüttel 1981)
31	Malaja Cimbalka	B	UA	(Metzner-Nebelsick 1992)
32	Maroscsapó (Cipau)	N/A	RO	(Kossack 1954; Metzner-Nebelsick 1992)
33	Mengen	B	D	(Hüttel 1981)
34	Mesic	N/A	RS	(Metzner-Nebelsick 1992)
35	Montale	S	IT	(Hüttel 1981)
36	Mörigen	L-D	CH	(Bernatzky-Goetze 1987; Hüttel 1981; Trachsel 1996)
37	Mošanec	N/A	UA	(Van Willigen and Mäder 2012)
38	Narce	N/A	IT	(Von Hase 1969)
39	Neuenbergersee	L	CH	(Hüttel 1981)
40	Nikolaevka	B	RU	(Dietz 1998)
41	Nikolaevka-Ukraine	B	UA	(Dietz 1998)
42	Nikolaevskoe	N/A	RU	(Metzner-Nebelsick 1992)
43	Nitriansky Hradok	FS	SK	(Hüttel 1981)
44	Nymö	B or H	SE	(Hüttel 1981)
45	Ockov	N/A	SK	(Kossack 1954; Metzner-Nebelsick 1992)
46	Ockstadt	H	D	(Hüttel 1981)
47	Palestrina	N/A	IT	(Von Hase 1969)
48	Parma	S	IT	(Hüttel 1981)
49	Parndorf	N/A	AT	(Metzner-Nebelsick 1992)
50	Pecica	S	RO	(Hüttel 1981)
51	Pécs	S	HU	(Hüttel 1981)
52	Pfatten/Vadena	N/A	IT	(Hüttel 1981; Von Hase 1969)
52	Pfatten/Vadena	B	IT	(Hüttel 1981; Von Hase 1969)
53	Plátenice	B	CZ	(Novák 1975)
54	Plovdosovchoz – Dubovaja Rošca	A	RU	(Dietz 1998)
55	Pšiš	N/A	RU	(Van Willigen and Mäder 2012)
56	Ramonte	B	IT	(Von Hase 1969)
57	Rome	A	IT	(Von Hase 1969)
58	Ronzano	N/A	IT	(Von Hase 1969)
59	Roseninsel	L-D	D	(Hüttel 1981)
60	Rudovac	H	RS	(Kossack 1954; Metzner-Nebelsick 1992)
61	Runden Bergs - Urach	HS	D	(Hüttel 1981; Kluge 1986; Metzner-Nebelsick 1992)
62	Rusellae	N/A	IT	(Von Hase 1969)
63	S. Maria di Geleria	N/A	IT	(Von Hase 1969)

64	Saesing	H	DK	(Hüttel 1981)
65	Sághegy	HS	HU	(Hüttel 1981)
66	Saint Sulpice	B?	CH	(Hüttel 1981)
67	Salacea	S	RO	(Hüttel 1981)
68	Salzburg-Rainberg	HS	AT	(Höglinger 1986; Hüttel 1981)
69	Seržen'-Jurt	B	RU	(Dietz 1998; Metzner-Nebelsick 1992)
70	Sorel-Moussel	B	FR	(Mohen and Bailloud 1987)
71	Spišsky Štvrtok	FS	SK	(Hüttel 1981)
72	St. Il'inskaja	Sgl	RU	(Dietz 1998; Metzner-Nebelsick 1992)
73	Steinkirchen	N/A	D	(Kossack 1954; Metzner-Nebelsick 1992)
74	Stillfried	B	AT	(Kossack 1954; Metzner-Nebelsick 1992)
75	Stockern	N/A	AT	(Kossack 1954; Metzner-Nebelsick 1992)
76	Subotica	N/A	RS	(Van Willigen and Mäder 2012)
77	Tarquinia	B	IT	(Von Hase 1969)
78	Tolentino	B	IT	(Von Hase 1969)
79	Tolna	N/A	HU	(Metzner-Nebelsick 1992)
80	Tószeg	B	HU	(Hüttel 1981)
81	Troian	N/A	BG	(Kossack 1954; Metzner-Nebelsick 1992)
82	Trteno	N/A	CZ	(Van Willigen and Mäder 2012)
83	Ugra	H	HU	(Kossack 1954)
84	Ungureni	H	RO	(Hüttel 1981)
85	Unteruhldingen-Stollenwiesen	L-D	D	(Schöbel 1996)
86	Veio	B	IT	(Von Hase 1969)
87	Vergiano	N/A	IT	(Von Hase 1969)
88	Verucchio	N/A	IT	(Von Hase 1969)
88	Verucchio	B	IT	(Von Hase 1969)
89	Vetulonia	A	IT	(Von Hase 1969)
89	Vetulonia	B	IT	(Von Hase 1969)
89	Vetulonia	N/A	IT	(Von Hase 1969)
90	Villiers-sur-Seine	FS	FR	(Peake *et al.* 2009)
91	Volterra	B	IT	(Von Hase 1969)
91	Volterra	N/A	IT	(Von Hase 1969)
92	Vulci	N/A	IT	(Von Hase 1969)
93	Waldi	S	CH	(Hüttel 1981; Lanzrein 2009)
94	Wasserburg Buchau	L-D	D	(Hüttel 1981)
95	Wiener Neustadt	N/A	AT	(Kossack 1954)
96	Wittnau Horn	HS	CH	(Hüttel 1981)
97	Wörschach	B	AT	(Hüttel 1981)
98	Žbince	H	SK	(Hüttel 1981)
99	Zmejskoe	S	RU	(Dietz 1998)
100	Zürich-Alpenquai	L-D; H	CH	(Chochorowski 1993; Hüttel 1981; Mäder 2001a; Trachsel 1996; Van Willigen 2011; Van Willigen and Mäder 2012)
101	"Psekups-Mündung"	Sgl	RU	(Dietz 1998)
102	Accesasee	B	IT	(Von Hase 1969)
103	Adaševci	H	RS	(Kossack 1954; Metzner-Nebelsick 1992)
104	Auvernier	L-D	CH	(Hüttel 1981)
105	Balabino I	B	RU	(Dietz 1998)
106	Batina	B	HR	(Kossack 1954)
107	Belc	N/A	UA	(Hüttel 1981)
108	Berlin-Buch	S	D	(Hüttel 1981)
109	Bevtoft	B	DK	(Hüttel 1981)
110	Biharugra	H	HU	(Chochorowski 1993; Metzner-Nebelsick 1992)
111	Bisenzio	N/A	IT	(Von Hase 1969)
112	Bogata de Jos	H	RO	(Hüttel 1981)
113	Bologna	A	IT	(Von Hase 1969)
113	Bologna	B	IT	(Von Hase 1969)
113	Bologna	H	IT	(Von Hase 1969)
114	Bologna-San Vitale	B	IT	(Von Hase 1969)
115	Bruchenbrücken	Sgl	D	(Hüttel 1981)
116	Brunnenthal	N/A	AT	(Kossack 1954)
117	Budapest-Lágymányos	S	HU	(Hüttel 1981)
118	Bukarest	S	RO	(Hüttel 1981)
119	Bürg bei Spiez	S	CH	(Hüttel 1981)
120	Castelfranco	B	IT	(Von Hase 1969)
121	Castione dei Marchesi	S	IT	(Hüttel 1981)
122	Cecelievka	B	UA	(Dietz 1998)
123	Cernogorovka	B	UA	(Dietz 1998)
124	Cernotín	H	CZ	(Říhovský 1992)
125	Cerveteri	A	IT	(Von Hase 1969)
125	Cerveteri	N/A	IT	(Von Hase 1969)
126	Chavéria	B	FR	(Hüttel 1981)
127	Cipau	N/A	RO	(Van Willigen and Mäder 2012)
128	Dinnyés	N/A	HU	(Kossack 1954; Metzner-Nebelsick 1992)

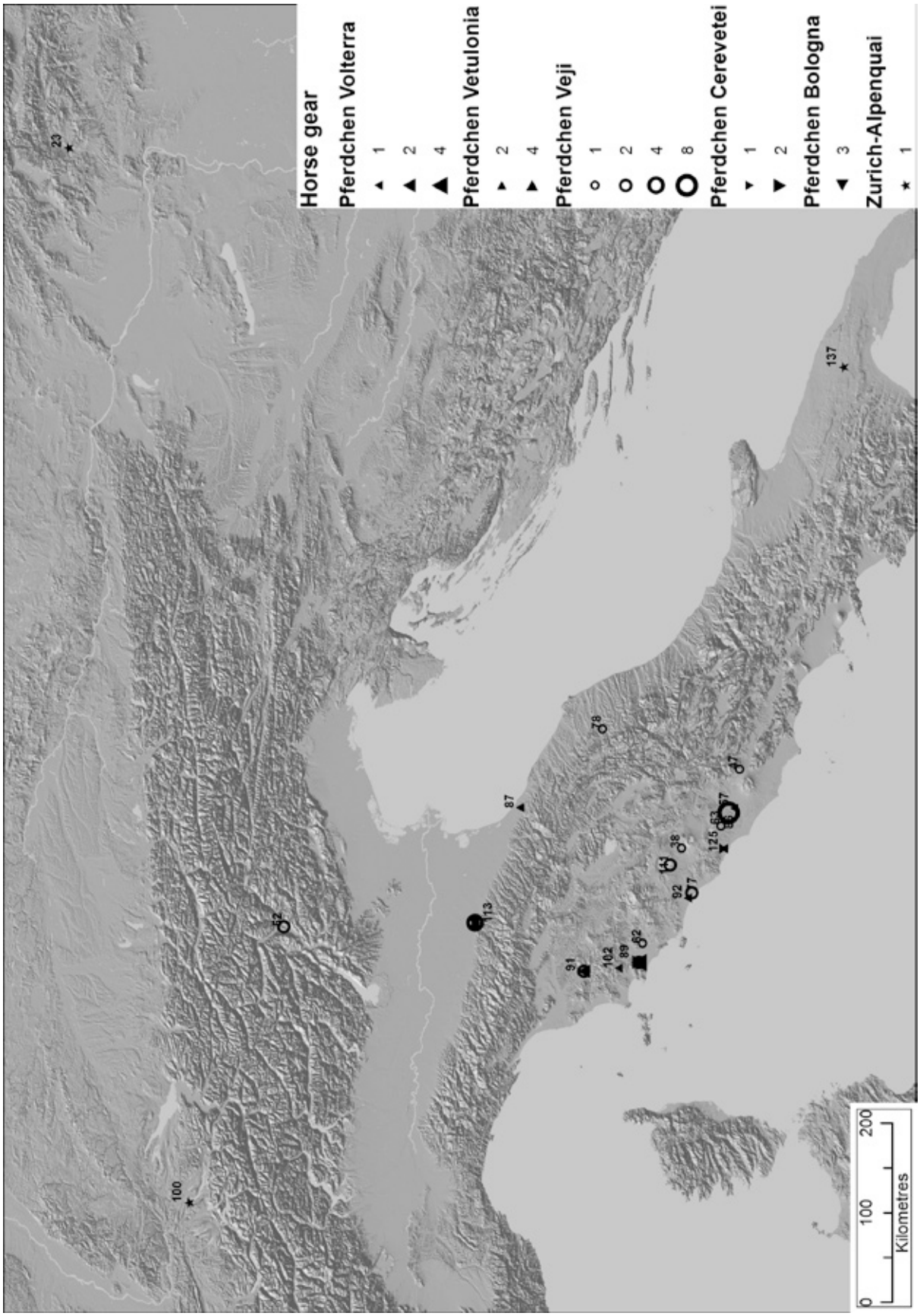
129	Dubovaja Rošca	N/A	RU	(Van Willigen and Mäder 2012)
130	Estavayer-le-Lac	L-D	CH	(Hüttel 1981)
131	Friano bei Mulazzano	N/A	IT	(Von Hase 1969)
132	Frög	B	AT	(Berger, D 2011; Metzner-Nebelsick 1992)
133	Fügöd	N/A	HU	(Chochorowski 1993)
134	Füzesabony	N/A	HU	(Metzner-Nebelsick 1992)
135	Germencik	N/A	RU	(Dietz 1998)
136	Gigen	N/A	BG	(Chochorowski 1993)
137	Gioia del Colle	B	IT	(Ciancio 2011)
138	Gîrbovat	S	RO	(Hüttel 1981)
139	Grandson-Corcelettes	L-D	CH	(Hüttel 1981)
140	Günzburg	Sgl	D	(Hüttel 1981)



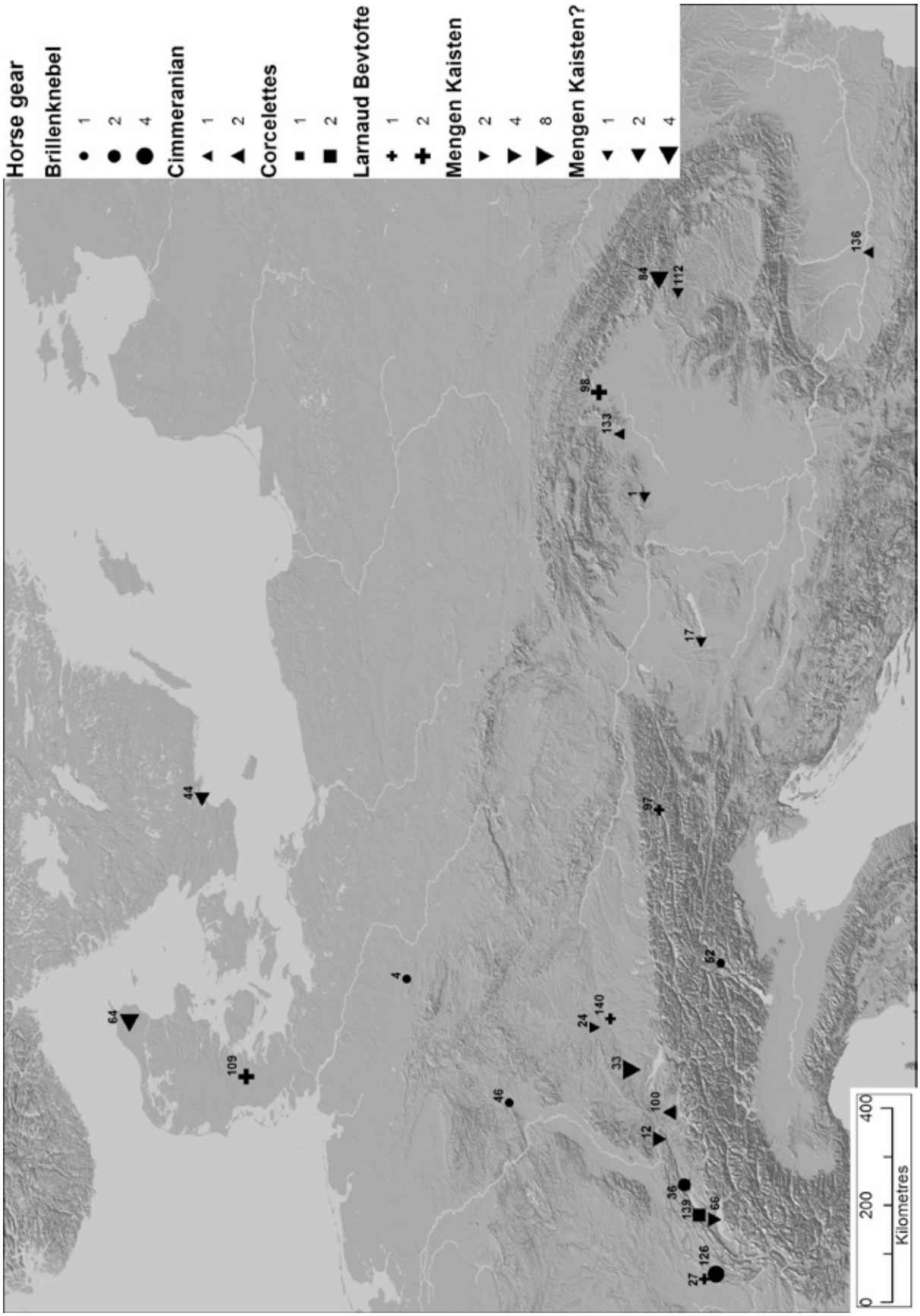
Map 133: European distribution of Late Bronze Age horse gear types made from antler. For inset region see Map 134.



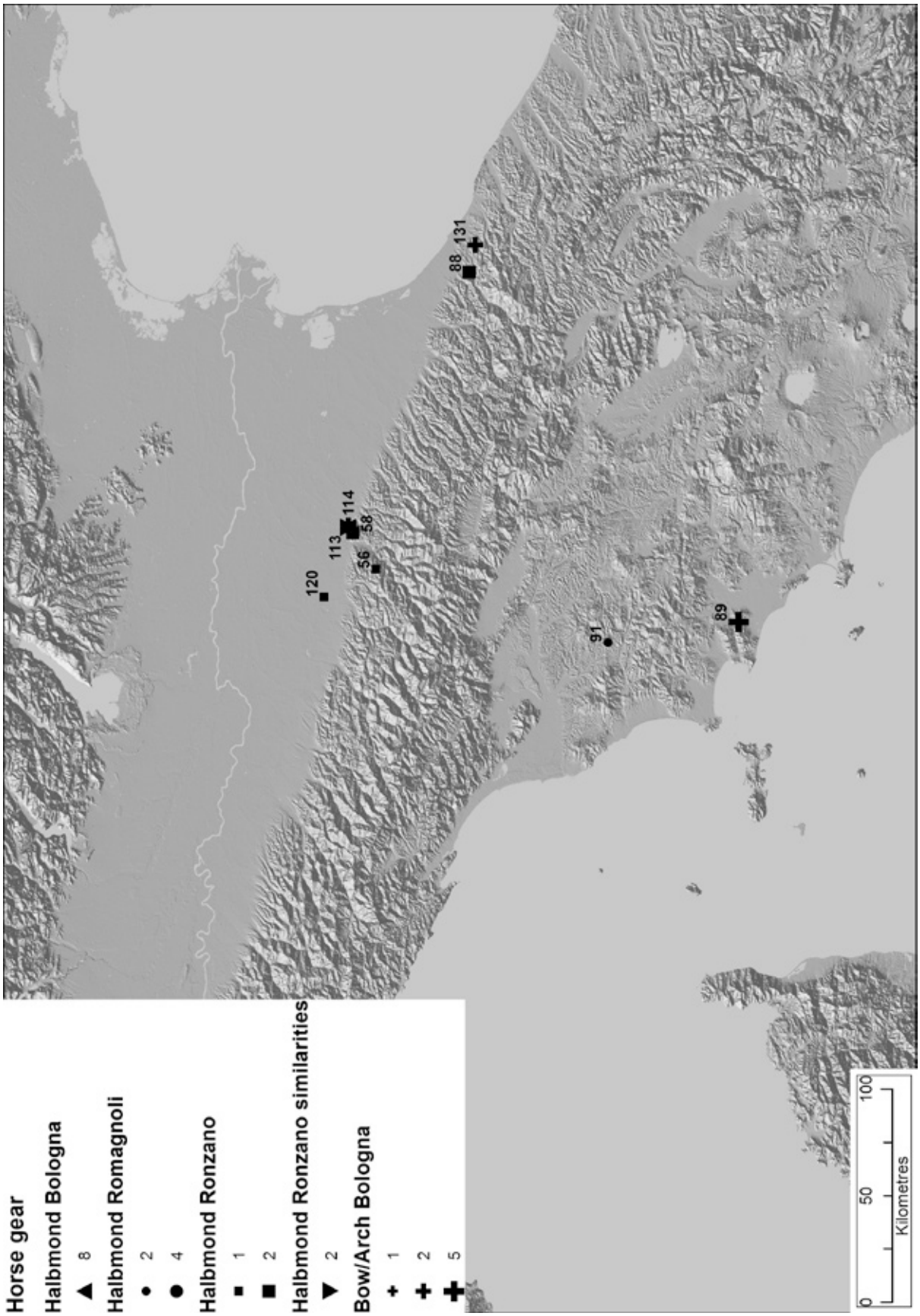
Map 134: Distribution of Late Bronze Age antler horse gear types in the northern Circum-Alpine region.



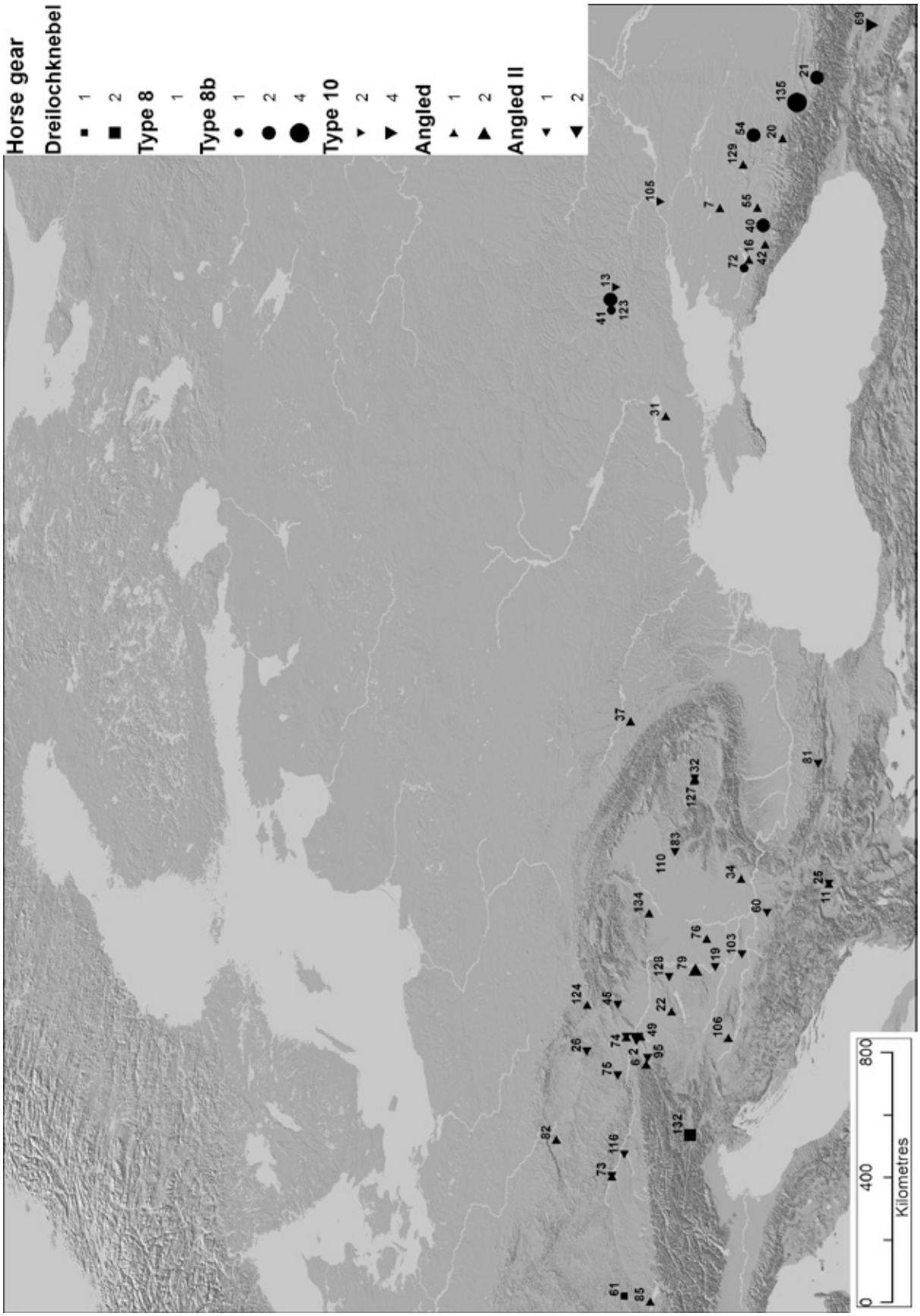
Map 135: Distribution of Late Bronze Age and early Iron Age bronze and iron horse-shaped horse gear cheek pieces (*Pferdchen* = small horse).



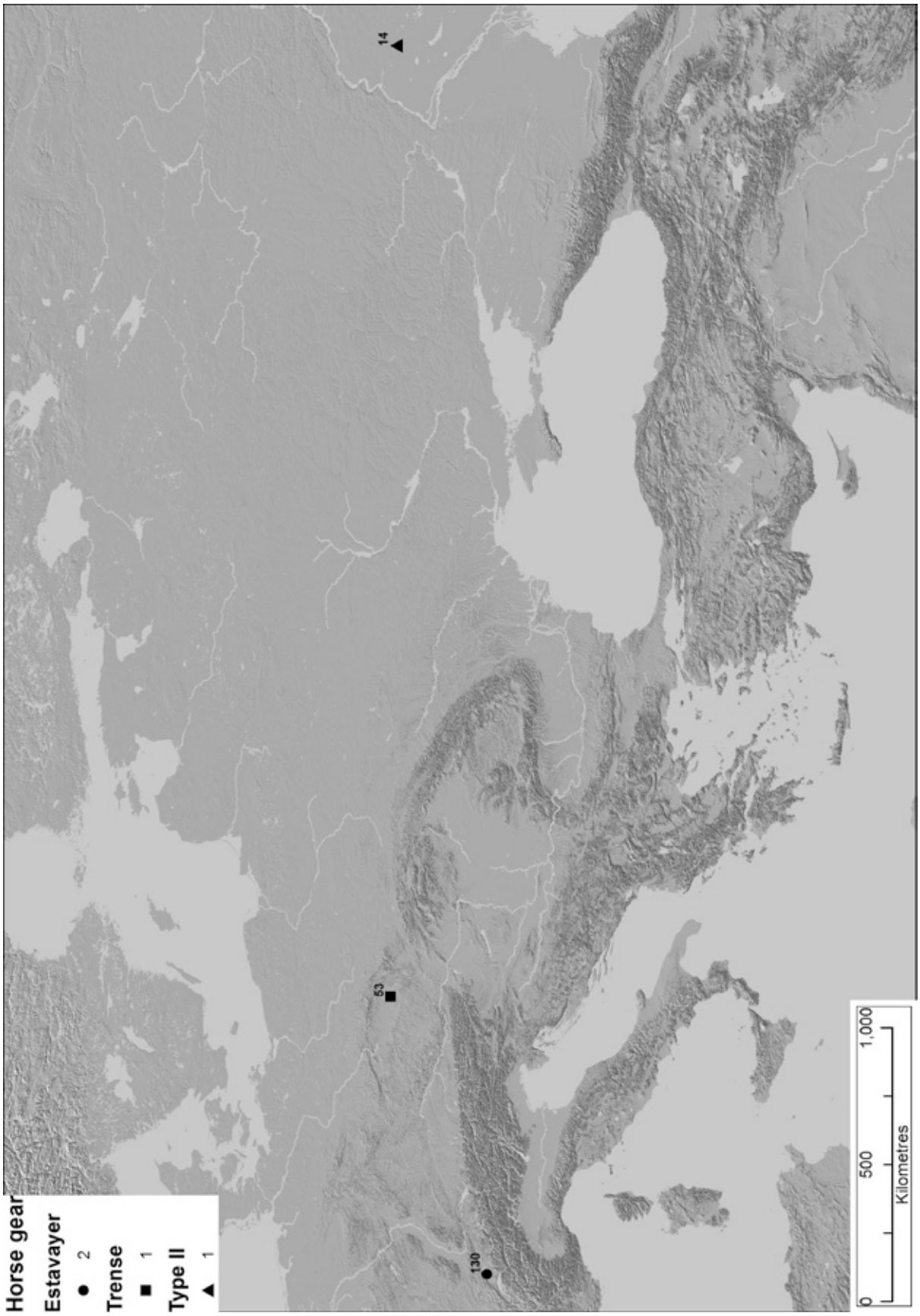
Map 136: Distribution of bar form Late Bronze Age bronze horse gear.



Map 137: Distribution of Late Bronze Age and early Iron Age metal (bronze and iron) horse gear types.



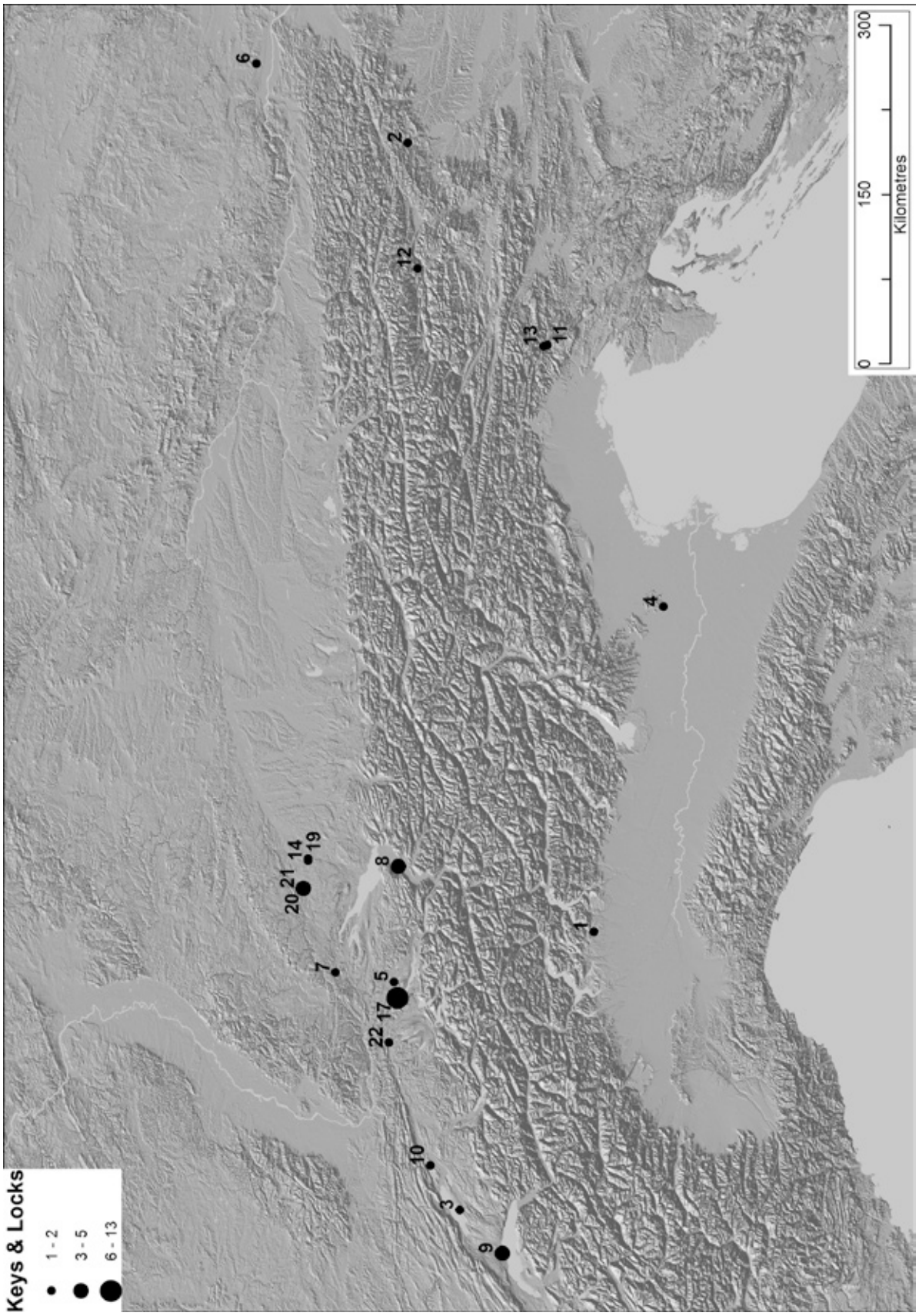
Map 138: Distribution of Late Bronze Age and early Iron Age angled form bronze horse gear.



Map 139: Distribution of singular types of LBA bronze horse gear.

Map 140 (for detailed regional chronology see Figure 7).

No.	Site	Period	Qty	Context	Country	References
1	Ca' Morta	HaC-HaD	1	Wagon Burial	IT	(Kossack 1956/57; Mäder 2001a)
2	Dürrnberg	HaD3	1	Burial	AT	(Mäder 2001a)
3	Estavayer-le-Lac	HaB	1	Lake Dwelling	CH	(Speck 1981b)
4	Este	HaC-HaD	2	Burial	IT	(Teržan 2005)
5	Greifensee-Böschen	HaB1	1	Lake Dwelling	CH	(Eberschweiler *et al.* 2007)
6	Grossweikersdorf	HaB2-B3	1	Hoard	AT	(Müller-Karpe 1959; Říhovský 1979)
7	Hohenhewen	HaB3-HaC	1	Hoard	D	(Müller-Karpe 1959)
8	Montlingerberg	HaB1-B2	3	Hilltop Settlement	CH	(Speck 1981b; Steinhauser-Zimmermann 1989)
9	Morges	HaB	5	Lake Dwelling	CH	(Speck 1981b; Vogt 1931)
10	Mörigen	HaB3	1	Lake Dwelling	CH	(Bernatzky-Goetze 1987; Speck 1981b; Vogt 1931)
11	Most na Soci	HaC-HaD	1	Burial	SI	(Teržan 2005)
12	Schönberg	HaB-HaC	2	Hoard	AT	(Mäder 2001a; Říhovský 1979; Schmid 1940)
13	Tolmin	HaC-HaD	2	Burial	SI	(Teržan 2005)
14	Wasserburg-Buchau	HaB1-B3	2	Lake Dwelling	D	(Kimmig 1992; Speck 1981b)
15	Zürich-Alpenquai	HaB3	3	Lake Dwelling	CH	(Mäder 2001a)
16	Zürich-Grosser-Hafner	HaB	1	Lake Dwelling	CH	(Speck 1981b)
17	Zürich-Pressehaus	HaB	1	Single find	CH	(Speck 1981b)
18	Zürich-Wollishofen	HaB	13	Lake Dwelling	CH	(Speck 1981b; Vogt 1931)
19	Oggelshauesn-Bruckgraben	HaC-HaD	1	Fishing Huts	CH	(Köninger In Preparation)
20	Heuneburg-Aussensiedlun	HaD	1	Tumulus	D	(Kurz 2000)
21	Heuneburg	HaD	5	Hilltop Settlement	D	(Sievers *et al.* 1984)
22	Kestenberg	HaC-HaD	1	Settlement	CH	(Holstein 2003)

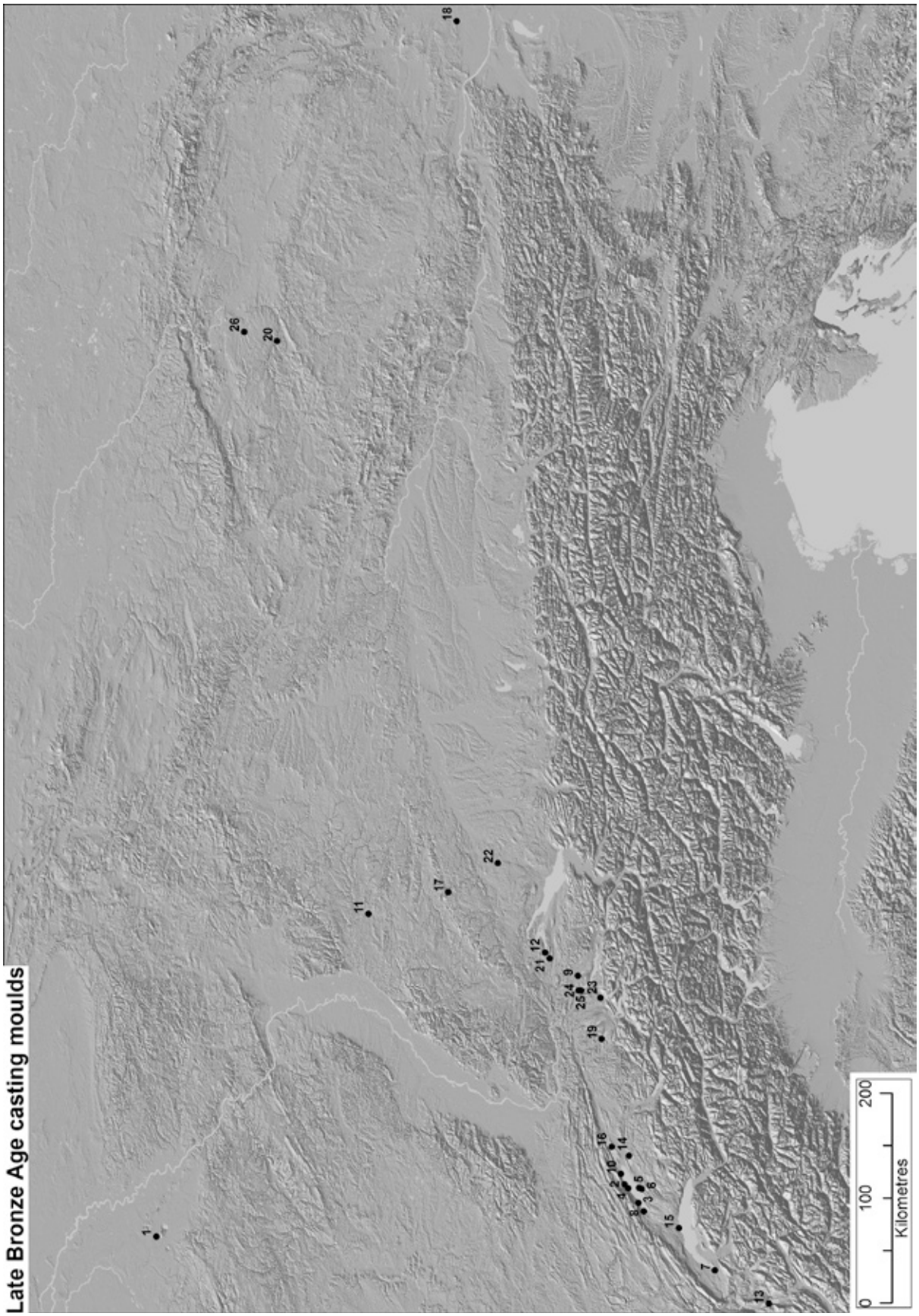


Map 140: Distribution of Late Bronze Age and early Iron Age keys.

Map 141

Material: B = Bronze; C = Clay; S = Stone. *Objects:* A = Axe; AR = Arrow head; B = Bracelet; BR = Bar; C = Chisel; H = Hammer; K = Knife; P = Pin; R = Ring; RZ = Razor; S = Spearhead; SL = Sickle; SW = Sword; TK = Socketed knife; V = Other; W = Wheel pendant; N/A = Not available.

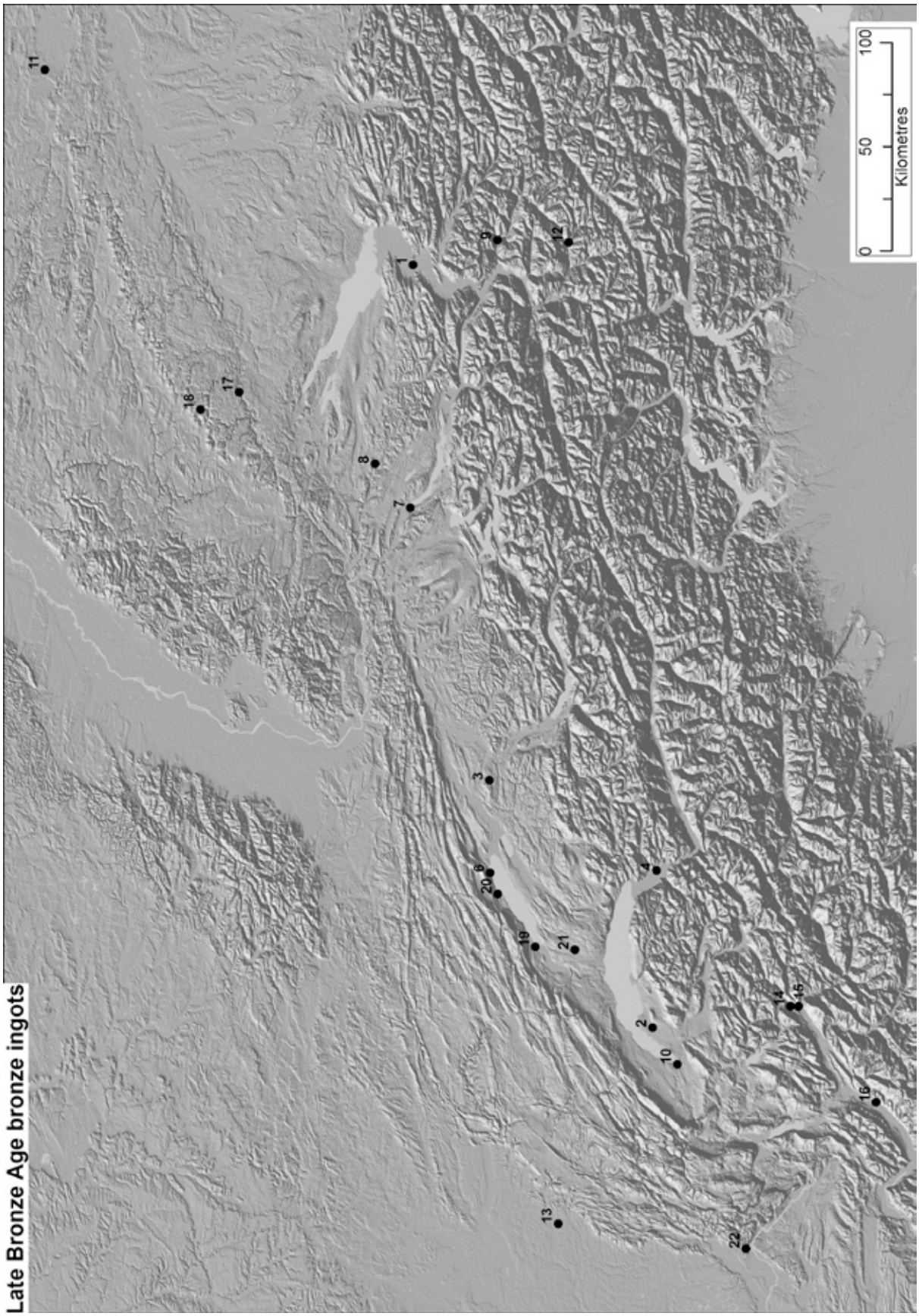
No.	Site	Context	Qty	Material	Object	Country	References
1	Ameln	Inland settlement	2	C	S; TK	D	(Hohlbein 2008b)
2	Auvernier	Lake-Dwelling	20	S; C; B	R; K; A; S; P; W; SL; B	CH	(Rychner 1979)
3	Concise	Lake-Dwelling	1	S	A or C	CH	(Colomb and Muyden 1896)
4	Cortaillod Est	Lake-Dwelling	2	S	SL; S	CH	(Arnold 1986)
5	Estavayer-le-Lac	Lake-Dwelling	N/A	N/A	N/A	CH	(Primas 2004)
6	Font	Lake-Dwelling	1	S	SW	CH	(Primas 2004; Schauer 1971)
7	Genève	Settlement area	N/A	N/A	N/A	CH	(Primas 2004)
8	Grandson-Corcelettes	Lake-Dwelling	14	S	A; S; P; AR; K; C; BR; RZ; SL; B	CH	(Colomb and Muyden 1896)
9	Greifensee-Böschen	Lake-Dwelling	1	S	P	CH	(Eberschweiler *et al.* 1987)
10	Hauterive-Champréveyres	Lake-Dwelling	13	S; C	SL; A; BR; S; K	CH	(Rychner-Faraggi 1993)
11	Heilbronn Neckargartach	Hoard	10	S	SW; SL; H; AR; K; BR	D	(Mödlinger 2011a; Schauer 1971; Binggeli 2011)
12	Eschenz-Insel Werd	Lake-Dwelling / Island settlement	8	S	SL; K	CH	(Brem *et al.* 1987)
13	Lake Bourget	Vicinity	1	C	SK	FR	(Thrane 1972)
14	Montilier	Lake-Dwelling	N/A	N/A	N/A	CH	(Primas 2004)
15	Morges-Grand Cité	Lake-Dwelling	N/A	N/A	N/A	CH	(Primas 2004)
16	Mörigen	Lake-Dwelling	12	S; C	K; C; S; SL; P; SK	CH	(Bernatzky-Goetze 1987)
17	Runden Bergs	Hilltop settlement	30	S	A; K; R; AR; S; V	D	(Pauli, J 1994)
18	Stillfried	Settlement	3	S	S; C; V	AT	(Eibner 1985)
19	Sursee-Landzunge	Lake-Dwelling	2	S	K; H	CH	(Speck 1955b)
20	Tetín	N/A	1	S	K	CZ	(Jiráň 2002)
21	Ürschhausen-Horn	Lake-Dwelling	1	S	P	CH	(Nagy 1999)
22	Wasserburg-Buchau	Lake-Dwelling	3	S; C	P; R; K; V	D	(Kimmig, W 1992)
23	Zug-Sumpf	Lake-Dwelling	3	S; C	V; S; A;	CH	(Weidmann 1983; Bauer, I and Northover 2004)
24	Zürich-Alpenquai	Lake-Dwelling	18	S	P; BR; A; SL	CH	(Weidmann 1983)
25	Zürich-Wollishofen	Lake-Dwelling	5	S	N/A	CH	(Weidmann 1983)
26	Zvoleněves	Hoard	13	S	K; P; R; C; H; A	CZ	(Jiráň 2002)



Map 141: Location of Late Bronze Age casting moulds from the northern Circum-Alpine region, and other sites studied in central Europe.

Map 142

No.	Site	Ingots	Country	References
1	Montlingerberg	Bar; Plano-convex	CH	(Rychner 1984)
2	Douvaine	Plano-convex	FR	(Rychner 1984)
3	Meikirch	Plano-convex	CH	(Rychner 1984)
4	Ollon	Plano-convex	CH	(Rychner 1984)
6	Hauterive-Champréveyres	Plano-convex	CH	(Rychner 1984)
7	Zürich-Wollishofen	Bar; Plano-convex	CH	(Wyss 1967)
8	Winterthur	Plano-convex	CH	(Rychner 1984)
9	Schiers - Montagna	Pick	CH	(Primas 1977; Bietti Sestieri 1997)
10	Genève	Plano-convex	CH	(Rychner 1984)
11	Oberwilflingen	Oxhide fragment	D	(Primas and Pernicka 1998)
12	Filisur	Pick	CH	(Primas 1977; Bietti Sestieri 1997)
13	Larnaud	Pick	FR	(Bietti Sestieri 1997)
14	Thénésol	Pick	FR	(Bietti Sestieri 1997)
15	Albertville	Pick	FR	(Bietti Sestieri 1997)
16	Goncelin	Pick	FR	(Bietti Sestieri 1997)
17	Beuron	Pick	D	(Bietti Sestieri 1997)
18	Pfeffingen - Albstadt	Pick	D	(Bietti Sestieri 1997)
19	Grandson-Corcelettes	Plano-convex	CH	(Rychner 1984)
20	Auvernier-Nord	Plano-convex	CH	(Rychner 1984)
21	Echallens	Plano-convex	CH	(Rychner 1984)
22	Lagnieu	Pick	FR	(Bietti Sestieri 1997)

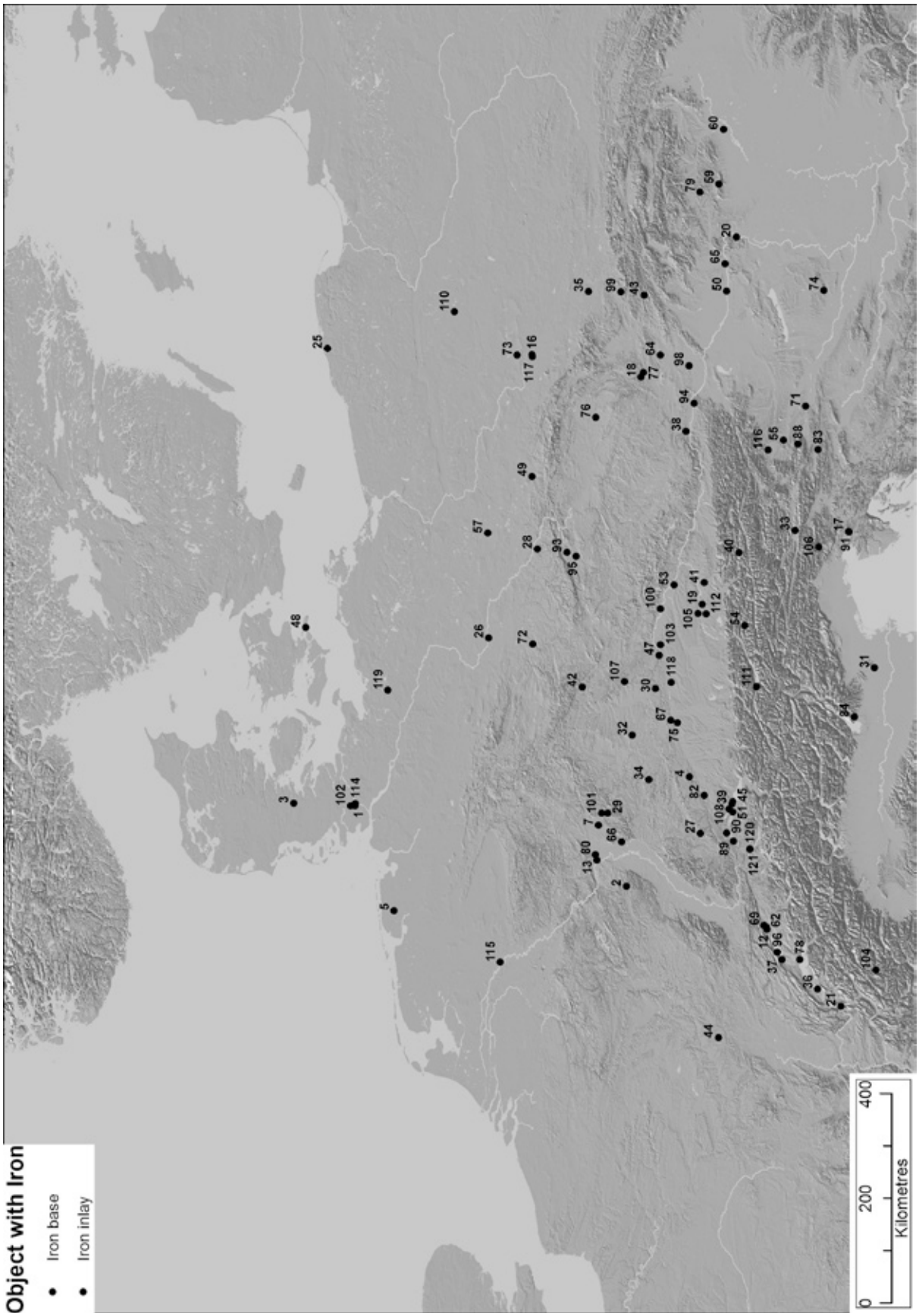


Map 142: Late Bronze Age bronze ingots (*Bar*, *Oxhide*, *Pick,* and *Plano-convex* type) from the nCA and other studied sites in central Europe.

Map 143 (for detailed regional chronology see Figure 7).

No.	Site	Period	Object	Qty	Inlay	Base	Country	References
1	Albersdorf	Per V	Knife blade	1		X	D	(Prüssing, P 1982)
2	Alsenborn	HaB	Spearhead	1		X	D	(Mödlinger 2011; Primas 2008)
3	Arnitlund	Per IV	Northern razor	1	X		DK	(Berger, D 2011)
4	Asch bei Blaubeuren	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
5	Aurich	HaB	Knife blade	1		X	D	(Prüssing, P 1982; Sprockhoff 1956)
7	Babenhausen	HaB	Ring	1		X	D	(Primas 2008)
12	Bielersee	HaB	Spearhead	1		X	CH	(Primas 2008)
13	Bischofsheim	HaB	Knife	1		X	D	(Primas 2008)
16	Breslau-Gräbschen	HaB	Knife blade	1		X	PL	(Jockenhövel and Smolla 1975; Kromer 1956)
17	Brežec	HaB	Knife	1		X	SI	(Primas 2008)
18	Brno – Obrany	HaB	Sword	1		X	CZ	(Primas 2008)
19	Bruck an der Alz	HaB3	Sword	1	X		D	(Berger, D 2011)
20	Budapest-Békásmegyer	HaB	Knife	1		X	HU	(Primas 2008)
21	Châtillon, Lac Bourget	HaB	Needle	1		X	CH	(Primas 2008)
25	Czysta	HaB3	Mörigen sword	1	X		PL	(Berger, D 2011)
26	Dessau-Kühnau	HaB3	Auvernier sword	1	X		D	(Berger, D 2011)
27	Dotternhausen-Plettenberg	HaB	Knife rivet	1		X	D	(Biel 1987; Hohlbein 2008a; Kromer 1956)
28	Dresden-Coschütz	HaB	Needle	1		X	D	(Primas 2008)
29	Erlenbach	HaB3	Knife	1		X	D	(Hohlbein 2008a)
30	Erlingshofen	HaB	Mould	1		X	D	(Primas 2008)
31	Este	HaB	Knife	1		X	IT	(Primas 2008)
32	Flachslanden	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
33	Frög	HaB3	Horse gear	2	X		AT	(Berger, D 2011)
33	Frög	HaB3	Socketed axe	1		X	AT	(Berger, D 2011)
34	Gailenkirchen	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
35	Gammau (Gamów)	HaB3	Sword	1	X		PL	(Berger, D 2011)
36	Genève	HaB3	Armring	1	X		CH	(Berger, D 2011)
37	Grandson-Corcelettes	HaB3	Mörigen sword	1	X		CH	(Berger, D 2011)
37	Grandson-Corcelettes	HaB3	Sion arm-ring	1	X		CH	(Berger, D 2011)
38	Hadersdorf am Kamp	HaB	Knife	1		X	AT	(Primas 2008)
39	Hagnau-Burg	HaB	Knife	1		X	D	(Schöbel 1996)
40	Hallstatt	HaB3	Sword	1	X		AT	(Berger, D 2011)
41	Helpfau-Uttendorf	HaB3	Mörigen sword	1	X		AT	(Berger, D 2011)
42	Heunischenburg	HaB	Spearhead	1	X		D	(Berger, D 2011; Primas 2008)
42	Heunischenburg	HaB	Spearhead	1		X	D	(Primas 2008)
43	Horní Lidec	N/A	Sword rivets	1		X	CZ	(Primas 2008)
44	Humes	HaB3	Tachlovice sword	1	X		FR	(Berger, D 2011)
45	Immenstaad - Bodensee	HaB	Knife	1		X	D	(Schöbel 1996)
47	Kelheim	HaB	Needle	1		X	D	(Primas 2008)
47	Kelheim	HaB	Ring	1		X	D	(Primas 2008)
48	Kjeldbymagle	Per IV	Northern razor	1	X		DK	(Berger, D 2011)
49	Klein Neundorf	HaB	Dagger blade	1		X	D	(Primas 2008)
50	Komarno	HaB	Dagger blade	1		X	SK	(Primas 2008)
51	Konstanz-Rauenegg	HaB	Knife	1		X	D	(Schöbel 1996)
53	Künzing	HaB	Spear	1		X	D	(Primas 2008)
53	Künzing	HaB	Needle	1		X	D	(Primas 2008)
54	Lebenberg - Kitzbühel	HaB	Needle	1		X	D	(Primas 2008)
55	Leibnitz	HaB	Dagger blade	1		X	AT	(Primas 2008)
57	Lübbenau	HaB	Rings	2		X	D	(Primas 2008)
59	Matra-Gebirge	HaB	Dagger blade	1		X	HU	(Primas 2008)
60	Mezöcsát	HaB	Arm-ring	1		X	HU	(Primas 2008)
62	Mörigen	HaB3	Knife	1	X		CH	(Berger, D 2011; Primas 2008)
62	Mörigen	HaB3	Sword blade	1		X	CH	(Berger, D 2011; Primas 2008; Tarot 2000)
62	Mörigen	HaB3	Sword	2	X		CH	(Berger, D 2011; Bernatzky-Goetze 1987; Primas 2008)
62	Mörigen	HaB3	Balingen arm-ring	1	X		CH	(Berger, D 2011; Bernatzky-Goetze 1987; Primas 2008)
62	Mörigen	HaB3	Mörigen Sword	1	X		CH	(Berger, D 2011; Bernatzky-Goetze 1987; Primas 2008)
64	Mutenice	HaB	Knife fragments	1		X	CZ	(Primas 2008)
65	Mužla	HaB	Knife blade	1		X	SK	(Primas 2008)
66	Nächstenbach Weinheim	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
67	Neudegg	HaB	Sword blade	1		X	D	(Primas 2008)
69	Nidau	HaB	Spearhead	1		X	CH	(Primas 2008)
71	Ormož	HaB	Various items	?		X	SI	(Primas 2008)
72	Pavelau	Per V	Knife blade	1		X	D	(Montelius 1913; Neudert 2003)
73	Pawellau (Pawlów Trzebnicki)	Per V	Knife blade	1		X	PL	(Kromer 1956)
74	Pécs-Jakabhegy	HaB	Dagger blade	1		X	HU	(Primas 2008)
75	Pfaffenhofen	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
76	Plátenice	HaC	Horse gear	1	X		CZ	(Novák 1975)
77	Podolí	HaB	Knife blade	1		X	CZ	(Primas 2008)
78	Pully-Chamblandes	HaB3	Needle	1	X		CH	(Moinat and David-Elbiali 2003)
79	Radzovce	HaB	Knife	1		X	SK	(Primas 2008)
80	Raunheim	HaB	Arm-ring	1		X	D	(Primas 2008)
82	Riedlingen	HaB3	Sword	1	X		D	(Berger, D 2011)
83	Rifnik	HaB	Sword fragment	1		X	SI	(Primas 2008)
84	Rivoli-Veronese	HaB	Sword blade	1		X	IT	(Primas 2008)

88	Ruže	HaB	Knife	1		X	SI	(Primas 2008)
89	Schlossberg-Rudolfingen	HaB3-HaC	Knife	2		X	CH	(Bauer *et al.* 1992)
90	Singen-Hohentwiel	HaB3	Sword	1		X	D	(Primas 2008)
91	Škocjan	HaB	Sword	1		X	SI	(Primas 2008)
91	Škocjan	HaB	Spearhead	1		X	SI	(Primas 2008)
93	Souš-Luh bei Most	HaB	Sword	1		X	CZ	(Primas 2008)
94	St Andrä	HaB	Needle fragments	1		X	AT	(Primas 2008)
95	Stankovice	HaB	Chisel	1		X	CZ	(Primas 2008)
96	St-Aubin NE	HaB	Knife blade	1		X	CH	(Drescher 1958; Pleiner 1979; Speck 1981a)
98	Stillfried	HaB	Needle	1		X	AT	(Primas 2008)
98	Stillfried	HaB	Knife blade	1		X	AT	(Primas 2008)
99	Štramberk-Kotouc	HaB	Dagger blade	1		X	CZ	(Primas 2008)
100	Straubing-Sand	HaB3	Leg-ring	2	X		D	(Berger, D 2011)
101	Sulzbach	HaB	Knife	1		X	D	(Hohlbein 2008a)
102	Tellingstedt	Per V	Knife blade	1		X	D	(Prüssing, P 1982)
103	Teugn	HaB3	Knife blade	1		X	D	(Neudert 2003; Primas 2008)
104	Thyl	HaB3	Mörigen sword	1	X		FR	(Berger, D 2011)
105	Töging	HaB3	Sword	1	X		D	(Berger, D 2011)
106	Tolmin	HaB	Various items	?		X	SI	(Primas 2008)
107	Unterkrumbach	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
108	Unteruhldingen-Stollenwiesen	HaB	Knife	1		X	D	(Schöbel 1996)
110	Vietkow (Witkowo)	HaB3	Auvernier sword	1	X		PL	(Berger, D 2011)
111	Völs bei Innsbruck	HaB	Ring	2		X	AT	(Primas 2008)
112	Wald an der Alz	HaB3	Mörigen sword	1	X		D	(Berger, D 2011)
114	Wennbüttel	Per V	Knife blade	1		X	D	(Montelius 1913; Neudert 2003)
115	Wesel	HaB3	Mörigen sword	1	X		D	
116	Wetzelsdorf	HaB	Knife	1		X	AT	(Primas 2008)
117	Wroclaw-Grabiszyn	Per V	Knife blade	1		X	PL	(Gedl 1984)
118	Zuchering	HaB	Needle	1		X	D	(Primas 2008)
119	Zülow	HaB	Knife blade	1		X	D	(Montelius 1913)
120	Zürich Kleiner-Hafner	HaB	Knife blade	1		X	CH	(Ruoff 1974)
121	Zürich-Alpenquai	HaB2/3	Needle	5		X	CH	(Berger, D 2011; Pleiner 1979; Primas 2008)
121	Zürich-Alpenquai	HaB2/3	Needle	1	X		CH	(Berger, D 2011; Pleiner 1979; Primas 2008)
121	Zürich-Alpenquai	HaB3	Leg-ring	2	X		CH	(Berger, D 2011; Pleiner 1979; Primas 2008)

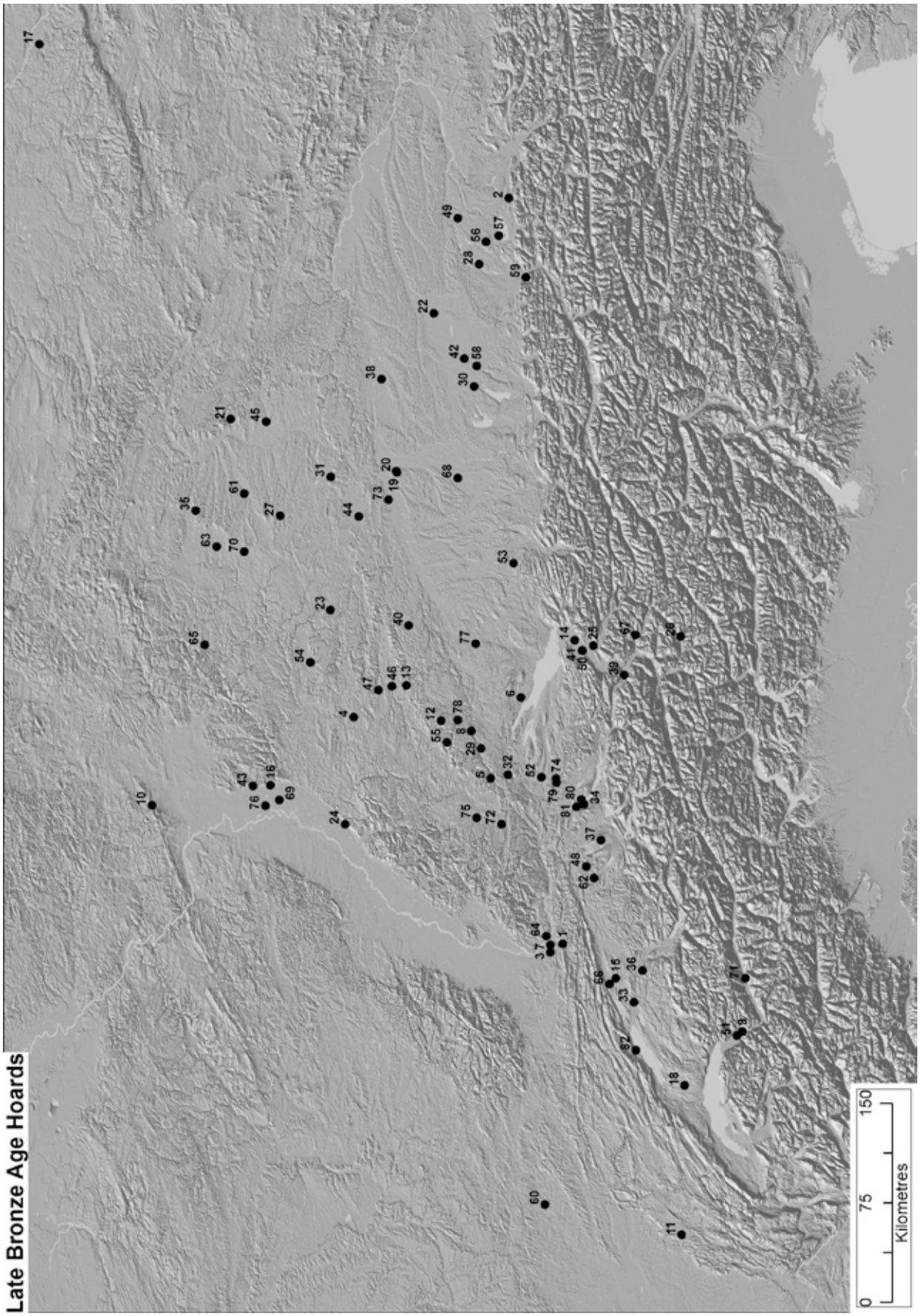


Map 143: Distribution of iron objects and objects with iron decoration from Late Bronze Age contexts.

Map 144 (for detailed regional chronology see Figure 7).

No.	Site	Period	Country	References
1	Aesch	BzD	CH	(Falkenstein 2011; Stein 1979)
2	Aigen	HaB1	D	(Nebelsick 1997; Stein 1979)
3	Allschwil	BzD	CH	(Falkenstein 2011; Müller 1982)
4	Asperg	HaB1	D	(Nebelsick 1997; Stein 1979)
5	Bachzimmern	HaB3	D	(Nebelsick 1997; Stein 1979)
6	Banzenreuthe	HaB3	D	(Nebelsick 1997; Stein 1979)
7	Basel-Elisabethenschanze	HaB3	CH	(Primas 1977)
8	Beuron	HaB1	D	(Nebelsick 1997; Stein 1979)
9	Bex	HaB3	CH	(Primas 1977)
10	Bleibeskopf (Bad Homburg)	HaB	D	(Kubach 1994)
11	Briod	HaB3	FR	(Fischer, V 2011, 2012)
12	Burladingen	HaB3	D	(Nebelsick 1997; Stein 1979)
13	Dettingen an der Ems	HaB1	D	(Nebelsick 1997; Stein 1979)
14	Diepoldsau	HaA1	CH	(Falkenstein 2011; Stein 1979)
15	Diessbach	HaB3	CH	(Müller 1993; Stein 1979)
16	Dossenheim	HaB3	D	(Nebelsick 1997; Stein 1979)
17	Dresden-Coschütz	HaB	D	(Kubach 1994)
18	Echallens	HaB3	CH	(Primas 1977)
19	Ehingen-Badfeld	HaB1	D	(Nebelsick 1997; Stein 1979)
20	Ehingen-Burgfeld	HaB3	D	(Nebelsick 1997; Stein 1979)
21	Ehrenbürg	HaB	D	(Kubach 1994)
22	Eiting-Reisen	HaB1	D	(Nebelsick 1997; Stein 1979)
23	Engelhofen	HaB3	D	(Nebelsick 1997; Stein 1979)
24	Ettlingen	HaB3	D	(Nebelsick 1997; Stein 1979)
25	Feldkirch-Altenstadt	BzD	AT	(Falkenstein 2011)
26	Filisur	HaB1-B2	CH	(Primas 1977)
27	Flachslanden	HaB3	D	(Nebelsick 1997; Stein 1979)
28	Freiham	HaB1	D	(Nebelsick 1997; Stein 1979)
29	Fridingen	HaB3	D	(Nebelsick 1997; Stein 1979)
30	Gauting	HaB1	D	(Nebelsick 1997; Stein 1979)
31	Gelbe Bürg	HaB1	D	(Nebelsick 1997; Stein 1979)
32	Hohenhewen	HaB1	D	(Nebelsick 1997; Stein 1979)
33	Kerzers	HaB3	CH	(Primas 1977)
34	Kilchberg	BzD	CH	(Falkenstein 2011; Stein 1979)
35	Knetzberg	HaB	D	(Nebelsick 1997)
36	Köniz	HaB3	CH	(Müller 1993; Stein 1979)
37	Lieli	HaB3	CH	(Müller 1993; Stein 1979)
38	Mändlfeld	HaB3	D	(Nebelsick 1997; Stein 1979)
39	Mels-Rossheld	HaA1	CH	(Falkenstein 2011; Stein 1979)
40	Merklingen	HaB1	D	(Nebelsick 1997; Stein 1979)
41	Montlingerberg	HaA2	CH	(Falkenstein 2011; Stein 1979)
42	München	HaB1	D	(Nebelsick 1997; Stein 1979)
43	Nächstenbach - Weinheim	HaB3	D	(Nebelsick 1997; Stein 1979)
44	Nördlingen	HaB1	D	(Nebelsick 1997; Stein 1979)
45	Nürnberg	HaB3	D	(Nebelsick 1997; Stein 1979)
46	Nürtingen	HaB1	D	(Nebelsick 1997; Stein 1979)
47	Obereßlingen	HaB1	D	(Nebelsick 1997; Stein 1979)
48	Oberkulm-Birch	HaA1	CH	(Falkenstein 2011; Fischer, C 1997; Primas 1986)
49	Oberneukirchen - Zehenthof	HaB1	D	(Nebelsick 1997; Stein 1979)
50	Oberriet	HaB3	CH	(Müller 1993; Stein 1979)
51	Ollon-Charpigny	HaB3	CH	(Primas 1977)
52	Ossingen	HaB3	CH	(Müller 1993; Stein 1979)
53	Ottenstall-Altusried	HaB3	D	(Nebelsick 1997; Stein 1979)
54	Pfedelbach	HaB3	D	(Nebelsick 1997; Stein 1979)
55	Pfeffingen - Albstadt	HaB1	D	(Nebelsick 1997; Stein 1979)
56	Pittenhardt-Aindorf	HaB1	D	(Nebelsick 1997; Stein 1979)
57	Preinersdorf	HaB3	D	(Nebelsick 1997; Stein 1979)
58	Pullach	HaB1	D	(Nebelsick 1997; Stein 1979)
59	Rachelburg-Flintsbach	HaB	D	(Möslein 1998/99)
60	Ray-sur-Saône	HaB3	FR	(Fischer, V 2011, 2012)
61	Reinhardshofen	HaB3	D	(Nebelsick 1997; Stein 1979)
62	Reitnau	HaB3	CH	(Müller 1993; Stein 1979)
63	Reupelsdorf	HaB3	D	(Nebelsick 1997; Stein 1979)
64	Riehen	BzD	CH	(Falkenstein 2011; Stein 1979)
65	Roden	HaB3	D	(Nebelsick 1997)
66	Safnern	HaB3	CH	(Müller 1993; Stein 1979)
67	Schiers – Montagna	HaB1-B2	CH	(Primas 1977)
68	Schwabmünchen	HaB1	D	(Nebelsick 1997; Stein 1979)

69	Schwetzingen	HaB3	D	(Nebelsick 1997; Stein 1979)
70	Seinsheim Bullenheimer Berg	HaB3	D	(Nebelsick 1997)
71	Sion - Kapuzinerkloster	HaB3	CH	(Primas 1977)
72	Unadingen	HaB3	D	(Nebelsick 1997; Stein 1979)
73	Unterglauheim	HaB1	D	(Nebelsick 1997; Stein 1979)
74	Veltheim-Winterthur	HaB3	CH	(Primas 1977)
75	Villingen-Schwenningen	HaB3	D	(Nebelsick 1997; Stein 1979)
76	Wallstadt	HaB3	D	(Nebelsick 1997; Stein 1979)
77	Wasserburg Buchau	HaB1	D	(Kimmig 1992; Nebelsick 1997; Stein 1979)
78	Winterlingen	HaB3	D	(Nebelsick 1997; Stein 1979)
79	Wülflingen	HaB3	CH	(Müller 1993; Stein 1979)
80	Zollikon	HaB3	CH	(Müller 1993; Stein 1979)
81	Zürich	HaB3	CH	(Müller 1993; Stein 1979)
82	Auvernier-Nord	HaB3	CH	(Arnold 1983; Fischer, V 2011, 2012; Rychner 1987)



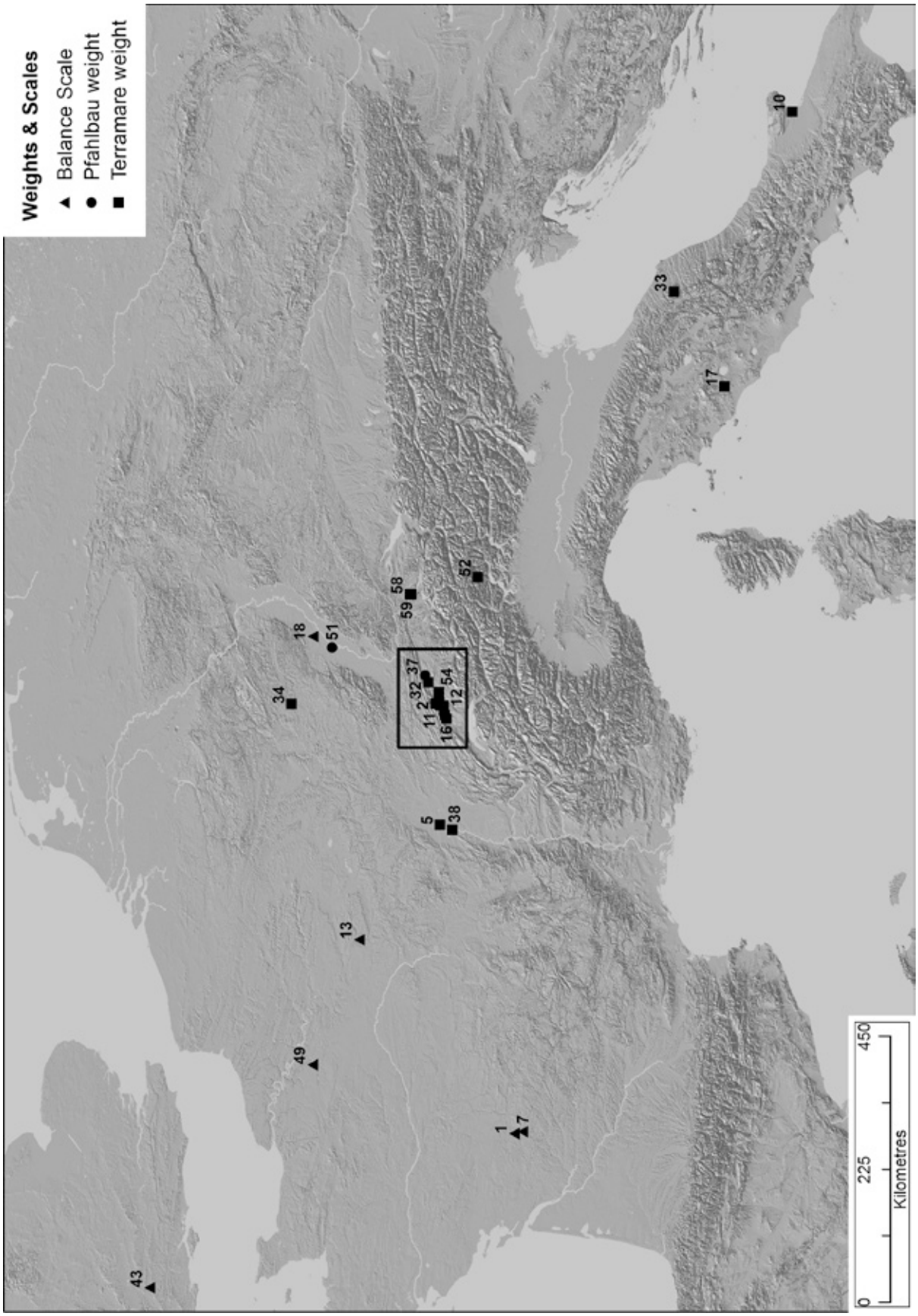
Map 144: Selected Late Bronze Age hoards from the northern Circum-Alpine region and beyond.

Maps 145 – 147

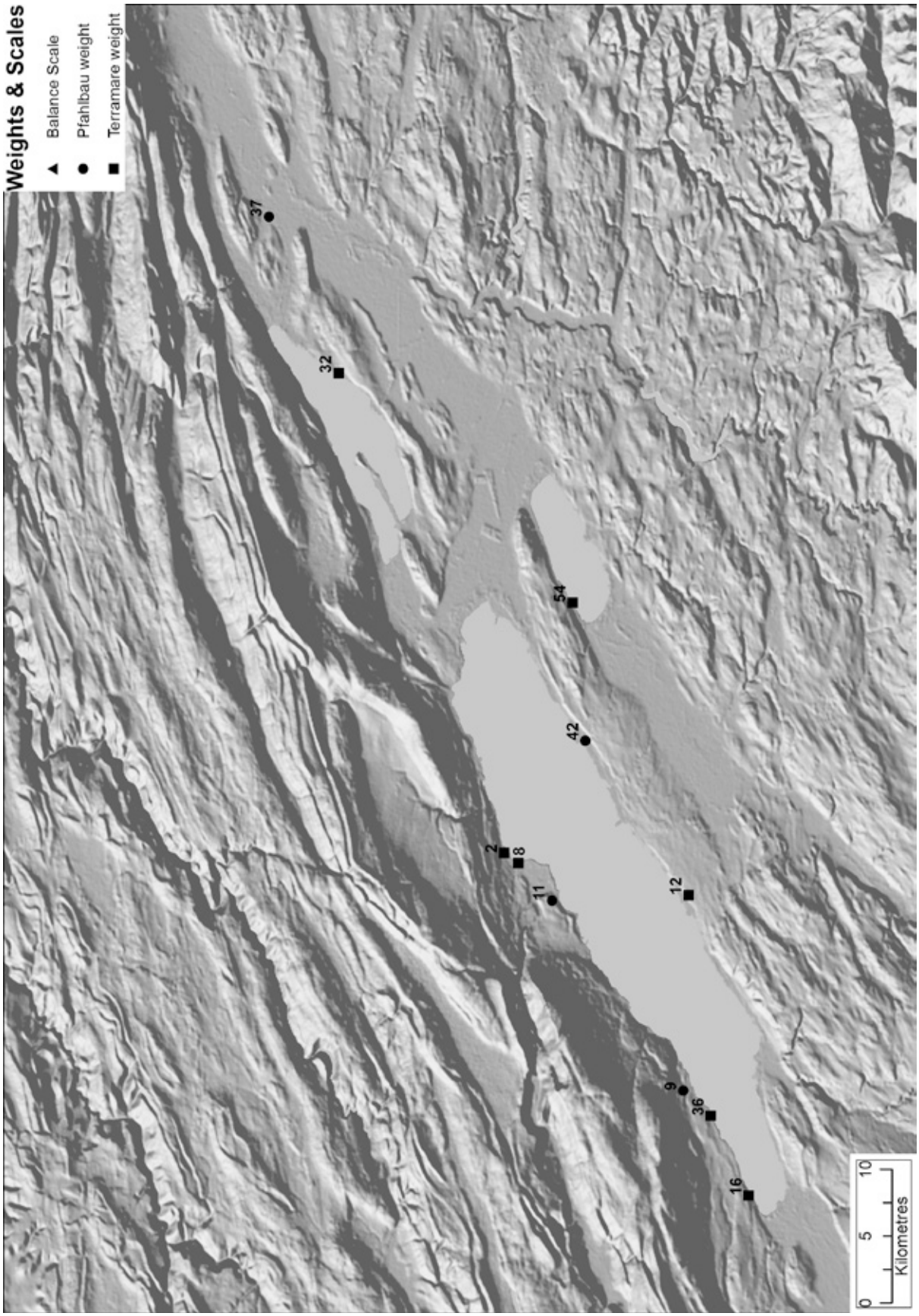
Contexts: N/A = Not available.

All sites referenced to (Pare 1996) in addition to those specified below unless marked with >.

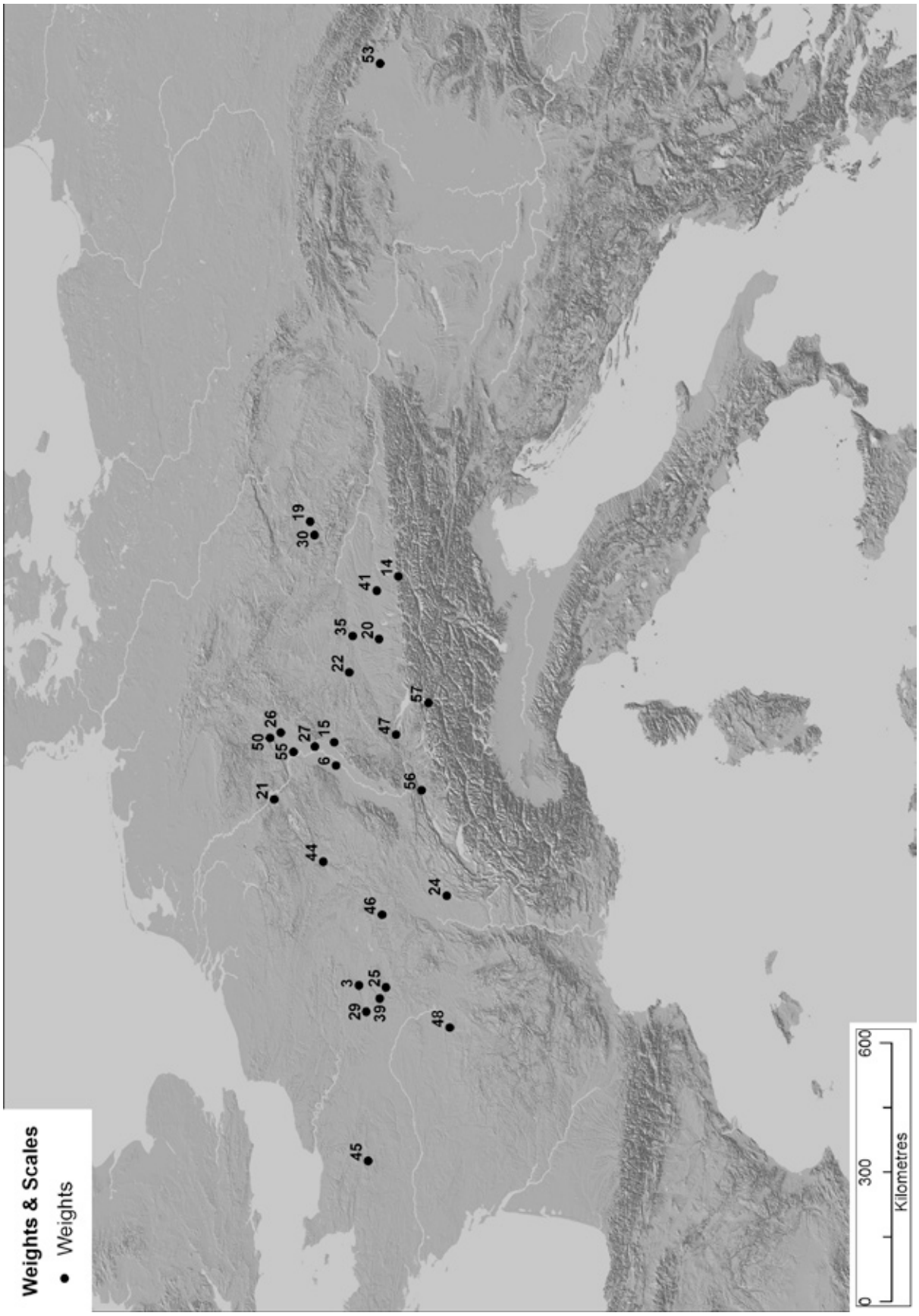
No.	Site	Context	Scale	Weight system	Country	References
1	Agris	Cave	X	?	FR	> (Roscio *et al.* 2011)
2	Auvernier	Lake-Dwelling		Pfahlbau	CH	(Forrer 1906)
2	Auvernier	Lake-Dwelling		Terramare	CH	(Forrer 1906)
3	Barbuise-Courtavant	Inhumation burial		?	FR	
3	Barbuise-Courtavant	Tumulus cremation		?	FR	
4	Bordjoš	Pit	X		RS	
5	Bragny-sur-Saône	Settlement		Terramare	FR	
6	Büchelberg	Inhumation burial		?	D	
7	Chazelles-Charente	Cave	X		FR	> (Roscio *et al.* 2011)
8	Columbier	Lake-Dwelling		Terramare	CH	(Forrer 1906)
9	Concise	Lake-Dwelling		Pfahlbau	CH	
10	Coppa Nevigata	N/A		Terramare	IT	> (Pearce 2007)
11	Cortaillod	Lake-Dwelling		Pfahlbau	CH	
12	Estavayer-le-Lac	Lake-Dwelling		Terramare	CH	(Forrer 1906)
13	Etigny	Burial	X		FR	> (Roscio *et al.* 2011)
14	Flintsbach	Hilltop settlement		?	D	
15	Gondelsheim	Inhumation burial		?	D	
16	Grandson-Corcelletes	Lake-Dwelling	X		CH	(Primas 2004)
16	Grandson-Corcelettes	Lake-Dwelling		Terramare	CH	
17	Grotta Nuova	N/A		Terramare	IT	> (Pearce 2007)
18	Haguenau-Oberfeld	Cremtion burial	X		FR	> (Roscio *et al.* 2011)
19	Horušany	Tumulus cremation		?	CZ	
20	Hurlach	Flat Cremation		?	D	
21	Kobern	Cremation burial		?	D	
22	Königsbronn	Cremation burial		?	D	
23	la Rochette	Cave		?	FR	
24	Larnaud	Hoard		?	FR	
25	Le Petit Moulin	Burial	X		FR	> (Roscio *et al.* 2011)
25	Le Petit Moulin	Burial		?	FR	> (Roscio *et al.* 2011)
26	Maintal-Wachenbuchen	Tumulus cremation		?	D	(Berger, D 2011)
27	Mannheim-Seckenheim	Tumulus inhumation		?	D	
28	Mannheim-Wallstadt	Settlement	X		D	> (Görmer 2003; Roscio *et al.* 2011)
29	Marolles-sure-Seine	Cremation burial	X		FR	
29	Marolles-sure-Seine	Inhumation burial		?	FR	
30	Milavce Tumulus	Cremation		?	CZ	
31	Monéteau	Inhumation burial	X		FR	> (Roscio *et al.* 2011)
32	Mörigen	Lake-Dwelling		Terramare	CH	(Bernatzky-Goetze 1987)
33	Moscosi	N/A		Terramare	IT	> (Pearce 2007)
34	Mt. Hérapel	Settlement		Terramare	FR	
35	Oberndorf	Cremation burial		?	D	
36	Onnens	Lake-Dwelling		Terramare	CH	(Forrer 1906)
37	Orpund	Lake-Dwelling?		Pfahlbau	CH	
38	Ouroux-sur-Saône	Settlement		Terramare	FR	
39	Passy-sur-Yonne	Inhumation burial		?	FR	
40	Passy-Véron	Burial	X		FR	> (Roscio *et al.* 2011)
41	Poing	Burial		?	D	
41	Poing	Creamtion burial		?	D	
42	Port-Alban	Lake-Dwelling		Pfahlbau	CH	(Forrer 1906)
43	Potterne	Settlement	X		UK	> (Roscio *et al.* 2011)
44	Richemont-Pépinville	Inhumation burial?	X		FR	(Berger, D 2011)
44	Richemont-Pépinville	Inhumation burial?		?	FR	
45	Saint Léonard des Bois	Hoard		?	FR	
46	Semoutiers	Cremation burial		?	FR	
47	Singen-Hohentwiel	Ditch		?	D	
48	Sologne	Region		?	FR	(Berger, D 2011)
49	Sorel-Moussel	Burial	X		FR	> (Roscio *et al.* 2011)
50	Steinfurth	Burial		?	D	
51	Strasbourg-Ile des Pêcheurs	Area		Pfahlbau	FR	
52	Tessin	Area		Terramare	CH	
53	Tiszabecs	Hoard		?	HU	
54	Vallamand	Settlement		Terramare	CH	
55	Wallerstädten	N/A		?	D	(Berger, D 2011)
56	Wangen an der Aare	Cemetery		?	CH	
57	Wartau-Herrenfeld	Settlement		?	CH	
58	Zürich-Alpenquai	Lake-Dwelling		Terramare	CH	
59	Zürich-Wollishofen	Lake-Dwelling		Terramare	CH	(Forrer 1906)



Map 145: European distribution of weights of the *Pfahlbau* and *Terramare* types (excluding *terramare* sites of the Po Plain). For inset region see Map 146.



Map 146: Distribution of *Pfahlbau* and *Terramare* type weights in the northern Circum-Alpine region.



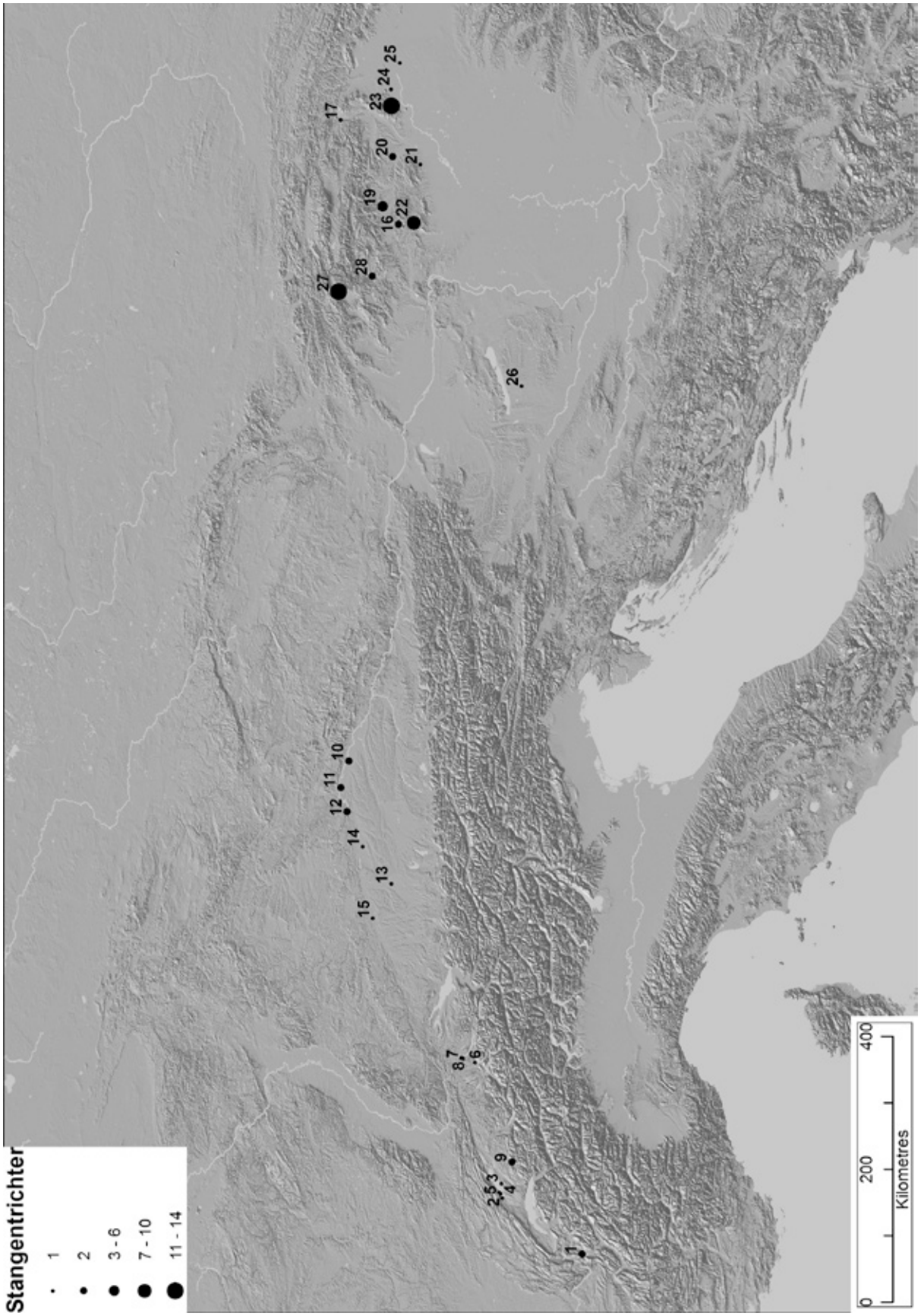
Map 147: Distribution of other Late Bronze Age weights in Europe north of the Alps.

Map 148

Contexts: N/A = Not available.

All site references (Mäder 2001a) in addition to those specified below.

No.	Site	Context	Qty	Country	References.
1	Grésine	Lake-Dwelling	2	FR	(Kerouanton 1996)
2	Grandson-Corcelettes	Lake-Dwelling	1	CH	
3	Font	Lake-Dwelling	1	CH	
4	Onnens	Lake-Dwelling	1	CH	(Colomb and Muyden 1896)
5	Concise	Lake-Dwelling	1	CH	
6	Zug-Sumpf	Lake-Dwelling	1	CH	
7	Zürich-Alpenquai	Lake-Dwelling	1	CH	
8	Zürich-Wollishofen	Lake-Dwelling	1	CH	
9	West Switzerland *	Lake area	2	CH	
10	Straubing-Kagers	Burial	2	D	
11	Barbing	Burial	2	D	
12	Kelheim	Burial	2	D	
13	Haunstetten	Burial	1	D	
14	Ingolstadt-Zuchering	Burial	1	D	
15	Lauingen	Burial	1	D	
16	Radzovce	Burial	2	SK	
17	Presov	Burial	1	SK	
18	Radzovce	N/A	1	SK	
19	Dražice	Hoard	6	SK	
20	Edelény	Hoard	2	HU	
21	Tibolddaróc	Hoard	1	HU	
22	Kisterenye	Hoard	1	HU	
23	Erdohorváti	Hoard	13	HU	
24	Vajdácska	Hoard	1	HU	
25	Rétközberencs	Hoard	1	HU	
26	Pamuk	Hoard	1	HU	
27	Žabokreky	Hoard	14	SK	
28	Zvolen	Hoard	2	SK	



Map 148: Distribtution of *Stangentrichter* in Europe.

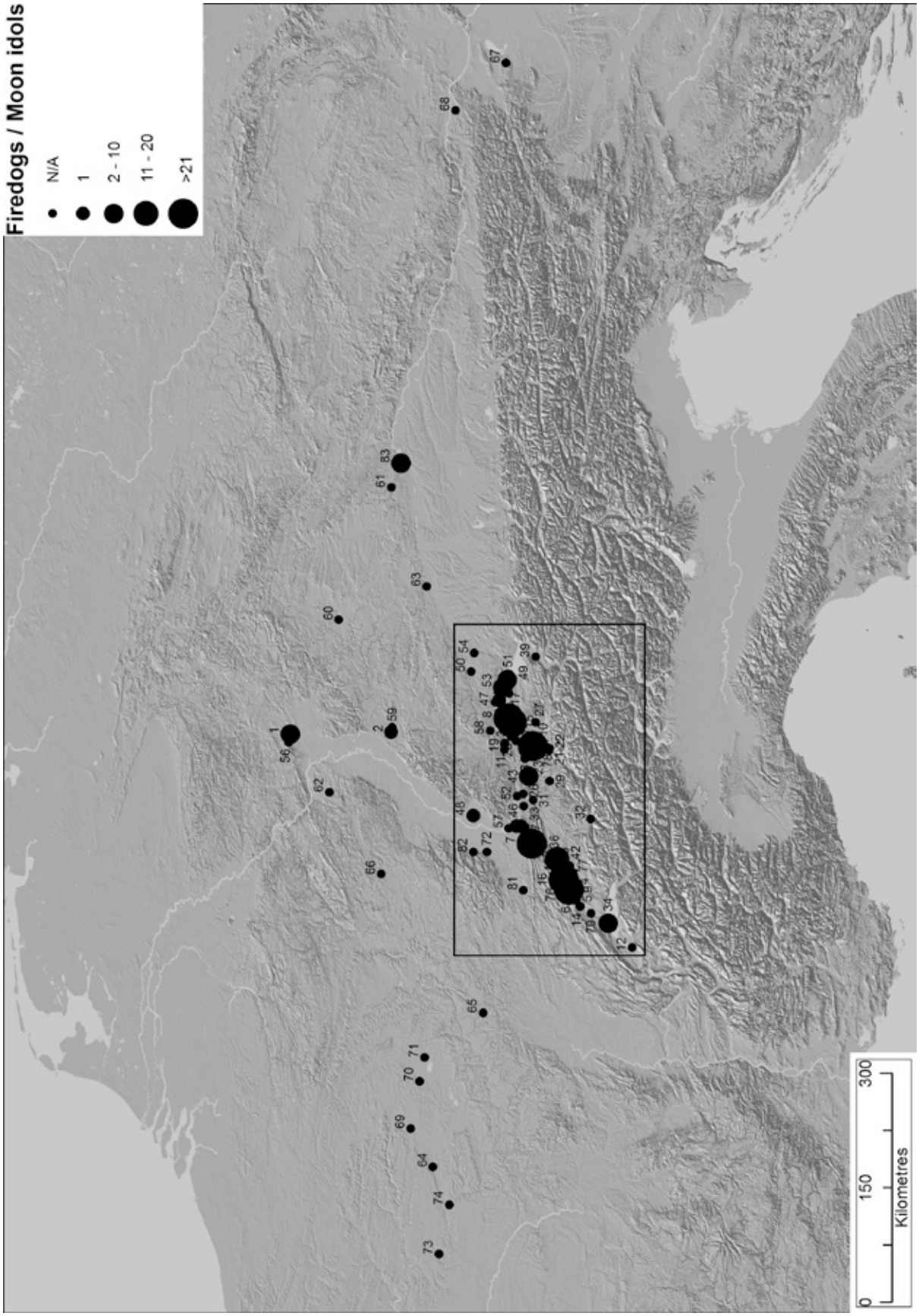
Maps 149 & 150

Contexts: B = Burial; HS = 'highland' settlement; L-D = Lake-Dwelling; N/A = Not available; S = Settlement.

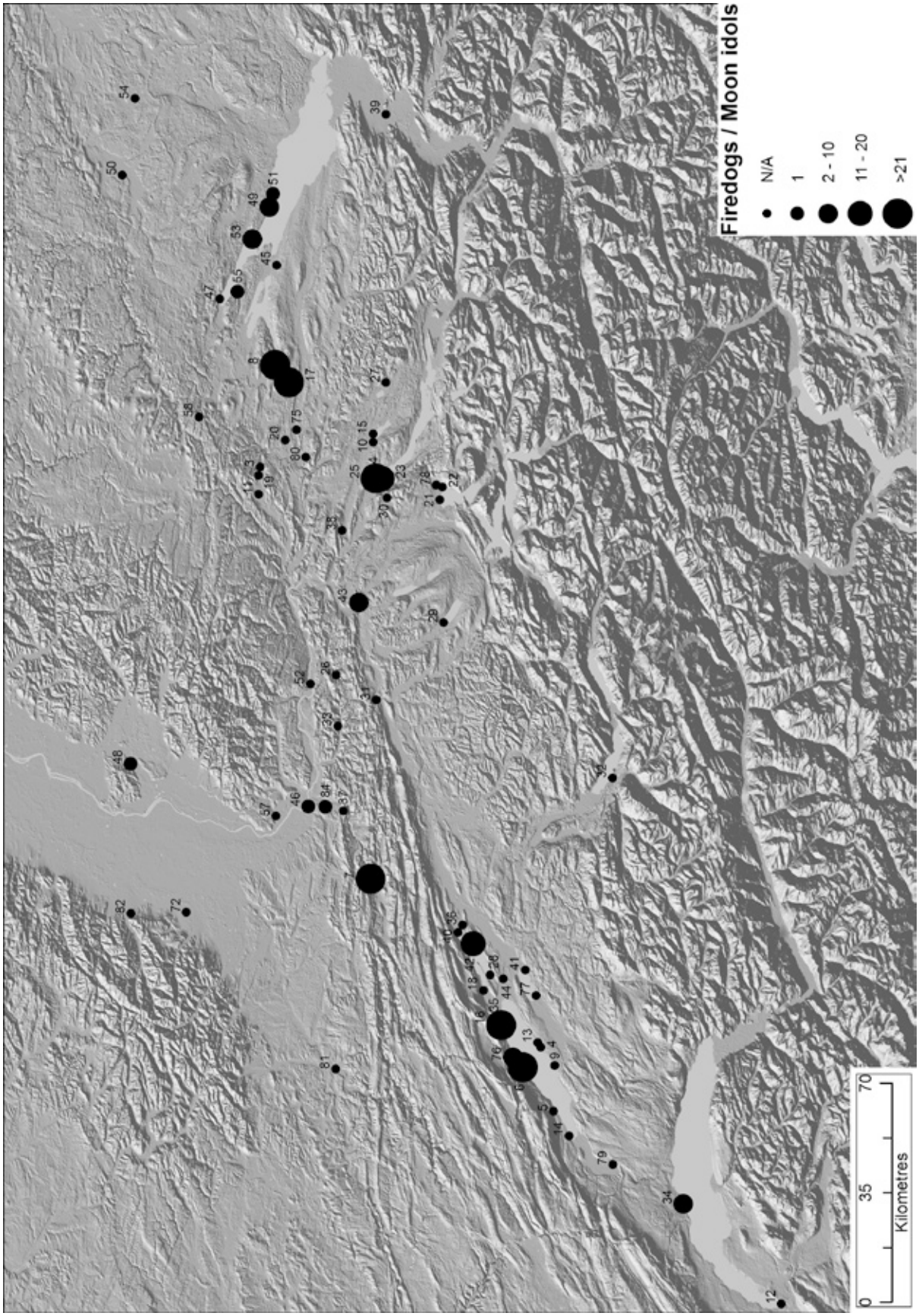
All sites referenced to (Primas *et al.* 1989) in addition to those specified below.

No.	Site	Context	Qty	Country	References
1	Ober-Erlenbach	S	4	D	(Lüning and von Kaenel 2006)
2	Bretten	S	1	D	(Baumstein 1994)
3	Beringen	S	N/A	CH	
4	Chevroux	L-D	N/A	CH	
5	Concise	L-D	N/A	CH	
6	Cortaillod Est	L-D	95	CH	
7	Roc de Courroux	HS	5N/A	CH	
8	Eschenz-Insel Werd	L-D	54	CH	
9	Estavayer-le-Lac	L-D	N/A	CH	
10	Fällanden-Wigarten	S	N/A	CH	
11	Gachlingen-Niederwiesen	S	N/A	CH	
12	Genève-Eaux Vives	L-D	N/A	CH	
13	Gletterens	L-D	N/A	CH	
14	Grandson-Corcelettes	L-D	N/A	CH	
15	Greifensee-Böschen	L-D	N/A	CH	
16	Hauterive-Champréveyres	L-D	192	CH	
17	Ürschhausen-Horn	L-D	54	CH	(Nagy 1999)
18	Le Landeron	L-D	N/A	CH	
19	Löhningen-Bachtel	S	N/A	CH	
20	Marthalen-Buetzi	S	N/A	CH	
21	Zug-Sumpf	L-D	N/A	CH	
22	Zug	S	N/A	CH	
23	Zürich-Wollishofen	L-D	14	CH	
24	Zürich-Grosser-Hafner	L-D	N/A	CH	
25	Zürich-Alpenquai	L-D	73	CH	
26	Wittnau Horn	HS	N/A	CH	
27	Wetzikon-Kempten	S	N/A	CH	
28	Vinelz	L-D	N/A	CH	
29	Sursee - Landzunge	L-D	N/A	CH	
30	Üetliberg Highland	S	N/A	CH	
31	Trimbach-Frohburg	HS	N/A	CH	
32	Spiez	S	N/A	CH	
33	Bischofsstein	S	N/A	CH	
34	St Prex	L-D	3	CH	
35	St-Blaise	S	N/A	CH	
36	Port	L-D	N/A	CH	
37	Pfeffingen	S	N/A	CH	
38	Otelfingen	S	N/A	CH	
39	Montlingerberg	HS	N/A	CH	
40	Nidau-Steinberg	L-D	N/A	CH	
41	Montilier	L-D	N/A	CH	
42	Mörigen	L-D	19	CH	
43	Kestenberg	S	8	CH	(Holstein 2003)
44	Ins	S	N/A	CH	(Kerner 2001)
45	Tägerwilen-Im Ribi	S	N/A	CH	(Kerner 2001)
46	Basel-Theodorskirchplatz	S	1	CH	(Holstein 2003; Kerner 2001)
47	Bodman	L-D	N/A	D	(Kerner 2001)
48	Bötzingen	S	1	D	(Grimmer 1982; Kerner 2001)
49	Hagnau-Burg	L-D	2	D	(Kerner 2001)
50	Heuneburg	HS	N/A	D	(Kerner 2001)
51	Immenstaad – Bodensee	L-D	1	D	(Kerner 2001)
52	Säckingen	S	N/A	D	(Kerner 2001)
53	Unteruhldingen-Stollenwiesen	L-D	3	D	(Kerner 2001)
54	Wasserburg Buchau	L-D	N/A	D	(Kerner 2001; Kimmig 1992, 2000)
55	Langenrain	N/A	1	D	(Kerner 2001)
56	Dornholzhausen	N/A	N/A	D	(Kerner 2001)
57	Efringen-Kirchen	N/A	N/A	D	(Kerner 2001)
58	Eichniger Kreuz	N/A	N/A	D	(Kerner 2001)
59	Knittlingen	N/A	N/A	D	(Kerner 2001)
60	Tückelhausen	N/A	N/A	D	(Kerner 2001)
61	Vlisingen-Dietfurt	N/A	N/A	D	(Kerner 2001)

62	Wendelsheim	N/A	N/A	D	(Kerner 2001)
63	Wittislingen	N/A	N/A	D	(Kerner 2001)
64	Barbuise-Courtavant	N/A	N/A	FR	(Kerner 2001)
65	Dampièrre	N/A	N/A	FR	(Kerner 2001)
66	Grosbliederstroff	N/A	N/A	FR	(Kerner 2001)
67	Sopron	Burial	N/A	HU	(Kerner 2001)
68	Zöfing	N/A	N/A	AT	(Kerner 2001)
69	Écury-le-Repos	N/A	N/A	FR	(Kerner 2001)
70	Frignicourt	N/A	N/A	FR	(Kerner 2001)
71	Hallignicourt	N/A	N/A	FR	(Kerner 2001)
72	Merxheim	N/A	N/A	FR	(Kerner 2001)
73	Perthes	N/A	N/A	FR	(Kerner 2001)
74	Vinneuf	N/A	N/A	FR	(Kerner 2001)
75	Andelfingen	S	N/A	CH	
76	Auvernier-Nord	L-D	1	CH	
77	Avenches "Eau Noire"	L-D	N/A	CH	
78	Baar-Neuer Friedhof	S	N/A	CH	
79	Bavois-En Raillon	S	N/A	CH	
80	Berg am Irchel	S	N/A	CH	
81	Audincout	N/A	N/A	FR	(Kerner 2001)
82	Wintzenheim-Hohlandsberg	N/A	N/A	FR	(Kerner 2001)
83	Kelheim	Burial	6	D	
84	Reinach-Langrüttiweg	B?	1	CH	(Fischer, C 1998)



Map 149: Distribution of Late Bronze Age 'Moon idols' or firedogs in central Europe. For inset region see Map 150.

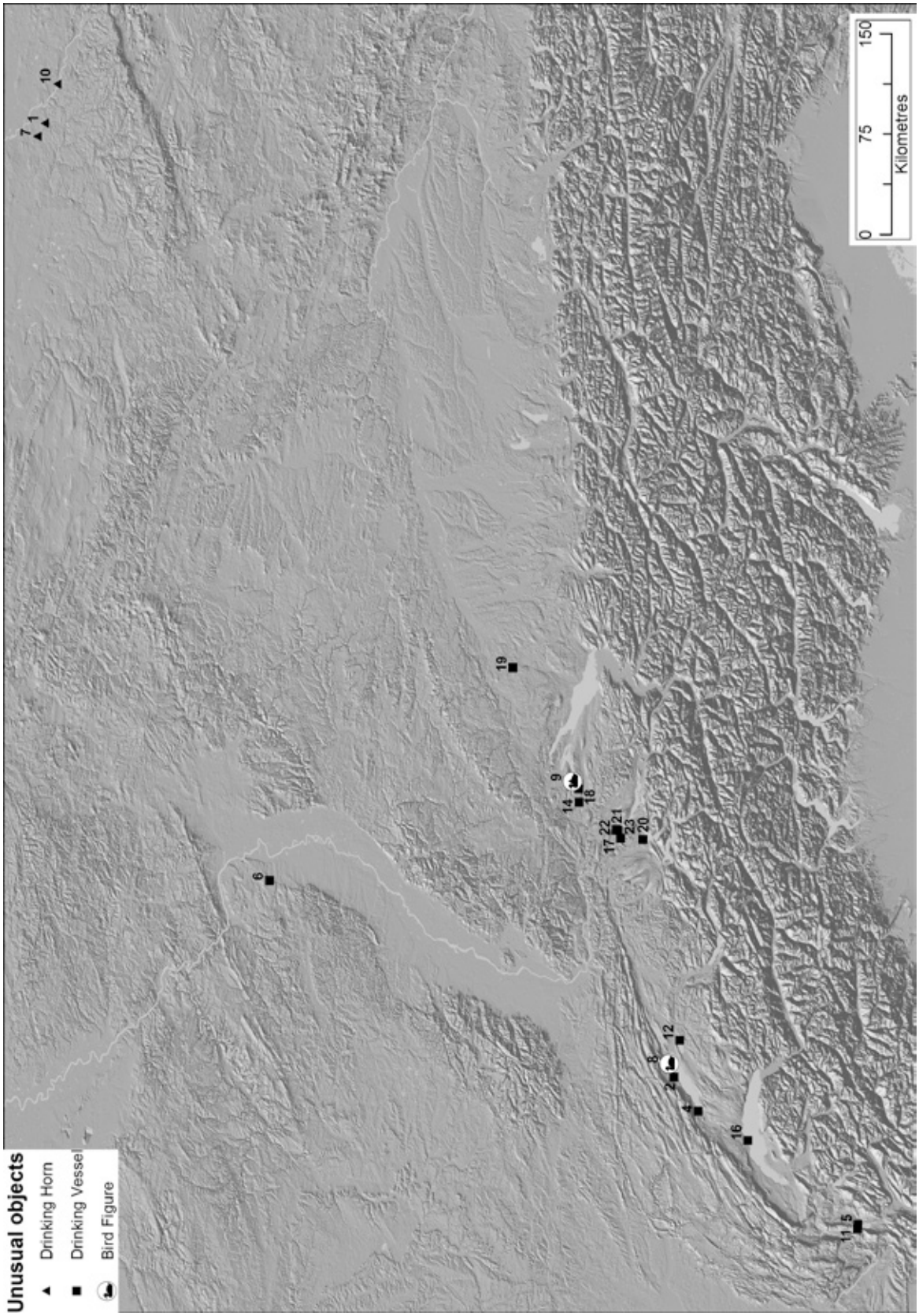


Map 150: Distribution of Late Bronze Age 'Moon idols' or firedogs in the northern Circum-Alpine region.

Map 151

Contexts: N/A = Not available.

No.	Site	Context	Object	Qty	Country	References
1	Altlommatzsch	Burial	Drinking horn	2	D	(Coblenz 1976)
2	Auvernier	Lake-Dwelling	Drinking vessel	1	CH	(Coblenz 1976)
4	Grandson-Corcelettes	Lake-Dwelling	Drinking vessel	1	CH	(Eibner 1973)
5	Grésine	Lake-Dwelling	Drinking vessel	2	CH	(Eibner 1973)
6	Gundersheim	Cremation Burial	Drinking vessel	1	FR	(Kubach-Richter 1980)
7	Hahnefeld	N/A	Drinking horn	1	D	(Coblenz 1976)
8	Hauterive-Champréveyres	Lake-Dwelling	Bird figure	1	D	(Wyss 1972)
9	Eschenz-Insel Werd	Lake-Dwelling	Drinking vessel	1	CH	(Primas *et al.* 1989)
9	Eschenz-Insel Werd	Lake-Dwelling	Drinking horn	1	CH	(Primas *et al.* 1989)
9	Eschenz-Insel Werd	Lake-Dwelling	Swann vessel	1	CH	(Primas *et al.* 1989)
10	Kötitz	Burial	Drinking horn end	1	D	(Coblenz 1976)
11	Lake Bourget	Lake-Dwelling	Drinking vessel	1	FR	(Eibner 1973)
12	Montilier	Lake-Dwelling	Drinking vessel	1	CH	(Eibner 1973)
14	Ossingen	Creamition Burial	Drinking vessel	1	CH	(Ruoff 1974)
16	Saint-Prex La Moraine	Lake-Dwelling	Drinking vessel	1	CH	(Moinat and David-Elbiali 2003)
17	Üetliberg	Highland Settlement	Drinking vessel	1	CH	(Bauer *et al.* 1991)
18	Ürschhausen-Horn	Lake-Dwelling	Drinking vessel	2	CH	(Nagy 1999)
19	Wasserburg-Buchau	Lake-Dwelling	Drinking vessel	5	D	(Kimmig 1992, 2000)
20	Zug-Sumpf	Lake-Dwelling	Drinking vessel	1	CH	(Ruoff 1974)
21	Zürich-Alpenquai	Lake-Dwelling	Drinking vessel	1	CH	(Eibner 1973; Wyss 1972)
22	Zürich-Grosser-Hafner	Lake-Dwelling	Drinking vessel	1	CH	(Wyss 1972)
23	Zürich-Wollishofen	Lake-Dwelling	Drinking vessel	1	CH	(Wyss 1972)



Map 151: Distribution of Drinking horns, drinking vessels or "Saugeflasch" and bird figures in the northern Circum-Alpine region, and other studied sites.

Density Distribution Maps

Density distribution map conventions

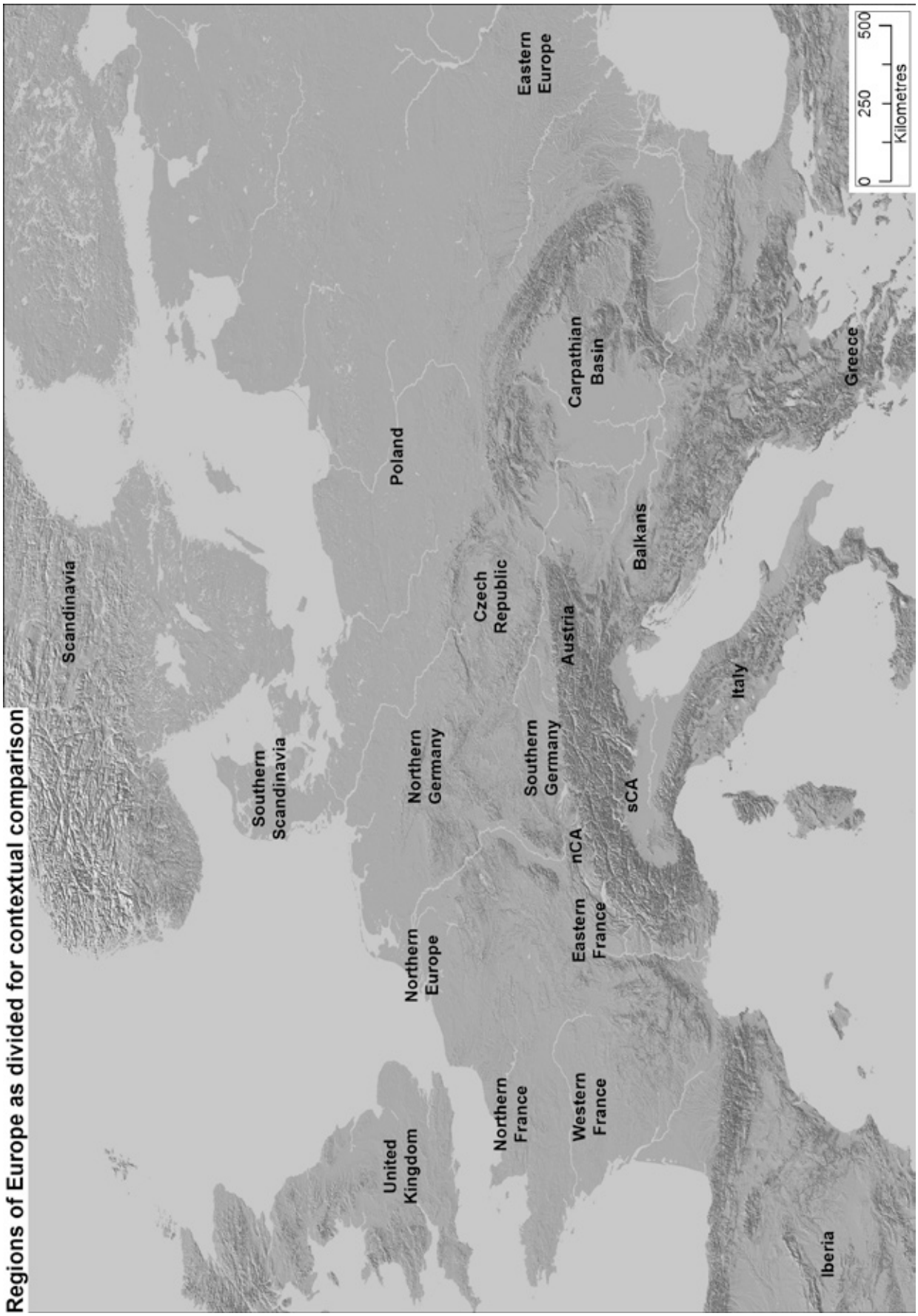
- Late Bronze Age (LBA) = c.1350-800 BC; early Iron Age (EIA) = c.800-450 BC. See Figure 7 for detailed regional chronologies.
- Density distribution maps relate to discussions in Chapter 7 and Chapter 8.
- Sites labelled in Density Distribution Maps (e.g. Map 153) relate to discusion in Chapters 7 & 8 and are used to provide:

a) comparison of find locations between time period: e.g. Late Bronze Age [Map 153] and early Iron Age [Map 154] amber distribution showing continuity in around Strasbourg (FR) but discontinuity around Komorowo-Gorszewice (PL).
b) comparison of object distribution density: e.g. *Pfahlbauperlen* [Map 155] compared to LBA amber beads [Map 153] overlapping at Frattesina (IT), Innsbruck (AT), and Montlingerberg (CH), or *Pfahlbau* [Map 178] and *West Baltic* [Map 179] spearheads showing little overlap other than Funen Island (DK).

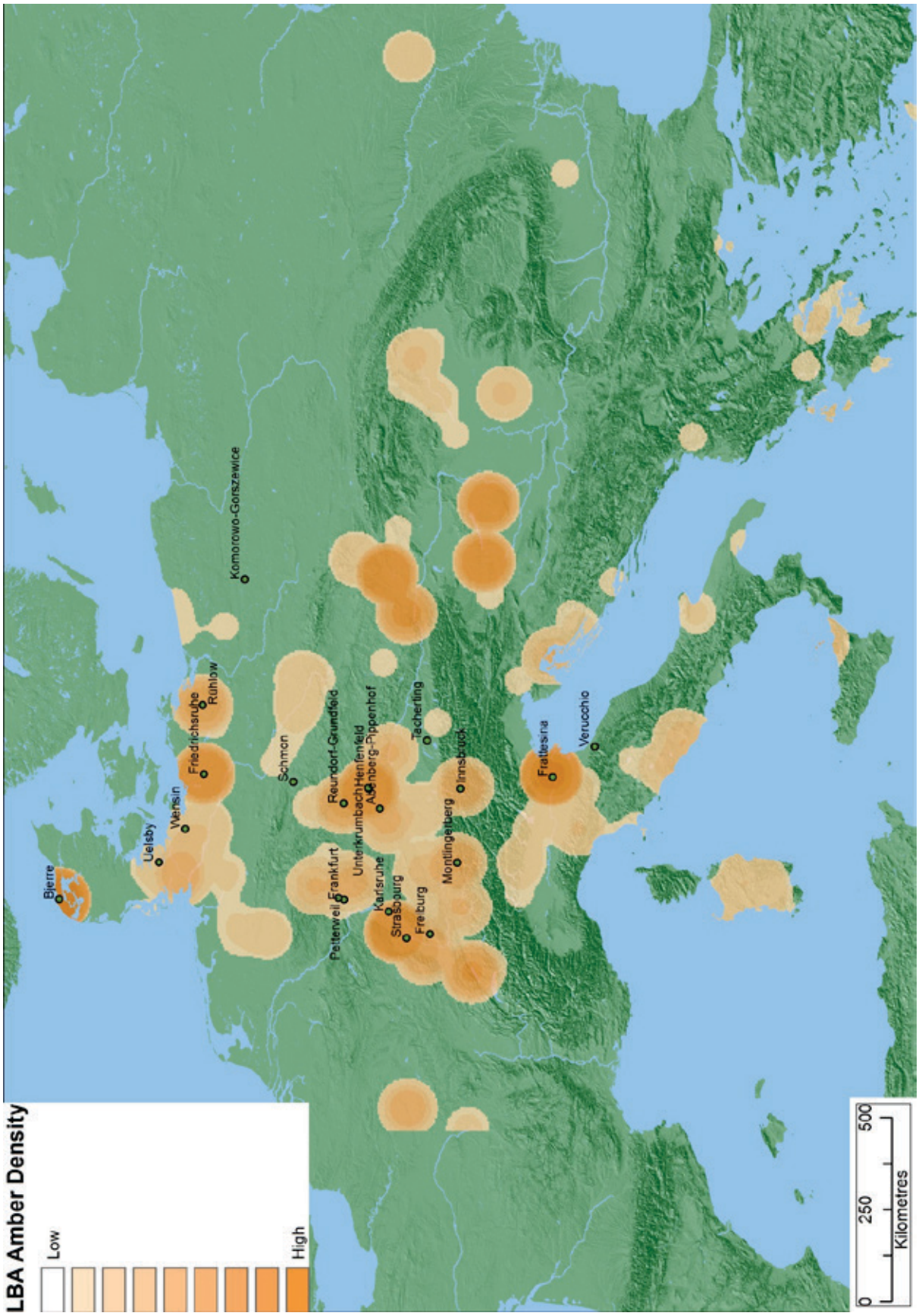
- Distribution Density maps created using Kernel Density toolbox function of ArcGIS.
- Half circles on Density Distribution Maps are an artefact of the process in ArcGIS, and occur because these points lie at the spatial limit of the distribution.

Object find context comparison maps

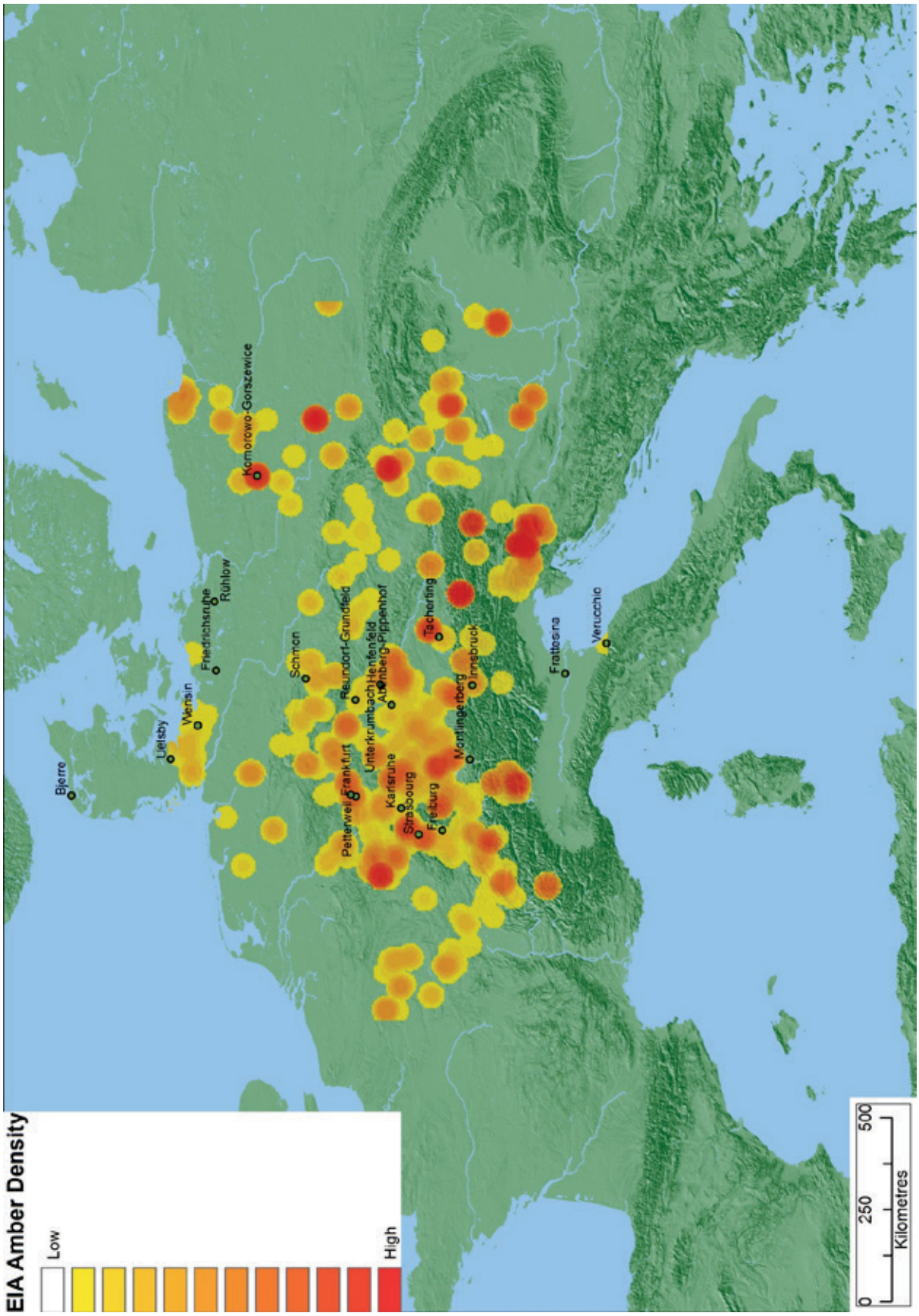
- Find contexts comparisons (e.g Map 156) follow regions set out in Map 152.
- Where possible the context comparison charts follow the same colour division.
- Pie chart size in find context comparisons relates to quantity of objects from that region: larger = more; smaller = less (e.g. Map 156). In cases where pie charts are of uniform size (e.g. Map 162), this is because one region had such a high proportion of the total assemblage (typically the nCA) that the chart would obscure those of neighbouring regions.
- Legends on context comparison maps include a reference pie for those displayed in the map area (e.g. Map 156). Number adjacent to pie chart in legend indicates quantity of objects represented by pie chart size. If pie chart on map area is larger than reference pie chart in legend, it represents a greater quantity of objects, and smaller pie charts in map area represent fewer objects.
- Area and N/A (Not available) category symbols are hollow (transparent).



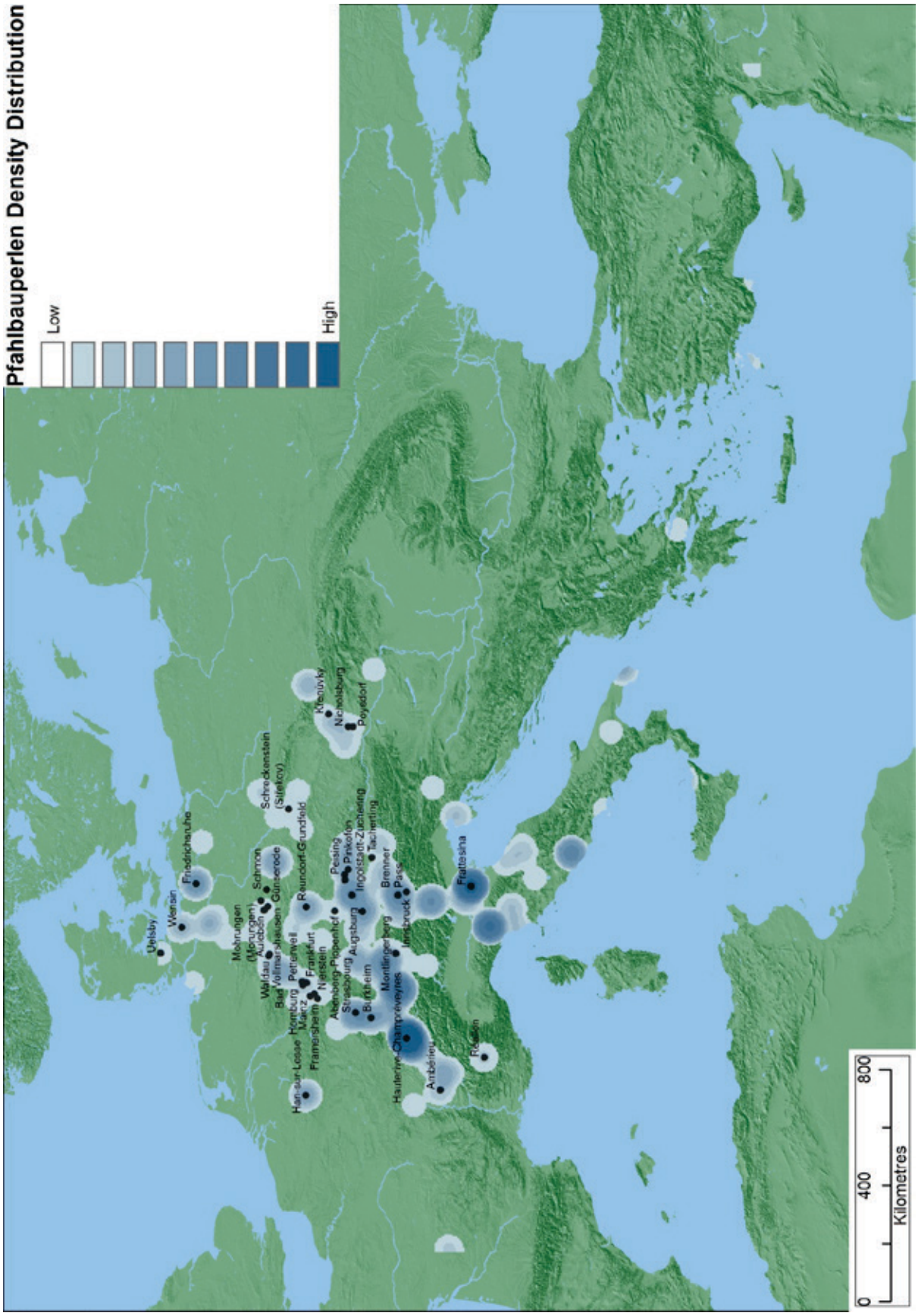
Map 152: Division of Europe in to regions for find context comparisons. Pie charts on context comparison maps always appear in same location, in place of text labels shown here.



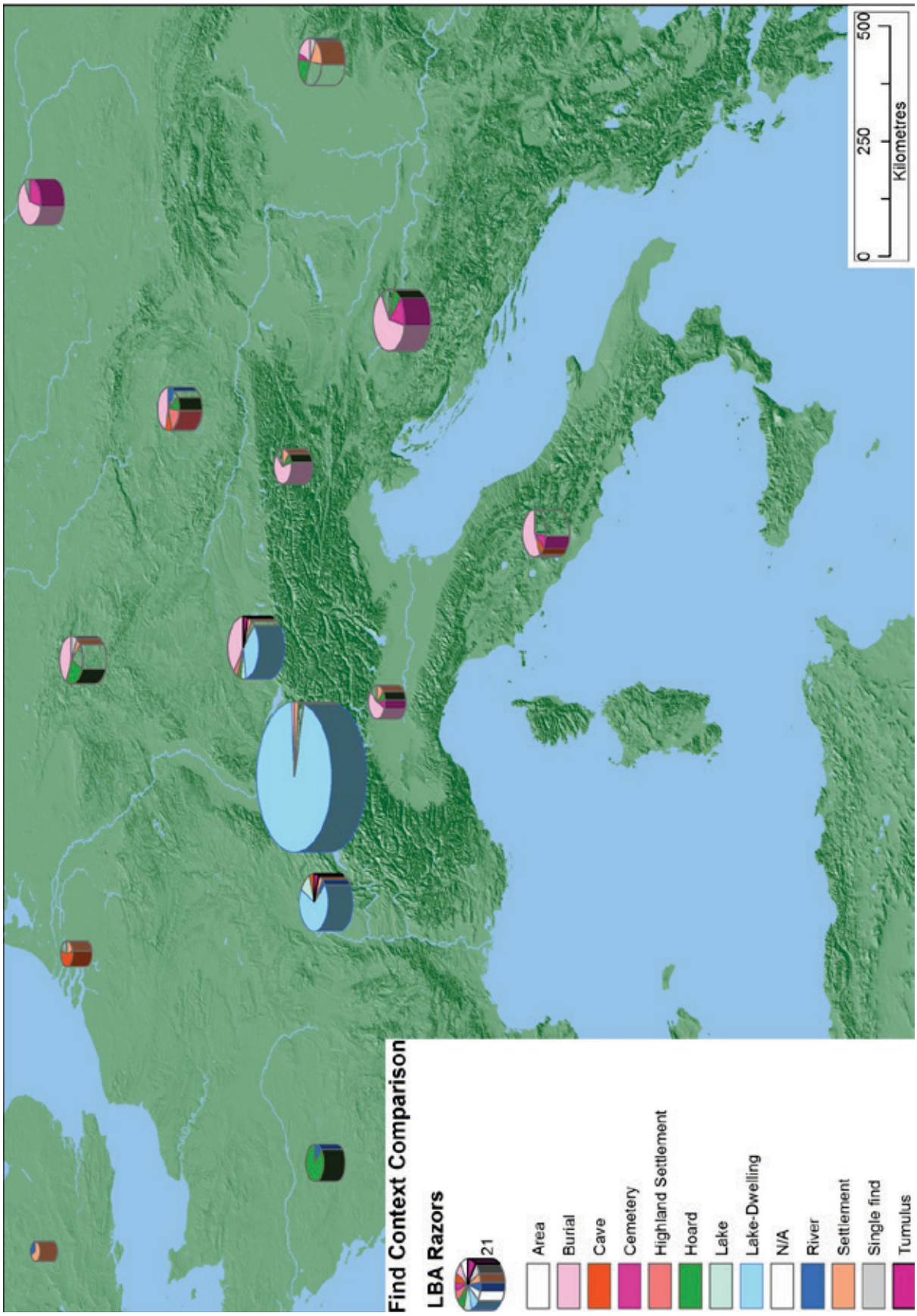
Map 153: Density distribution for Late Bronze Age amber artefacts in Europe. Only *Tiryns* and *Allumiere* beads mapped in Italy and the Mediterranean region. (Central European data from Stahl 2006; Mediterranean region data from Negroni Catacchio 2006).



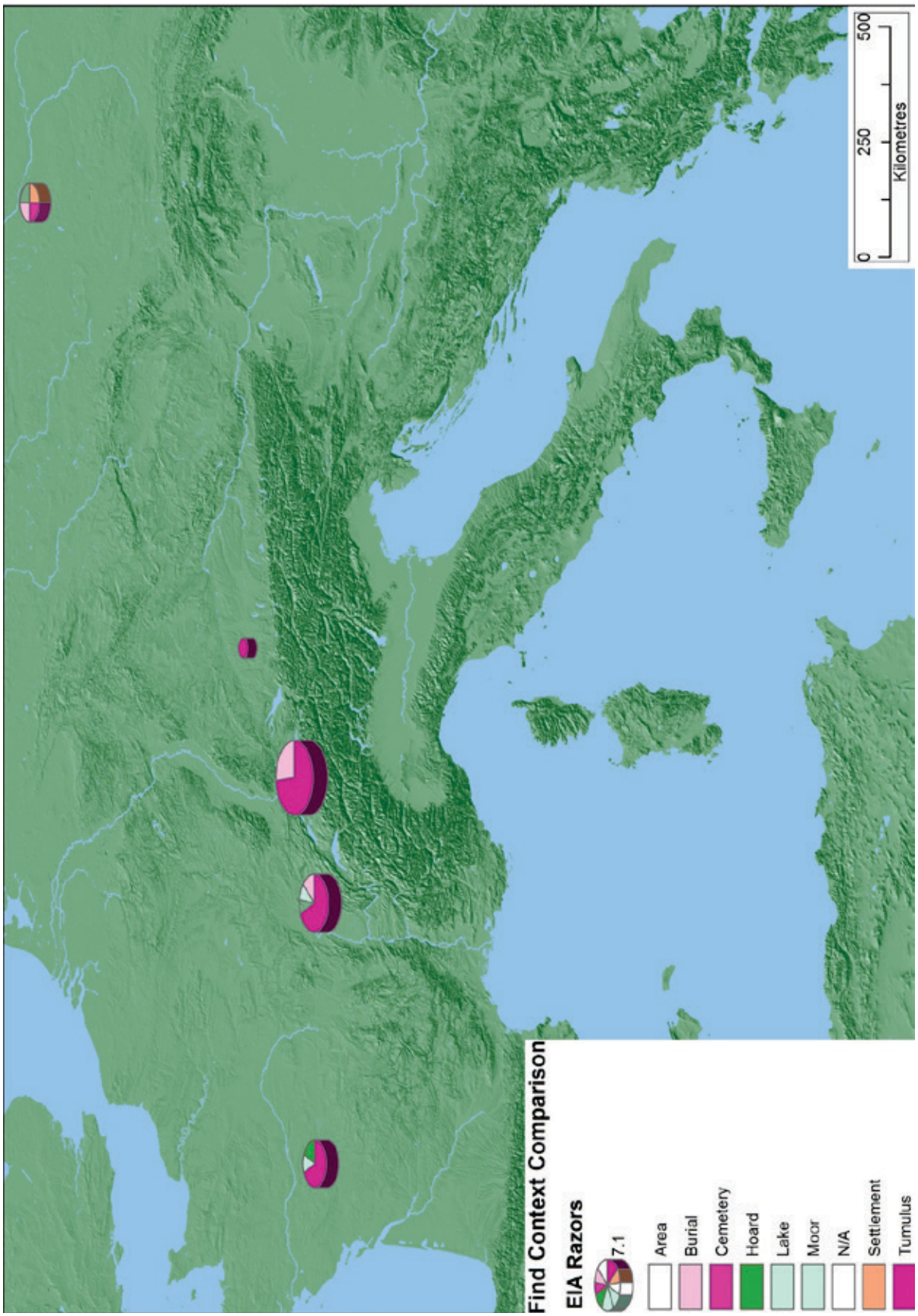
Map 154: Density distribution for early Iron Age amber objects in central Europe. (Data from Stahl, 2006).



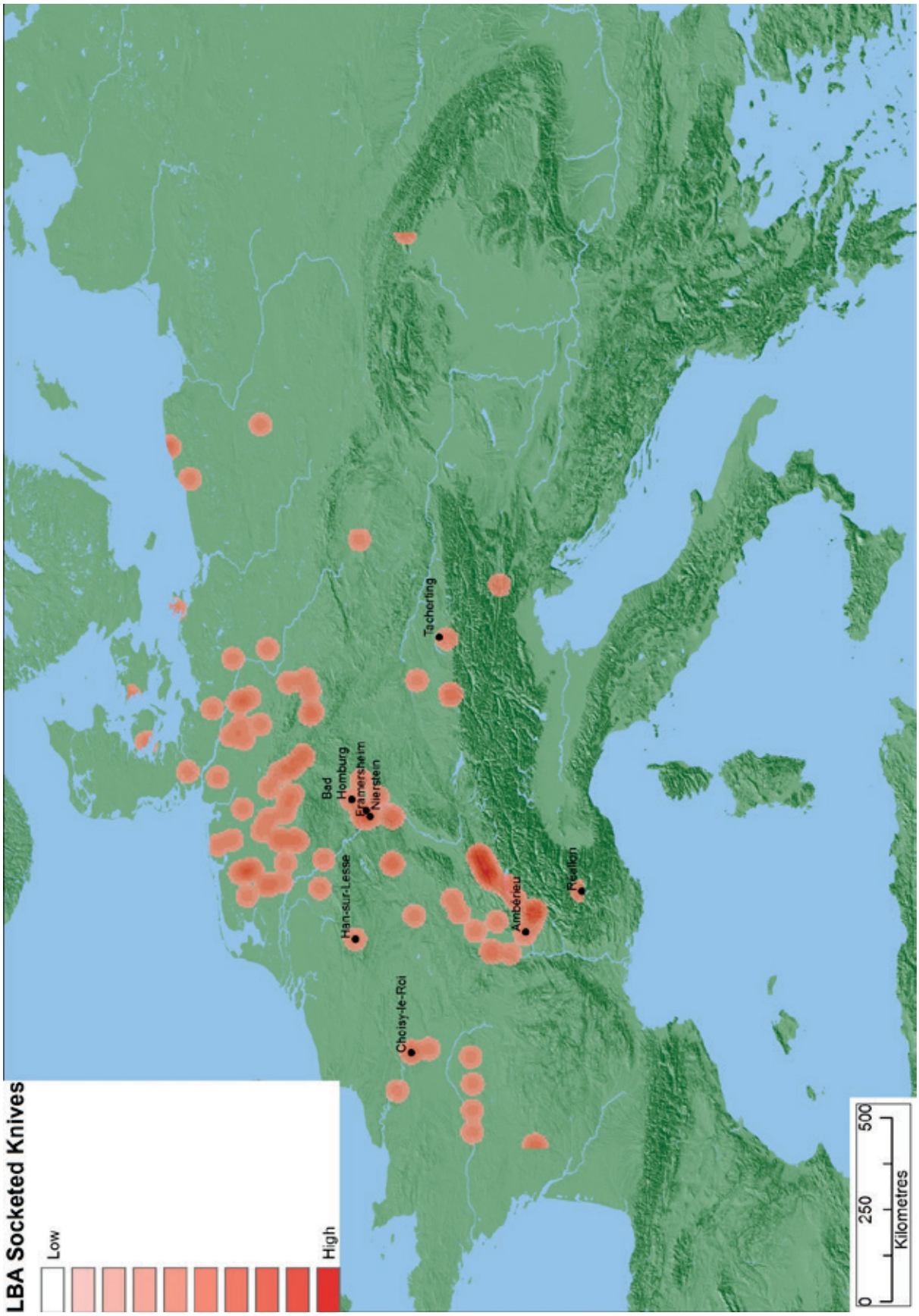
Map 155: Density distribution of Late Bronze Age *Pfahlbauperlen*. Clear centres of high density are visible in the Po Plain (Frattesina) and around Lake Neuchâtel. Density decreases as they circulated further north through Europe.



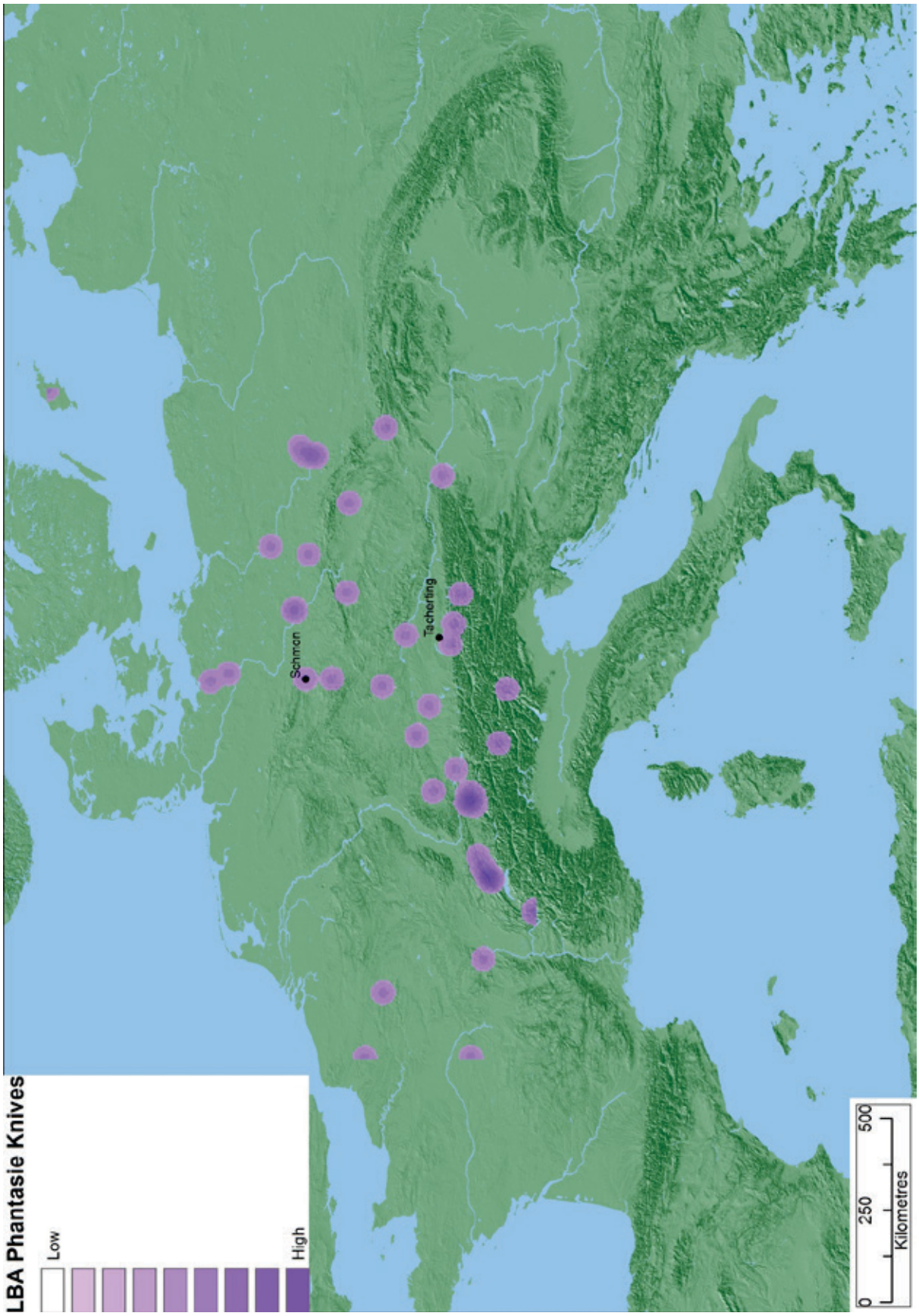
Map 156: Find contexts for Late Bronze Age razors of all types detailed in Section 5.4.2.1 from different regions of Europe. (See Map 152 for region definition).



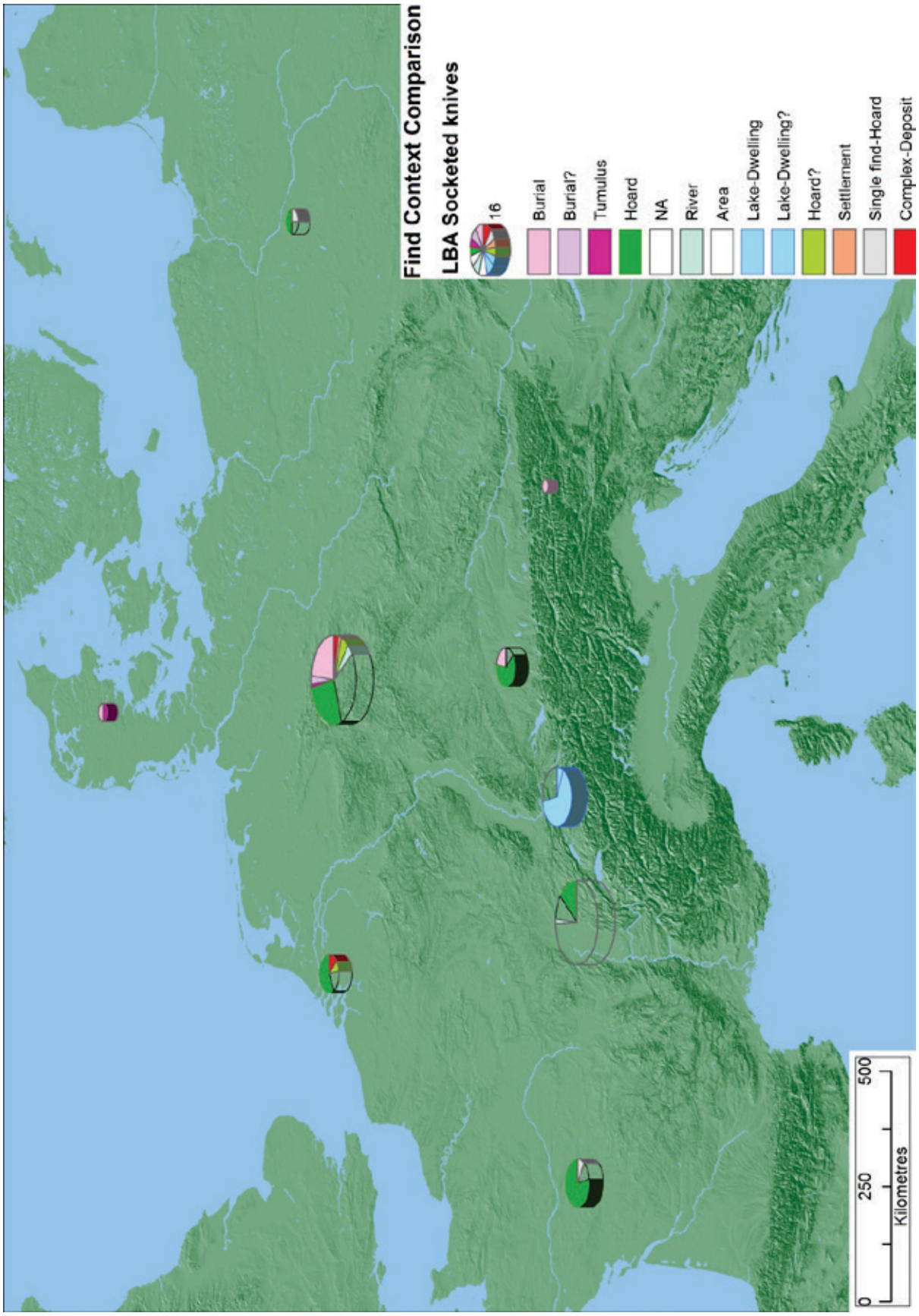
Map 157: Find contexts for early Iron Age razors of all types discussed in Section 5.4.2.1 from different areas of Europe. (See Map 152 for region definition).



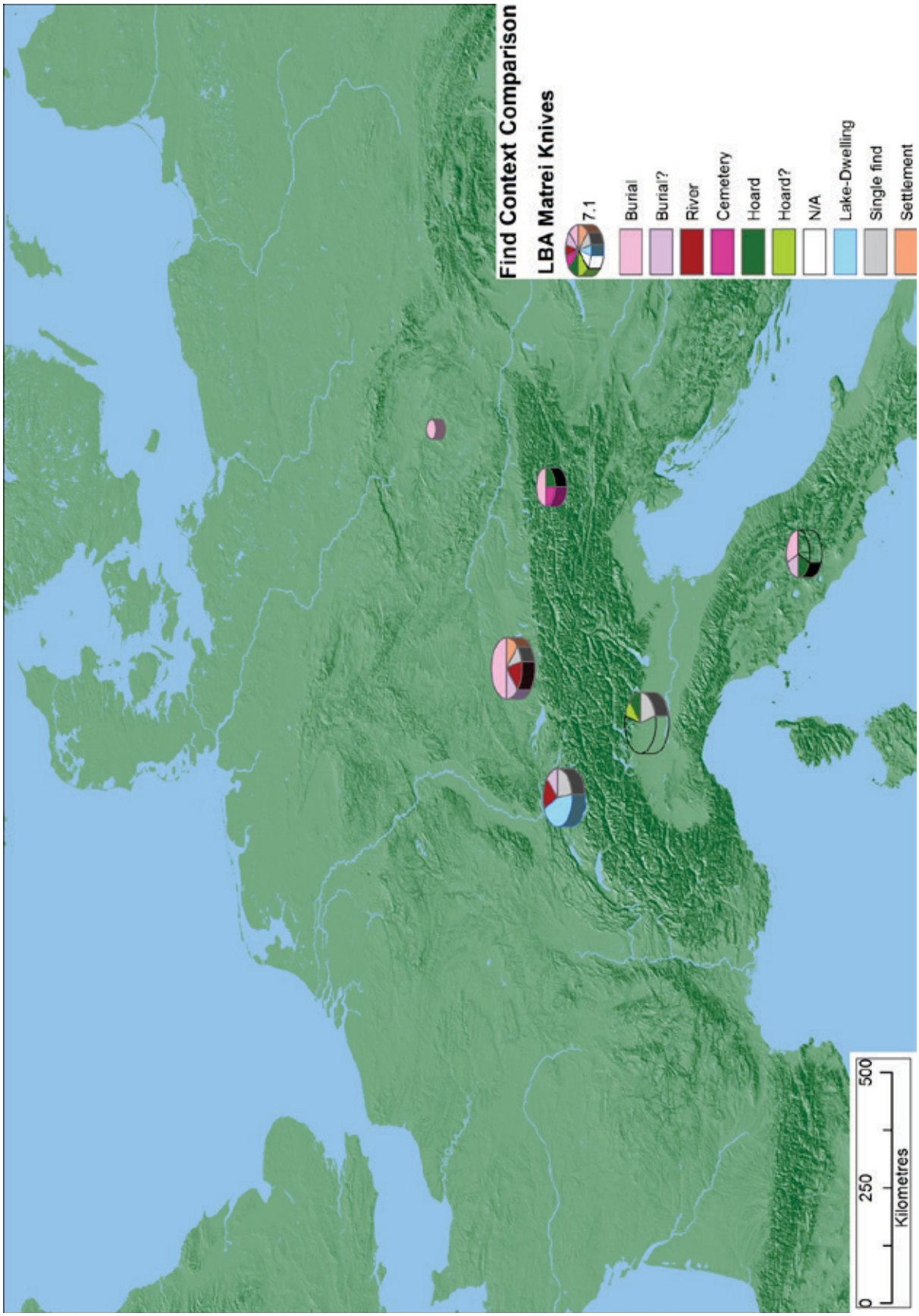
Map 158: Density distribution of LBA *Socketed* knives. High densities are visible around Lake Neuchâtel (CH) and Lake Bourget (FR), and in northern Germany, suggesting possible manufacture in these regions. A cluster is visible around Bad Homburg, and examples are also recorded at Réallon (FR); *Pfahlbauperlen* are found in each of these locations (see Map 155).



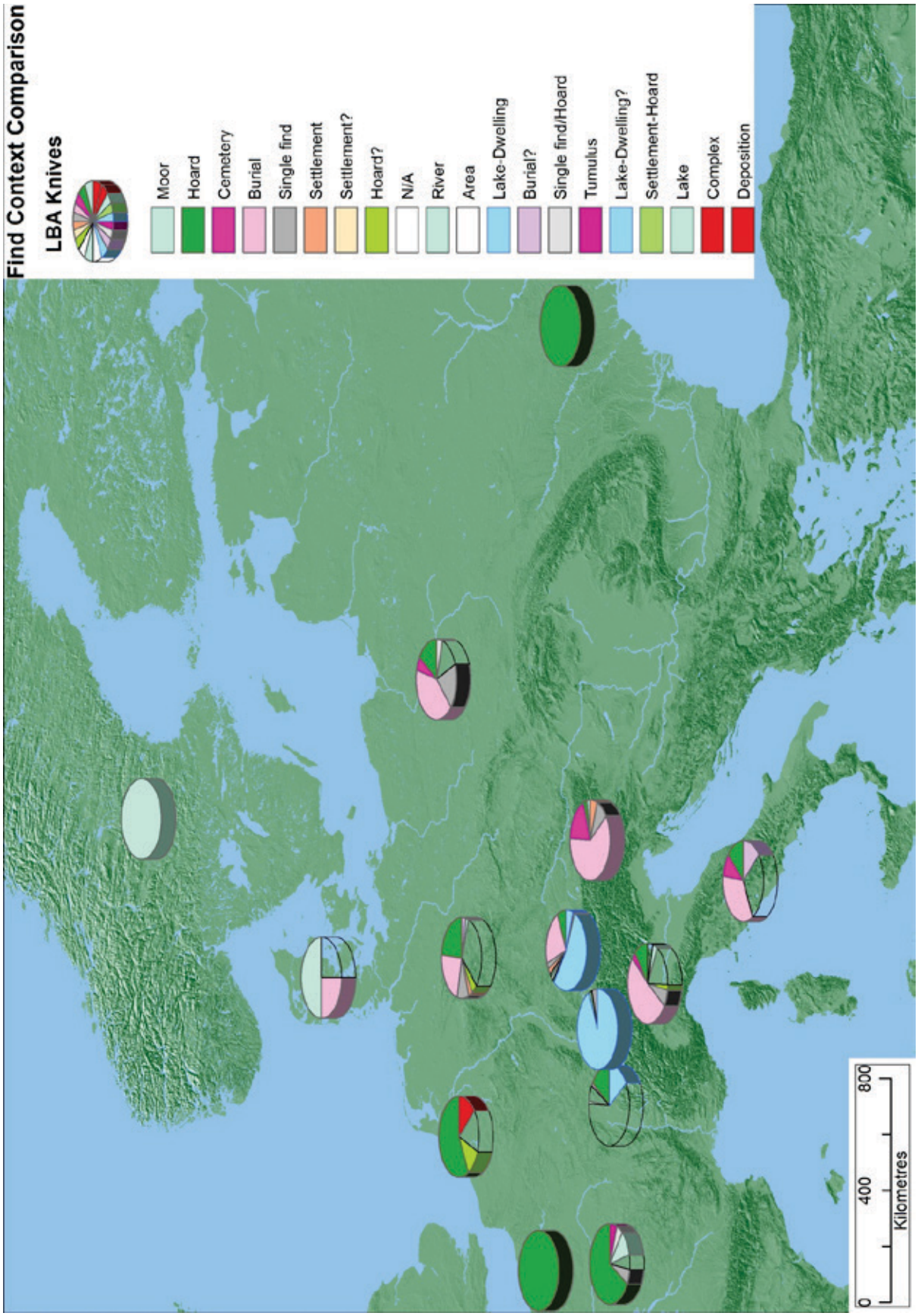
Map 159: Density of LBA *Phantasie* handle knives. Few areas of overlap with *Socketed* knives are observed (Map 158), with the exception of, for example, around Tacherting (D). Some overlap with *Homburg* type arm-/leg-rings occurs (Map 172), for example around Schmon (D).



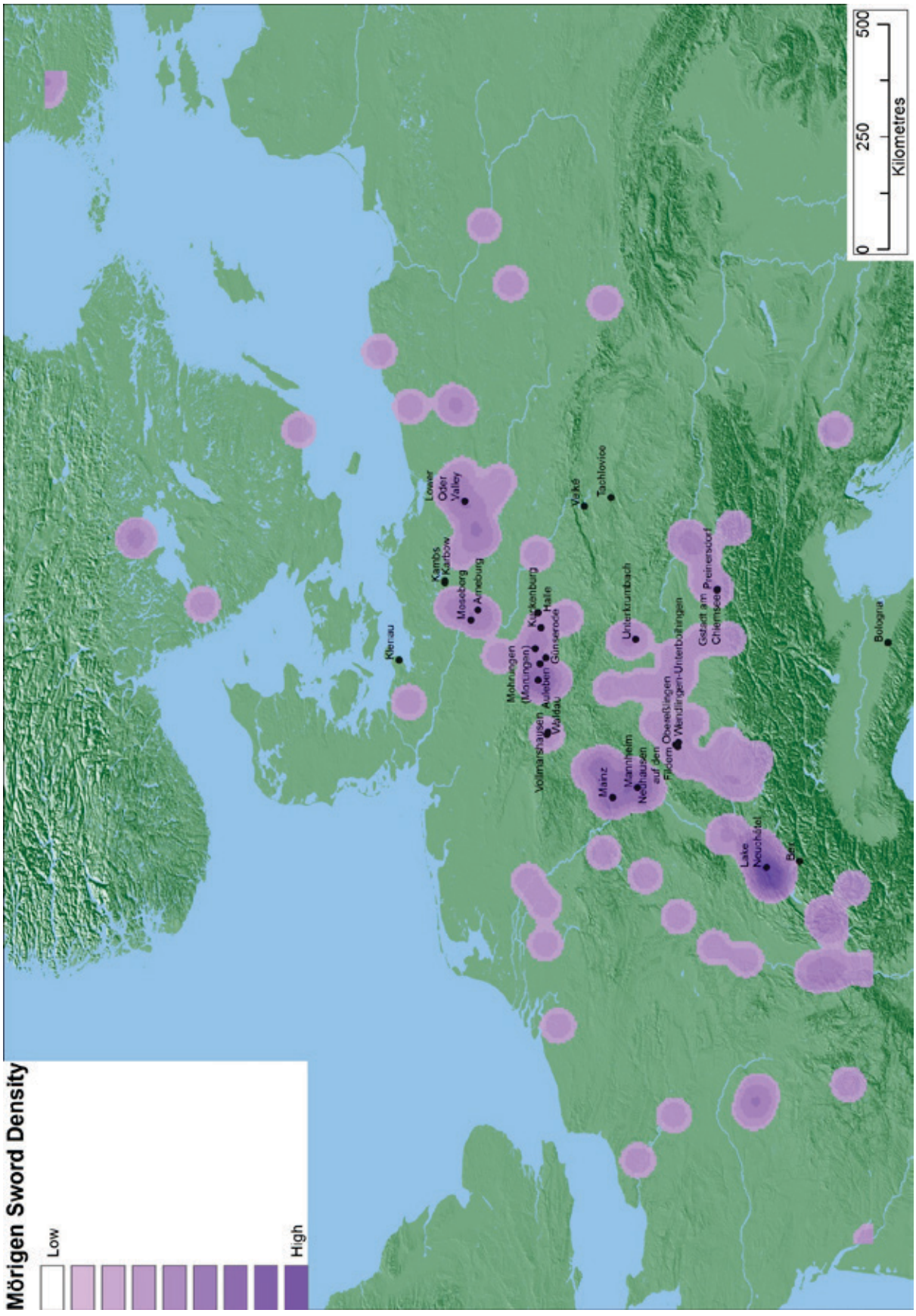
Map 160: Find contexts of *Socketed* knives from different areas of Europe. (See Map 152 for region definition).



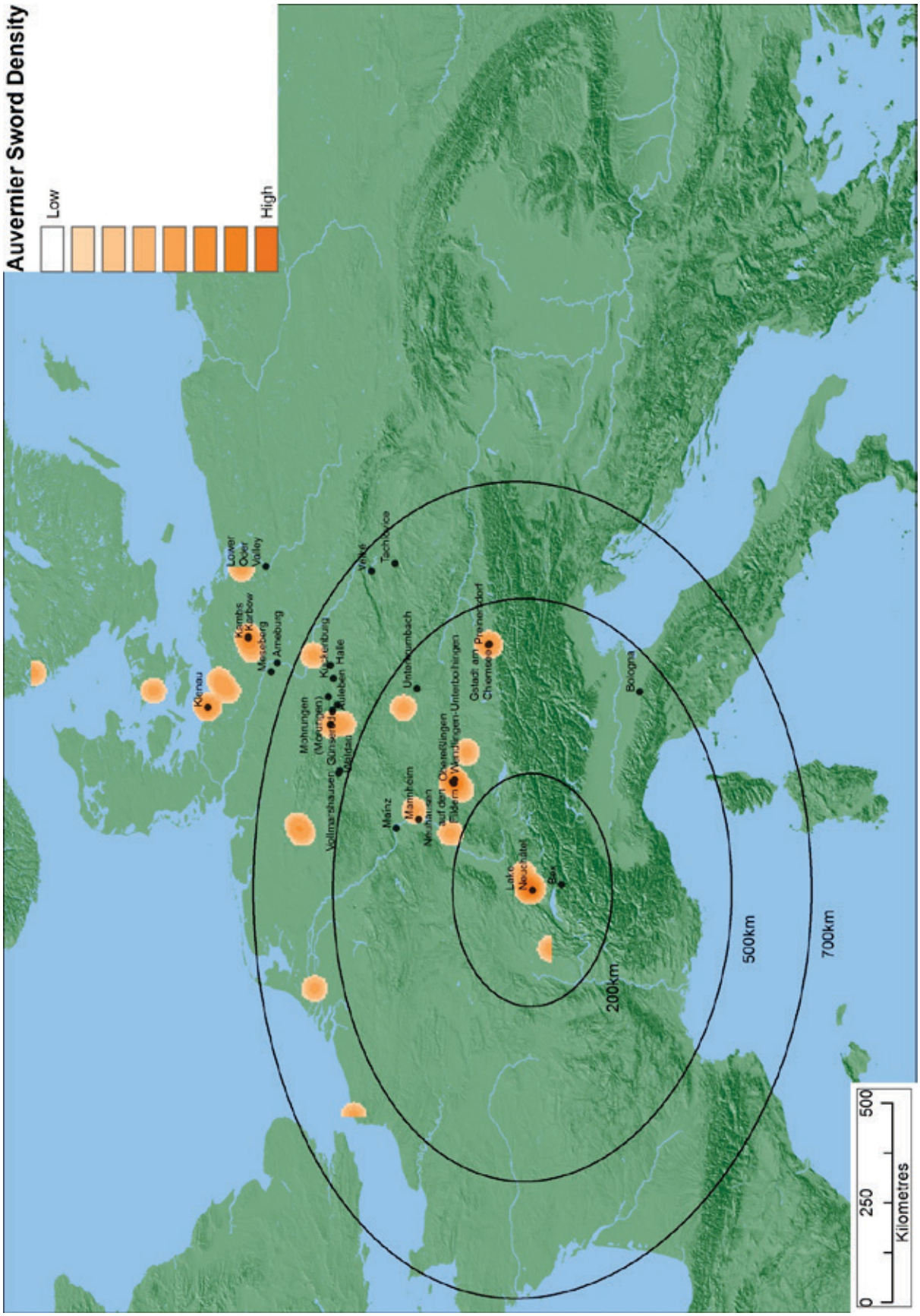
Map 161: Find contexts for LBA *Matrei* type knives from different areas of Europe. (See Map 152 for region definition).



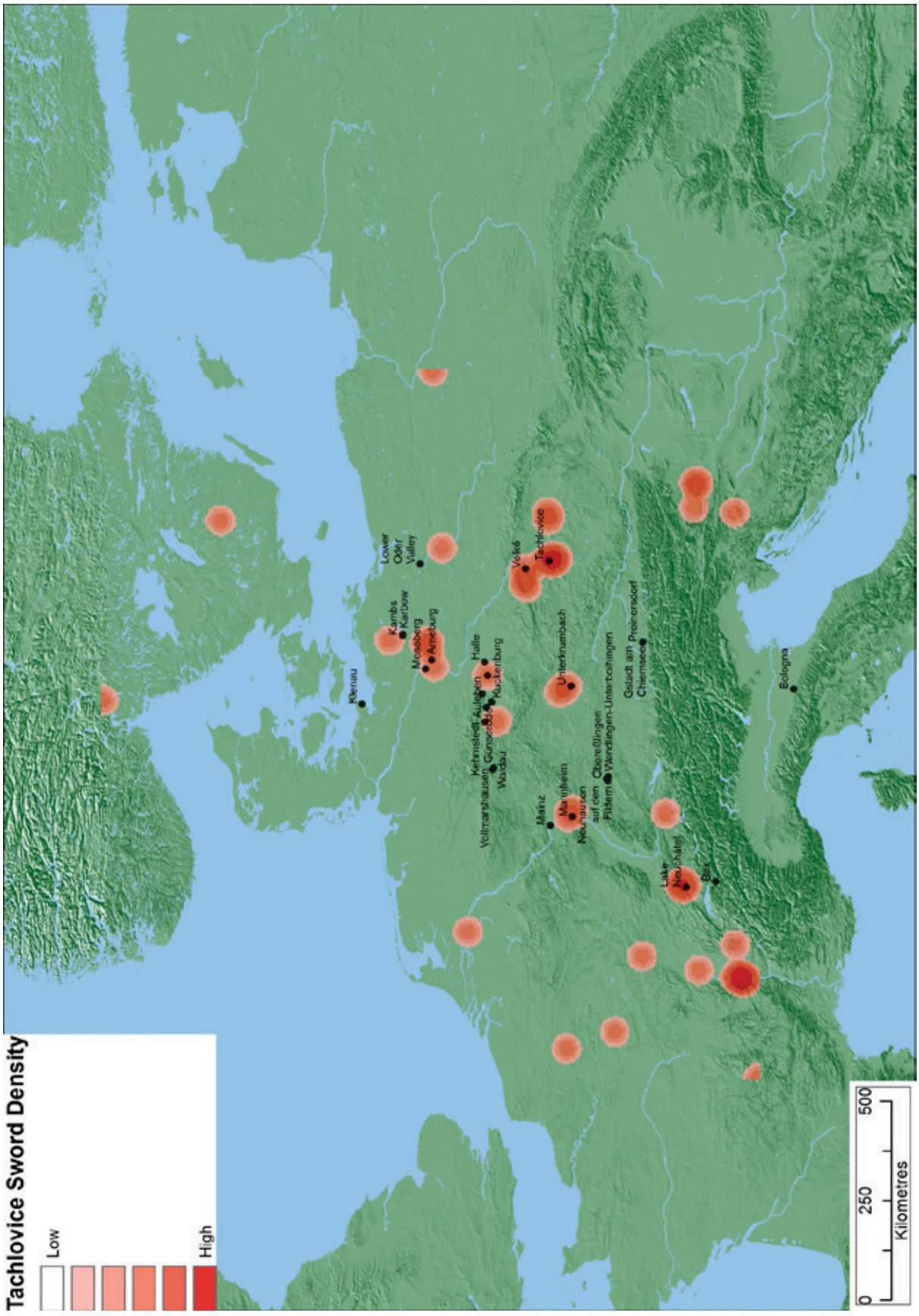
Map 162: Find contexts for all Late Bronze Age knife types discussed in Section 5.4.2.2 from different areas of Europe. Note that all pie charts are the same size (do not represent quantity of objects) due to display considerations (see explanation on page 255). (See Map 152 for region definition).



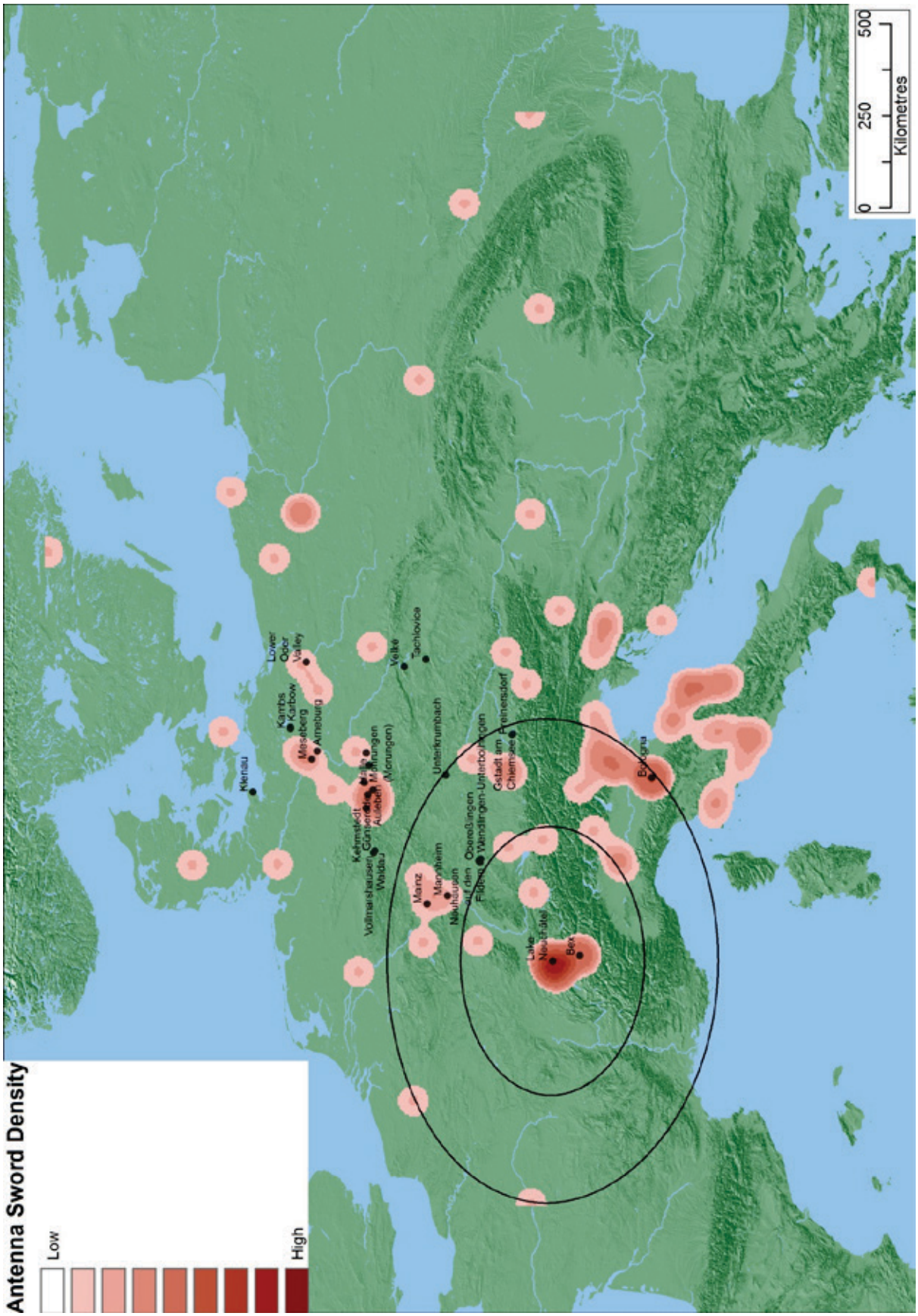
Map 163: Density distribution of Late Bronze Age *Mörigen* type swords. A clear area of high density is evident around Lake Neuchâtel, but a general continual spread is seen across central Europe, in contrast to the Auvernier type sword (Map 164). Similar to the *Gündlingen* sword (Map 167), the distribution of *Mörigen* swords extends to the lower Rhône valley (FR).



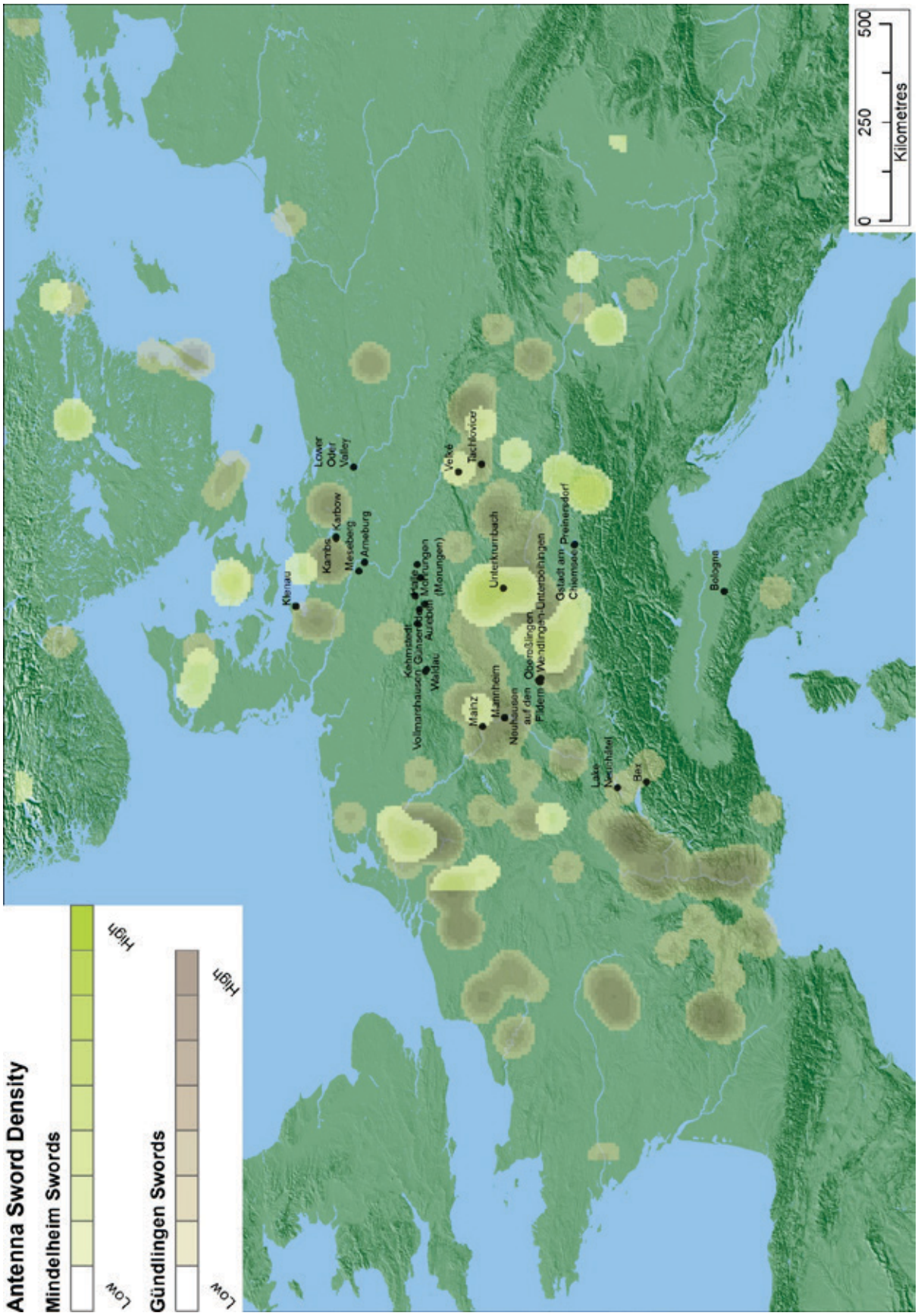
Map 164: Density distribution of LBA *Auvernier* type swords. In contrast to the *Mörigen* type sword, a banding of the distribution of *Auvernier* swords can be seen, grouped into bands of <200km, 200km to 500km, and 700km from Lake Neuchâtel.



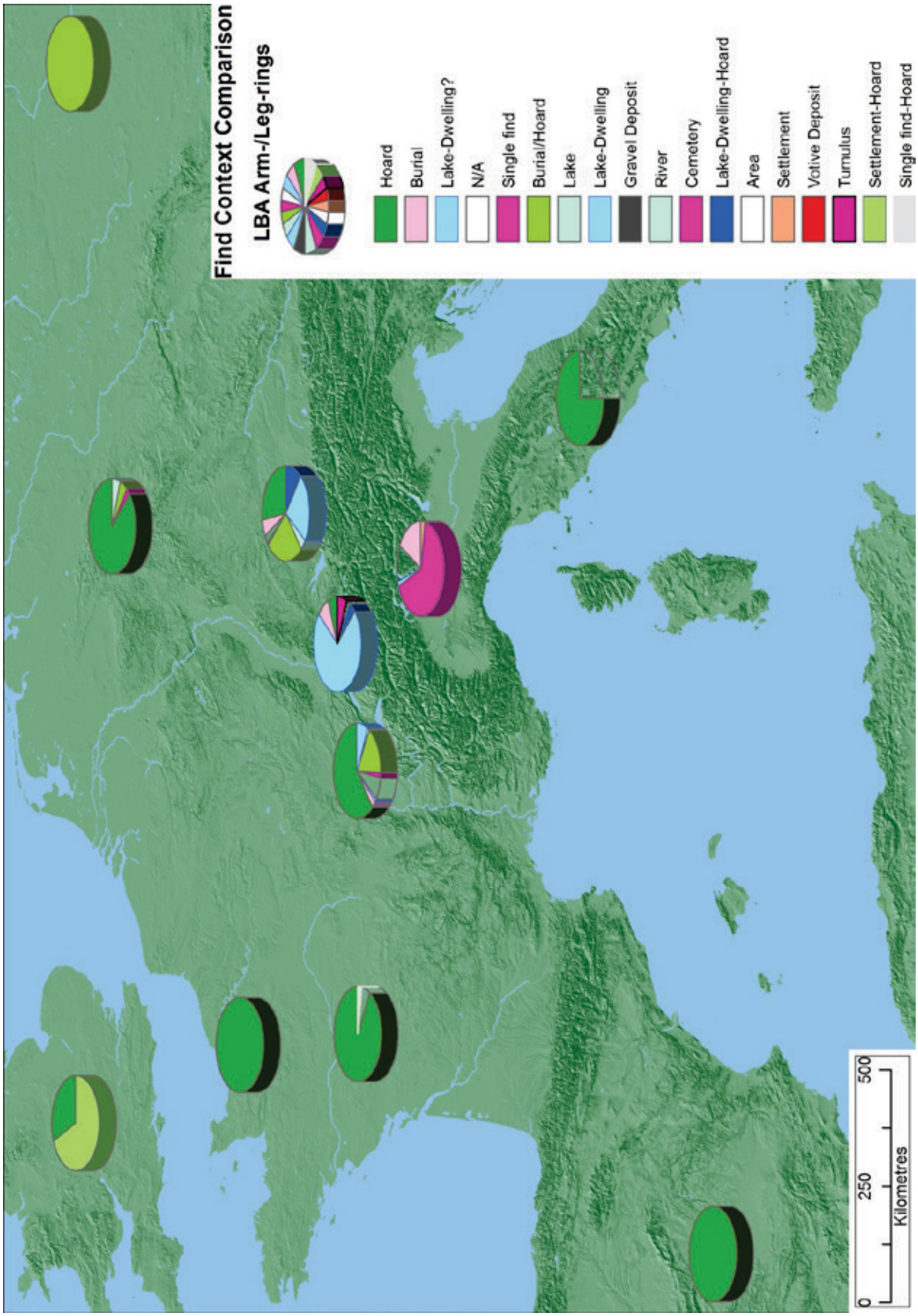
Map 165: Density distribution of *Tachlovice* swords. High densities of *Tachlovice* swords can be seem in eastern central Europe, and also around Lake Neuchâtel and in the lower Rhône valley.



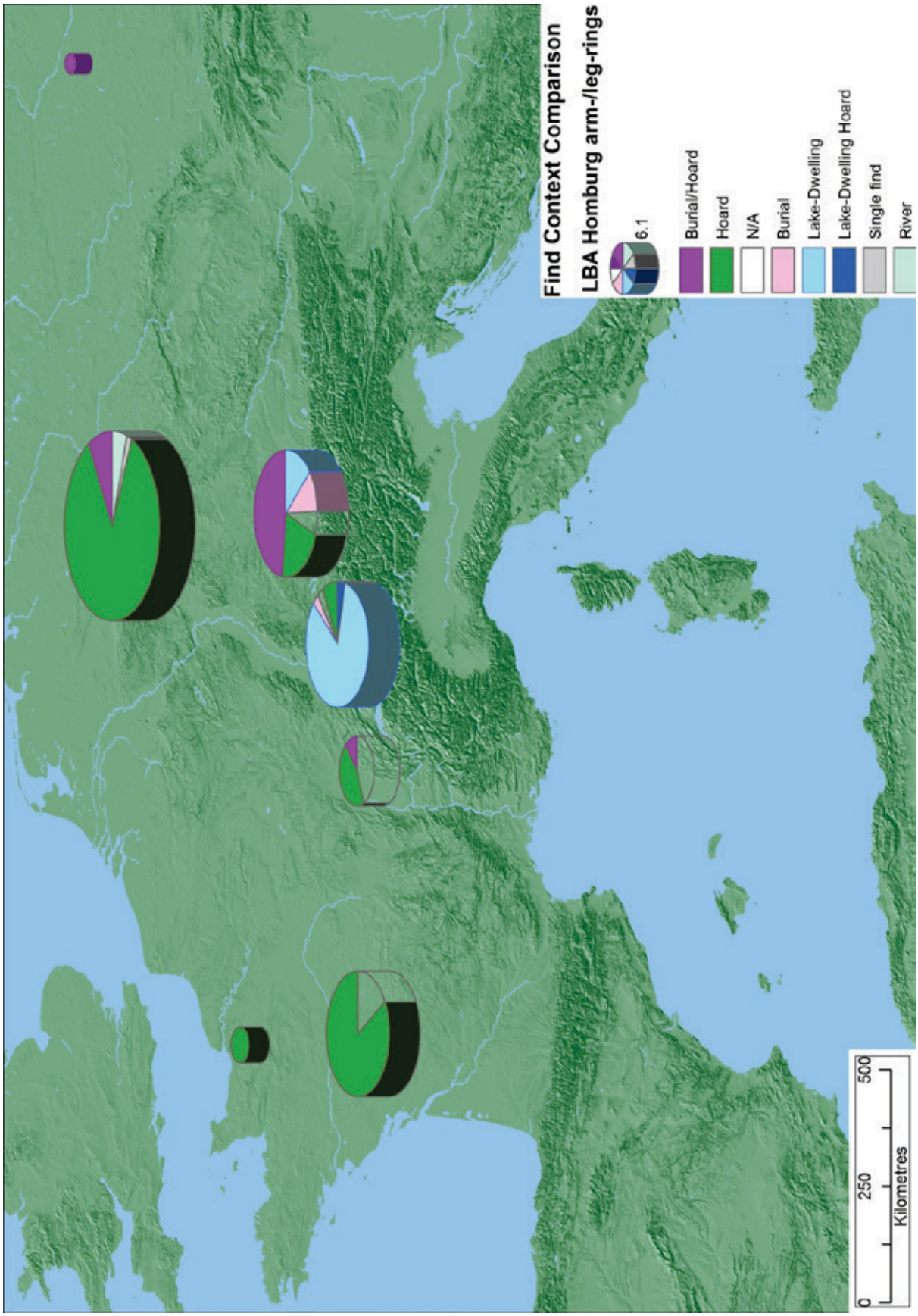
Map 166: Denisty distribution of Late Bronze Age Antenna type swords (*Tarquinia*; *Zurich*; *Weltenburg*; *Corcelettes*). In contrast to the *Mörigen* type, distribution banding can be seen in the ranges of up to 250km, between 250 and 450km, and over 450km from a high density around Lake Neuchâtel.



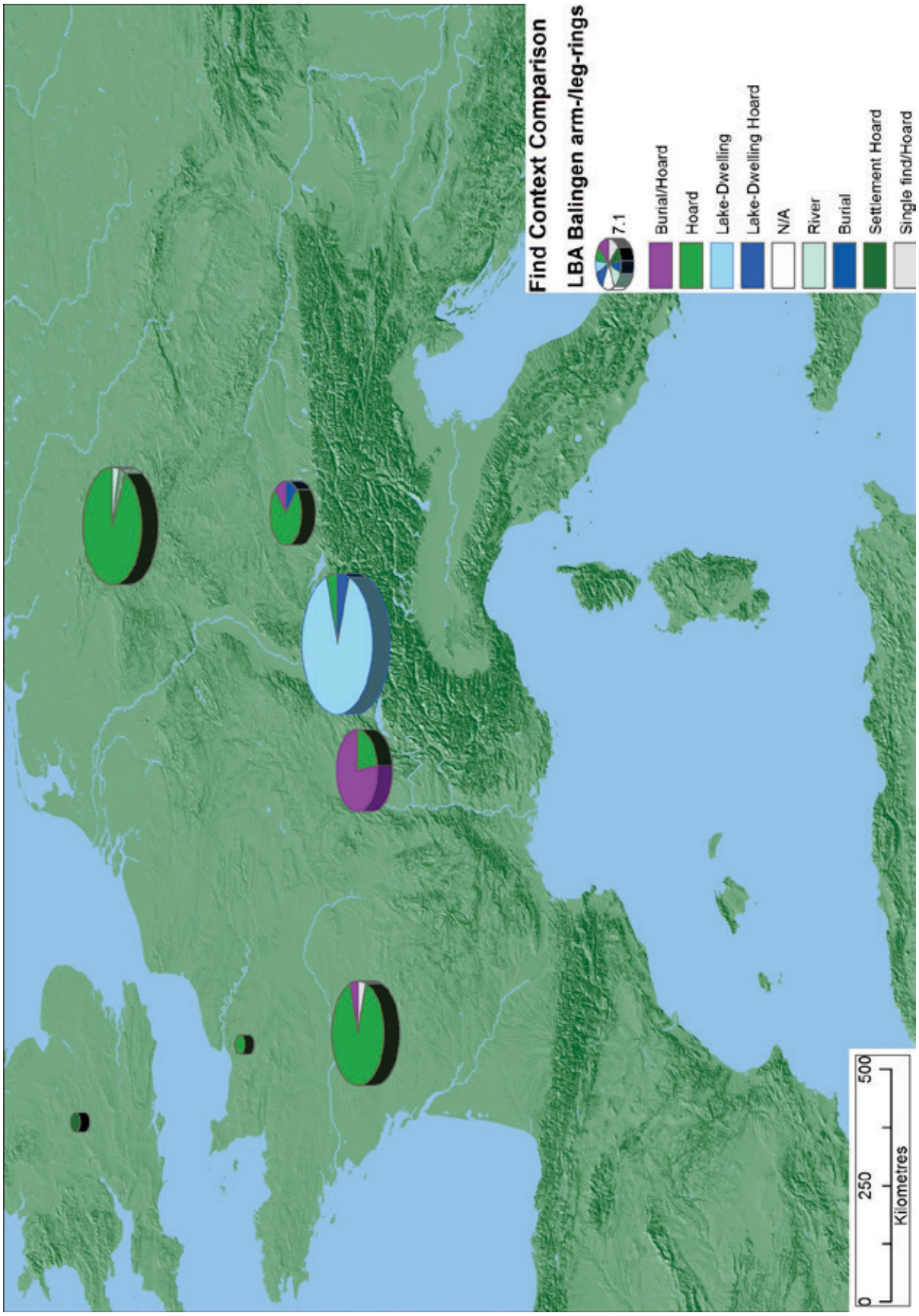
Map 167: Density of early Iron Age *Gündlingen* (examples from Britain and Ireland not mapped) and *Mindelheim* type swords. A high density of Gündlingen swords can be seen extending along the lower Rhône valley (FR), but largely avoiding the Lake Neuchâtel region which was dominant in the distribution of Late Bronze Age *Mörigen* swords (Map 163).



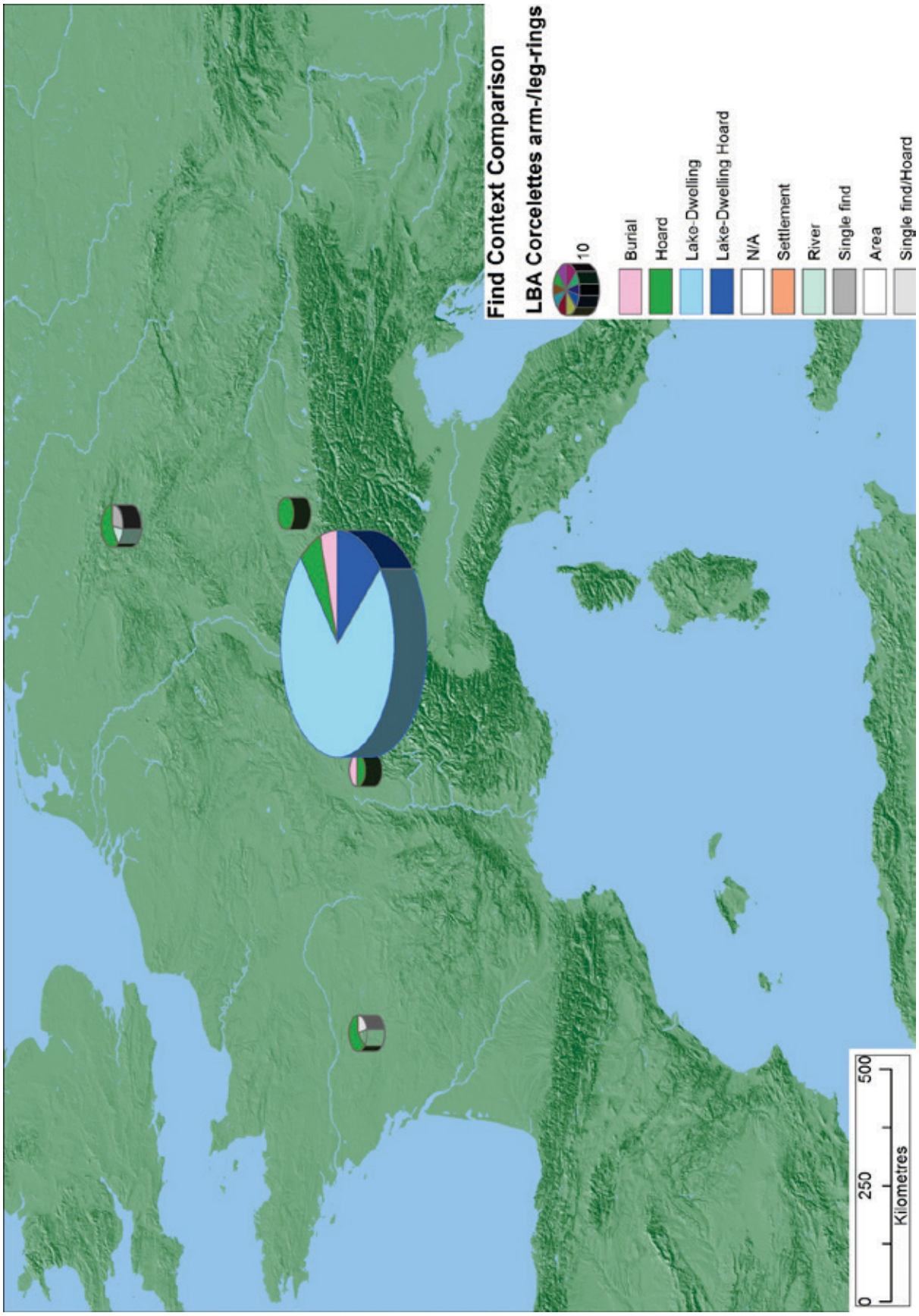
Map 168: Find contexts for LBA arm-/leg-ring jewellery by region. Note that all pie charts are the same size (do not represent quantity of objects) due to display considerations (see explanation on page 255). (See Map 152 for region definition).



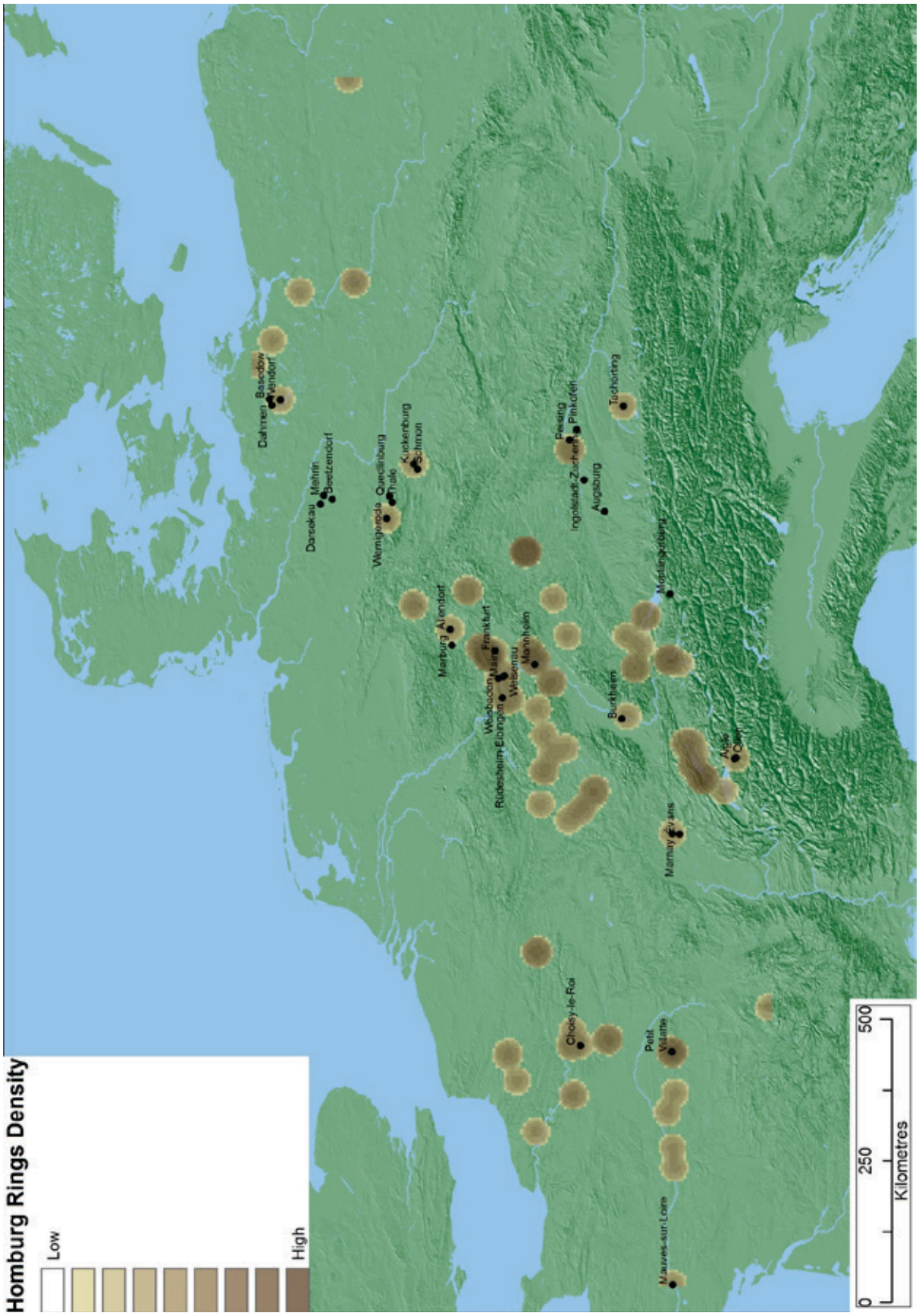
Map 169: Find context comparison for LBA *Homburg* type arm-/leg-rings from different regions of Europe. (See Map 152 for region definition).



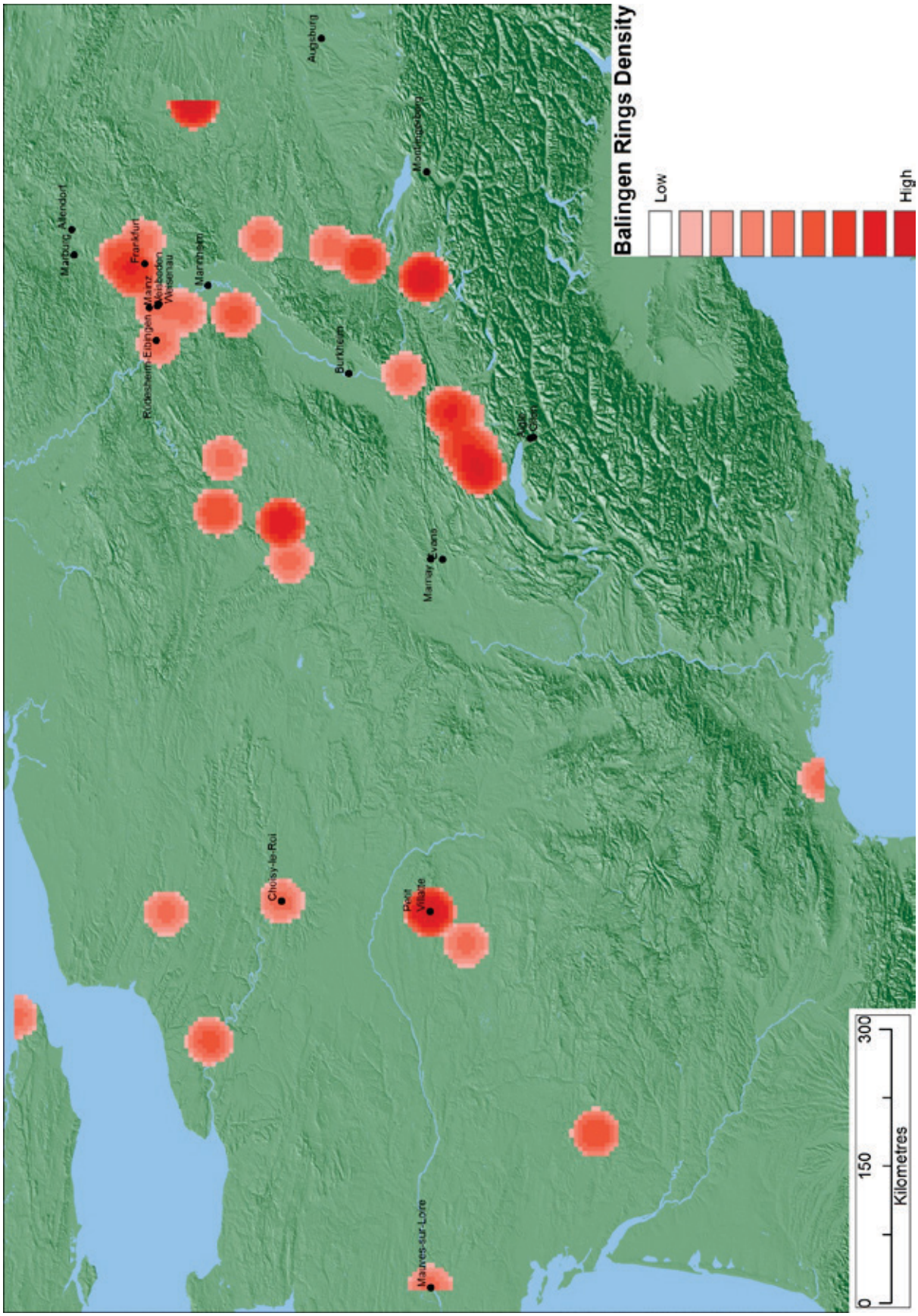
Map 170: Find contexts comparison for LBA *Balingen* type arm-/leg-rings from different regions of Europe. (See Map 152 for region definition).



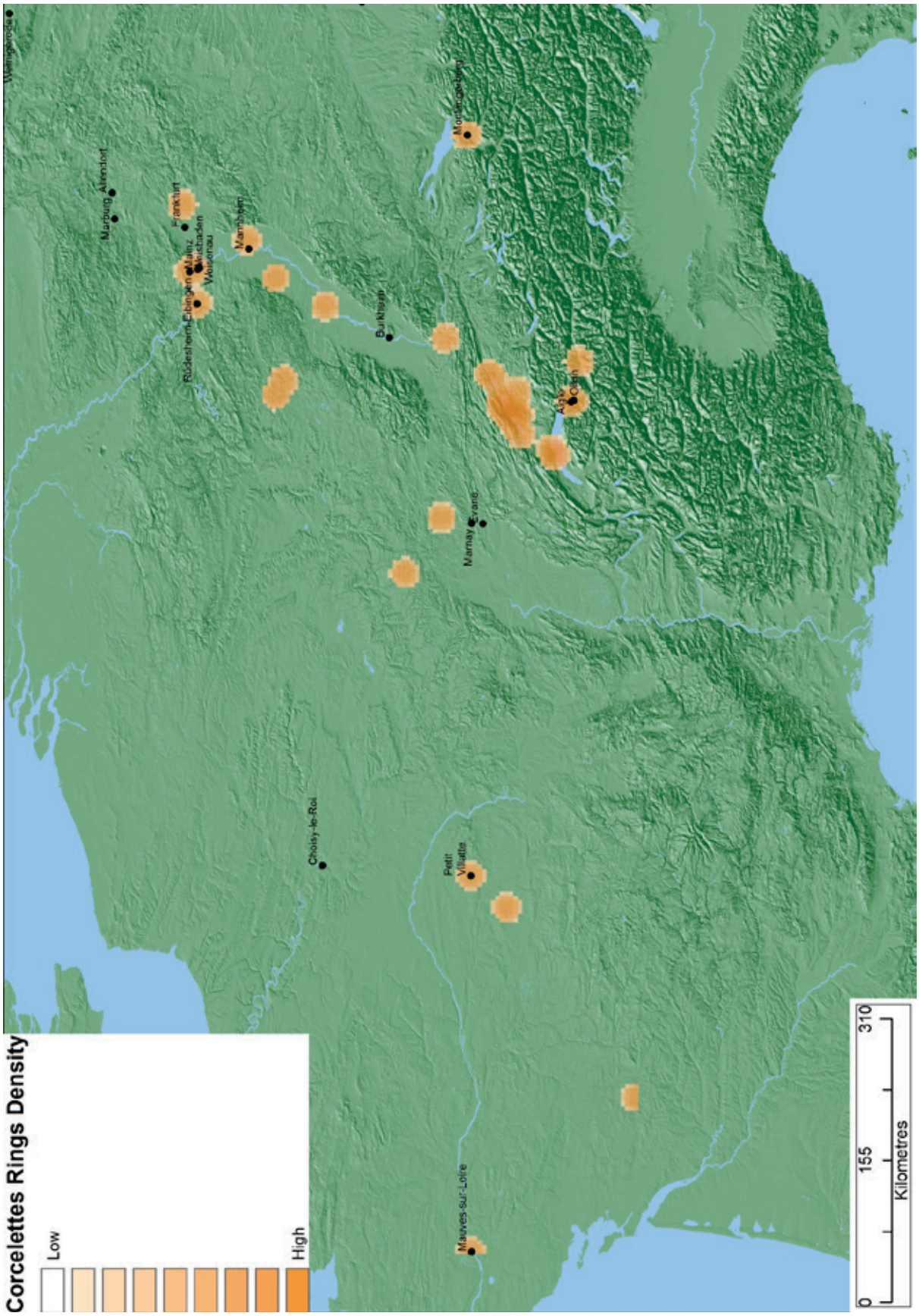
Map 171: Find context comparison for LBA *Corcelettes* arm-/leg-rings from different regions of Europe. (See Map 152 for region definition).



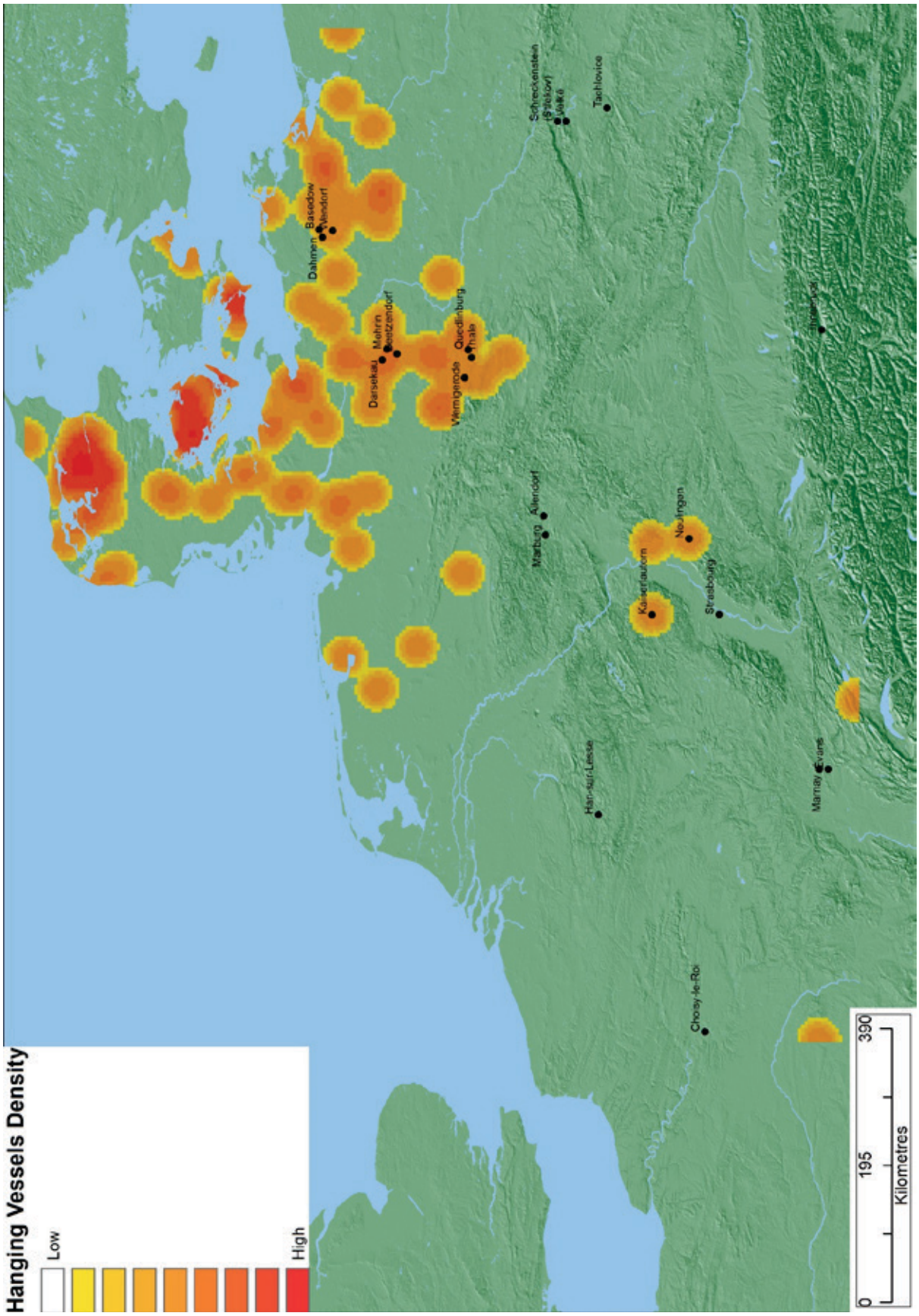
Map 172: Distribution density of LBA *Homburg* type arm-/leg-rings. Centres of high density are visible around Lake Neuchâtel (CH) and in the Middle Rhine Valley (FR; D) around Frankfurt and Mannheim. Overlaps of *Homburg* rings with *Pfahlbauperlen* (Map 155) and *Platten* fibula (Map 177) are evident at various locations, including Wenndorf (D) and around Frankfurt.



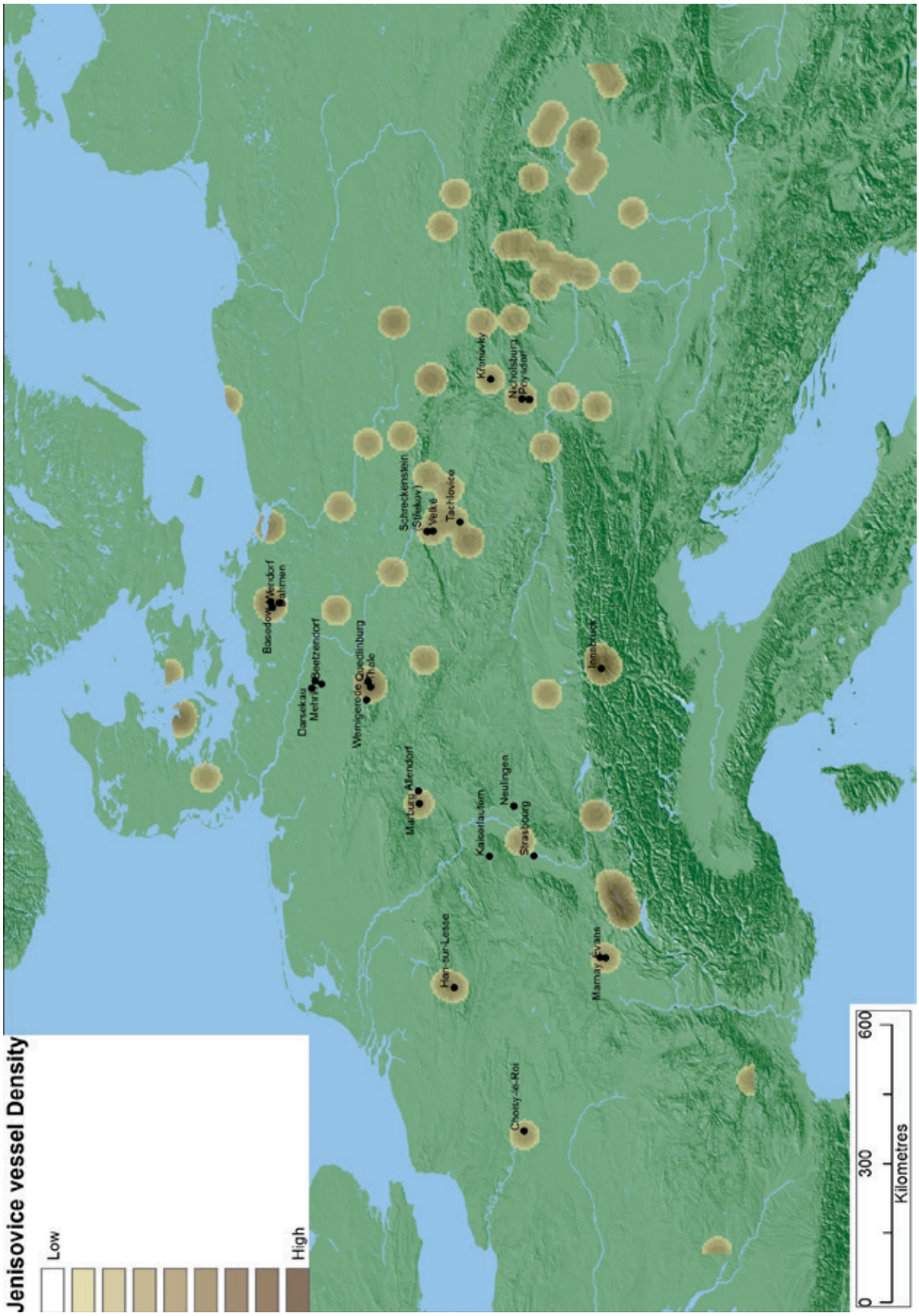
Map 173: Density distribution of LBA *Balingen* type arm-/leg-rings. The highest density is observed around Lake Neuchâtel, and in eastern Switzerland. Some rings are recorded from Petit Villatte (FR), along with other ring jewellery (Map 172 & Map 174) and *West Baltic* type spearheads (Map 179).



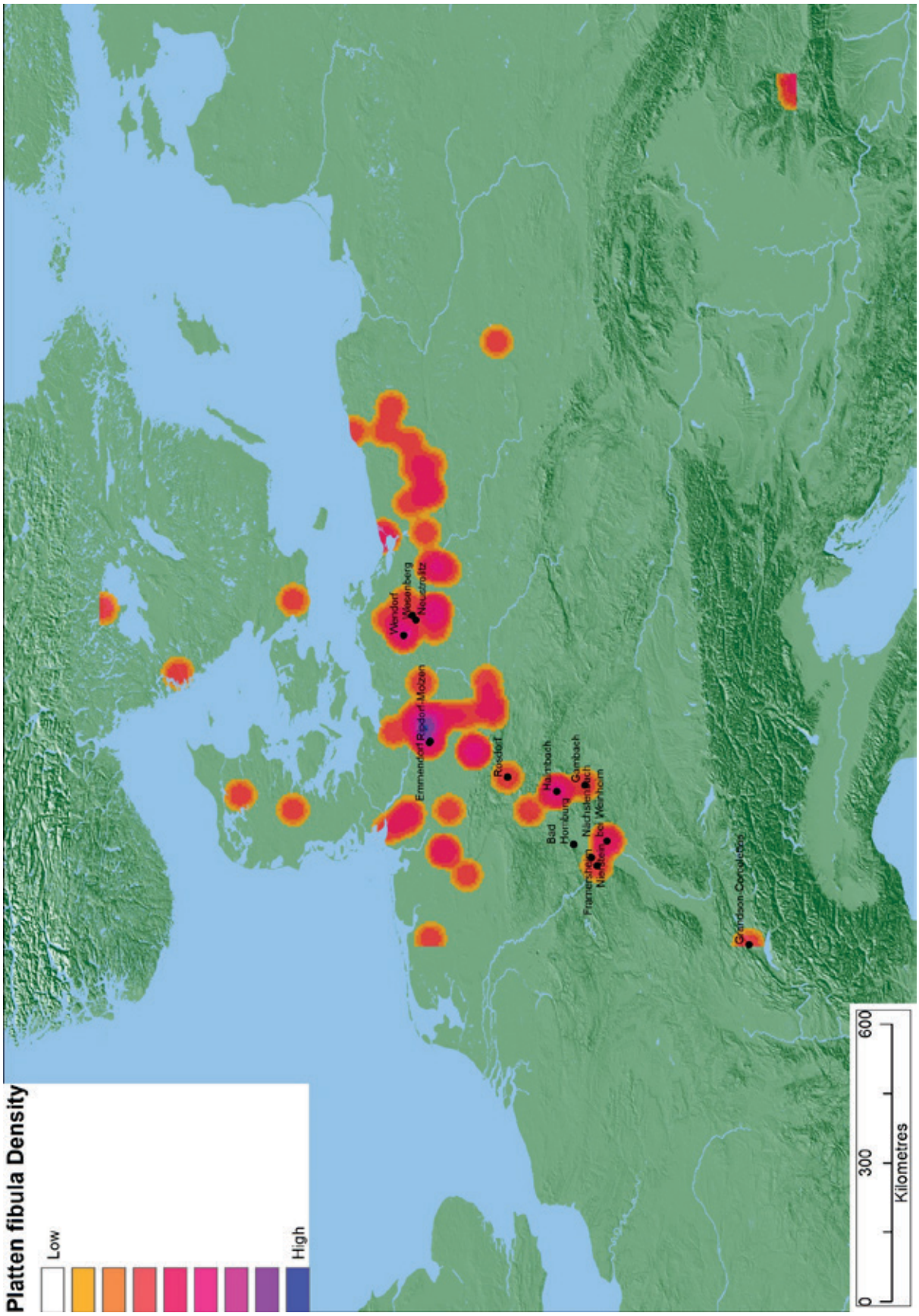
Map 174: Density distribution of *Corcelettes* type LBA arm-/leg-rings. High density is observed around Lake Neuchâtel (CH), with dispersed instances in western Switzerland and the Middle Rhine Valley (FR; D). Some *Corcelettes* rings overlap with other ring jewellery types is seen (Map 172 & Map 173), but they did not travel as far as other objects, for example *Pfahlbauperlen* (Map 155) or *Pfahlbau* spearheads (Map 178).



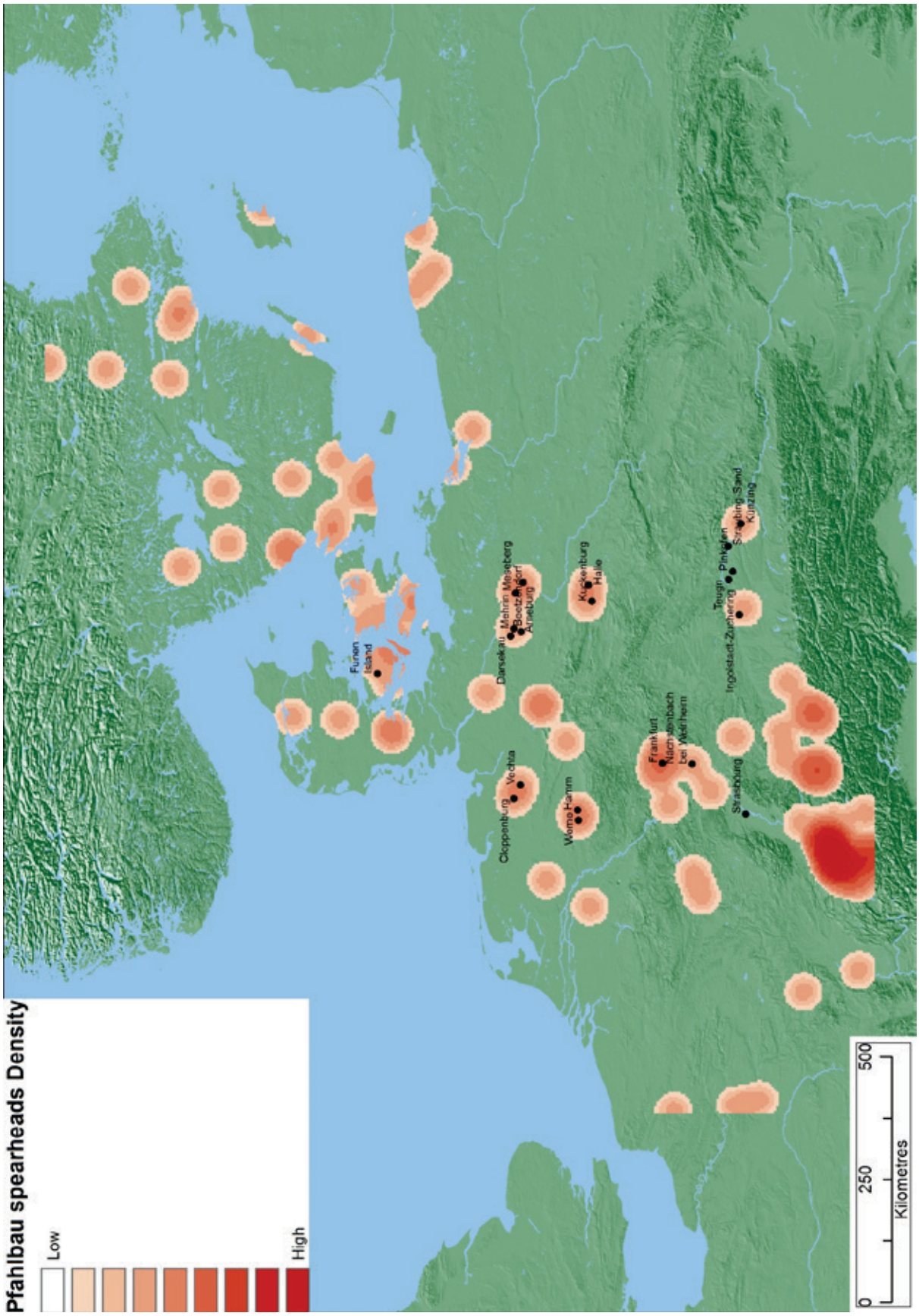
Map 175: Density distribution of Late Bronze Age *Hanging Vessels*. Primary distribution of these bronze vessels is in Denmark, and particularly Funen Island, with isolated examples in the Middle Rhine Valley (FR; D) and at Grandson-Corcelettes (Lake Neuchâtel, Switzerland). Considerable overlap with *West Baltic* type spearheads (Map 179) and *Platten* fibula (Map 177) is seen in northern Germany (e.g. around Wendorf).



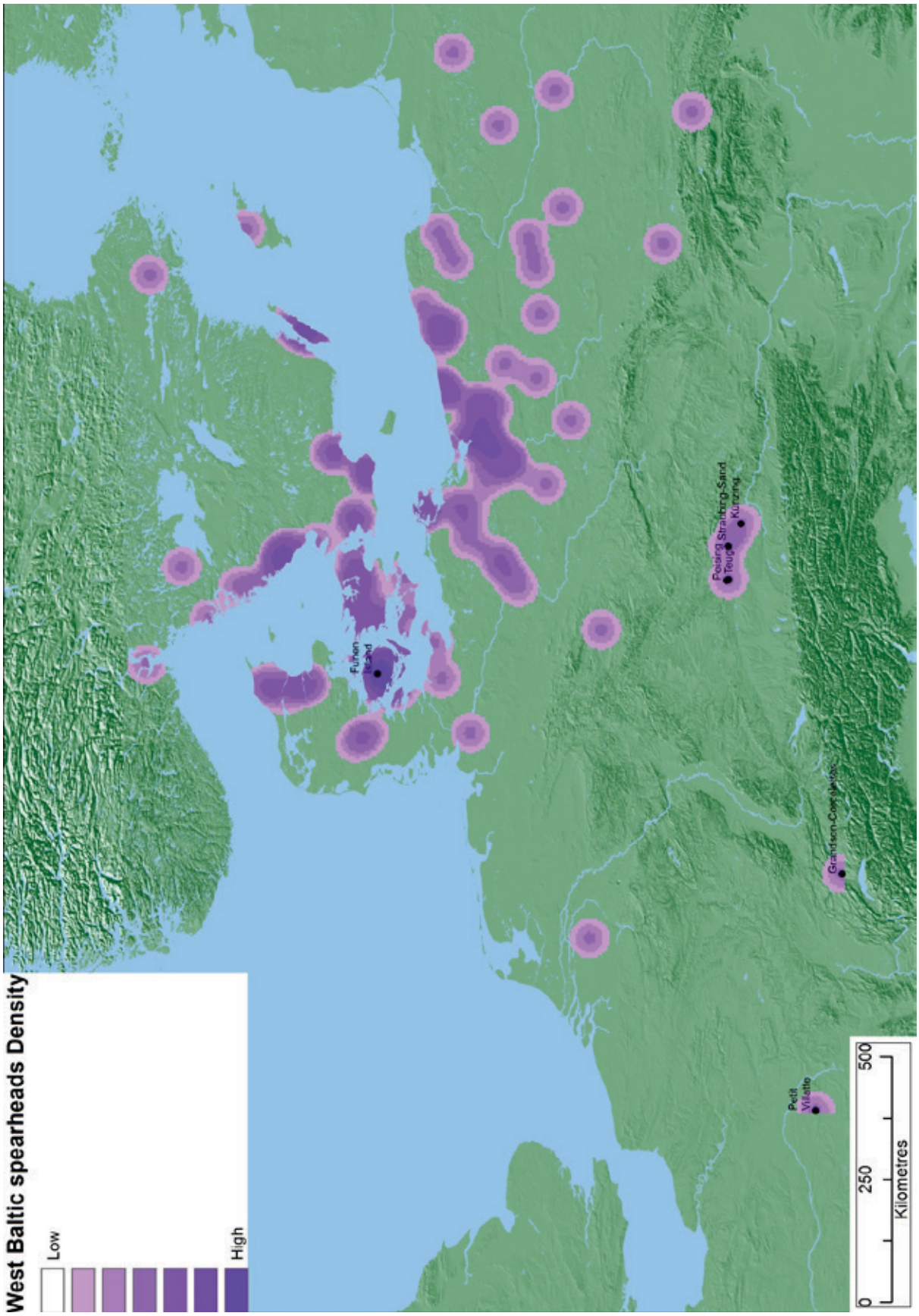
Map 176: Density distribution of Late Bronze Age *Jenišovice* cups (not all examples from Denmark mapped, as detailed in Section 5.4.2.6). Occasional examples overlap with *Homburg* type ring jewellery (Map 172), e.g. Marnay Évans (FR) and with *Pfahlbau* spearheads (Map 172), e.g. around Darsekau (D).



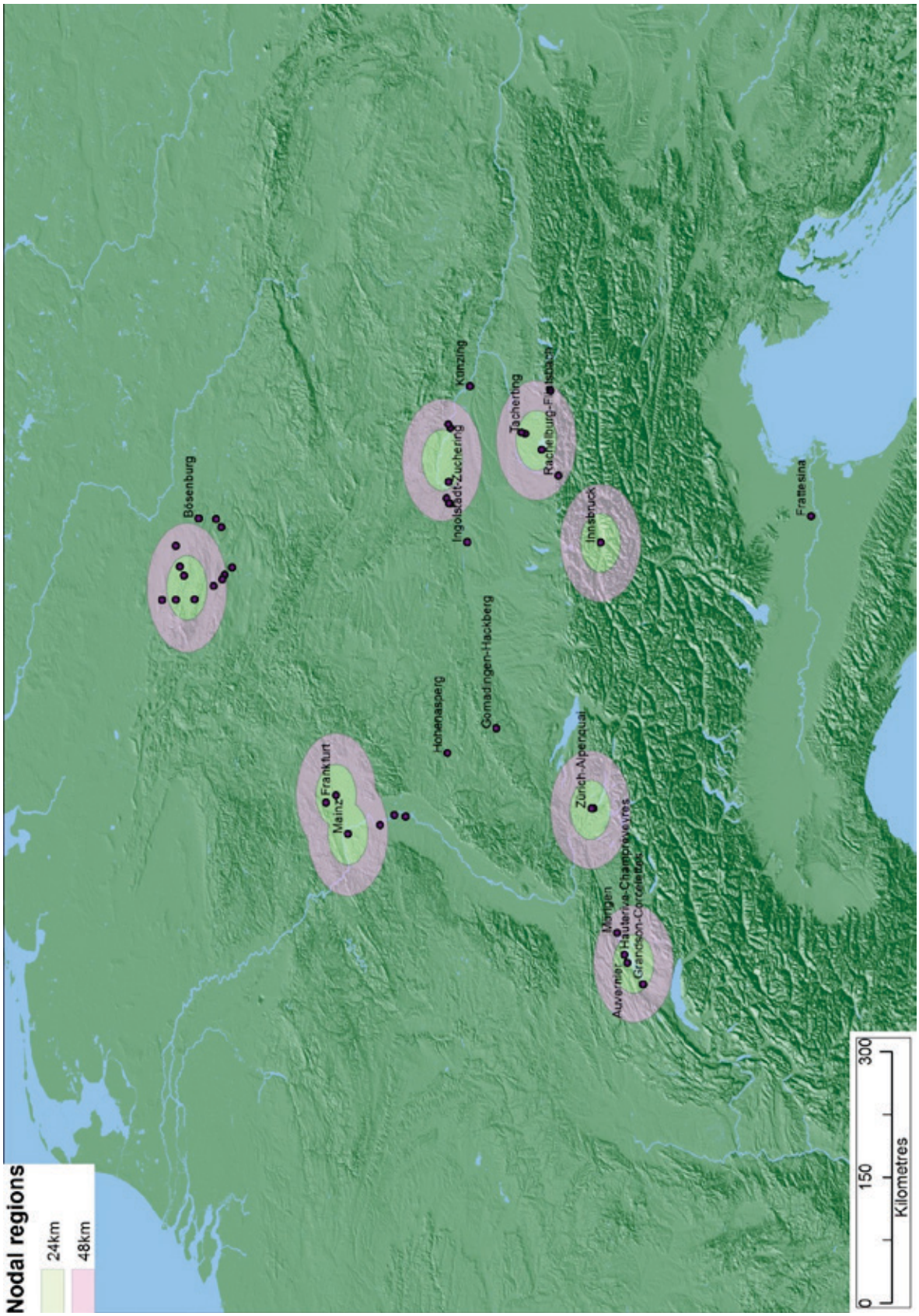
Map 177: Density distribution of LBA *Platten* fibula. Primary distribution of these vessels is in northern Germany and Denmark, with isolated examples in the Middle Rhine Valley (D) and at Grandson-Corcelettes (Lake Neuchâtel, CH). Some overlap with *Pfahlbau* and *West Baltic* spearheads can be seen (compare Map 178 and Map 179), but relatively little with *Pfahlbauperlen* (Map 155).



Map 178: Density distribution of *Pfahlbau* LBA spearheads. Little overlap is seen with *West Baltic* type LBA spearheads outside of nothern Germany and Funen Island (DK), though possible exceptions occur around Künzing (D). With increasing distance from the nCA relatively little overlap occurs with *Pfahlbauperlen* (Map 155) or *Socketed* knives (Map 158).



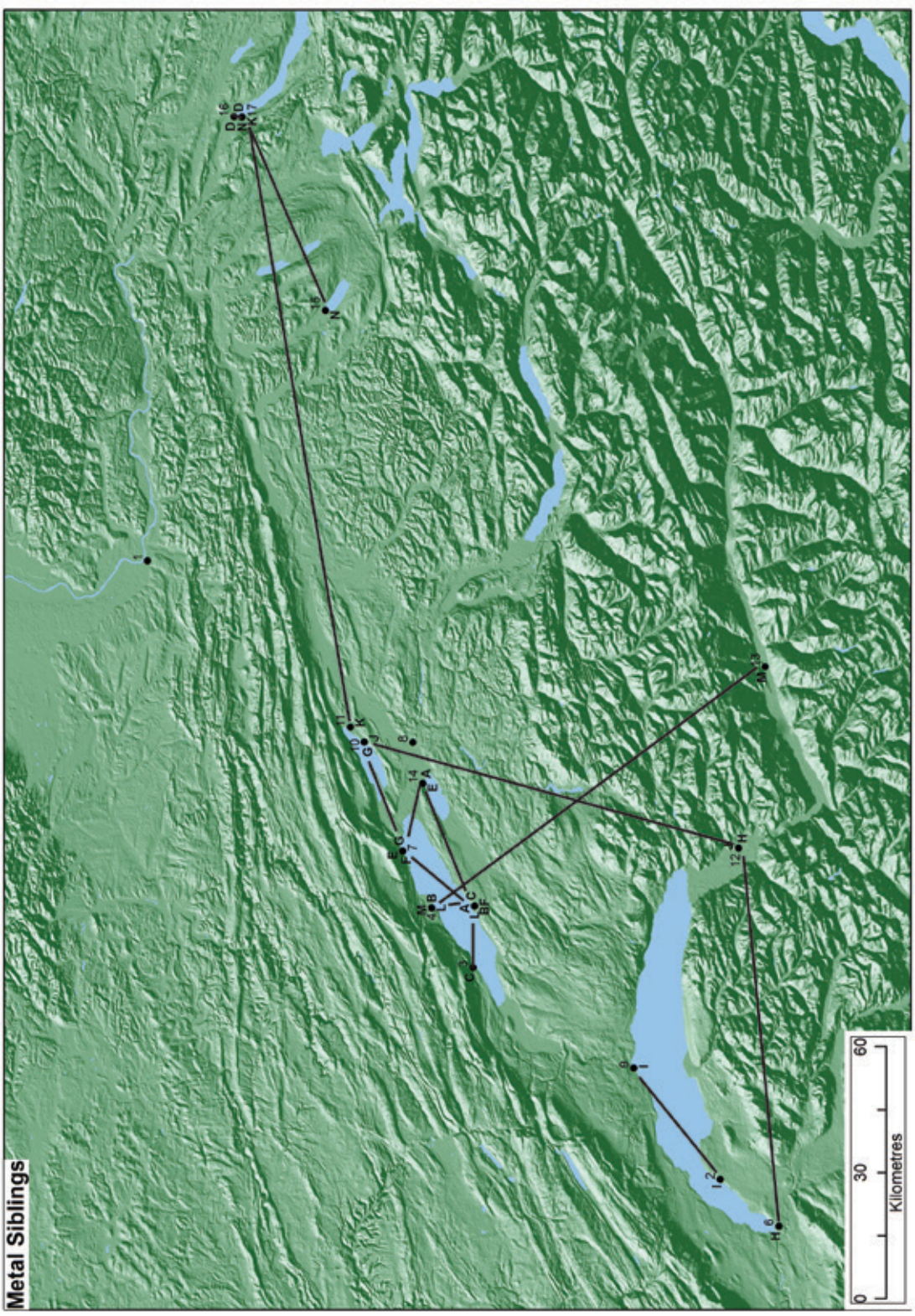
Map 179: Density distribution of *West Baltic* LBA spearheads. Primary distribution occurs in northern Germany, Poland, and Denmark, especially on Funen Island (DK). Notable examples outside of the region are at Grandson-Corcelettes (CH). Overlap with *Pfahlbau* spearheads (Map 178) may occur around Künzing (D).



Map 180: Possible 'nodal' zones or regions on the transport routes connected to the northern Circum-Alpine region. Halo shown at 24km and 48km radii, based on travel estimates of c. 24km per day (cf. Kniesel 2013). Sites relate to possible nodal settlements (e.g. Mörigen) or nodal areas (e.g. Frankfurt & Mainz) as detailed in Chapter 8. Frattesina shown without halo due to the known wide ranging extent of its trading links – e.g. southern Italy, eastern Mediterranean.

Map 181 (all sites in Switzerland; data from Rychner & Kläntschi 1995: 64-66)

No.	Site	Links
1	Basel-Elisabethenschanze	-
2	Chens-sur-Léman	I
3	Concise	C
4	Cortaillod	B; L; M
5	Estavayer-le-Lac	A; B; C; F; L
6	Genève-Eaux Vives	H
7	Hauterive-Champréveyres	E; F; G
8	Kerzers	-
9	Morges	I
10	Mörigen	G; J
11	Nidau	K
12	Ollon-Charpigny	H; J
13	Sion – Kapuzinerkloster	M
14	Sugiez	A; E
15	Sursee – Zellmoos	N
16	Zürich-Alpenquai	D
17	Zürich-Wollishofen	D; K; N



Map 181: Metal objects manufactured from the same ingot or in the same casting event. Numbers equate to sites listed on page 285; letters link sites together, i.e. A ↔ A. Sites without letter only have interal 'siblings'. (Data from Rychner & Kläntschi 1995).

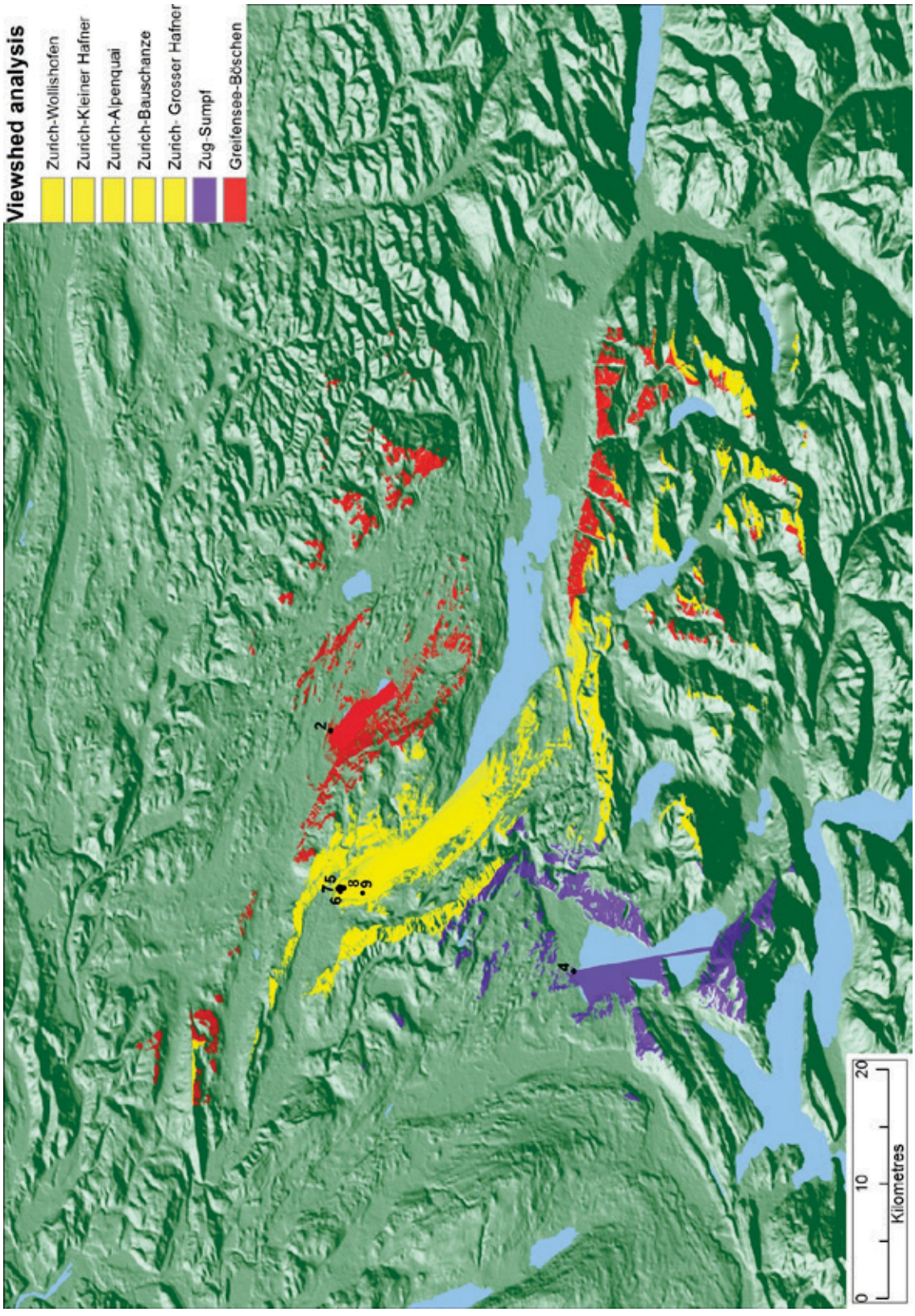
Viewshed Analysis

Viewshed conventions

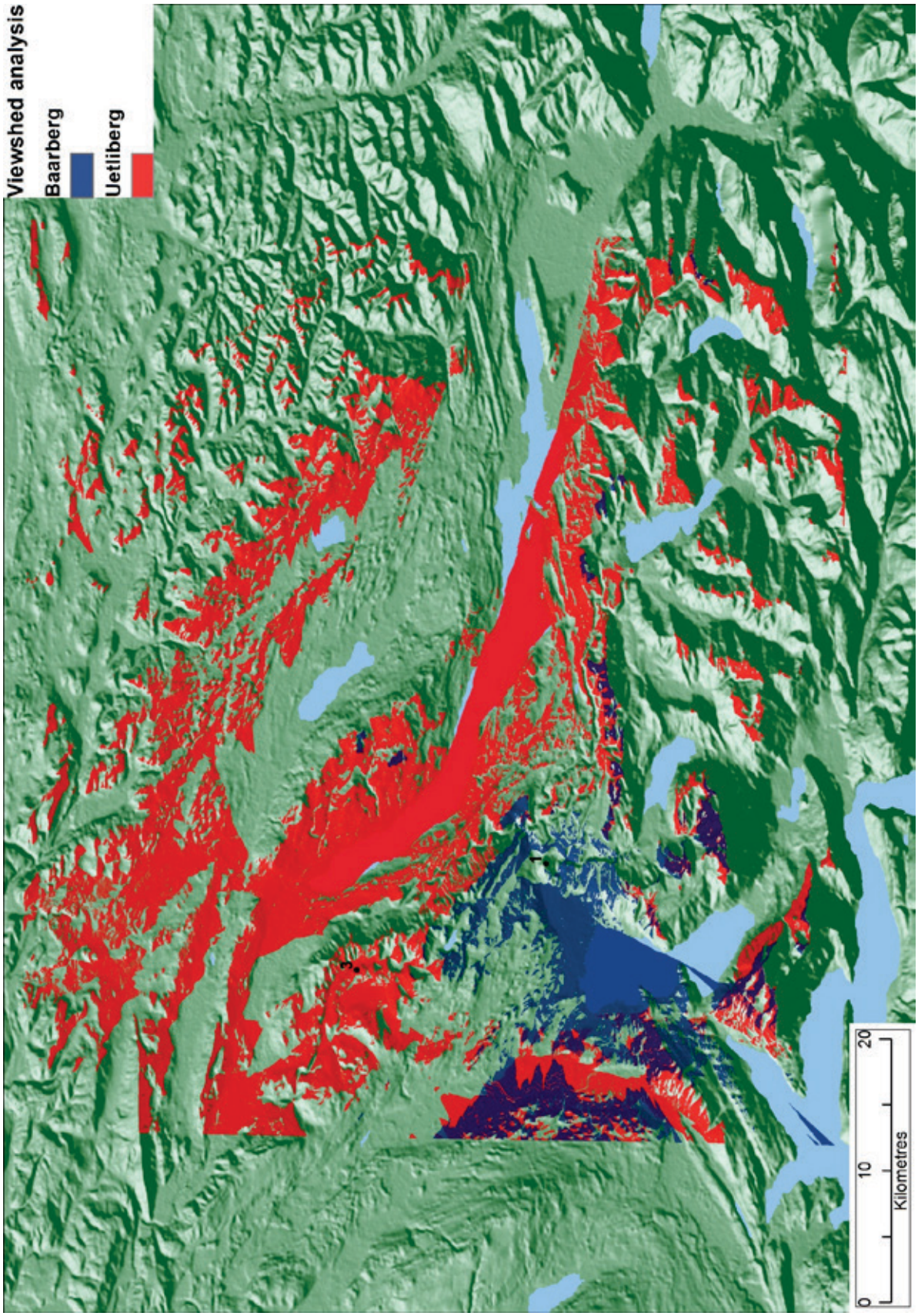
- All viewshed analysis completed using ArcMap 10 and DHM25 digital height model available from SwissTopo.

Viewshed 1 and Viewshed 2

No.	Site	Site type
1	Baarburg	Hilltop settlement
2	Greifensee-Böschen	Lake-dwelling
3	Üetliberg	Hilltop settlement / Fürstensitz
4	Zug-Sumpf	Lake-dwelling
5	Zurich-Kleiner Hafner	Lake-dwelling
6	Zurich-Alpenquai	Lake-dwelling
7	Zurich-Bauschanze	Lake-dwelling
8	Zurich-Grosser Hafner	Lake-dwelling
9	Zurich-Wollishofen-Haumesser	Lake-dwelling



Viewshed 1: GIS viewshed analysis for Late Bronze Age lake-dwellings in the Lake Zurich, Lake Greifen, and Lake Zug regions. The potential visibility, and therefore presence in the landscape, of lake-settlements appears rather limited when compared to hilltop settlements (compare Viewshed 2).



Viewshed 2: Potential viewshed from the Üetliberg (3)and Baarburg (1) Late Bronze Age and Iron Age hilltop settlements. Both sites show much greater visibility than the LBA lake-dwellings (compare Viewshed 1). Between the two hilltop settlements, the Üetliberg was potentially far more visible than the Baarburg, which may have been a factor in the rise of the former site to a *Fürstensitz* during the Iron Age HaD period.

Charts and Multiple Correspondence Analysis Charts

Multiple Correspondence Analsysis Chart conventions.

- Variables plotted with both Absence (-0) and Presence (-1) labels. Labels abbreviated as below:

Abbreviation	Category
A	Small metal work
B	Beads
BV	Bronze Vessels
C	Ceramics
D	Domestic
F	Fastners
H	Horse
I	Inorganics
K	Keys
L	Large Jewellery
M	Metal working
O	Small Jewellery
R	Organics
T	Tools
U	Utensils
V	Vessels
W	Weapons

- Observations plotted with variable labels dependent upon display of chart; detailed in individual chart captions.
- Supplementary Variables and Observations plotted as per key in individual charts.
- Multiple Correspondence Analysis completed using XLSTAT 2013.

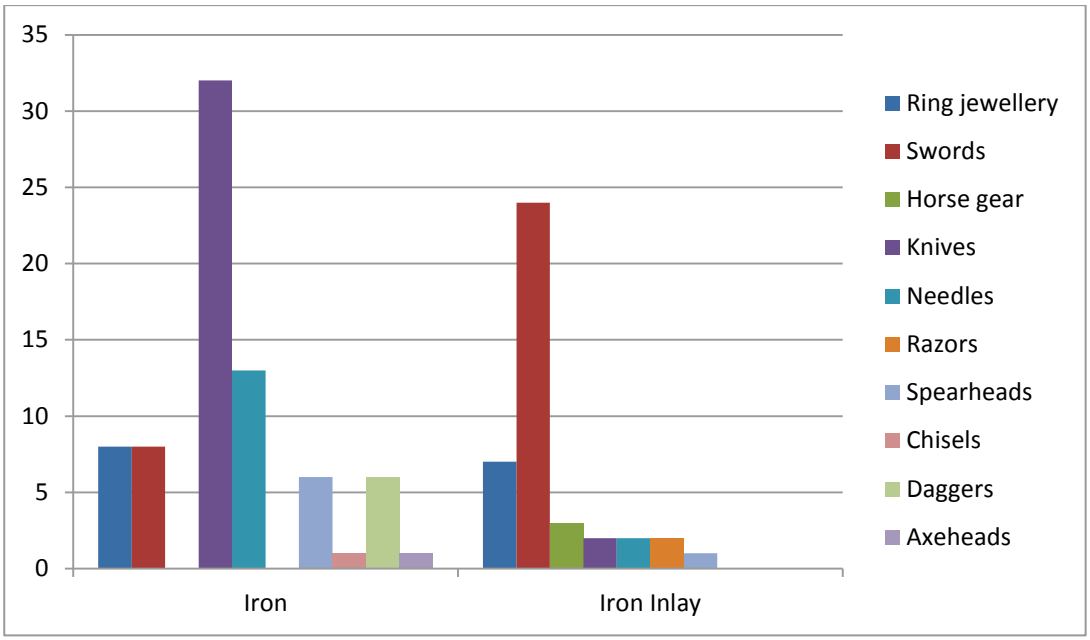


Chart 1: Quantities of objects made of iron, and iron decorated objects (iron inlay) from Late Bronze Age contexts in central Europe, grouped by object type.

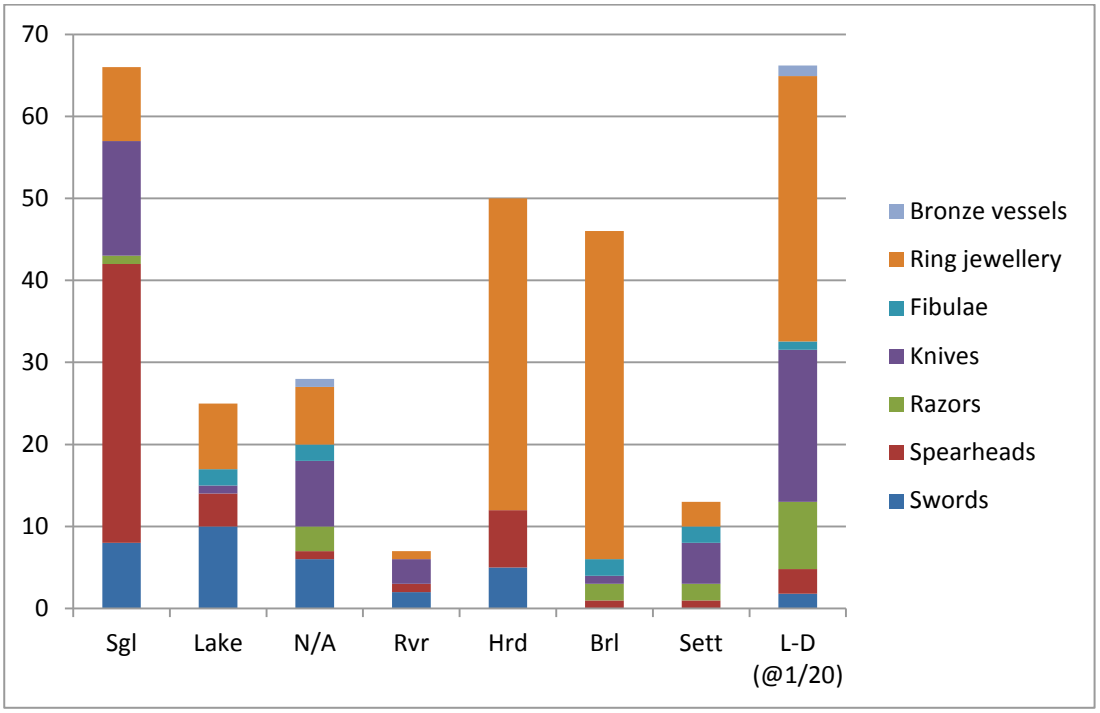


Chart 2: Frequency of objects by context in the northern Circum-Alpine region of Switzerland. Sgl = single find; Lake = Lake find without context; N/A = No provenance information available; Rvr = River; Hrd = Hoard; Brl = Burial; Sett = Inland settlement; L-D = Lake-dwelling. (Objects from hoards in lake-dwellings are classified under lake-dwelling. Lake Dwelling column at 1/20th of value to increase visibility of other classes).

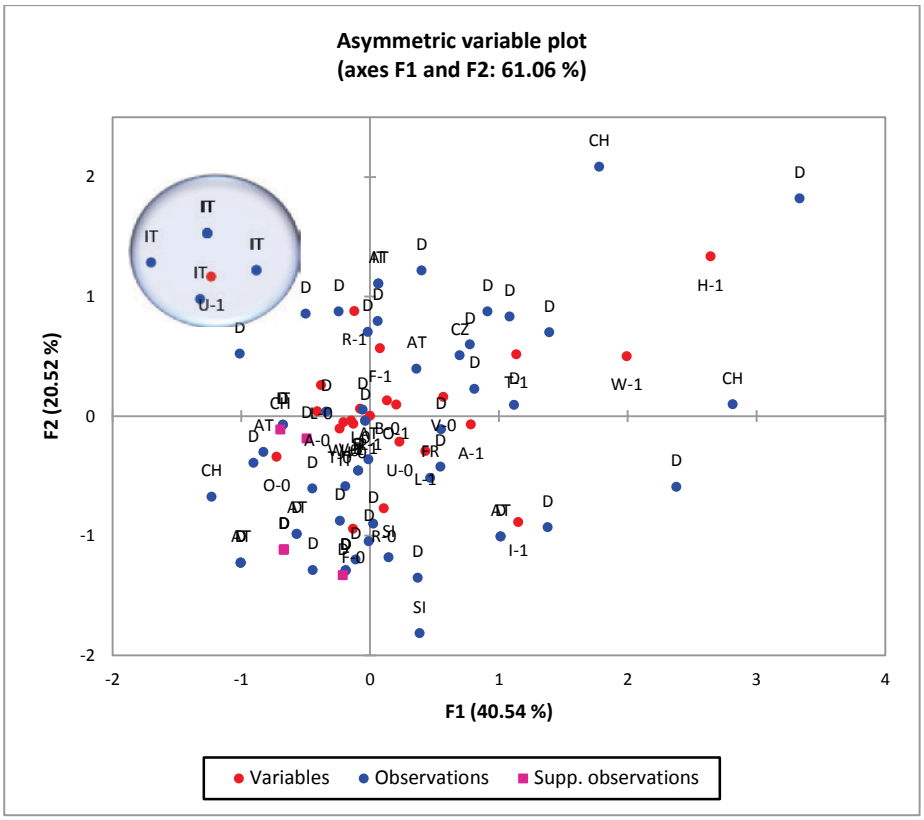


Chart 3: MCA analysis of assemblages including *Pfahlbauperlen*, labelled by country. AT = Austria; CH = Switzerland; CZ = Czech Republic; D = Germany; IT = Italy. Circle denotes cluster of burial assemblages from Italy. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

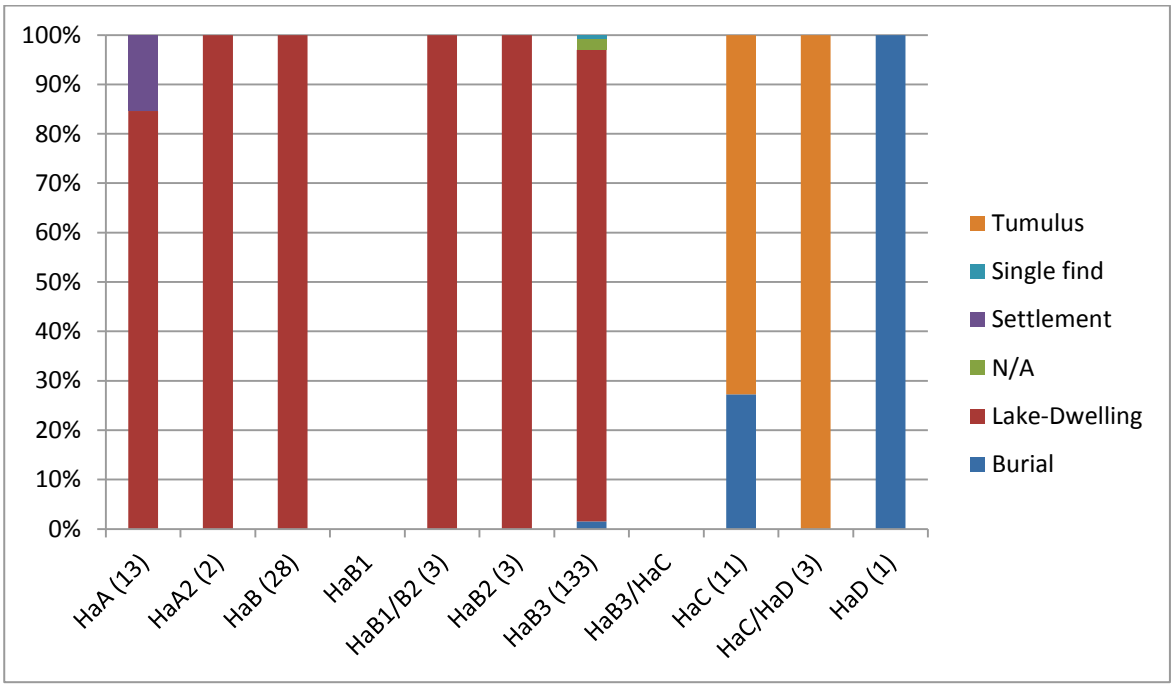


Chart 4: Contexts for all razors detailed in text (Section 5.4.2.1) from the nCA, grouped by time period. Number in brackets relates to quantity of razors recorded (see Figure 7 for detailed regional chronology). N/A = Not available.

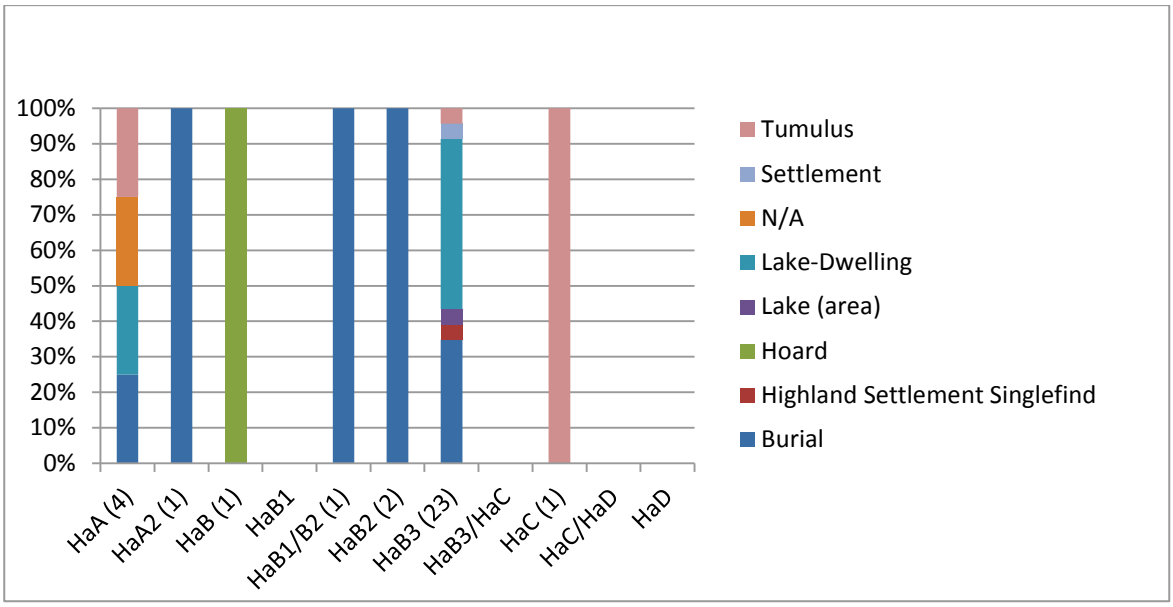


Chart 5: Contexts for razors from southern Germany (Section 5.4.2.1), grouped by time period. Number in brackets relates to quantity of razors recorded (see Figure 7 for detailed regional chronology). N/A = Not available.

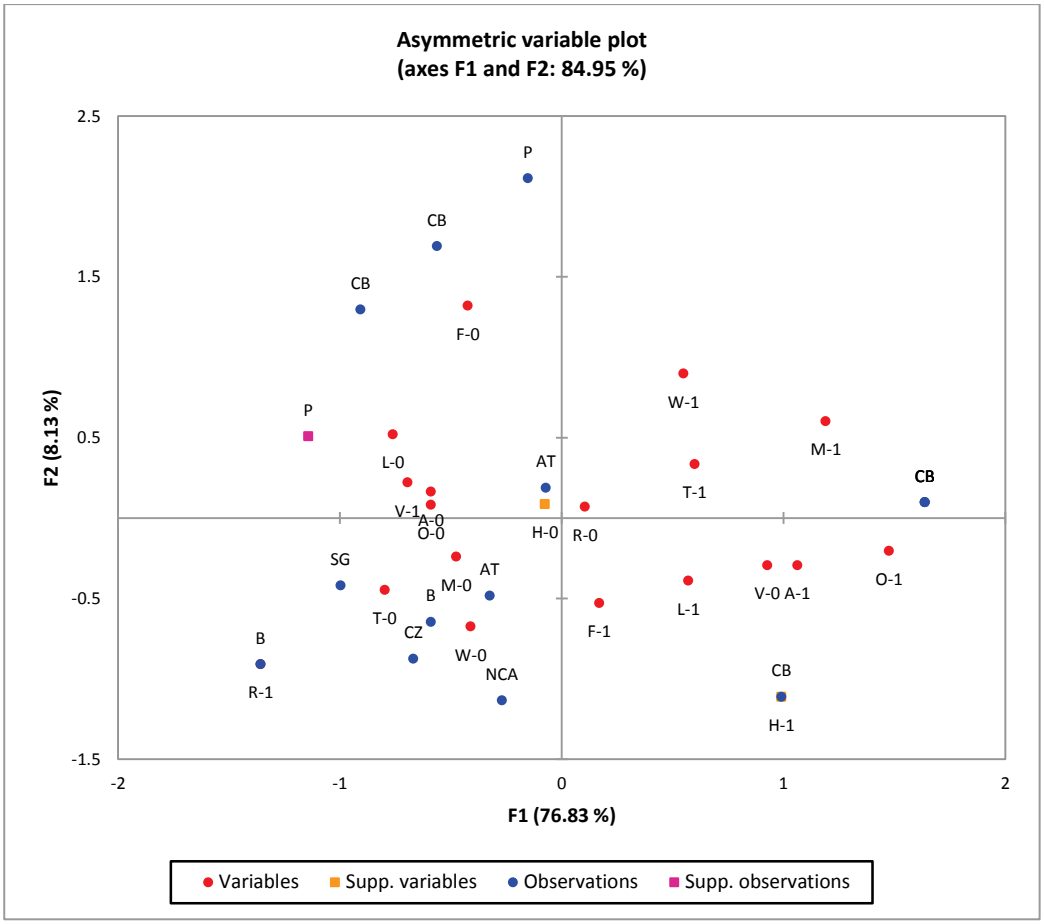


Chart 6: MCA for *Herrnbaumgarten* razors with associated objects in their find contexts. AT = Austria; B = Balkans; CB = Carpathian Basin; CZ = Czech Republic; NCA = northern Circum-Alpine region; SG = southern Germany; P = Poland. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

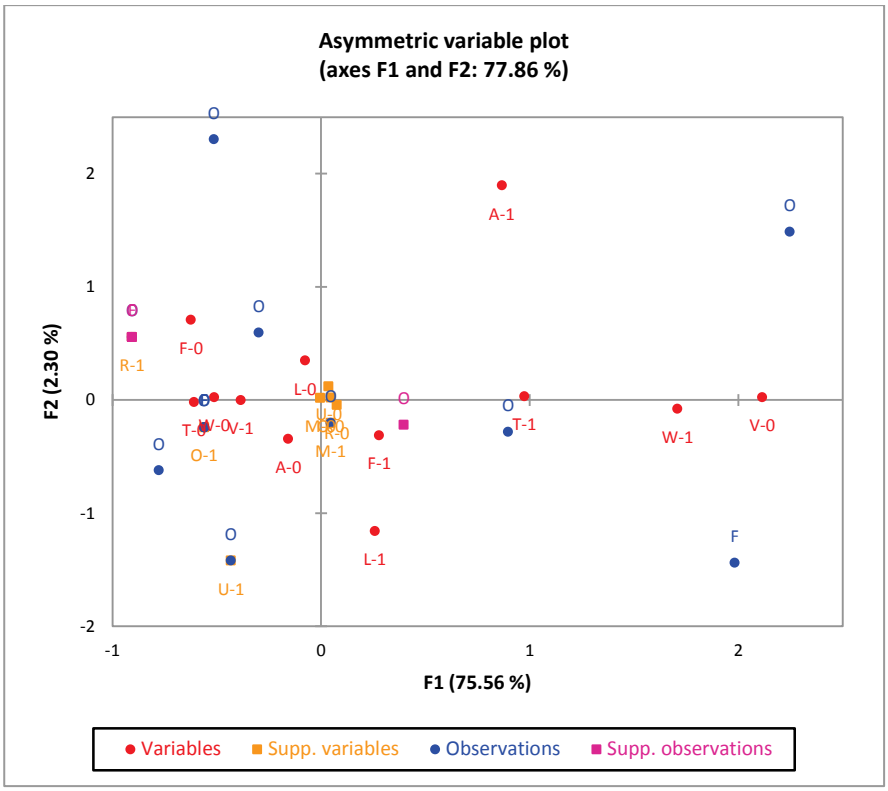


Chart 7: MCA for *Oblekovice* and *Fontanella* type razors. F = *Fontanella*; O = *Oblekovice*. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

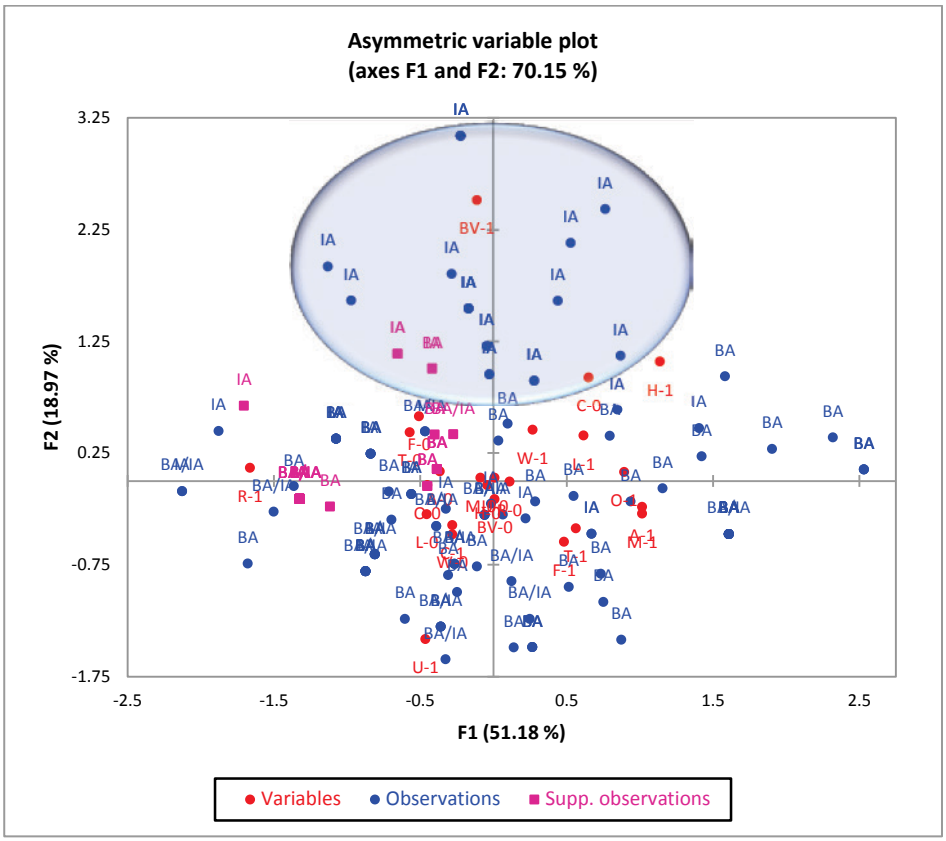


Chart 8: MCA of LBA and EIA razors with associated finds. BA = Late Bronze Age; IA = early Iron Age. Main distribution of early Iron Age razors highlighted by the oval area. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

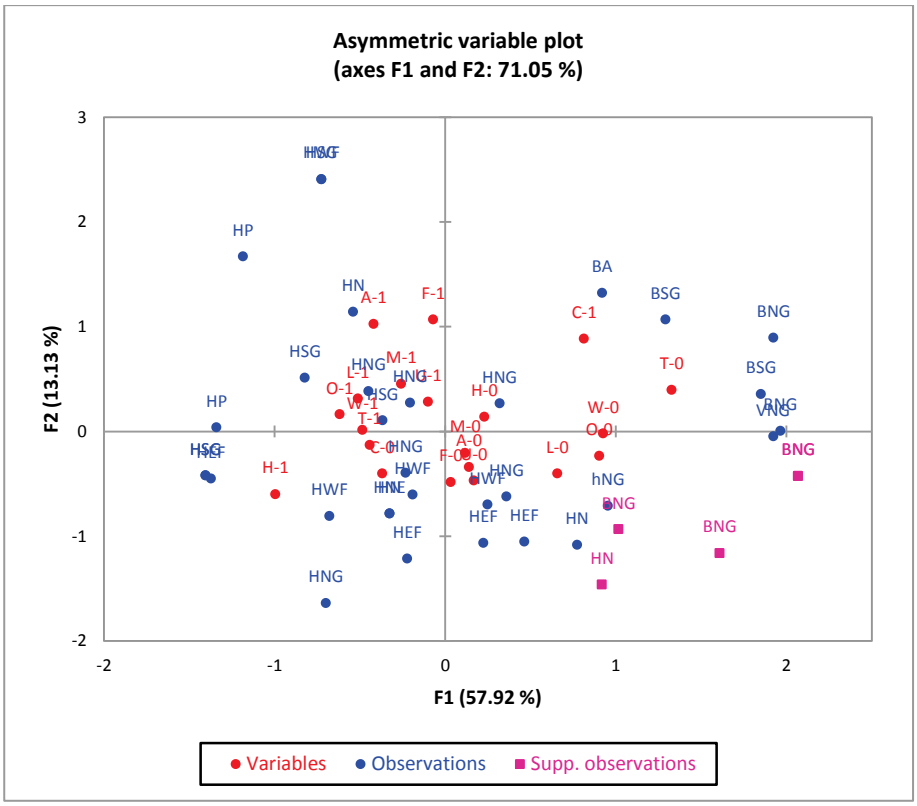


Chart 9: MCA of *Tüllenmesser* by context and region. B = Burial; b = burial?; H = Hoard; h = hoard?; N = northern Europe; EF = eastern France; NG = northern Germany; WF = western France; SG = southern Germany; P = Poland. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

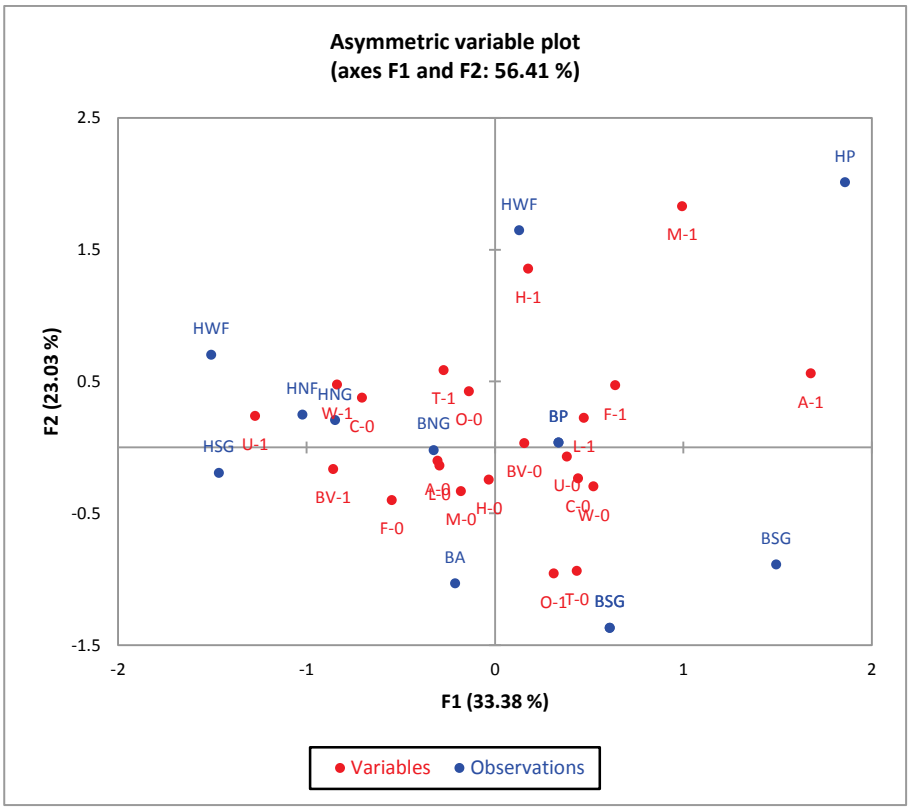


Chart 10: MCA of *Phantasie* handle knives. B = Burial; H = Hoard. A = Austria; EF = eastern France; NE = northern Europe; NG = northern Germany; P = Poland; SG = southern Germany; WF= western France. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

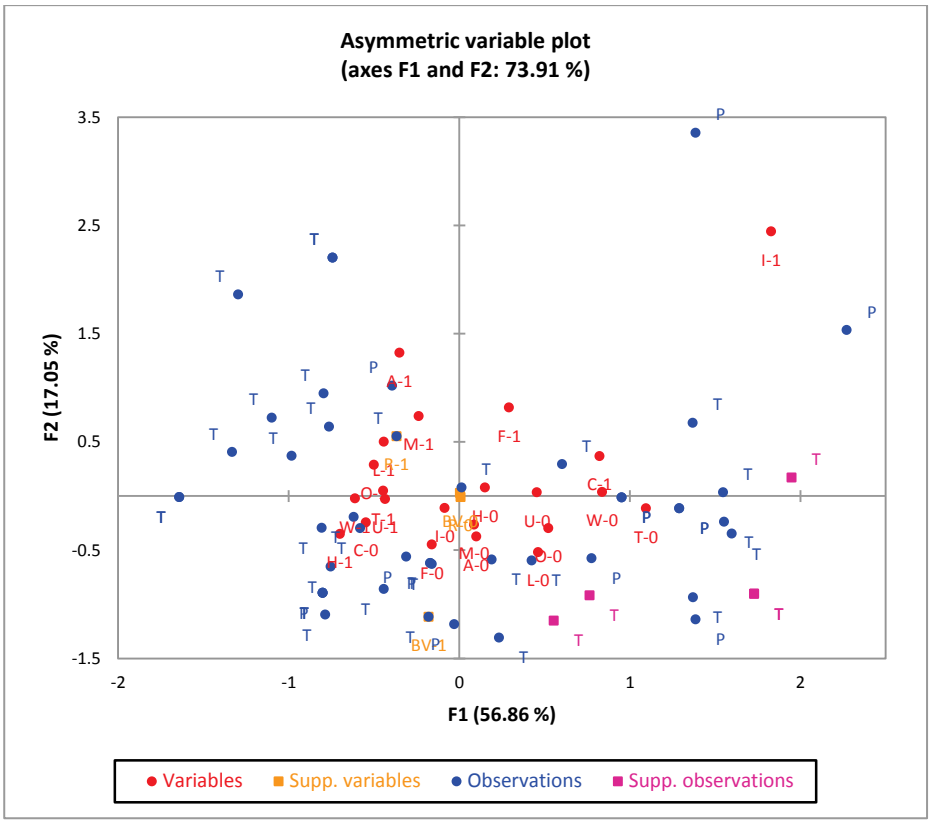


Chart 11: MCA comparison of *Tüllen* and *Phantasie* knife assemblages. T = *Tüllenmesser*; P = *Phantasiemesser*. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

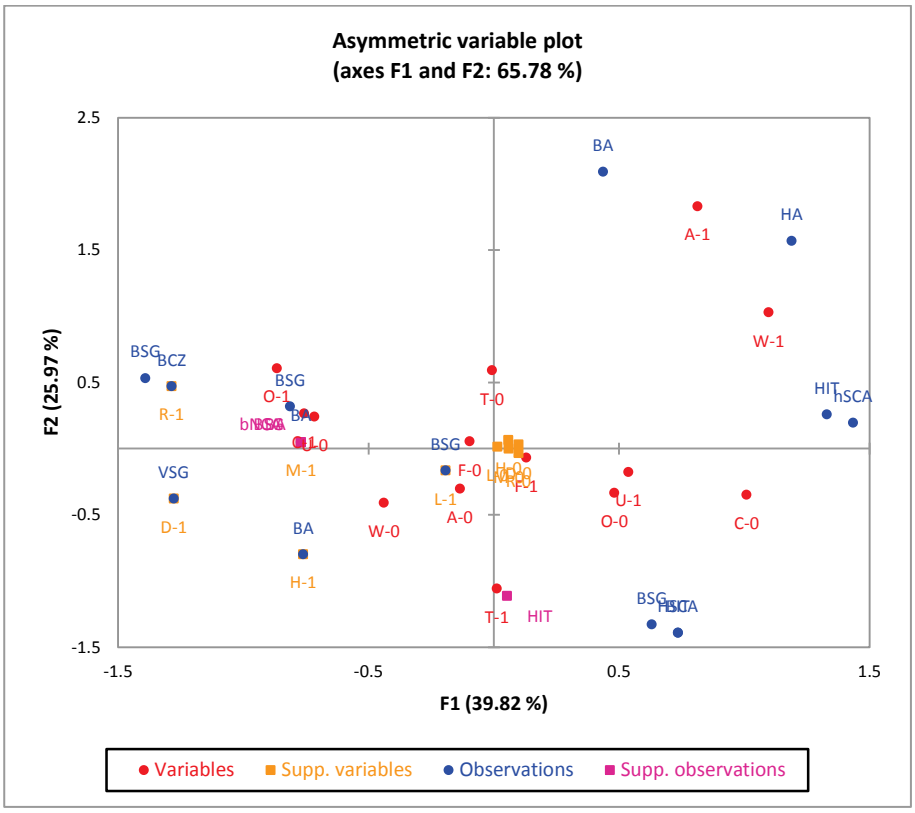


Chart 12: MCA *Matrei* group knives. B = Burial; H = Hoard. A = Austria; CZ = Czech Republic; IT = Italy; NCA = northern Circum-Alpine region; SCA = southern Circum-Alpine region; SG = southern Germany. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

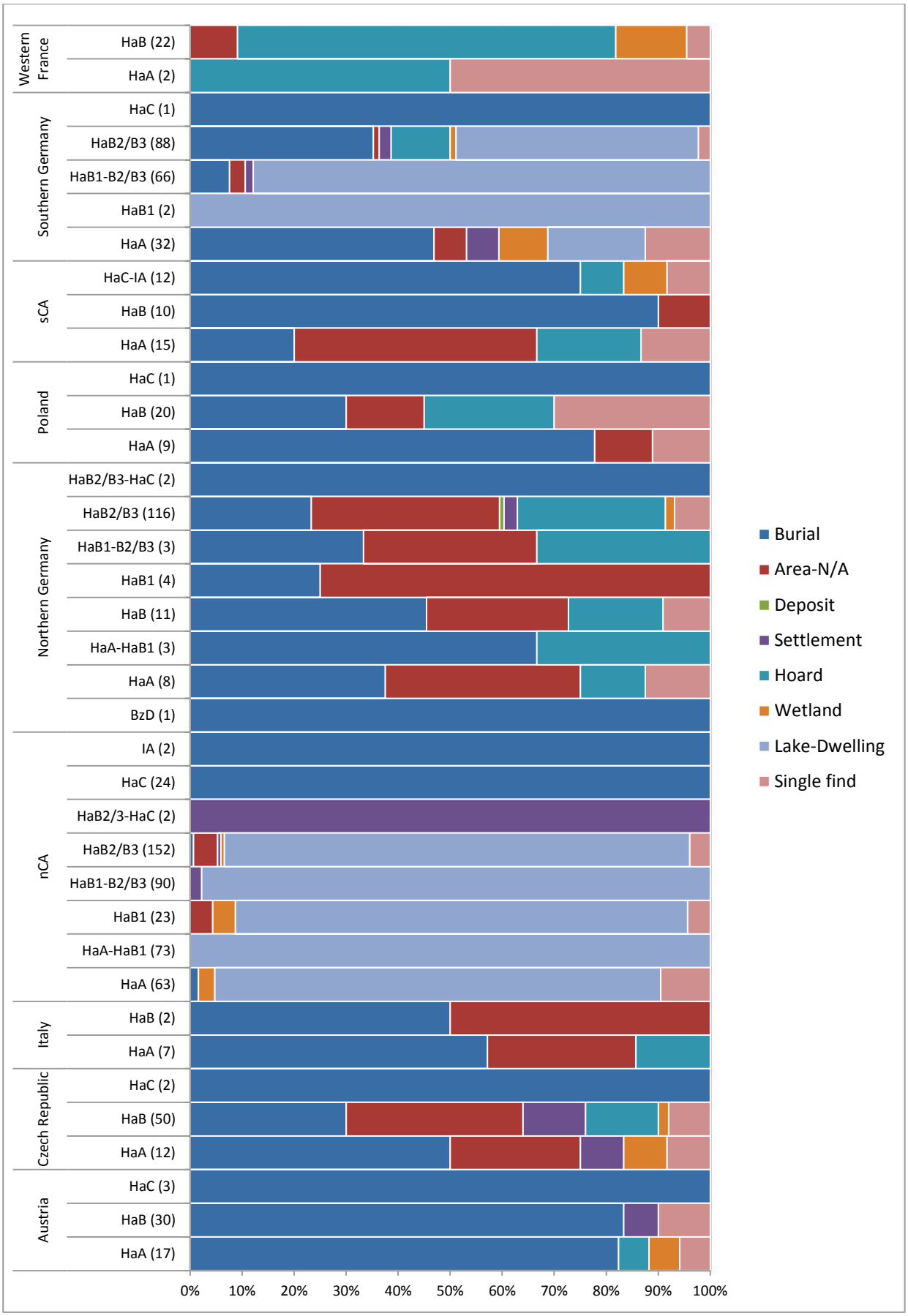


Chart 13: Comparison of find contexts for all knives detailed in text seperated by region and period (Section 5.4.2.2). Number in bracketes indicates quantity of knives recorded. N/A = Not available. (For detailed regional chronology see Figure 7).

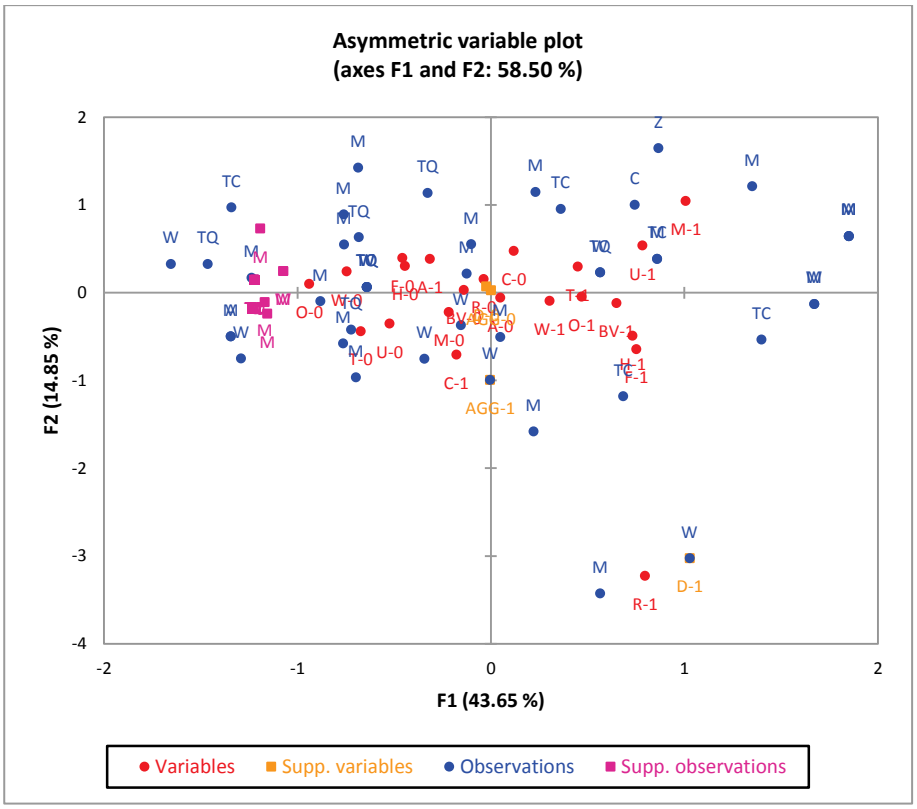


Chart 14: MCA of Late Bronze Age sword types. A= *Auvernier*; C = *Corcelettes*; M = *Mörigen*; TC = *Tachlovice*; TQ = *Tarquinia*; W – *Weltenburg*. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

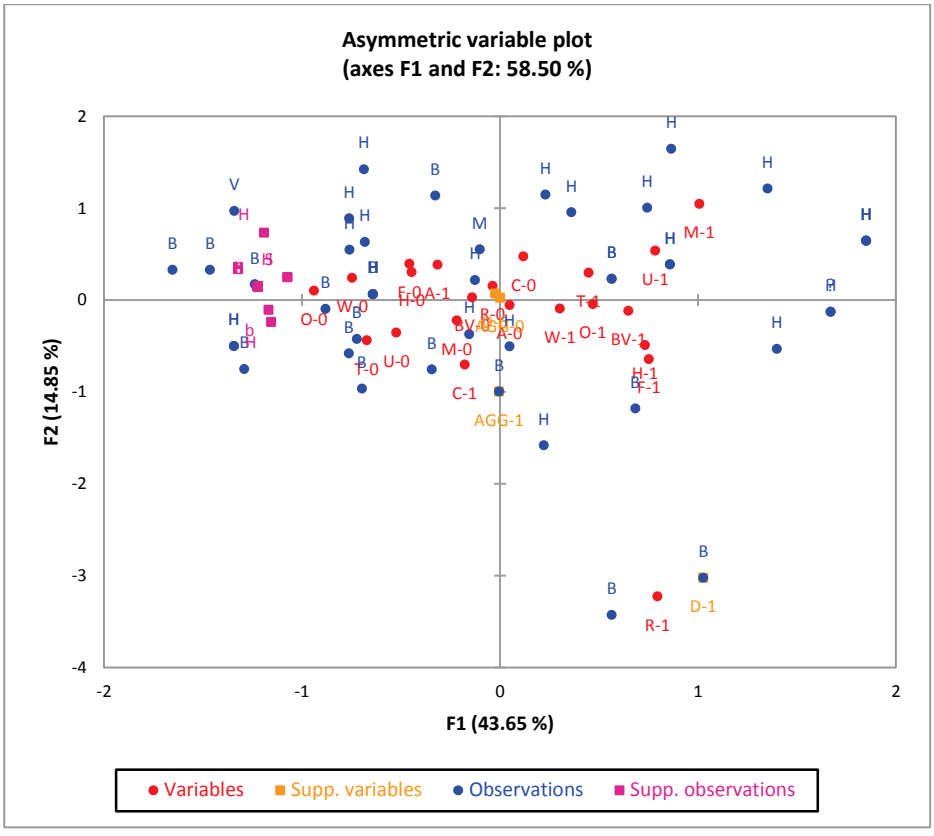


Chart 15: MCA of find contexts for LBA sword types. B = Burial; b = burial?; H = Hoard; h = hoard?; V = Settlement; ? = Un-known. Sword types as in Chart 14. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

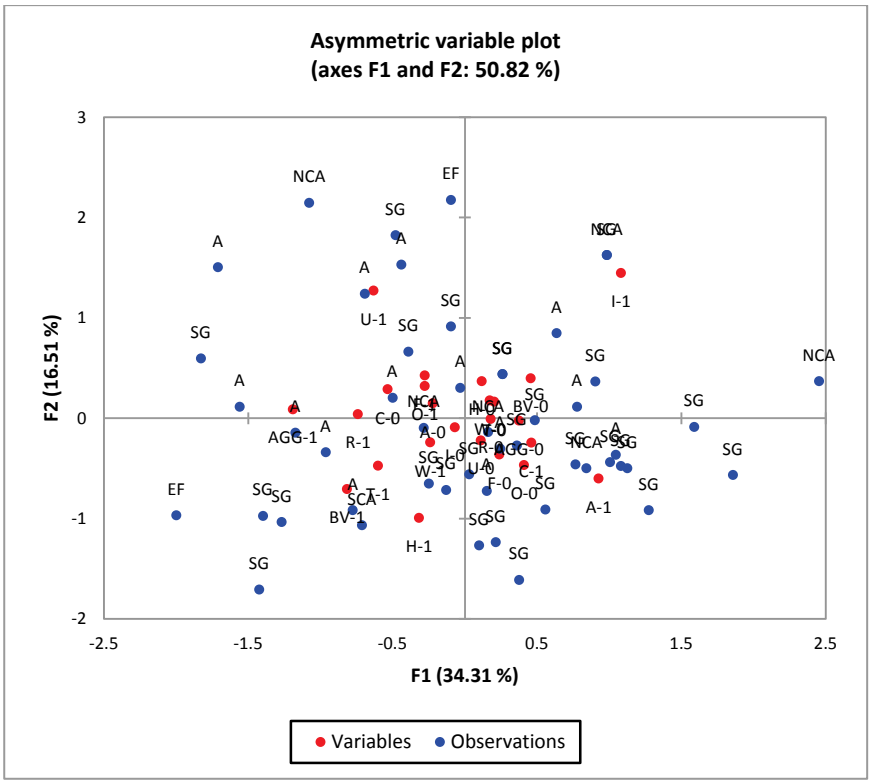


Chart 16: MCA of Iron Age daggers by region. A = Austria; EF = eastern France; NCA = northern Circum-Alpine region; NG = nothern Germany; SCA = southern Circum-Alpine region; SG = southern Germany. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

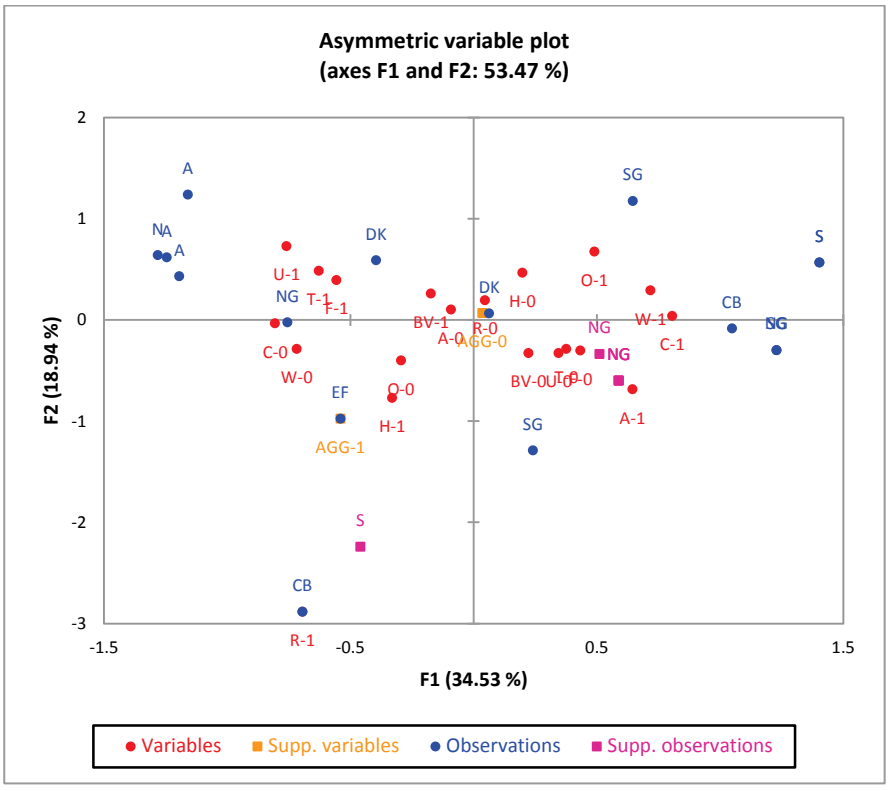


Chart 17: MCA of *Mindelheim* type swords. A = Austria; CB = Carpathian Basin; DK = Denmark; EF = eastern France; N = northern Europe; NG = northern Germany; S = Scandinavia; SG = southern Germany. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

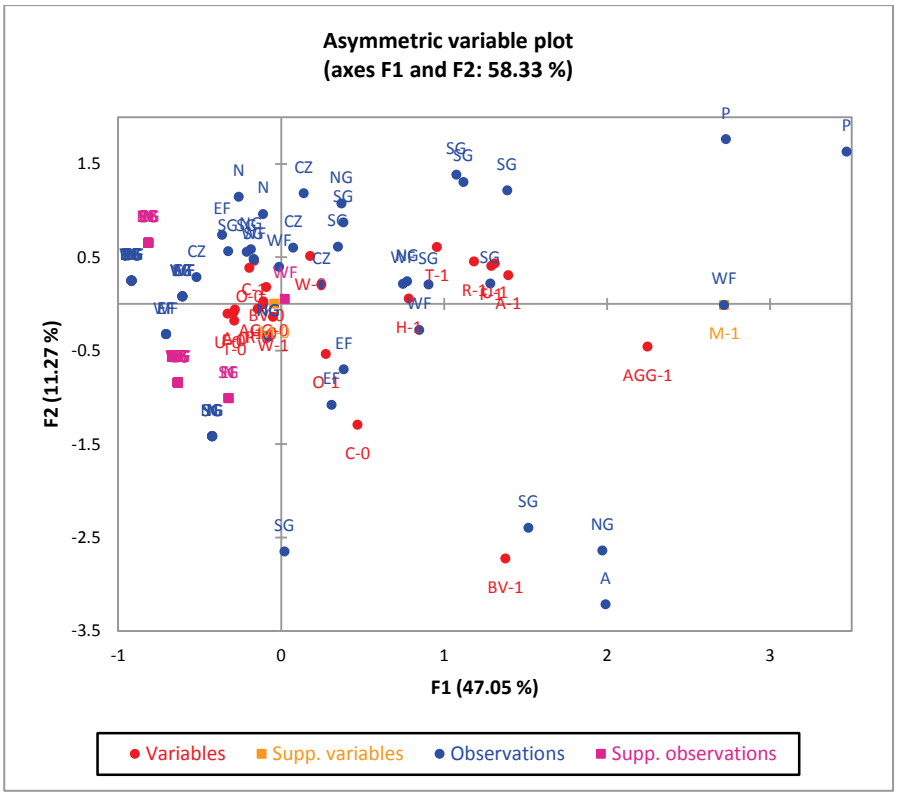


Chart 18: MCA of *Gündlingen* type swords. A = Austria; CZ = Czech Republic; EF = Eastern France; N = northern Europe; NG = northern Germany; P = Poland; SG = southern Germany; WF = western France. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

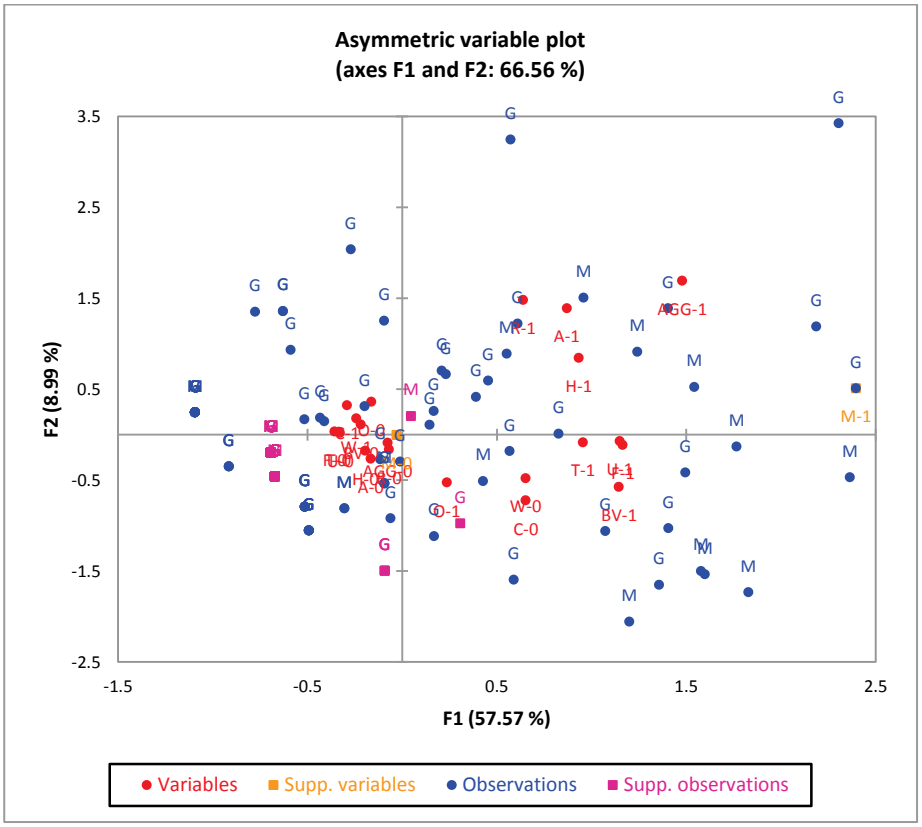


Chart 19: MCA of *Gündlingen* and *Mindelheim* swords. G = *Gündelingen*; M = *Mindelheim*. Regions as Chart 17 & Chart 18. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

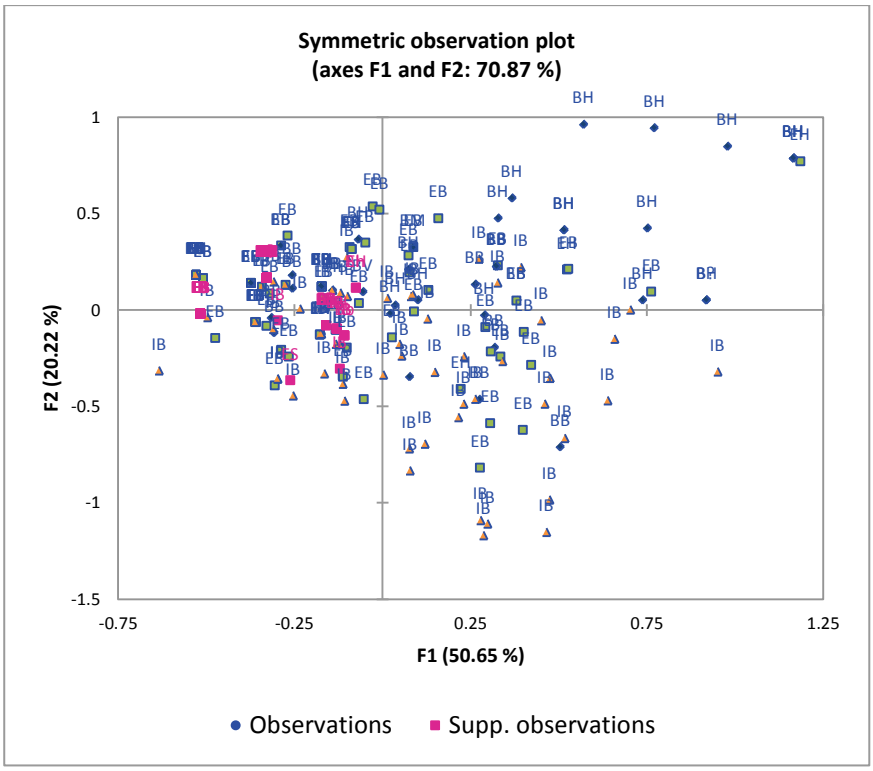


Chart 20: MCA of Late Bronze Age and Iron Age sword find contexts. BB = Bronze Age Burial; BH = Bronze Age Hoard; EB = early Iron Age Burial (*Gündlingen* & *Mindelheim* swords); EH = early Iron Age Hoard (*Gündlingen* & *Mindelheim* swords); IB = Iron Age Burial. Bronze Age = point; Early Iron Age = square; Iron Age = triangle (only for observations; supplementary observations = pink square).

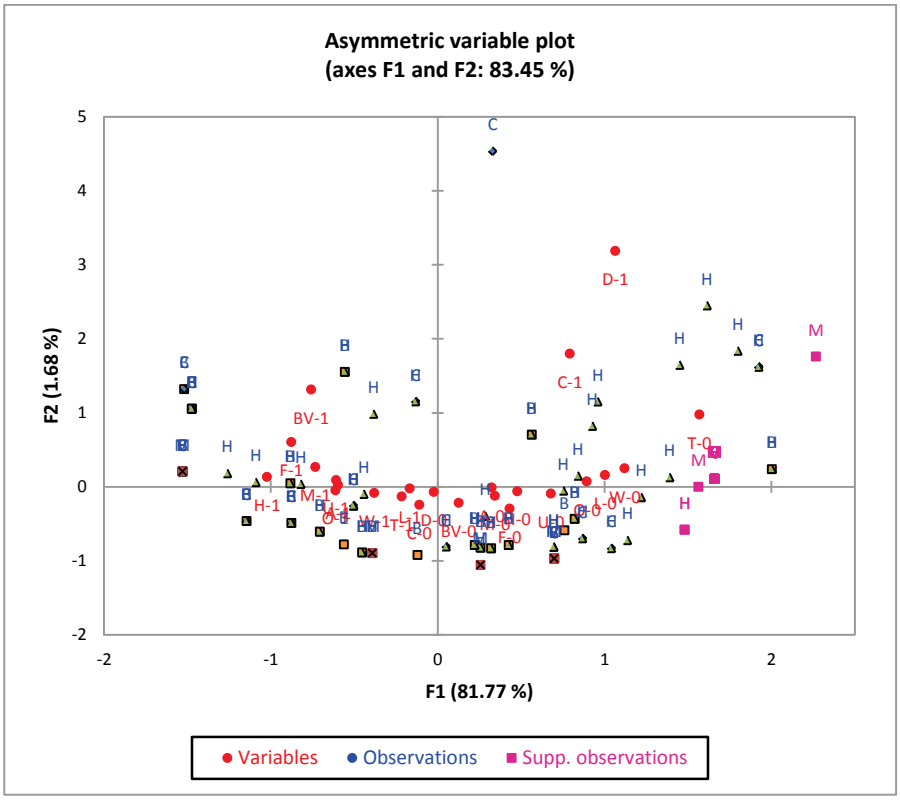


Chart 21: MCA of *Homburg* (H; Triangle), *Balingen* (B; orange Square), *Corcelettes* (C; Diamond), and *Mörigen* (M; Square with cross) type arm-/leg-rings from all regions. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

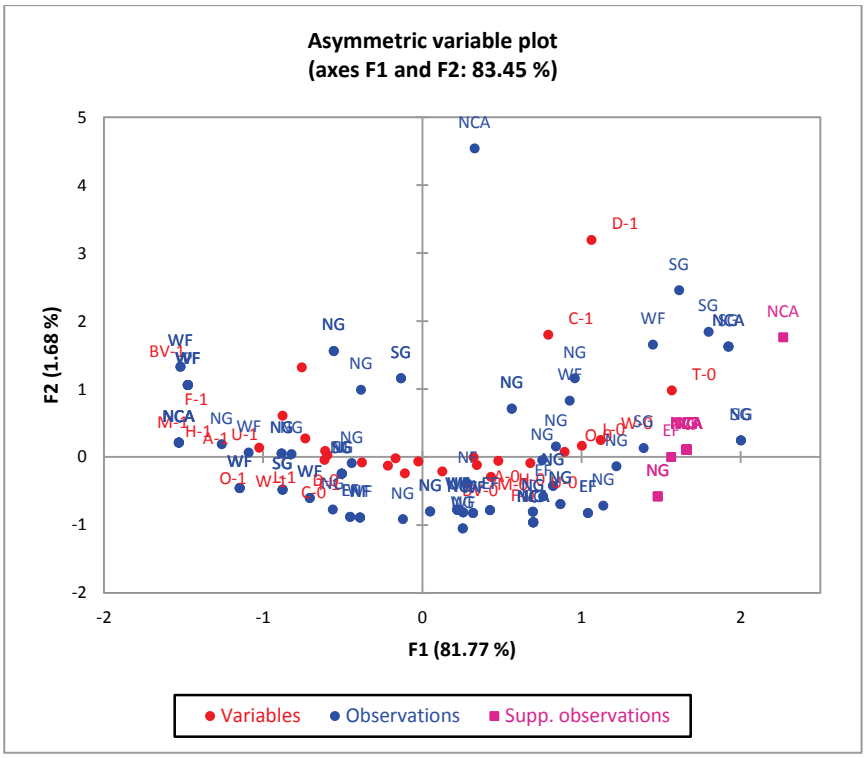


Chart 22: MCA of arm-/leg-ring types by origin. SG = southern Germany; nCA = northern Circum-Alpine region; NG = northern Germany; WF = western France; SG = southern Germany. Type as per Chart 21. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

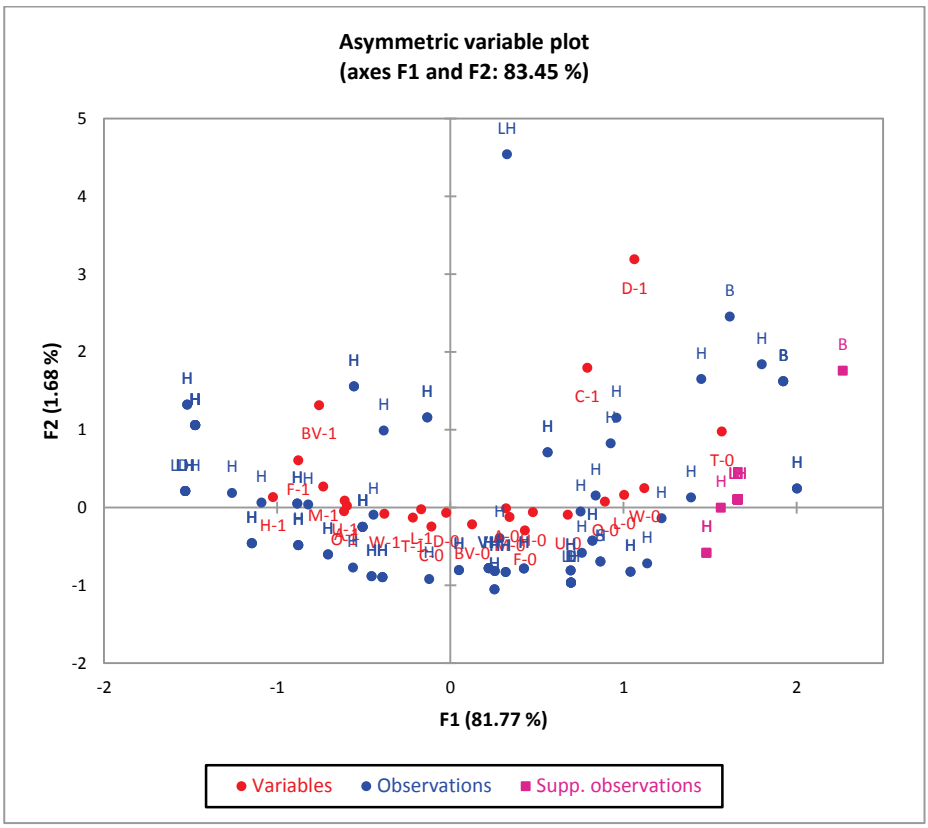


Chart 23: MCA of LBA arm-/leg-rings by context. B = Burial; D = Votive deposit; H = Hoard; L = Lake-Dwelling; LH = Lake-Dwelling hoard; S = Single find; VH = Settlement Hoard. Types as per Chart 21; Regions as per Chart 22. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

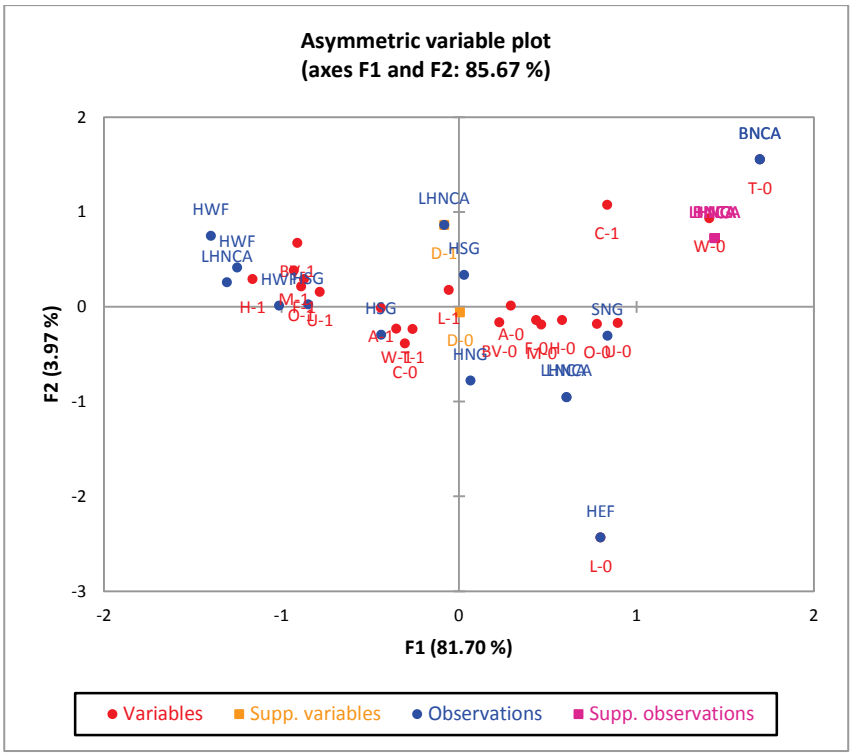


Chart 24: MCA of LBA *Corcelettes* type arm-/leg-ring assemblages by context and region. B = Burial; H = Hoard. EF = eastern France; NCA = northern Circum-Alpine region; NG = northern Germany; SG = southern Germany; WF = western France. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

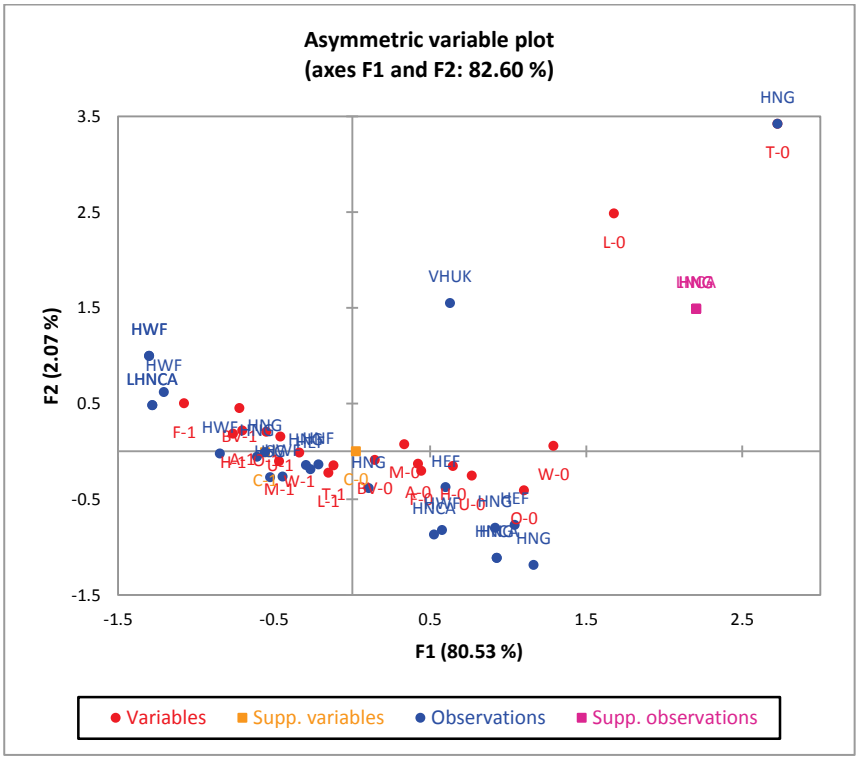


Chart 25: MCA of LBA *Balingen* type arm-/leg-ring assemblages by context and region. H = Hoard; L = Lake-Dwelling; VH = Setlement hoard. EF = eastern France; NCA = northern Circum-Alpine region; NF = northern France; NG = northern Germany; SG = southern Germany; UK = United Kingdom; WF = western France. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

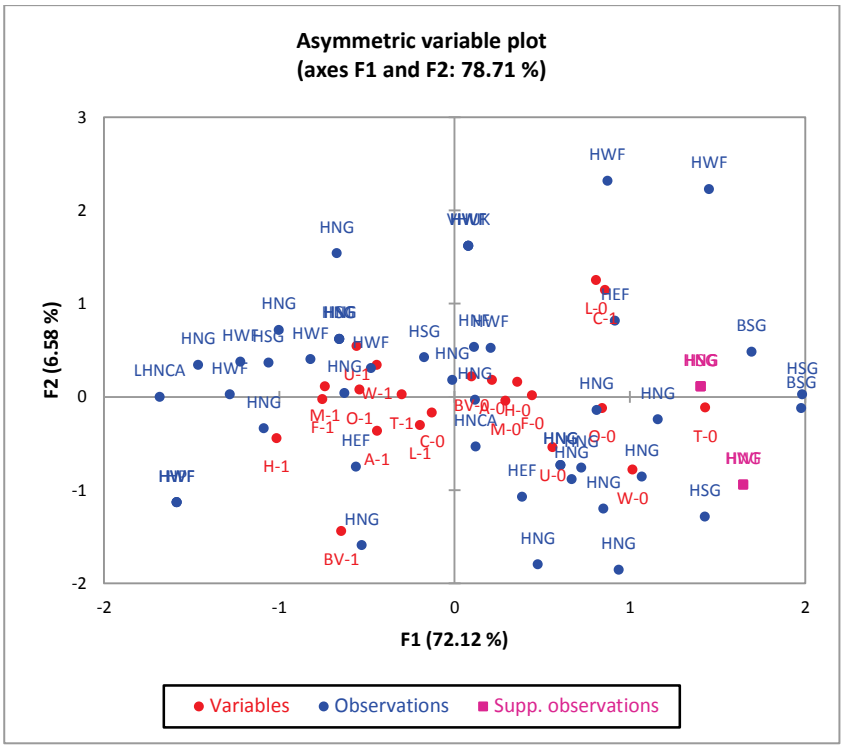


Chart 26: MCA of LBA *Homburg* type arm-/leg-ring assemblages by context and region. B = Burial; H = Hoard; LH = Lake-Dwelling hoard; VH = Settlement hoard. EF = eastern France; NCA = northern Circum-Alpine region; NF = nothern France; NG = northern Germany; P = Poland; SG = southern Germany; UK = United Kingdom; WF = western France. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

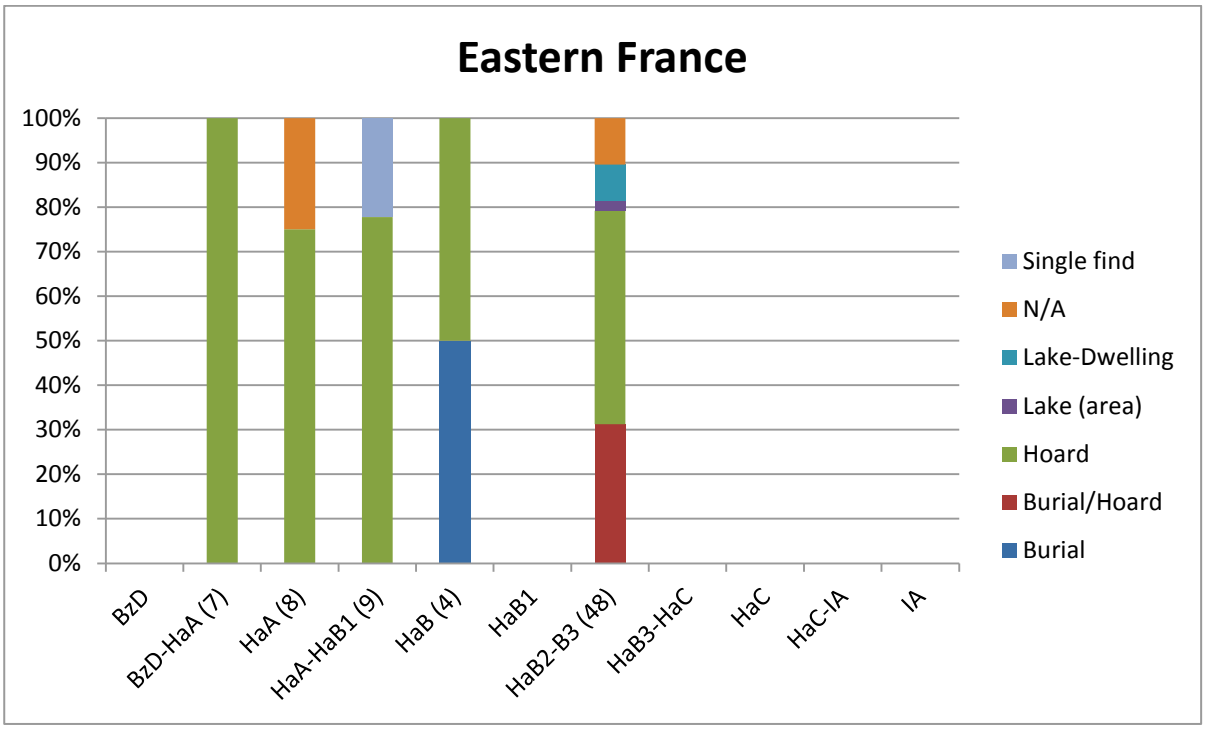


Chart 27: Find contexts from arm-/leg-rings of the types detailed in the text from eastern France, grouped by time period (see Figure 7 for detailed regional chronology). Number in brackets relates to quantity of rings recorded. N/A = Not available.

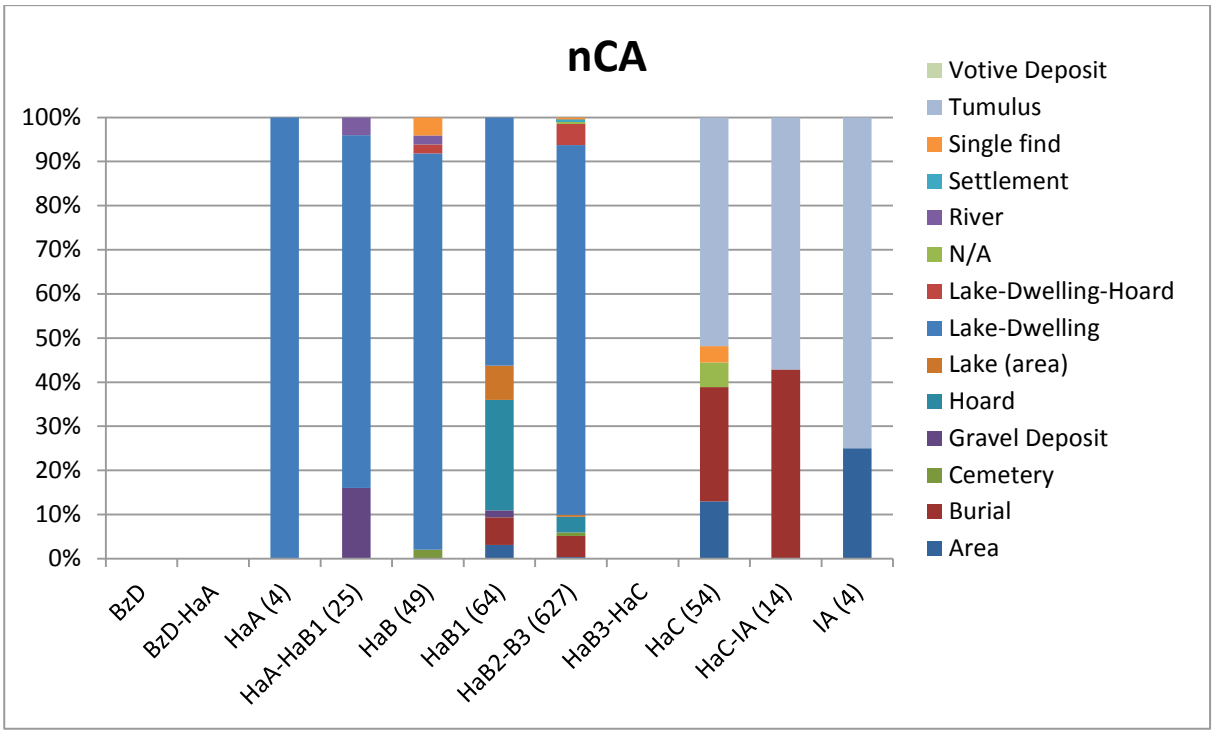


Chart 28: Find contexts for all arm-/leg-rings from the northern Circum-Alpine region, of types discussed in the text, grouped by time period (see Figure 7 for detailed regional chronology). Number in brackets relates to quantity of rings recorded. N/A = Not available.

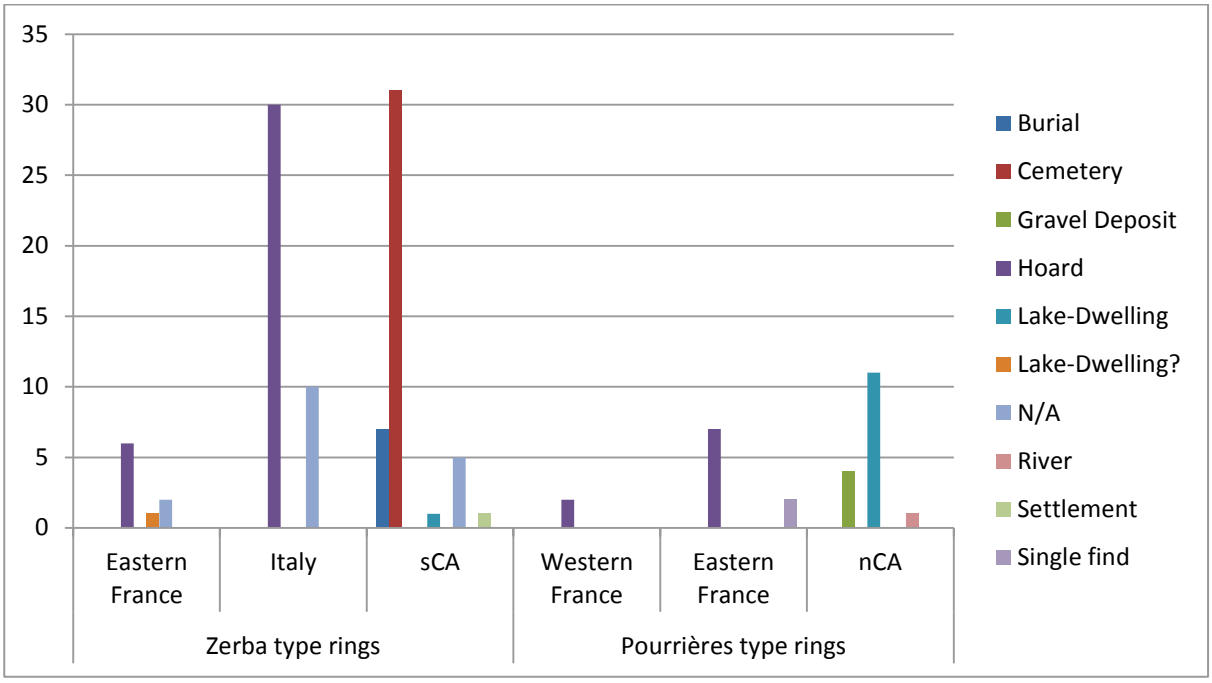


Chart 29: Comparison of find contexts for *Zerba* and *Pourrières* type arm-/leg-rings, gouped by region. N/A = Not available.

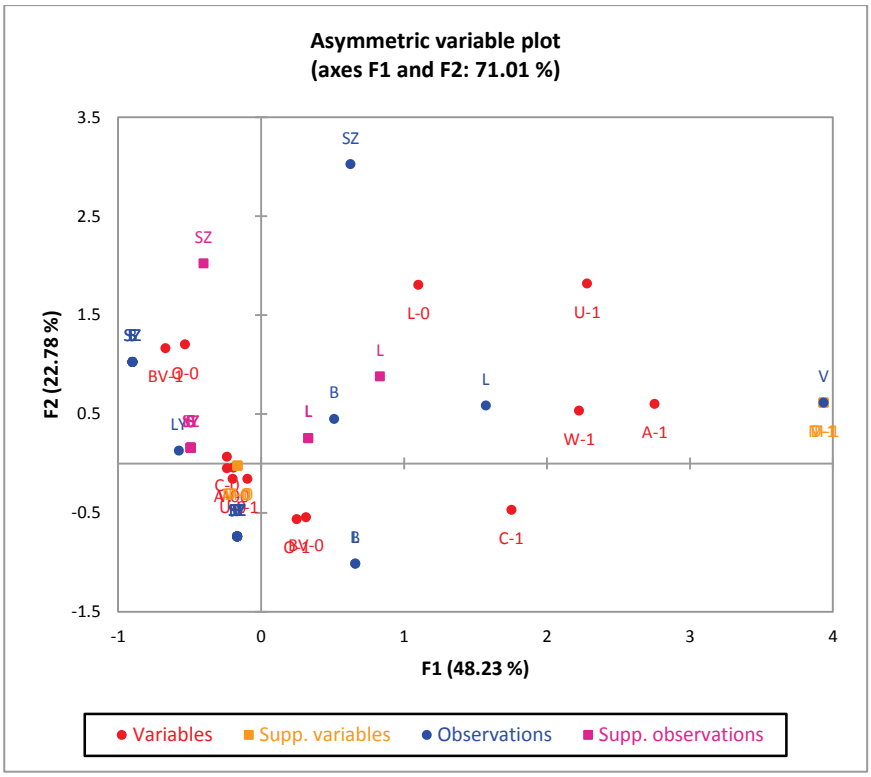


Chart 30: MCA of Iron Age arm-rings by type. L = *Lausanne*; LY = *Lyssach*; SZ = *Schötz*; B = *Belp*; V = *Valangin*; S = *Subingen*; G = *Gorgier*. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

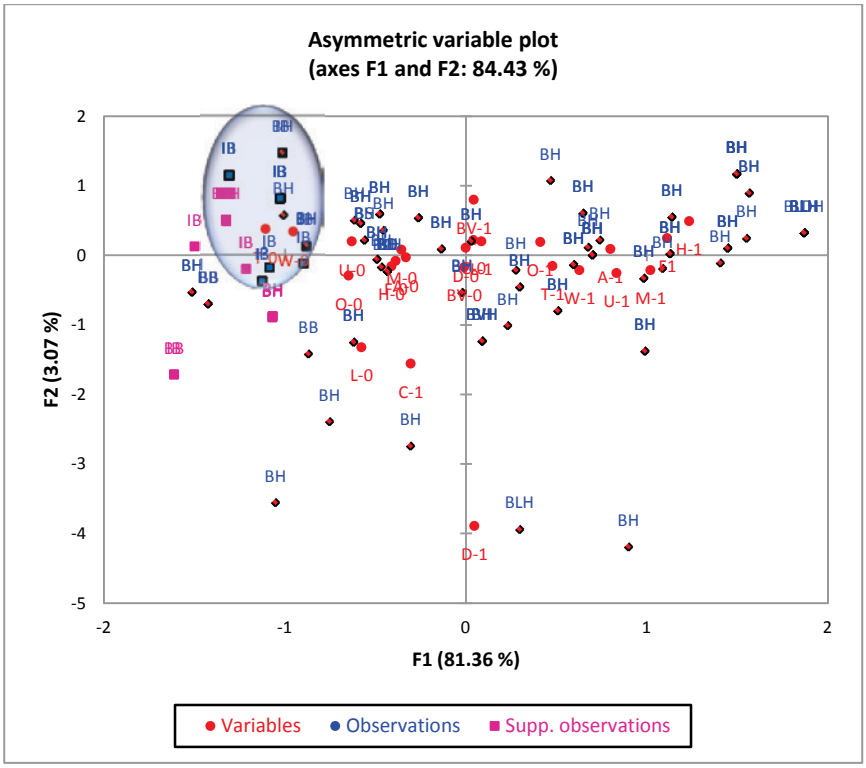


Chart 31: Comparative MCA of Late Bronze Age and Iron Age arm-leg-rings by time period and context. B = Burial; D = Votive deposit; H = Hoard; L = Lake-Dwelling; L-H = Lake-Dwelling hoard; S = Settlement; VH = settlement hoard; ? = unknown context. B = Late Bronze Age; I = early Iron Age. Late Bronze Age = Red diamond; Iron Age = Blue square (only for observations; supplementary observations = pink square). Main early Iron Age cluster highlighted by the oval area. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

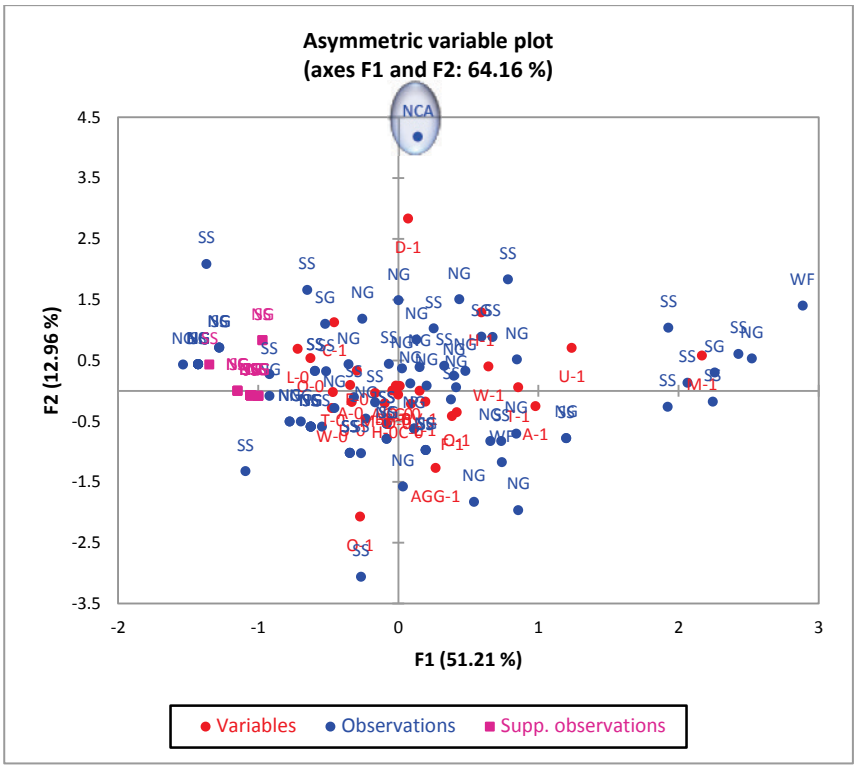


Chart 32: MCA of LBA *Hanging vessels* by region. Grandson-Corcelettes = NCA at top of plot. NCA = northern Circum-Alpine region; NG = nothern Germany; P = Poland; SG = southern Germany; SS = southern Scandinavia (Denmark); WF = western France. Oval area highlights example from Grandson-Corcelettes. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

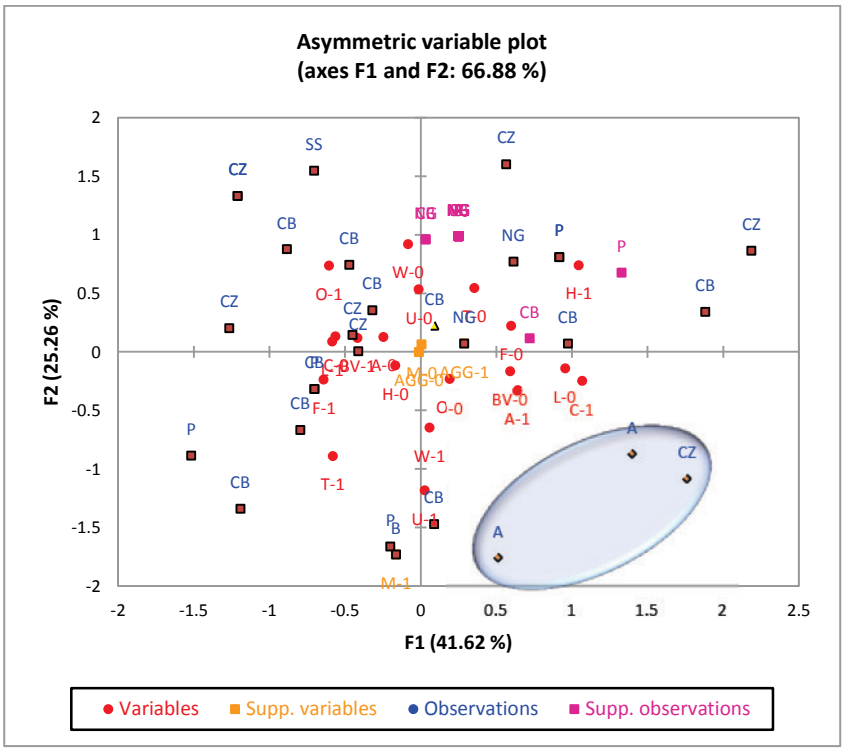


Chart 33: MCA of LBA *Jenišovice* type bronze cups by region. A = Austrial; CB = Carpathian Basin; CZ = Czech Republic; EF = eastern France; NG = northern Germany; P = Poland; SS = southern Scandinavia (Denmark). Contexts: Red square = Hoard; Orange diamond = Burial; Yellow triangle = Not available (not recorded from supplementary observations). Oval area highlights cups from burial assemblages. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

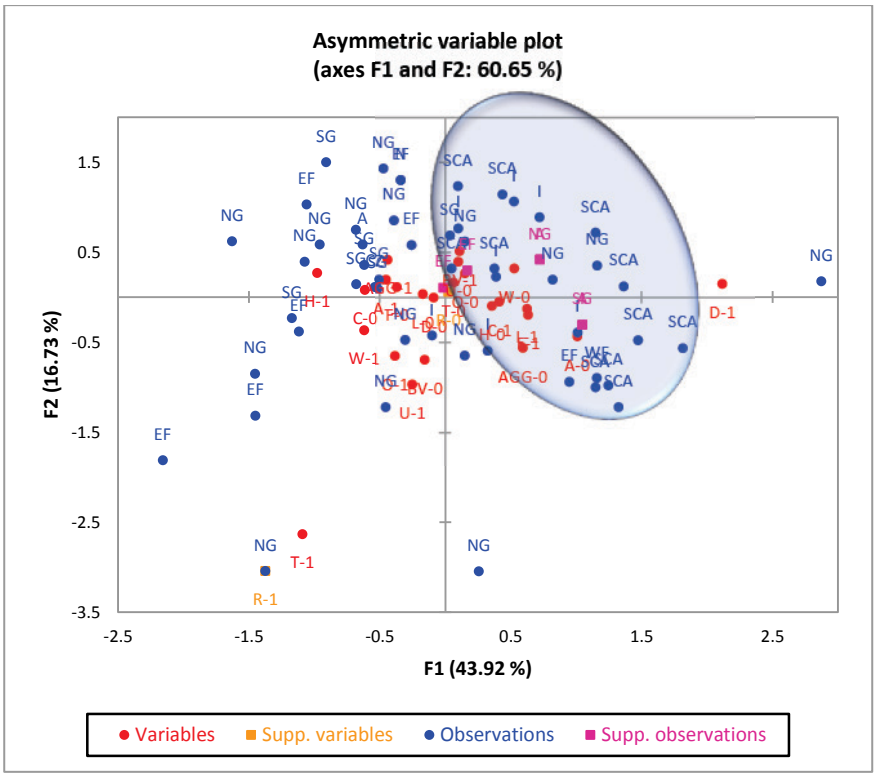


Chart 34: MCA of Iron Age *Schnabelkannen* by region. A = Austria; CZ = Czech Republic; EF = eastern France; I = Italy; NG = nothern Germany; SCA = southern Circum-Alpine region; SG = southern Germany; WF = western France. Oval area highlights primary cluster of assemblages from Italy and the southern Circum-Alpine region. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

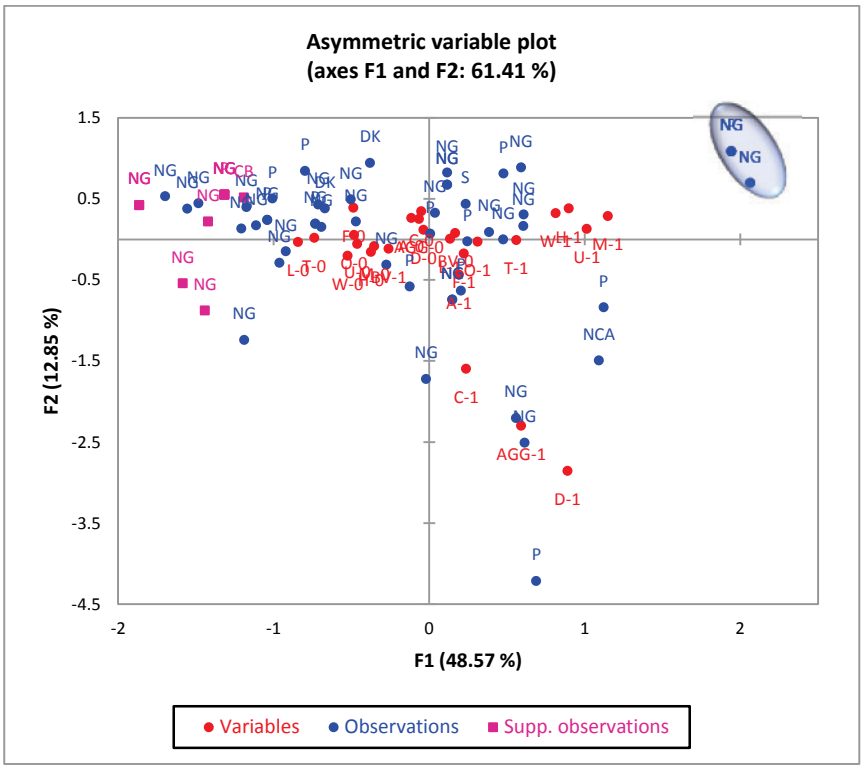


Chart 35: MCA of LBA *Platten* fibula by region. DK = Denmark; NCA = northern Circum-Alpine region; NG = northern Germany; P = Poland. Oval area marks assemblages from Nächstenbach-Weinheim (D), Haimbach (D), and Schwachenwalde (Chłopowo (PL)). Grandson-Corcelettes example = NCA. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

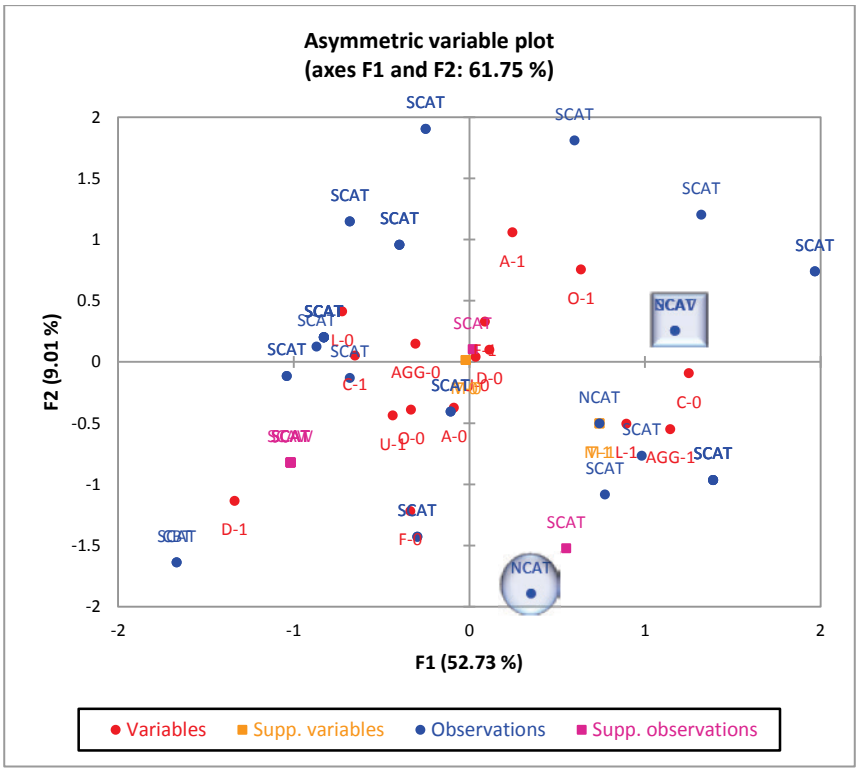


Chart 36: MCA of *Valais* type fibula and fibula from Zug-Sumpf (NCAT at bottom of plot) compared to *Torsion Bogen* fibula, by region and fibula type. CB = Carpathian Basin; NCA = nothern Circum-Alpine region; SCA = southern Circum-Alpine region. T = *Torsion* fibula; V = *Valais* fibula; W = *Wollishofen* fibula. Oval area denotes Zug-Sumpf assemblage; Square area denotes Sitten/Sion assemblage. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

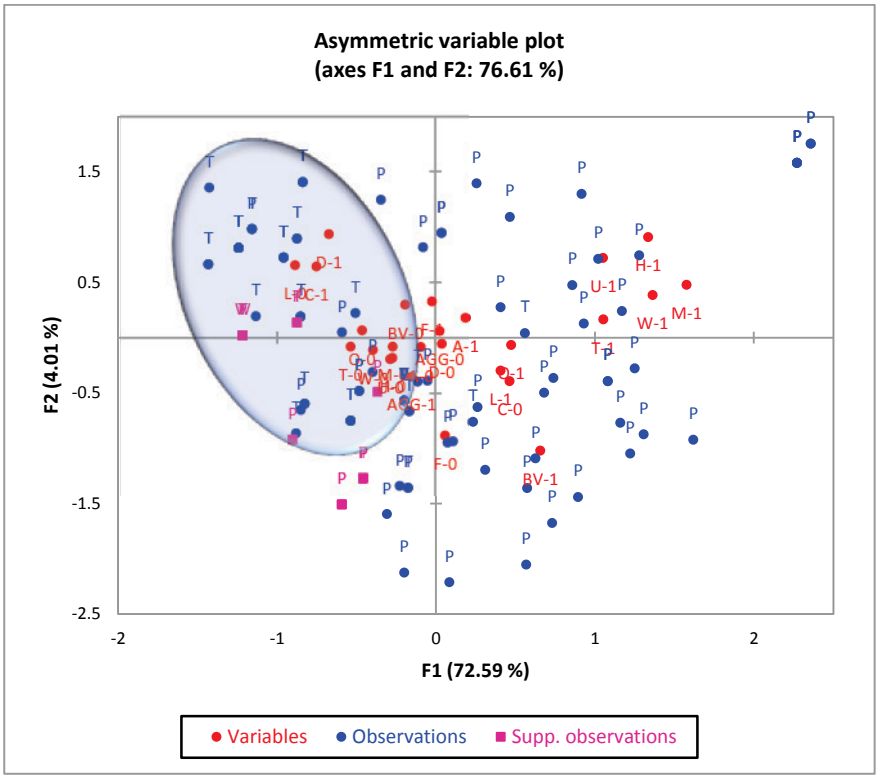


Chart 37: MCA of *Platten* fibula compared to *Torsion bogen* fibula of the northern and southern Circum-Alpine region. P = *Platten* fibula; T = *Torsion* fibula; V = *Valais* fibula; W = *Wollishofen* fibula. Oval area denotes main cluster of *Torsion* type fibula. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

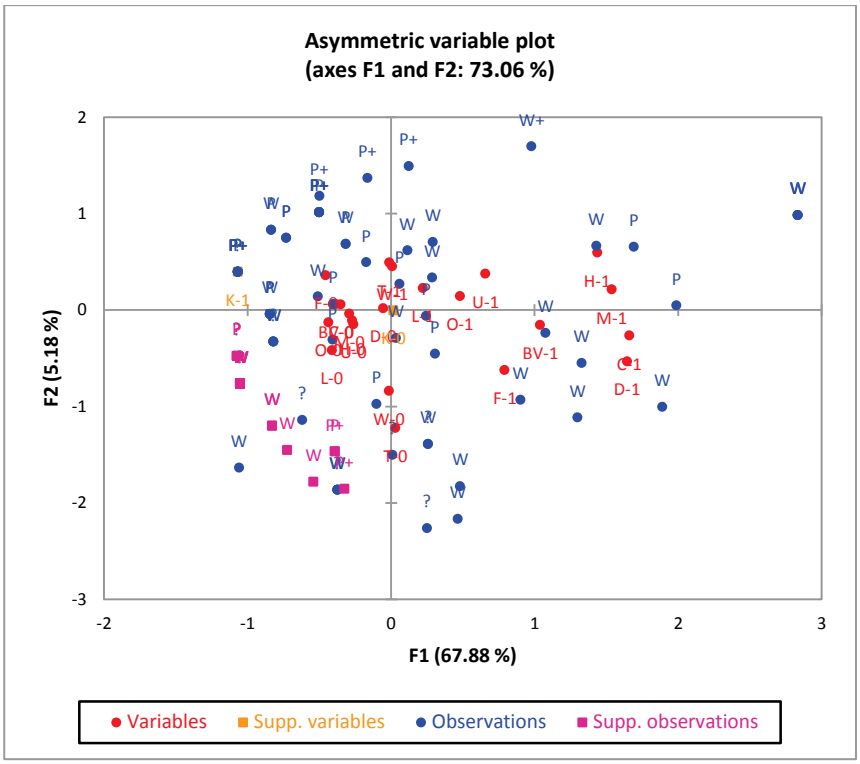


Chart 38: MCA of *Pfahlbau* and *West Baltic* spearheads by type. P = *Pfhalbau*; P+ = possible *Pfahlbau*; W = *West Baltic*; W+ = possible *West Baltic*; ? = *Pfahlbau* or *West Baltic*. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

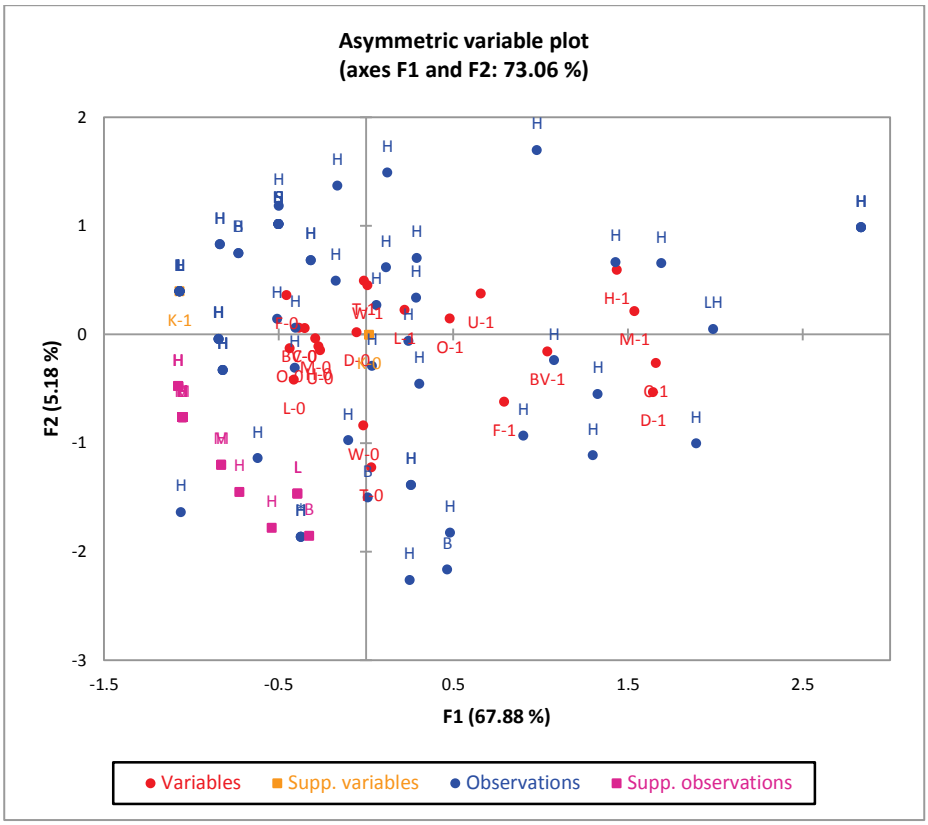


Chart 39: MCA of *Pfahlbau* and *West Baltic* spearheads by context. B = Burial; H = Hoard; L = Lake-Dwelling; LH = Lake-Dwelling hoard; M = Moor; S = Single find; * = Not available. Types as per Chart 38. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

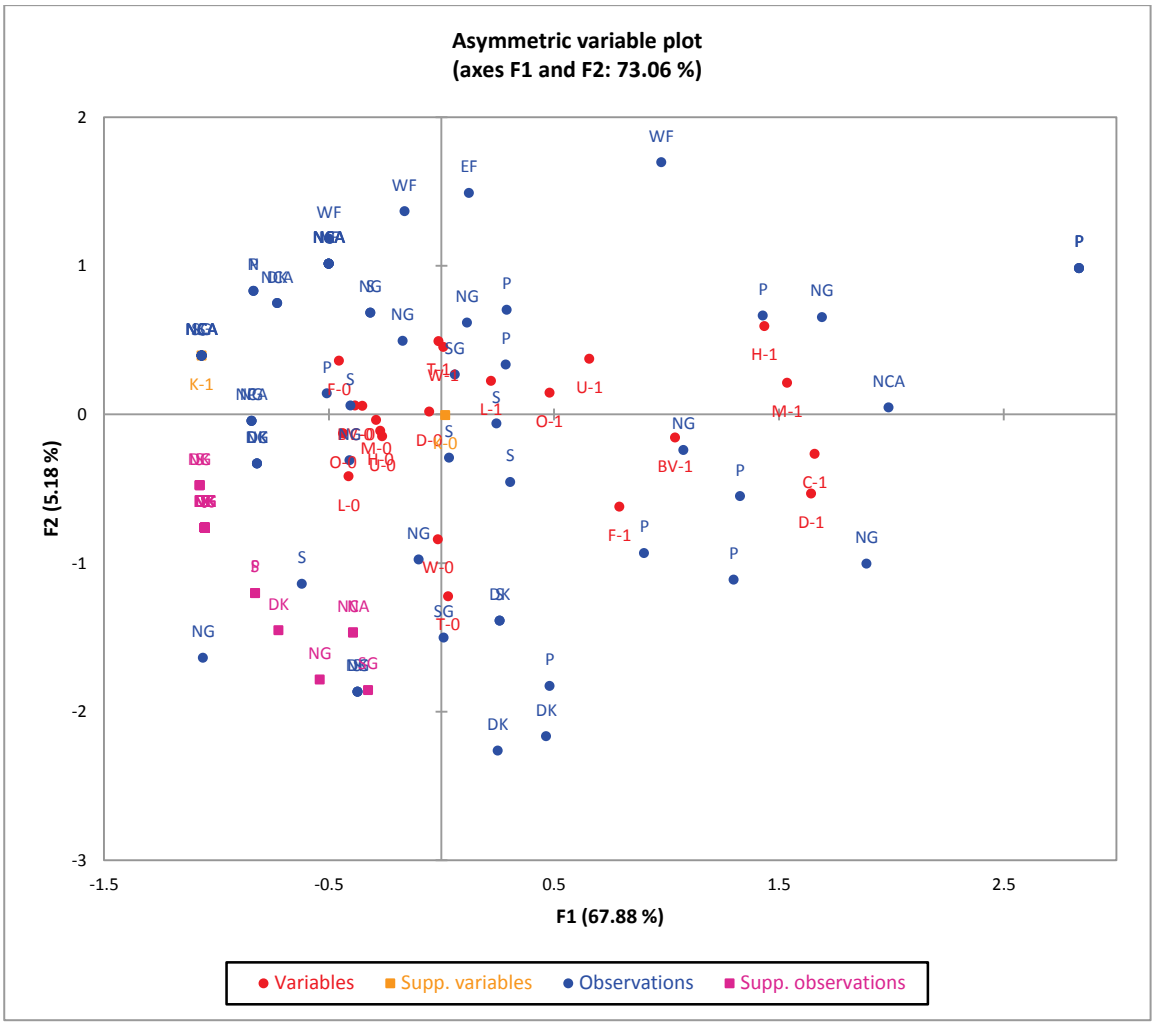


Chart 40: MCA of *Pfahlbau* and *West Baltic* spears by region. DK = Denmark; eastern France; NCA = northern Circum-Alpine region; NG = northern Germany; P = Poland; S = Scandinavia; SG = southern Germany; WF = western France. Types as per Chart 38 and contexts as per Chart 39. (For Variables labels see MCA Chart conventions [page 290] and Table 47).

Sites and Objects Bibliography

ABAUZIT, P. (1973) Le déconcertant dépot d'épées d'Aliès (Menet, Cantal), *Bulletin de la Société préhistorique française,* 70 (9), 279-81.

ALTORFER, K. (2010) *Die prähistorischen Feuchtbodensiedlungen am Südrand des Pfäffikersees : Eine archäologische Bestandesaufnahme der Stationen Wetzikon-Robenhausen und Wetzikon-Himmerich*, Monographien der Kantonsarchäologie Zürich 41, Zürich / Egg, FO-Fotorotar.

ARCHÄOLGOSCHE BODENFORSCHUNG BASEL-STADT (2008) *Unter Uns: Archäologie in Basel,* Basel, Christoph Merian Verlag.

ARNOLD, B. (1983) Les 24 maisons d' Auvernier-Nord (Bronze final), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte,* 66, 87-104.

ARNOLD, B. (1986) *Fouille subaquatique et photographie aérienne,* Saint-Blaise, Editions du Ruau.

ARNOLD, B. (1992) Le site hallstattien et l'enceinte quadrangulaire laténienne de Marin-Les Bourguignonnes (canton de Neuchâtel), in G. KAENEL & P. CURDY (Eds.) *L'âge du Fer dans le Jura : actes du 15e colloque de l'Association française pour l'étude sur l'âge du Fer, Pontarlier (France) et Yverdon-les-Bains (Suisse), 9-12 mai 1991***,** Lausanne, Bibliothèque historique vaudoise. 309-15.

ARNOLD, B. & LANGENEGGER, F. (2012) *Plateau de Bevaix, 8. Bevaix Sud: plongée dans le passé, fouille subaquatique d'un village du Bronze final,* Neuchâtel, Office et Musée cantonal d'archéologie de Neuchâtel.

AUDOUZE, F. & COURTOIS, J.-C. (1970) *Les épingles du Sud-Est de la France : (Départements Drôme, Isère, Hautes-Alpes, Savoie et Haute-Savoie)*, Prähistorische Bronzefunde 13 / 1, München, Beck.

AUST, H. (1951) Ein bronzezeitliches Hügelgrab bei Debstedt, *Jahrbuch der Männer vom Morgenstern,* 32, 92-100.

AVERSA, G. (2011) 4.43. Elsa di spada ad antenne, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 499.

BADENS, U.-U. F. F. (1935) Urnenfelder= und Hallstattzeit, *Badische Fundberichte,* 3 (7/8), 362-67.

BADER, T. (1983) *Die Fibeln in Rumänien*, Prähistorische Bronzefunde 14 / 6, München, C. H. Beck.

BADER, T. (1991) *Die Schwerter in Rumänien*, Prähistorische Bronzefunde 4 / 8, Stuttgart, Franz Steiner.

BĄK, U. (1992) Bronzezeitliche geweiknebel in südpolen, *Archäologisches Korrespondenzblatt,* 22 (2), 201-08.

BALZER, I. (2009) *Chronologisch-chorologische Untersuchung des späthallstatt- und frühlatènezeitlichen "Fürstensitzes" auf dem Münsterberg von Breisach (Grabungen 1980-1986),* Stuttgart, Konrad Theiss Verlag.

BASS, G. F. (1967) *Cape Gelidonya : a bronze age shipwreck,* Philadelphia, American Philosophical Society.

BATOVIĆ, Š. (1959) Iz ranog željeznog doba Liburnije, *Diadora,* 1 (1), 37-86.

BAUDOU, E. (1960) *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im nordischen Kreis,* Stockholm, Almqvist and Wiksell.

BAUER, I., FORT-LINKSFEILER, D., RUCKSTUHL, B., HASENFRATZ, A., HAUSER, C. & MATTER, A. (1992) *Bronzezeitliche Landsiedlungen und Gräber,* Egg, Kommissionsverlag Fotorotar.

BAUER, I., FRASCOLI, L., PANTLI, H., SIEGFRIED, A., WEIDMANN, T. & WINDLER, R. (1991) *Üetliberg, Uto-Kulm : Ausgrabungen 1980-1989,* Zürich, Komm. Orell Füssli.

BAUER, I. & NORTHOVER, P. (2004) *Bronzegiesser und Bronzeschmiede am Zugersee,* Zug, Kantonales Museum für Urgeschichte.

BAUER, I., RUCKSTUHL, B. & SPECK, J. (2004) *Zug-Sumpf: Die Funde der Grabungen 1923-37,* Zug, Kantonales Museum für Urgeschichte.

BAUMSTEIN, R. (1994) Bretten, *Fundberichte aus Baden-Württemberg,* 19 (2), 42-44.

BECK, C. W., HARTNETT, H. E. & PHOCAS, J. G. (1993) The origin of amber found at Hauterive-Champréveyres, Switzerland, in A.-M. RYCHNER-FARAGGI (Ed.) *Hauterive-Champréveyres 9: Métal et parure au Bronze final***,** Neuchâtel, Musée cantonal d'archéologie : Service cantonal de la conservation des monuments et des sites. 119-21.

BEECHING, A. (1977) *Le Boiron : une nécropole du bronze final près de Morges (Vaud, Suisse),* Lausanne, Musée d'archéologie et d'histoire.

BELLINTANI, P. (2002) Bernsteinstraßen, Glasstraßen, in G. SCHNEKENBURGER (Ed.) *Über die Alpen : Menschen - Wege - Waren***,** Stuttgart, Theiss. 39-48.

BELLINTANI, P. (2004) Ambre del II millennio a.C. in Italia, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 200-07.

BELLINTANI, P. (2011a) Prima dei Fenici. Perle in faience, glassy faience e vetro in Italia nel II millennio a.C, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 160-71.

BELLINTANI, P. (2011b) Progetto "Materiali vetrosi della protostoria italiana" Aggiornamenti e stato della ricerca, *Rivista di Scienze Preistoriche,* 61.

BELLINTANI, P. & RESIDORI, G. (2003) Quali e quante conterie: perle ed altri materiali vetrosi edll'italia settentrionale nel quadro dell'età del bronzo europea, in I. I. D. P. E. PROTOSTORIA (Ed.) *Atti Della XXXV Riunione Scientifica*, Firenze, Istituto Italiano di Preistoria e Protostoria. 483-98.

BELLINTANI, P. & STEFAN, L. (2009) Nuovi dati sul primo vetro Europeo: il caso di Frattesina, in A. MAGNA (Ed.) *Atti del primo convegino interdiciplinare sul vetro nei beni culturali e nell'arte di ieri e di oggi*, Parma, 71-86.

BELTZ, R. (1910) *Die vorgeschichtlichen Altertümer des Grossherzogtums Mecklenburg-Schwerin. Vollständiges Verzeichnis der im Grossherzöglichen Museum zu Schwerin bewahrten Funde,* Berlin, Schwerin.

BERGER, D. (2011) *Bronzezeitliche Färbetechniken an Metallobjekten nördlich der Alpen*, unpublished thesis for Doktor des Naturwissenschaften, (Eberhard-Karls-Universität Tübingen).

BERGER, D. & PERNICKA, E. (2009) Archäolometallurgische Untersuchungen zur Metalleinlegetechnik einiger Auvernierschwerter, *Restaurierung und Archäologie,* 2, 1-17.

BERGER, L. & BROGLI, W. (1980) *Wittnauer Horn und Umgebung,* Basel, Schweiz Gesellschaft für Ur- und Frühgeschichte.

BERGMANN, J. & CZARNETZKI, A. (1982) *Ein Gräberfeld der jüngeren Bronze- und älteren Eisenzeit bei Vollmarshausen, Kr. Kassel : zur Struktur und Geschichte einer vorgeschichtlichen Gemeinschaft im Spiegel ihres Gräberfeldes,* Marburg, N.G. Elwert Verlag.

BERNATZKY-GOETZE, M. (1987) *Mörigen : die spätbronzezeitlichen Funde,* Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

BERSU, G. (1945) *Das Wittnauer Horn im Kanton Aargau : seine ur- und frühgeschichtlichen Befestigungsanlagen,* Basel, Verlag Birkhäuser & CIE.

BERTONE, A., CARANZANO, S. & ROSSI, P. (2004) Dalla Pietra ai Metalli, in A. BERTONE & S. CARANZANO (Eds.) *La civiltà di Viverone : la conquista di una nuova frontiera nell'Europa del II Millennio a.C***,** Biella, Eventi & Progetti. 53-69.

BETZLER, P. (1974) *Die Fibeln in Süddeutschland, Österreich und der Schweiz I : (urnenfelderzeitliche Typen)*, Prähistorische Bronzefunde 14 / 3, München, Beck.

BIANCO PERONI, V. (1970) *Die Schwerter in Italien*, Prähistorische Bronzefunde 4 / 1, München, Beck.

BIANCO PERONI, V. (1976) *Die Messer in Italien*, Prähistorische Bronzefunde 7 / 2, München, Beck.

BIANCO PERONI, V. (1979) *I rasoi nell'Italia continentale*, Prähistorische Bronzefunde 8 / 2, München, Beck.

BIEL, J. (1987) *Vorgeschichtliche Höhensiedlungen in Südwürttemberg-Hohenzollern,* Stuttgart, Konrad Theiss.

BIETTI SESTIERI, A. M. (1992a) *The Iron Age community of Osteria dell'Osa a study of socio-political development in central Tyrrhenian Italy,* Cambridge, Cambridge University Press.

BIETTI SESTIERI, A. M. (Ed.) (1992b) *La necropoli laziale di Osteria dell'Osa***,** Roma, Quasar.

BIETTI SESTIERI, A. M. (1997) Italy in Europe in the Early Iron Age, *Proceedings of the Prehistoric Society,* 63, 371-402.

BIGLER, B. (2005) Der Rhinsberg bei Eglisau, Kanton Zürich, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 88, 169-200.

BILL, J., NUNGÄSSER, W., MAGGETTI, M. & GALETTI, G. (1992) Liechtensteinische Keramikfunde der Eisenzeit, *Jahrbuch des Historischen Vereins für das Fürstentum Liechtenstein,* 91, 85-165.

BILLAUD, Y. (2013) Vivre au bord des lacs savoyards à l'âge du bronze, *Les Dossiers d'Archéologie,* 355, 56-63.

BILLAUD, Y. & GRATUZE, B. (2002) Les perles en verre et en faïence de la Protohistoire française, in J. GUILAINE (Ed.) *Matériaux, productions, circulations du Néolithique à l'Âge du Bronze***,** Paris, Errance. 193-212.

BINGGELI, M. (2011) Spearheads and Swords - the making of bronze objects, in M. UCKELMANN & M. MÖDLINGER (Eds.) *Bronze age warfare : manufacture and use of weaponry***,** Oxford, Archaeopress. 11-21.

BOČKAREV, V. S. & LESKOV, A. M. (1981) *Jung- und spätbronzezeitliche Grußformen im nördlichen Schwarzmeergebiet*, Prähistorische Bronzefunde 19 / 1, München, C. H. Beck.

BOISAUBERT, J.-L. & BUGNON, D. (2008) Morat/Löwenberg, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 64-79.

BOISAUBERT, J.-L., BUGNON, D. & MAUVILLY, M. (2008) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000),* Fribourg, Service archéologique de l'Etat de Fribourg.

BOLLIGER SCHREYER, S. (2001) *Zürich Wollishofen-Haumesser: spätbronzezeitliche Keramik : Tauchsondierungen 1964-1970,* Zürich, Baudirektion Kanton Zürich, Hochbauamt, Kantonsarchäologie.

BONNET, C. (1973) Une station d'altitude de l'époque du Hohlandsberg, *Bulletin de la Société préhistorique de France,* 70, 455-78.

BOROFFKA, N. (2001) Bemerkungen zu einigen Bernsteinfunden aus Rumänien, *Archäologisches Korrespondenzblatt,* 31 (3), 395-409.

BORRELLO, M. A. (1986) *La céramique,* Saint-Blaise, Editions du Ruau.

BORRELLO, M. A. (1992) *Hauterive-Champréveyres, 6. La céramique du Bronze final : zones D et E,* Saint-Blaise, Editions du Ruau.

BORRELLO, M. A. (1993) *Hauterive-Champréveyres, 7. La céramique du Bronze final : zones A et B,* Neuchâtel, Musée cantonal d'archéologie.

BOULUD-GAZO, S. (2011) The discovery of a new Tachlovice sword at Pont-sur-Seine, Aube, France, in M. UCKELMANN & M. MÖDLINGER (Eds.) *Bronze age warfare : manufacture and use of weaponry***,** Oxford, Archaeopress. 133-52.

BOUYER, M. & BOISAUBERT, J.-L. (1992) La nécropole de l'âge du Bronze de Murten/Löwenberg, *Archäologie der Schweiz,* 15 (2), 68-73.

BRANDHERM, D. & SICHERL, B. (2001) Überlegungen zur Schwertproduktion der spätern Urnenfelderzeit, *Archäologisches Korrespondenzblatt,* 31 (2), 223-41.

BREM, H., BOLLIGER SCHREYER, S. & PRIMAS, M. (1987) *Die römische und spätbronzezeitliche Besiedlung,* Zürich, Abt. Ur- und Frühgeschichte der Universität Zürich.

BRESTRICH, W. & WAHL, J. (1998) *Die mittel- und spätbronzezeitlichen Grabfunde auf der Nordstadtterrasse von Singen am Hohentwiel,* Stuttgart, Komm. Konrad Theiss Verlag.

BRIARD, J. (1966) *Dépôts de l'Age du Bronze de Bretagne : la Prairie de Mauves à Nantes,* Rennes, Laboratoire d'anthropologie préhistorique, Faculté des sciences.

BURGESS, C. & COLQUHOUN, I. (1988) *The Swords of Britain*, Prähistorische Bronzefunde 4 / 5, München, C. H. Beck.

BUSCH, R. (1976) Der Depotfund von Watenstedt, in H. MITSCHA-MÄRHEIM, H. FRIESINGER & H. KERCHLER (Eds.) *Festschrift für Richard Pittioni zum siebzigsten Geburtstag. (volume 1)***,** Wien, Deuticke. 336-48.

BUTLER, J. J., ARNOLDUSSEN, S. & STEEGSTRA, H. (2012) Single-edged socketed Urnfield knives in the Netherlands and western Europe, *Palaeohistoria,* 2011/2012, 65-107.

BUTLER, J. J. & STEEGSTRA, H. (2005) Bronze Age metal and amber in the Netherlands (III:2). Catalogue of the socketed axes, part B, *Palaeohistoria,* 45/46 (197-300)

CHOCHOROWSKI, J. (1993) *Ekspansja kimmeryjska na tereny europy strodkowej,* Krakow, Universytet Jagiellonski.

CIANCIO, A. (2011) 1.11. Morso Equino, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 406.

CICIRELLI, C. & ALBORE LIVADIE, C. (Eds.) (2012) *L'abitato protostorico di Poggiomarino : località Longola, campagne di scavo 2000-2004***,** Roma, "L'Erma" di Bretschneider.

COBLENZ, W. (1976) Ein Trinkhornendbeschlag aus Hahnfeld, Kreis Oschatz, in H. MITSCHA-MÄRHEIM, H. FRIESINGER & H. KERCHLER (Eds.) *Festschrift für Richard Pittioni zum siebzigsten Geburtstag. (volume 1)***,** Wien, Deuticke. 349-61.

COFFYN, A., GOMEZ, J. & MOHEN, J.-P. (1981) *L'apogée du bronze atlantique : le dépôt de Vénat,* Paris, Picard.

COLOMB, A. & MUYDEN, B. V. (1896) *Antiquités lacustres : album,* Lausanne, G. Bridel.

COLONNA, C., SALZANI, L. & TOMAELLO, E. (2010) Catalogo, in L. SALZANI & C. COLONNA (Eds.) *la Fragilità dell'Urna: I recenti scavi a Narde Necropoli di Frattesina (XII-IX sec. a.C.)***,** Rovigo, Soprintendenza per i beni archeologici del Veneto. 181-374.

CORDIER, G. (1985) "Nouveaux" objets de l'Age du Bronze tirés de la Loire, *Revue Archeologique du Centre de la France,* 24 (1), 63-68.

CORDIER, G. (2002) Le dépôt de l'âge du Bronze final des Châtelliers à Amboise (Indre-et Loire) / The late Bronze Age deposit "Les Châtelliers" at Amboise (Indre-et-Loire), *Revue Archeologique du Centre de la France*, 5-34.

CORDIER, G. & BOURHIS, J. R. (1996) *Le dépôt de l'âge du bronze final du Petit-Villatte à Neuvy-sur-Barangeon (Cher) et son contexte régional,* Joué-les-Tours, G. Cordier.

CORDIER, G., MILLOTTE, J.-P.-E. & RIQUET, R. (1960) Trois cachettes de Bronze de l'Indre-et-loire, *Gallia Préhistoire,* 3, 109-28.

COUTIER, L. & SORDES, R. (1939) Note sur la découverte dans le Vivarais de poterie à décor d'étain, *Bulletin de la Société préhistorique de France*, 289-93.

COUTIL, L. (1915) La Céramique des Palafittes du lac du Bourget (Savoie), *Bulletin de la Société préhistorique de France*, 386-402.

COWEN, J. D. (1955) Eine Einführing in die Geschichte der bronzenen Griffzungenschwerter in Süddeutschland un den angrenzend Gebieten, *Berichte der Römischen Germanischen Kommission,* 36, 52-155.

COWEN, J. D. (1968) The Hallstatt Sword of Bronze: on the Continent and in Britain, *Proceedings of the Prehistoric Society,* 33 (1967), 377-454.

CULTRARO, M. (2006) I vaghi di ambra del tipo Tirinto nella protostoria italiana: nuovi dati dell'area Egeo-Balcanica, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1533-53.

CULTRARO, M. (2007) Evidence of amber in Bronze Age Sicily: local sources and the Balkan-Mycenaean connection, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 377-89.

CUPITÒ, M. (2006) *Tipocronologia del Bronzo medio e recente tra l'Adige e il Mincio sulla base delle evidenze funerarie,* Padua, Saltuarie dal laboratorio del Piovego.

CURDY, P., MANUEL MOTTET, NICOUD, C., BAUDAIS, D., LUNDSTRÖM-BAUDAIS, K. & MOULIN, B. (1993) Brig-Glis/Waldmatte, un habitat alpin de l'âge du Fer Fouills archéologiques N9 en Valais, *Archäologie Schweiz,* 16 (4), 138-51.

DALL'AGLIO, M. C. (2004) Corredo della tomba XXXI di Campo Pianelli di Bismantova (Regio Emilia), in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 592-93.

DAVID-ELBIALI, M. & MOINAT, P. (2005) Saint-Prex (Vaud) à l'âge du Bronze: le cas d'une commune lémanique, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 88, 119-68.

DE MARINIS, R. C. (1975) Le tombe di guerriero di sesto Calende e le spade e i pugnali hallstattiani scoperti nell'italia nord-occidentale, in N. CAFFARELLO & A. NEPPI MODONA (Eds.) *Archaeologica : scritti in onore di Aldo Neppi Modona***,** Firenze, Olschki. 213-69.

DELLA CASA, P. (2000) *Mesolcina præhistorica : Mensch und Naturraum in einem Bündner Südalpental vom Mesolithikum bis in römische Zeit / Presenza umana ed ambiente naturale in una vallata sudalpina dei Grigioni dal mesolitico all'epoca romana,* Bonn, Rudolf Habelt.

DELLA CASA, P., BASS, B. & FEDELE, F. (1999) The Grisons Alpine Valleys survey 1995-97: Methods, results and prospects of an interdisciplinary research program, in P. DELLA CASA (Ed.) *Prehistoric alpine environment, society, and economy*, Universitätsforschungen zur prähistorischen Archäologie. 151-72.

DESCHLER-ERB, S. (1989) Die prähistorischen Funde der Holzfluh bei Balsthal SO, *Archäologie des Kantons Solothurn,* 6, 7-100.

DIETZ, U. L. (1998) *Spätbronze- und früheisenzeitliche Trensen im Nordschwarzmeergebiet und im Nordkaukasus*, Prähistorische Bronzefunde 16 / 2, Stuttgart, Franz Steiner Verlag.

DIJKMAN, W. & HULST, R. (2000) Het urnenveld van Maastricht-Voerendael, *Archeologie in Limburg,* 84, 19-26.

DOITEAU, S. (1989) Le site pré-protohistorique "En Chaplix" (Avenches VD), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 72, 245-52.

DOITEAU, S. (1991) Faoug VD, Derrière Le Chaney, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 74, 244-46.

DOITEAU, S. (1992) Nouvelles données sur l'habitat et le Premier Age du Fer en Suisse occidentale, in C. MORDANT & A. RICHARD (Eds.) *L'habitat et l'occupation du sol a l'âge du bronze en Europe***,** Paris, Editions du Comité des travaux historiques et scientifiques. 313-25.

DRACK, W. (1958) *Aeltere Eisenzeit der Schweiz : Kanton Bern,* Basel, Birkhäuser.

DRACK, W. (1973a) Grosser Hafner, *Zürcher Denkmalpflege,* 6 (1968/69), 175-78.

DRACK, W. (1973b) Waffen und messer der hallstattzeit aus dem Schweizerischen mitteland und Jura, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 57, 119-68.

DRACK, W. (1977) Die Bronzegefässe der Hallstattzeit aus dem schweizerischen Mittelland und Jura, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 60, 103-20.

DRACK, W. (1985) Drei hallstattzeitliche Grabhügel bei Bonstetten, Kanton Zürich, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 68, 123-72.

DRESCHER, H. (1958) *Der Überfangguss : ein Beitrag zur vorgeschichtlichen Metalltechnik,* (Hans Drescher edition), Mainz, Römisch-Germanisches Zentralmuseum.

DUNNING, C. & RYCHNER, V. (1994) Archäologische Untersuchungen zum Übergand von der Bronze- zur Eisenzeit in der Westschweiz, in P. SCHAUER (Ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus*, Bonn, Universitätsverlag Regensburg / Rudolf Habelt. 63-97.

EBELS, B.-U. (1992) Eine Tonschnabelkanne von der Ehrenbürg in Oberfranken, *Archäologisches Korrespondenzblatt,* 22, 79-92.

EBERSCHWEILER, B., RIETHMANN, P. & RUOFF, U. (1987) Greifensee-Böschen ZH: Ein spätbronzezeitliches Dorf. Ein Vorbericht, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 70, 77-100.

EBERSCHWEILER, B., RIETHMANN, P. & RUOFF, U. (2007) *Das spätbronzezeitliche Dorf von Greifensee-Böschen : Dorfgeschichte, Hausstrukturen und Fundmaterial,* Zürich, Neue Medien.

ECKSTEIN, M. (1963) Ein späturnenfelderzeitliches Kriegergrab von Mauern, Ldkr. Neuburg a. d. Donau, *Germania,* 41, 88-92.

EIBNER, C. (1973) Die urnenfelderzeitlichen Sauggefässe. Ein Beitrag zur morphologischen und ergologischen Umschreibung, *Prähistorische Zeitschrift,* 48, 144-99.

EIBNER, C. (1985) Die urnenfelderzeitliche Wallburg und das Gräberfeld ("In der Gans" / Burenberg), in H. WINDL (Ed.) *Ausgrabungen in Stillfried : Stratigraphie von der Eiszeit bis zur Gegenwart***,** Wien, Nö Landesmuseum. 31-37.

ELES MASI, P. V. (1986) *Le fibule dell'Italia settentrionale*, Prähistorische Bronzefunde 14 / 5, München, C. H. Beck.

FALKENSTEIN, F. (2011) Zu Struktur und Deutung älterurnenfelderzeitlicher Hortfunde im nordalpinen Raum, in U. L. DIETZ & A. JOCKENHÖVEL (Eds.) *Bronzen im Spannungsfeld zwischen praktischer Nutzung und symbolischer Bedeutung : Beiträge zum internationalen Kolloquium am 9. und 10. Oktober 2008 in Münster***,** Stuttgart, Steiner. 71-105.

FALKENSTEIN, F., LINK, T., PETER-RÖCHER, H. & SCHUßMANN, M. (2011) Archäologische Prospektionen und Ausgrabungen auf dem Bullenheimer Berg, *Das archäologische Jahr in Bayern*, 51-53.

FEUSTEL, R. (1958) *Bronzezeitliche Hügelgräberkultur im Gebiet von Schwarza (Südthüringen),* Weimar, Böhlau.

FILIP, J. (1948) *Pravěké československo : úvod do studia dějin pravěku,* Praha, Vytiskla státní tiskárna.

FISCHER, C. (1993) Zinnachweis auf Keramik der Spätbronzezeit, *Archäologie der Schweiz,* 16 (1), 17-24.

FISCHER, C. (1997) *Innovation und Tradition in der Mittel- und Spätbronzezeit : Gräber und Siedlungen in Neftenbach, Fällanden, Dietikon, Pfäffikon und Erlenbach,* Zürich, Fotorotar AG/Druck Kommunikation Verlag.

FISCHER, C. (1998) Die spätbronzezeitlichen Kindergräber von Reinach-Alte Brauerei, in J. EWALD & J. TAUBER (Eds.) *Tatort Vergangenheit : Ergebnisse aus der Archäologie heute***,** Basel, Wiese Verlag. 165-80.

FISCHER, V. (2011) The deposition of bronzes at Swiss lakeshore settlements: new investigations, *Antiquity,* 85 (330), 1298-311.

FISCHER, V. (2012) *Les bronzes en contexte palafittique sur les rives du Léman et des Trois-Lacs (Suisse occidentale),* Lausanne, Musée cantonal d'archéologie et d'histoire.

FLINDT, S. (2000) Die Lichtensteinhöhle bei Osterode am Harz, in R. BUSCH, T. CAPELLE & F. LAUX (Eds.) *Opferplatz und Heiligtum. Kult der Vorzeit in Norddeutschland***,** Neumünster, Wachholtz. 60-65.

FONTIJN, D. R. (2002) *Sacrificial landscapes : cultural biographies of persons, objects and 'natural' places in the Bronze Age of the southern Netherlands, c. 2300-600 B.C.,* Leiden, University of Leiden.

FORENBAHER, S. (1995) Trade and Exchange in Late Bronze and Early Iron Age Croatia, in B. HÄNSEL (Ed.) *Handel, Tausch und Verkehr im bronze- und früheisenzeitlichen Südosteuropa*, München, Südosteuropa-Gesellschaft. 269-82.

FORRER, R. (1906) Die ägyptischen, kretischen, phönikischen etc. Gewichte und Maße der europäischen Kupferß, Bronzeß und Eisenzeit. Grundlagen zur Schaffung einer prähistorischen Metrologie, *Jahr-Buch der Gesellschaft für Lothringische Geschichte und Altertumskunde,* 18, 1-77.

FRASCOLI, L. (1991) Der "Keltenwall" von Rheinau, Kt. Zürich - Die Grabung von 1989, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 74, 7-42.

FRONTINI, P. (2004) 5.20. La Prima Tomba di Guerriero (Tomba A) di Sesto Calende (Varese), in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 614-16.

GAUCHER, G. (1981) *Sites et cultures de l'âge du bronze le bassin parisien,* Paris, Éditions du CNRS.

GAVRANOVIĆ, M. (2011) *Die Spätbronze- und Früheisenzeit in Bosnien,* Bonn, Rudolf Habelt.

GEDL, M. (1981) *Die Rasiermesser in Polen*, Prähistorische Bronzefunde 8 / 4, München, C. H. Beck.

GEDL, M. (1984) *Die Messer in Polen*, Prähistorische Bronzefunde 7 / 4, München, C. H. Beck.

GEDL, M. (2001) *Die Bronzegefässe in Polen*, Prähistorische Bronzefunde 2 / 15, Stuttgart, Franz Steiner Verlag.

GEDL, M. (2004) *Die Fibeln in Polen*, Prähistorische Bronzefunde 14 / 10, Stuttgart, Franz Steiner.

GEDL, M. (2009) *Die Lanzenspitzen in Polen*, Prähistorische Bronzefunde 5 / 3, Stuttgart, Franz Steiner.

GERDSEN, H. (1986) *Studien zu den Schwertgräbern der älteren Hallstattzeit,* Mainz am Rhein, Philipp von Zabern.

GERSBACH, E. (1951) Ein Beitrag zur Untergliederung der jüngeren Urnenfelderzeit (HaB) im Raume der südwestdeutsch-schweizerischen Gruppe, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 41, 175-91.

GERSBACH, E. (1968) *Urgeschichte des Hochrheins : Funde und Fundstellen in den Landkreisen Säckingen und Waldshut,* Freiburg, Staatliches Amt für Ur- und Frühgeschichte.

GESCHWINDE, M. (2000) *Die Hügelgräber auf der Großen Heide bei Ripdorf im Landkreis Uelzen. Archäologische Beobachtungen zu den Bestattungssitten des Spätneolithikums und der Bronzezeit in der Lüneburger Heide,* Neumünster, Wachholtz.

GESSNER, V. (1947) Vom Problem der spätbronzezeitlichen Glasperlen, in W. DRACK & P. FISCHER (Eds.) *Beiträge zur Kulturgeschichte : Festschrift Reinhold Bosch zu seinem sechzigsten Geburtstag***,** Aarau, Sauerländer. 80-98.

GLÄSER, R. & CONRAD, S. (2010) Aus Sand gebaut - Bronzezeitliche Grabhügel und Siedlungsbefunde bei Ilmendorf, *Das archäologische Jahr in Bayern,* 2009, 41-43.

GÖRMER, I. (2003) Die Mittel- und Spätbronzezeit zwischen Mannheim und Karlsruhe, *Fundberichte aus Baden-Württemberg,* 27, 79-280.

GÖTZE, A., HÖFER, P. & ZSCHIESCHE, P. (1909) *Die vor- und frühgeschichtlichen Altertümer Thüringens,* Würzburg, Kabitzsch.

GRATUZE, B., LOUBOUTIN, C. & BILLAUD, Y. (1998) Les perles protohistoriques en verre du Musée de Antiquités nationales, *Antiquités Nationales,* 30, 11-24.

GRIMMER, B. (1982) Ein "Feuerbock" oder "Mondidol" aus Ton von Bötzingen, *Archäologische Nachrichten aus Baden,* 29, 3-6.

GROSS, E. (1984) Die Stratigraphie von Vinelz und ihre Ergebnisse für die Chronologie der westschweizerischen Spätbronzezeit, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 67, 61-72.

GROSS, E. (1986) *Vinelz-Ländti : Grabung 1979 : die neolithischen und spätbronzezeitlichen Ufersiedlungen,* Bern, Staatlicher Lehrmittelverlag.

GROSS, E., BROMBACHER, C., DICK, M., DIGGELMANN, K., HARDMEYER, B., JAGHER, R., RITZMANN, C., RUCKSTUHL, B., RUOFF, U., SCHIBLER, J., VAUGHAN, P. C. & WYPRÄCHTIGER, K. (1987) *Zürich "Mozartstrasse" : neolithische und bronzezeitliche Ufersiedlungen,* Zürich, Orell Füssli.

GROSS, V. (1883) *Les Protohelvètes, ou, Les premiers colons sur les bords des lacs de Bienne et Neuchâtel,* Berlin, A. Asher.

GRÜNBERG, W. (1943) *Die Grabfunde der jüngeren und jüngsten Bronzezeit im Gau Sachsen,* Berlin, Walter de Gruyter & Co.

GUTZWILLER, P. (1994) Die vörromische Besiedlung des Fleckens Zurzach, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 77, 7-33.

GUTZWILLER, P. & FREY-KUPPER, S. (1989) *Das vormittelalterliche Fundgut vom Areal der Frohburg bei Trimbach/SO,* Basel, Verl. Schweizerische Gesellschaft für Ur- und Frühgeschichte.

HAEVERNICK, T. E. (1975) Hallstatt Glasringe und Hagenauer Perlen, *Trierer Zeitschrift,* 38, 63-73.

HAEVERNICK, T. E. (1978) Urnenfelderzeitliche Glasperlen, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 35, 145-57.

HAEVERNICK, T. E. (1981) Die Glasperlen der Býcî Skála-Höhle, in T. E. HAEVERNICK *Beiträge zur Glasforschung : die wichtigsten Aufsätze von 1938 bis 1981*, Mainz am Rhein, Philipp von Zabern. 411-16.

HAGL, M. (2008) *Ein urnenfelderzeitlicher Depotfund vom Bullenheimer Berg in Franken (Hort F),* München, Verlag C.H. Beck.

HAHNEKAMP, C. (2012) Schwerter Datenbank. Bronze- und urnenfelderzeitliche Schwerter; available online at *http://chc.sbg.ac.at/schwerter/map.php*. [accessed 9 April, 2012].

HÄNSEL, A. & HÄNSEL, B. (Eds.) (1997) *Gaben an die Götter : Schätze der Bronzezeit Europas***,** Berlin, Seminar für Vor- und Frühgeschichte der Freien Universität.

HANSEN, L. (2010) *Hochdorf 8 : Die Goldfunde und Trachtbeigaben des späthallstattzeitlichen Fürstengrabes von Eberdingen-Hochdorf (Kr. Ludwigsburg),* Stuttgart, Konrad Theiss.

HANSEN, S. (1991) *Studien zu den Metalldeponierungen während der Urnenfelderzeit im Rhein-Main-Gebiet,* Bonn, Rudolf Habelt.

HANSEN, S. (1994) *Studien zu den Metalldeponierungen während der älteren Urnenfelderzeit zwischen Rhônetal und Karpatenbecken,* Bonn, Rudolf Habelt.

HAUSER-FISCHER, C. (1990) Die Funde aus Spätbronze-, Hallstatt-, und Latènezeit im Heimatmuseum Pfäffikon ZH, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte*, 7-17.

HEIERLI, J. (1886) Der Pfahlbau Wollishofen, *Mitteilungen der Antiquarischen Gesellschaft in Zürich,* 22 (1), 1-32.

HENNIG, H. (1980) Urnenfelderzeitliche Grabfunde aus dem Obermaingebiet, in K. SPINDLER (Ed.) *Vorzeit zwischen Main und Donau. Neue archäologische Forschungen und Funde aus Franken und Altbayern***,** Erlangen, Universitätsbund Erlangen-Nürnberg. 99-158.

HERRMANN, F.-R. (1966) *Die Funde der Urnenfeldkultur in Mittel- und Südhessen,* Berlin, De Gruyter.

HERRMANN, F.-R. (2008) Zur Urnenfelderzeitlichen Befestigung des Glaubergs in der Wetterau, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 197-99.

HOCHULI, S. (1990) *Wäldi-Hohenrain TG : eine mittelbronze- und hallstattzeitliche Fundstelle,* Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

HOCHULI, S. (1991) Eine spätbronzezeitliche Messerklinge aus Arbon TG, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 74, 202-03.

HOCHULI, S., NIFFELER, U. & RYCHNER, V. (Eds.) (1998) *Bronzezeit: Die Schweiz vom Paläolithikum bis zum frühen Mittelalter***,** Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

HÖCKMANN, O. (2012) Ein gegossenes Bronzebecken aus Münster-Gittrup, *Ausgrabungen und Funde in Westfalen-Lippe,* 11, 5-148.

HOFMANN, A. (2000) *Das urnenfelderzeitliche Gräberfeld von Pinkofen, Markt Schierling, Lkr. Regensburg,* Büchenbach, Verlag Dr. Faustus.

HOFMANN, P. (1991) Le Landeron NE, Les Carougets, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 74, 240-41.

HOFMANN ROGNON, P. & DOSWALD, C. (2005) *Le Landeron - Les Carougets : vestiges protohistoriques, villa romaine, tombes et habitat médiévaux,* Hauterive, Service et musée cantonal d'archéologie de Neuchâtel.

HÖGLINGER, P. (1986) Vier Geweihknebel vom Rainberg - Stadt Salzburg, *Archäologisches Korrespondenzblatt,* 16, 419-25.

HOHLBEIN, M. (2008a) *Die spätbronze- und urnenfelderzeitlichen Bronzemesser im mittleren und südlichen Westedutschland I*, unpublished thesis for Doctor of Philosophy, (Westfälischen Wilhelms-Universität zu Münster (Westf.)).

HOHLBEIN, M. (2008b) Urnenfelderzeitlichen vollgriffmesser der griffschemata Aub/Mirebeau-sur-Bèze und Ehingen/Bruchköbel, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 201-09.

HOLSTEIN, D. (2003) *Der Kestenberg bei Möriken (AG) : Auswertung der Ausgrabungen 1950-1953 in der bronze- und eisenzeitlichen Höhensiedlung,* Basel, D. Holstein.

HOPERT, S., SCHLICHTERLE, H., SCHÖBEL, G., SPATZ, H. & WALTER, P. (1998) Der "Hals" bei Bodman. Eine Höhensiedlung auf dem Bodanrück und ihr Verhältnis zu den Ufersiedlung des Bodensees, in H. KÜSTER, A. LANG & P. SCHAUER (Eds.) *Archäologische Forschungen in urgeschichtlichen Siedlungslandschaften : Festschrift für Georg Kossack zum 75. Geburtstag***,** Regensburg, Universitätsverlag. 91-154.

HOYDEM, A., LEHMKUHL, A. & RATHGEBER, T. (1994) Bonndorf im Schwarzwald, *Fundberichte aus Baden-Württemberg,* 19 (2), 42.

HUNDT, H.-J. (1950) Der Bogenberg bei Bogen (Niederbayern) in vor- und frühgeschichtlicher zeit, *Bayerische Vorgeschichtsblätter,* 21, 31-46.

HUNDT, H.-J. (1958) Spätbronzezeitliches Doppelgrab in Frankfurt-Berkersheim, *Germania,* 36 (3/4), 344-61.

HÜTTEL, H.-G. (1981) *Bronzezeitliche Trensen in Mittel- und Osteuropa : Grundzüge ihrer Entwicklung*, Prähistorische Bronzefunde 16 / 2, München, C. H. Beck.

ISCHER, T. (1928) *Die Pfahlbauten des Bielersees,* Biel, Verlag der Heimatkundekommission Seeland.

JACOB-FRIESEN, G. (1957) Nordische und mitteleuropäische Beziehungen eines Bronzefundes aus dem hannoverischen Wendlands, *Die Kunde,* 8, 214-34.

JACOB-FRIESEN, G. (1967) *Bronzezeitliche Lanzenspitzen Norddeutschlands und Skandinaviens,* Hildesheim, August Lax.

JACOB, C. (1995) *Metallgefässe der Bronze- und Hallstattzeit in Nordwest-, West- und Süddeutschland*, Prähistorische Bronzefunde 2 / 9, Stuttgart, Franz Steiner Verlag.

JAHN, W. (1998) Glasschmuck der Bronzezeit und der Eisenzeit aus Rhön-Grabfeld, *Vorzeit. Spuren in Rhön-Grabfeld***,** Kleineibstadt, Druckerei Schedel. 117-20.

JANTZEN, D. J. & SCHMIDT, J. P. (1999) Ein Hortfund der Periode III aus Neustrelitz, Lkr. Mecklenburg-Strelitz, *Bodendenkmalpflege in Mecklenburg-Vorpommern,* 47, 7-127.

JIRÁŇ, L. (2002) *Die Messer in Böhmen*, Prähistorische Bronzefunde 7 / 5, Stuttgart, Franz Steiner Verlag.

JOCKENHÖVEL, A. (1971) *Die Rasiermesser in Mitteleuropa (Süddeutschland, Tschechoslowakei, Österreich, Schweiz)*, Prähistorische Bronzefunde 8 / 1, München, C. H. Beck'sche Verlagsbuchhandlung.

JOCKENHÖVEL, A. (1974a) Eine Bronzeamphore des 8. Jahrhunderts v. Chr. von Gevelinghausen, Kr. Meschede (Sauerland), *Germania,* (52), 16-54.

JOCKENHÖVEL, A. (1974b) Zu befestigten Siedlungen der Urnenfelderzeit aus Süddeutschland, *Fundberichte aus Hessen,* 14, 19-62.

JOCKENHÖVEL, A. (1980) *Die Rasiermesser in Westeuropa (Westdeutschland, Niederlande, Belgien, Luxemburg, Frankreich, Grossbritannien und Irland)*, Prähistorische Bronzefunde 8 / 3, München, C. H. Beck.

JOCKENHÖVEL, A. & KUBACH, W. (1994) *Bronzezeit in Deutschland,* Stuttgart, Konrad Theiss.

JOCKENHÖVEL, A. & SMOLLA, G. (1975) Le dépôt de Juvincourt-Damary (Aisne), *Gallia Préhistoire,* 18, 290-313.

KAENEL, G. & KLAUSENER, M. (1990) Quelques tombes à incinération du Bronze final (Xe siècle av. J.-C.) à Vidy (Lausanne VD), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frühgeschichte,* 73 (51-82).

KASSEROLER, A. (1959) *Das Urnenfeld von Volders,* Innsbruck, Universitätsverlag Wagner.

KEILING, H. (1987) *Die Kulturen der mecklenburgischen Bronzezeit,* Schwerin, Museum für Ur- und Frühgeschichte.

KELLER, F. (1863) *Pfahlbauten, fünfter Bericht,* Zürich.

KELLER, F. (1866) *Pfahlbauten. Sechster Bericht*, Mitteilungen der Antiquarischen Gesellschaft in Zürich 15 (2), Zürich.

KELLER, F. (1876) *Pfahlbauten. Siebenter Bericht*, Mitteilungen der Antiquarischen Gesellschaft in Zürich 19 (3), Zürich.

KEMENCZEI, T. (1991) *Die Schwerter in Ungarn II*, Prähistorische Bronzefunde IV / 9, München, C. H. Beck.

KERNER, M. (2001) Mondhörner. Urgeschichtliche Messgeräte, *Helvetia Archaeologica,* 32 (127/128), 82-136.

KEROUANTON, I. (1998) La production métallique des stations littorales immergées de Lac du Bourget (Savoie) à l'âge du Bronze Final, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". III : Production, circulation et consomation du bronze*, Paris, Editions du Comité des Travaux Historiques et Scientifiques. 87-102.

KEROUANTON, I. (2002) Le lac du Bourget (Savoie) à l'Âge du Bronze final : les groupes culturels et la question du groupe du Bourget, *Bulletin de la Société préhistorique française,* 99 (3), 521-61.

KIMMIG, W. (1940) *Die Urnenfelderkultur in Baden : untersucht auf Grund der Gräberfunde,* Berlin, Gruyter.

KIMMIG, W. (1954) Ou en est l'étude de la civilisation des Champs d'Urnes en France, principalement dans l'est?, *Revue archéologique de l'Est et du Centre-Est,* 54 (3), 209-32.

KIMMIG, W. (1981) Ein Grabfund der jüngeren Urnfelderzeit (Hallstatt B3) mit Eisenschwert von Singen am Hohentwiel, in R. PLEINER, H. HAEFNER & W. U. GUYAN (Eds.) *Frühes Eisen in Europa*, Schaffhausen, Peter Meili. 37-43.

KIMMIG, W. (1981) Ein Grabfund der jüngeren Urnenfelderzeit mit eisenschwert von Singen am Hohentwiel, *Fundberichte aus Baden-Württemberg,* 6, 93-119.

KIMMIG, W. (1992) *Die "Wasserburg Buchau" : eine spätbronzezeitliche Siedlung,* Stuttgart, Konrad Theiss.

KIMMIG, W. (2000) *Die "Wasserburg Buchau" : Keramikfunde,* Stuttgart, K. Theiss.

KIMMIG, W. & GERSBACH, E. (1971) Die Grabungen auf der Heuneburg 1966-1969, *Germania,* 49, 21-91.

KLUGE, J. (1986) Ein Thrako-Kimmerischer Trensenknebel vom Rundem Berg bei Urach, Kreis Reutlingen, *Archäologisches Korrespondenzblatt,* 16, 413-17.

KÖNIG, P. (2004) *Spätbronzezeitliche Hortfunde aus Bosnien und der Herzegowina*, Prähistorische Bronzefunde 20 / 11, Stuttgart, Franz Steiner.

KÖNINGER, J. (In Preparation) *Oggelshausen-Bruckgraben,* Freiburg, Janus Verlag.

KOSSACK, G. (1949) *Führer durch die vorgeschichtliche Abteilung des Stadtmuseums Deggendorf,* Deggendorf, Stadtmuseums Deggendorf.

KOSSACK, G. (1954) Pferdegeschirr aus Gräbern der älteren Hallstattzeit Bayerns, *Jahrbuch des Römisch-Germanisches Zentralmuseum,* 1954 (1), 111-78.

KOSSACK, G. (1956/57) Zu den Metallbeigaben des Wagengrabes von Ca'Morta (Como), *Sibrium,* 3, 41-51.

KRÄMER, W. (1985) *Die Vollgriffschwerter in Österreich und der Schweiz*, Prähistorische Bronzefunde 4 / 10, München, C. H. Beck.

KRAUSE, R. (2005) Rechteckhöife und Grossgrabhügel am Fürstensitze auf dem Ipf bei Bopfingen (Ostalbkreis), in J. BIEL & D. KRAUSSE (Eds.) *Frühkeltische Fürstensitze : älteste Städte und Herrschaftszentren nördlich der Alpen : internationaler workshop zur keltischen Archäologie in Eberdingen-Hochdorf, 12. und 13. September 2003***,** Esslingen, folio-Verlag Dr. G. Wesselkamp. 28-41.

KRAUSE, R. & CHRISTOFORIDIS, A. (1988) *Die endneolithischen und frühbronzezeitlichen Grabfunde auf der Nordstadtterrasse von Singen am Hohentwiel,* Stuttgart, Komm. Konrad Theiss.

KRAUSSE-STEINBERGER, D. (1990) Ein gegossenes bronzebecken der jüngeren bronzezeit aus Bad Driburg, Kr. Höxter, *Archäologisches Korrespondenzblatt,* 20 (4), 397-407.

KRAUSSE, D. & EBINGER-RIST, N. (2011) Die Keltenfürstin von Herbertingen Entdeckung, Bergung und wissenschaftliche Bedeutung des neuen hallstattzeitichen Prunkgrabs von der Heuneburg, *Denkmalpflege in Baden-Württemberg,* 40 (4), 202-07.

KREUTLE, R. (2007) *Die Urnenfelderkultur zwischen Schwarzwald und Iller. Südliches Württemberg, Hohenzollern und südöstliches Baden,* Erlangen, Faustus.

KREUZ, A. & SCHÄFER, E. (2008) Archäobotanische Ergebnisse zur Bronze- und Eisenzeit in Hessen, in D. KRAUSSE (Ed.) *Frühe Zentralisierungs- und*

Urbanisierungsprozesse : zur Genese und Entwicklung frühkeltischer Fürstensitze und ihres territorialen Umlandes. Kolloquium des DFG-Schwerpunktprogramms 1171, Stuttgart, Kommissionsverlag - Konrad Theiss Verlag. 115-41.

KROITZSCH, K. (1983) Ein bronzezeitlicher Grabhügel aus dem Kammerforst, Gemeindebezirk Lehma, Kreis Altenburg, *Arbeits- und Forschungsberichte zur sächsischen Bodendenkmalpflege,* (26), 17-43.

KROMER, K. (1956) Ein Bronzemesser aus Hallstatt in Oberösterreich, *Mitteilungen der Anthropologischen Gesellschaft in Wien,* 86 (64-70)

KUBACH-RICHTER, I. (1980) Amulettbeigaben in bronzezeitlichen Kindergräbern, *Jahresbericht des Instituts für vorgeschichte der Universität Frankfurt a.M.,* 1978-1979, 127-78.

KUBACH, W. (1973) *Die Nadeln in Hessen und Rheinhessen*, Prähistorische Bronzefunde 13 / 3, München, Beck.

KUBACH, W. (1994) Vergraben, versenkt, verbrannt - Opferfunde und Kultplätze, in A. JOCKENHÖVEL & W. KUBACH (Eds.) *Bronzezeit in Deutschland***,** Stuttgart, Konrad Theiss. 65-74.

KUNTER, K. (1996) Zu früh für Kontroversen, *Archäologie in Deutschland,* 1, 22-25.

KÜNZLER WAGNER, N. (2005) *Zürich-Alpenquai V : Tauchgrabungen 1999-2001 : Funde und Befunde,* Zürich, Kantonsarchäologie.

KURZ, S. (2000) *Die Heuneburg-Aussensiedlung : Befunde und Funde,* Stuttgart, Konrad Theiss.

KYTLICOVÁ, O. (1991) *Die Bronzegefässe in Böhmen*, Prähistorische Bronzefunde 2 / 12, Stuttgart, Franz Steiner.

L'ABBÉ, M. & JOLY, J. (1959) Barbirey-sur-Ouche, *Gallia Préhistoire,* 2, 90-92.

LANZREIN, A. N. (2009) *Die befestigte Höhensiedlung Toos-Waldi: von der Frühbronzezeit dis in die Spätantike,* Thurgau, Amtes für Archäologie des Kantons Thurgau.

LAUR-BELART, R. (1952) *Die Ausgrabung von 1952 auf dem Kestenberg,* Zurich, Ur-Schweiz.

LAUX, F. (1971) *Die Bronzezeit in der Lüneburger Heide,* Hildesheim, Lax.

LAUX, F. (1973) *Die Fibeln in Niedersachsen*, Prähistorische Bronzefunde 14 / 1, München, Beck.

LAUX, F. (2009) *Die Schwerter in Niedersachsen*, Prähistorische Bronzefunde 4 / 17, Stuttgart, Franz Steiner.

LAUX, F. (2012) *Die Lanzenspitzen in Niedersachsen*, Prähistorische Bronzefunde 5 / 4, Stuttgart, Franz Steiner Verlag.

LIÉGER, A. & MARGUET, A. (1974) Decouverts recentes dans les dragages de Toul et de Chaudenery-sur-Moselle (Meurthe-et-Moselle), *Revue Archéologique du Centre de l'Est at du Centre-Est,* 25 (1), 215-34.

LING, J., HJÄRTHNER-HOLDAR, E., GRANDIN, L., BILLSTRÖM, K. & PERSSON, P.-O. (2013) Moving metals or indigenous mining? Provenancing Scandinavian Bronze Age artefacts by lead isotopes and trace elements, *Journal of Archaeological Science,* 40 (1), 291-304.

LORENZ, A. (2006) *Der spätbronzezeitliche Hortfund von Stadtallendorf unter besonderer Berücksichtigung seiner Gläser,* Bonn, Habelt.

LUDWIG-LUKANOW, S. (1983) *Hügelgräberbronzezeit und Urnenfelderkultur im Nördlinger Ries,* Kallmünz/Opf., Lassleben.

LÜNING, J. & VON KAENEL, H.-M. (2006) *Ausgrabungen zur Bandkeramik, Bronze- und Römerzeit in Bad Homburg v.d.H. - Ober-Erlenbach 2001-2002,* Bonn, Habelt.

LUNZ, R. (1974) *Studien zur End-Bronzezeit und älteren Eisenzeit im Südalpenraum,* Firenze, Sansoni.

LÜSCHER, G. (1986) *Allschwil-Vogelgärten : eine hallstattzeitliche Talsiedlung,* Liestal, Amt für Museum und Archäologie des Kantons Baselland.

LÜSCHER, G. (1991) Frühkeltische "Fürstensitze" in der Schweiz, *Archäologie der Schweiz,* 14 (1), 68-74.

LÜSCHER, G. (1993) *Unterlunkhofen und die hallstattzeitliche Grabkeramik in der Schweiz,* Basel, Verlag Schweizerische Gesellschaft für Ur- und Frühgeschichte.

MÄDER, A. (1996) Pfanzliche Applikationen an spätbronzezeitlicher Keramik, *Archäologie der Schweiz,* 19 (1), 9-17.

MÄDER, A. (2001a) *Die spätbronzezeitliche Seeufersiedlung Zürich-Alpenquai 1: Die Metallfunde : Baggerungen von 1916-1919,* Zürich, Baudirektion Kanton Zürich, Hochbauamt, Kantonsarchäologie.

MÄDER, A. (2001b) *Zürich-Alpenquai 2: Die Schultergefässe und Kugelbecher : Baggerungen von 1916 und 1919,* Zürich, Baudirektion Kanton Zürich, Hochbauamt.

MÄDER, A. (2002) *Die spätbronzezeitlichen und spätlatènezeitlichen Brandstellen und Brandbestattungen in Elgg (Kanton Zürich) : Untersuchungen zu Kremation und Bestattungsbrauchtum,* Zürich, Baudirektion Kanton Zürich.

MAIER, F. B. (1986) Die urnenfelderzeitlichen Brandgräber von Möhlin-Niederriburg AG. Grabungsbericht, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 69, 105-19.

MARTIN, J. (2009) *Die Bronzegefässe in Mecklenburg-Vorpommern, Brandenburg, Berlin, Sachsen-Anhalt, Thüringen und Sachsen*, Prähistorische Bronzefunde 2 / 16, Stuttgart, Franz Steiner.

MASSARI, A. (1998) L'ambra in Sardegna in età nuragica, *Atti del XIII congresso dell UISPP*, Forlì, A.B.A.C.O. 479-88.

MATT, C. (2012) Basel BS, Utengasse 15/17 (2011/21), *Jahrbuch Archäologie Schweiz,* 95, 167-68.

MAUVILLY, M., ANTENEN, I., BROMBACHER, C., GASSMANN, P., GUÉLAT, M., MORINA-CURTY, L., OLIVE, C., PILLONEL, D., RICHOZ, I. & STUDER, J. (1997) Frasses "Praz au Doux" (FR), un site du Hallstatt ancien en bordure de rivière, *Archäologie Schweiz,* 20 (3), 112-25.

MAUVILLY, M. & RUFFIEUX, M. (2008) Frasses/Praz au Doux, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 204-11.

MERHART, G. V. (1952) Studien über einige Gattungen von Bronzegefässen, *Festschrift des Römisch-Germanischen Zentralmuseums in Mainz zur Feier seines hundertjährigen Bestehens 1952*, Vol. 2**,** Mainz, 1-71.

MERHART, G. V. (1969) Studien über einige gattungen von bronzegefässen, in G. KOSSACK & G. V. MERHART (Eds.) *Hallstatt und Italien : gesammelte Aufsätze zur frühen Eisenzeit in Italien und Mitteleuropa***,** Mainz, Römisch-Germanischen Zentralmuseums Mainz. 280-379.

METZNER-NEBELSICK, C. (1994) Die früheisenzeitliche Trensenentwicklung zwischen Kaukasus und Mitteleuropa, in P. SCHAUER (Ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus*, Bonn, Universitätsverlag Regensburg / Rudolf Habelt. 383-447.

MIHOVILIĆ, K. (1972) *Nekropola gradine iznad Limskog kanala,* Pula, Arheološki muzej Istre.

MILCENT, P.-Y. (1998) Le Petit-Vilatte à Neuvy-sur-Barrageon (Cher): lecture d'un dépôt complexe, in C. MORDANT, M. PERNOT & V. RYCHNER (Eds.) *L'Atelier du bronzier en Europe du XXe au VIIIe siècle avant notre ère : actes du colloque international "Bronze 96". III : Production, circulation et consomation du bronze*, Paris, Comité des Travaux Historiques et Scientifiques. 55-70.

MILDNER, S. (2008) *Bronzezeitliche Glasperlen in Deutschland - Eine Bestandsaufnahme*, unpublished thesis for Master of Archaeology, (Otto-Freidrich-Universität Bamberg).

MÖDLINGER, M. (2011) *Herstellung und Verwendung bronzezeitlicher Schwerter Mitteleuropas : eine vertiefende Studie zur mittelbronze- und urnenfelderzeitlichen Bewaffnung und Sozialstruktur,* Bonn, Rudolf Habelt.

MOHEN, J.-P. & BAILLOUD, G. (1987) *La vie quotidienne : les fouilles du Fort-Harrouard,* Paris, Picard.

MOHEN, J.-P., ÉLUÈRE, C. & DUVAL, A. (1974) Les fibules antérieures au VIe siècle avant notre ère, trouvées en France, *Gallia*, 1-61.

MOINAT, P. & DAVID-ELBIALI, M. (2003) *Défunts, bûchers et céramiques : la nécropole de Lausanne-Vidy (VD) et les pratiques funéraires sur le Plateau suisse du XIe au VIIIe s.av.J.-C,* Lausanne, Cahiers d'archéologie romande.

MONS STEINBERG (1954) *Festgabe zur 25-Jahrfeier des Steinsburgmuseums Römhild,* Römhild, Rat der Stadt.

MONTELIUS, O. (1913) Wann begann die allgemeine Verwendung des Eisens?, *Praehistorische Zeitschrift,* 5 (3/4), 289-330.

MÖSLEIN, S. (1998/99) Siedlung, Depotfund und Gräberfeld der Urnenfelderzeit auf der Innterrasse am Fusse der Rachelburg bei Flintsbach a. Inn, LKR Rosenheim, *Bericht der Bayerischen Bodendenkmalpflege,* 39/40, 331-48.

MÜLLER-KARPE, H. (1957) *Münchener Urnenfelder,* Kallmünz/Opf., M. Lassleben.

MÜLLER-KARPE, H. (1959) *Beiträge zur Chronologie der Urnenfelderzeit nördlich und südlich der Alpen,* Berlin, De Gruyter.

MÜLLER-KARPE, H. (1961) *Die Vollgriffschwerter der Urnenfelderzeit aus Bayern,* München, Beck.

MÜLLER-KARPE, H. (1966) Ein Bronzemesser von Zürich-Bauschanze, in R. DEGEN, W. DRACK & R. WYSS (Eds.) *Helvetia antiqua : Festschrift Emil Vogt : Beiträge zur Prähistorie und Archäologie der Schweiz***,** Zürich, Conzett und Huber. 97-100.

MÜLLER-KARPE, H. (1975) Zur Urnenfelderzeitlichen besiedlung der gegend von Steinkirchen, Niederbayern, in RÖMISCH-GERMANISCHES ZENTRALMUSEUM MAINZ (Ed.) *Ausgrabungen in Deutschland, gefördert von der Deutschen Forschungsgemeinshcaft 1950-1975*, Mainz, Komm. Habelt. 171-86.

MÜLLER, F. (1982) Ein mittelbronzezeitlicher Hortfund aus Allschwil BL, *Archäologie der Schweiz,* 5 (3), 170-77.

MÜLLER, F. (1993) Argumente zu einer Deutung von "Pfahlbaubronzen", *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 76, 71-92.

NADLER, M. & PFAUTH, U. (1994) Grab- oder Hortfund? Ein reiches Trachtensemble der älteren Urnenfelderzeit aus Pippenhof, *Das archäologische Jahr in Bayern,* 1993, 70-72.

NAGY, G. (1999) *Keramik und Kleinfunde der spätestbronzezeitlichen Siedlung,* Frauenfeld, Departement für Erziehung und Kultur des Kantons Thurgau.

NEBELSICK, L. (2000) Rent asunder: ritual violence in Late Bronze Age hoards, in C. F. E. PARE (Ed.) *Metals make the world go round : the supply and circulation of metals in Bronze Age Europe*, Oxford, Oxbow Books. 160-75.

NEGRONI CATACCHIO, N. (1999) Produzione e commercio dei vaghi d'ambra tipo Tirinto e tipo Allumiere alla luce delle recenti scoperte, in O. PAOLETTI (Ed.) *Protostoria e Storia del 'Venetorum Angulus' Atti del XX Convegno di Studi Etruschi ed Italici*, Pisa, Instituti editoriali e poligrafici internazionali. 241-65.

NEGRONI CATACCHIO, N., MASSARI, A. & RAPOSSO, B. (2006) L'ambra come idicatore di scambi nell'Italia pre e protostorica, in ISTITUTO ITALIAN DI PREISTORIA E PROTOSTORIA (Ed.) *Atti Della XXXIX Riunione Scientfica: materie prime e scambi nella preistoria Italiana*, Firenze, Istituto Italian di Preistoria e Protostoria. 1439-75.

NEKVASIL, J. & PODBORSKÝ, V. (1991) *Die Bronzegefässe in Mähren*, Prähistorische Bronzefunde 2 / 13, Stuttgart, Franz Steiner.

NEUBAUER, W. (1994) *Flums-Gräpplang : eine spätbronzezeitliche Siedlung in der Schweiz,* Buchs, BuchsDruck und Verlag.

NEUDERT, C. (2003) *Archäologische Untersuchungen im Umland des Frauenberges, Niederbayern,* Regensburg, Universitätsverlag Regensburg.

NEUGEBAUER, J.-W. (1994) *Bronzezeit in Ostösterreich,* St. Pölten-Wien, Verlag Niederösterreichisches Pressehaus.

NICOLAS, I. (2003) Au fil du rasoir: étude des rasoirs métalliques de l'âge du Bronze jusq'au haut Moyen Age en Suisse, in M. BESSE, L.-I. STAHL GRETSCH & P. CURDY (Eds.) *ConstellaSion. Hommage à Alain Gallay***,** Lausanne, Cahiers d'archéologie romande. 273-89.

NIKITA, K. & HENDERSON, J. (2006) Glass Analyses from Mycenaean Thebes and Elateia: Compositional Evidence for a Mycenaean Glass Industry, *Journal of Glass Studies,* 48, 71-120.

NIKITA, K., HENDERSON, J. & NIGHTINGALE, G. (2009) An Archaeological and Scientific Study of Mycenaean Glass from Elateia-Alonaki, Greece, in K. JANSSENS, P. DEGRYSE, P. COSYNS, J. CAEN & L. VAN'T DACK (Eds.) *Annales of the 17th Congress of the International Association for the History of Glass*, Antwerp, University Press Antwerp. 39-46.

NOVÁK, P. (1975) *Die Schwerter in der Tschechoslowakei I*, Prähistorische Bronzefunde 4 / 4, München, Beck.

NOVOTNÁ, M. (1991) *Die Bronzegefässe in der Slowakei*, Prähistorische Bronzefunde 2 / 11, Stuttgart, Franz Steiner.

NOVOTNÁ, M. (2001) *Die Fibeln in der Slowakei*, Prähistorische Bronzefunde 14 / 11, Stuttgart, Franz Steiner.

O'CONNOR, B. (1980) *Cross-Channel relations in the later Bronze Age : relations between Britain, North-Eastern France and the Low Countries during the later Bronze Age and the early Iron Age, with particular reference to the metalwork,* Oxford, British Archaeological Reports.

PAHLOW, M. (2006) Gold der Bronzezeit in Schleswig-Holstein**,** Bonn, Habelt.

PALAVESTRA, A. (1993) *Praistorijski ćilibar na centralnom i zapadnom Balkanu,* Beograd, AIZ Dosije : Srpska akademija nauka i umetnosti.

PALTINERI, S. & RUBAT BOREL, F. (2010) Le armille tipo Zerba: un riesame della questione, in N. NEGRONI CATACCHIO (Ed.) *Preistoria e protostoria in Etruria. L'alba dell'Etruria Fenomeni di continuità e trasformazione nei secoli XII-VIII a.C. Ricerche e scavi. Atti del Nono Incontro di Studi (12-14 Settembre)*, Milano, Centro studi di preistoria e archaeologia. 609-21.

PARE, C. F. E. (1991) *Swords, wagon-graves, and the beginning of the early iron age in central Europe,* Marburg, Philipps-Universität.

PARE, C. F. E. (1992) *Wagons and wagon-graves of the Early Iron Age in Central Europe,* Oxford, Oxford University Committee for Archaeology.

PARE, C. F. E. (1999) Weights and Weighing in Bronze Age Central Europe, in R.-G. Z. M. KOLLOQUIUM (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 421-514.

PÁSZTHORY, K. (1985) *Der bronzezeitliche Arm- und Beinschmuck in der Schweiz*, Prähistorische Bronzefunde 10 / 3, München, C. H. Beck.

PATAY, P. & PETRES, É. F. (1990) *Die Bronzegefässe in Ungarn*, Prähistorische Bronzefunde 2 / 10, München, C. H. Beck.

PAULI, J. (1994) *Die urgeschichtliche Besiedlung des Runden Bergs bei Urach,* Sigmaringen, Jan Thorbecke.

PAULI, L. (1971) Die Golasecca-Kultur und Mitteleuropa : ein Beitrag zur Geschichte des Handels über die Alpen, *Hamburger Beiträge zur Archäologie,* 1 (1), 1-84.

PAULI, L. (1993) Hallstatt- und Frühlatènezeit, in H. BENDER, L. PAULI & I. STORK (Eds.) *Der Münsterberg in Breisach II: Hallstatt- und Latènezeit***,** München, C.H. Beck. 19-171.

PEAKE, R., ALLENET, G., AUXIETTE, G., BOISSEAU, F., CHAUSSÉ, C., COUBRAY, S., LEROYER, C., PAUTRET-HOMERVILLE, C., PERRIÈRE, J. & TOULEMONDE, F. Villiers-sur-Seine, Le Gros Buisson : un habitat arisocratique de la fin de l'âge du bronze et du début du premier âge dur fer, in M.-J. ROULIÈRE-LAMBERT, A. DAUBIGNEY, P.-Y. MILCENT, M. TALON & J. VITAL (Eds.) *De l'Âge du Bronze à l'Âge du Fer en France et en Europe occidentale (Xe - VIIe siècle av. J.-C.) ; la moyenne vallée du Rhône aux âges du Fer, Actes du XXXème colloque international de l'AFEAF, co organisé avec l'APRAB, 26-28 mai*, Revue Archéologique de l'Est.

PEARCE, M. (1994) *Il territorio di Milano e Pavia tra mesolitico e prima età del ferro : dalla carta archeologica alla ricostruzione del paesaggio,* Firenze, La Nuova Italia editrice.

PEARCE, M. (2007) *Bright blades and red metal : essays on north Italian prehistoric metalwork,* London, Accordia Research Institute, University of London.

PERLER, O. (1962) Der antennadolch von Estavayer-le-Lac, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 49, 25-28.

PERONI, R. (1960) Allumiere - Scavo di tomber in località "La Pozza", *Notizie Scavie,* 8 (14), 341-62.

PERRIN, A. (1869) *Étude préhistorique sur la Savoie : spécialement à l'époque lacustre (Age du Bronze),* Chambéry.

PESCHECK, C. (1972) Ein reicher Grabfund mit Kesselwagen aus Unterfranken, *Germania,* 50, 29-56.

PFAUTH, U. (1998) *Beiträge zur Urnenfelderzeit in Niederbayern,* Bonn, Rudolf Habelt.

PININGRE, J.-F. (2002) Le dépot d'Évans (Jura - France) et les dépôts de vaisselle métallique de l'âge dr Bronze Final en France, *Archäologisches Korrespondenzblatt,* 32 (1), 59-66.

PLEINER, R. (1981) Die Wege des Eisens nach Europa, in R. PLEINER, H. HAEFNER & W. U. GUYAN (Eds.) *Frühes Eisen in Europa*, Schaffhausen, Peter Meili. 115-28.

PODBORSKÝ, V. (1970) *Mähren in der Spätbronzezeit und an der Schwelle der Eisenzeit,* Brno, Univ. J. E. Purkyně.

PRENDI, F. (1975) Un aperçu sur la civilisation de la première pé riode du fur en Albanie, *Iliria,* 3, 109-38.

PRIMAS, M. (1970) *Die südschweizerischen Grabfunde der älteren Eisenzeit und ihre Chronologie,* Basel, Birkhäuser.

PRIMAS, M. (1971) Zwei etruskische Bronzekannen aus Castaneda, *Helvetia Archaeologica,* 2 (6), 49-54.

PRIMAS, M. (1977) Beobachtungen zu den spätbronzezeitlichen Siedlungs- und Depotfunden der Schweiz, in K. STÜBER & A. ZÜRCHER (Eds.) *Festschrift Walter Drack zu seinem 60. Geburtstag***,** Zürich, Th. Gut & Co. . 44-55.

PRIMAS, M. (1986) *Die Sicheln in Mitteleuropa I (Österreich, Schweiz, Süddeutschland)*, Prähistorische Bronzefunde 18 / 2, München, C. H. Beck.

PRIMAS, M. (1990) Verkehr und Innovation, *Archäologie der Schweiz,* 13 (2), 80-88.

PRIMAS, M. (2004) Wirtschaft und Gessellschaft urnenfelderzeitlicher Seeufersiedlungen - eine Aktualisierung, in B. HÄNSEL (Ed.) *Parerga Praehistorica : Jubiläumsschrift zur Prähistorischen Archäologie : 15 Jahre UPA***,** Bonn, R. Habelt. 113-33.

PRIMAS, M. (2008) *Bronzezeit zwischen Elbe und Po : Strukturwandel in Zentraleuropa 2200-800 v. Chr,* Bonn, Verlag Habelt.

PRIMAS, M., DELLA CASA, P. & SCHMID-SIKIMIĆ, B. (1992) *Archäologie zwischen Vierwaldstättersee und Gotthard : Siedlungen und Funde der ur- und frühgeschichtlichen Epochen,* Bonn, Rudolf Habelt.

PRIMAS, M. & PERNICKA, E. (1998) Der Depotfund von Oberwilflingen, *Germania,* 76 (1), 25-65.

PRIMAS, M. & RUOFF, U. (1981) Die urnenfelderzeitliche Inselsiedlung "Grosser Hafner" im Zürichsee (Schweiz) Tauchausgrabung 1978-1979, *Germania,* 59 (1).

PRIMAS, M., TAROT, J., MEIER, W., SCHMID-SIKIMIĆ, B. & FANKHAUSER, C. (1989) *Die Keramik der Spätbronzezeit*, Eschenz, Insel Werd 4, Zürich, Abt. Ur- und Frühgeschichte der Universität Zürich.

PRÜSSING, G. (1991) *Die Bronzegefässe in Österreich*, Prähistorische Bronzefunde 2 / 5, Stuttgart, Franz Steiner.

PRÜSSING, P. (1982) *Die Messer im nördlichen Westdeutschland (Schleswig-Holstein, Hamburg und Niedersachsen)*, Prähistorische Bronzefunde 7 / 3, München, C. H. Beck.

PUGIN, C. (1984) Saint-Nicolas, distr. de Viège, VS, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 67, 200-02.

PUTZER, A. (2012) Von Bernstein und Hirtinnen - Prähistorische weidewirtschaft im schnalstal in südtirol, *Archäologisches Korrespondenzblatt,* 42 (2), 153-70.

QUILLFELDT, I. V. (1995) *Die Vollgriffschwerter in Süddeutschland*, Prähistorische Bronzefunde 4 / 11, Stuttgart, Franz Steiner.

RADDATZ, K. (1957) Ein Mörigerschwert aus der Uckermark, *Berliner Blätter für Vor- und Frühgeschichte,* 6 (2), 71-78.

RAMSTEIN, M. (2010) Attiswil, Wybrunne. Fundmaterial einer hallstattzeitlichen Siedlung, *Archäologie Bern,* 2010, 199-220.

RAMSTEIN, M. (2012) Kernenried, Oberholz. Gräber der Hallstattzeit, *Archäologie Bern,* 2012, 95-134.

REBOUL, R. & MILLOTTE, J.-P.-E. (1975) *Dépôts de l'Age du Bronze final en Lorraine et en Sarre*, Inventaria archaeologica France 4, St-Germain-en-Laye, Société des Amis du Musée des Antiquités Nationales et du Château de St-Germain-en-Laye.

REIM, H. (1997) Höhensiedlungen der Bronze- und Urnenfelderzeit, in G. KASTL (Ed.) *Goldene Jahrhunderte : die Bronzezeit in Südwestdeutschland***,** Stuttgart, Kommissionsverlag Konrad Theiss Verlag. 77-85.

REINECKE, P. (1911) Glasperlen vorrömischer Zeiten aus Funden nördlich der Alpen, *Die Altertümer unserer heidnischen Vorzeit,* 5, 60-72.

RICHTER, I. (1970) *Der Arm- und Beinschmuck der Bronze- und Urnefelderzeit in Hessen und Rheinhessen*, Prähistorische Bronzefunde 10 / 1, München, Beck.

RIETH, A. (1942) *Die Eisentechnik der Hallstattzeit,* Leipzig, Barth.

RIGERT, E. (1997) *Die spätbronzezeitliche Siedlung Sursee "Landzunge" bei Mariazell (Kanton Luzern) : Auswertung der Befunde und des Fundmaterials der archäologischen Ausgrabung von 1991,* Basel, Univ.

ŘÍHOVSKÝ, J. (1972) *Das Messer in Mähren und dem Ostalpengebiet*, Prähistorische Bronzefunde 7 / 1, München, Beck.

ŘÍHOVSKÝ, J. (1979) *Die Nadeln in Mähren und im Ostalpengebiet (von der mittleren Bronzezeit bis zur älteren Eisenzeit)*, Prähistorische Bronzefunde 13 / 5, München, Beck.

ŘÍHOVSKÝ, J. (1989) *Die Sicheln in Mähren*, Prähistorische Bronzefunde 18 / 3, München, C. H. Beck.

ŘÍHOVSKÝ, J. (1992) *Die Äxte, Beile, Meissel und Hämmer in Mähren*, Prähistorische Bronzefunde 9 / 17, Stuttgart, Franz Steiner.

RIND, M. M. (1999) *Der Frauenberg oberhalb Kloster Weltenburg I,* Regensburg, Universitätsverlag Regensburg.

ROCHNA, O. (1962) Hallstattzeitlicher Lignit- und Gagatschmuck, *Fundberichte aus Schwaben. Neue Folge,* 16, 44-83.

ROSCIO, M., DELOR, J.-P. & MULLER, F. (2011) Late Bronze Age Graves with Weighing Equipment from Eastern France, *Archäologisches Korrespondenzblatt,* 41 (2), 173-87.

ROUSSOT-LARROQUE, J. (2003) Épée de Mörigen draguée en Garonne en amount de Bordeaux, *Préhistoire du Sud-Ouest,* 10 (2), 211-20.

ROYMANS, N. (1991) Late Urnfield Societies in the Northwest European Plain and the expanding networks of Central European Hallstatt Groups, in N. ROYMANS & F. THEUWS (Eds.) *Images of the past : studies on ancient societies in Northwestern Europe***,** Amsterdam, Instituut voor Pre- en Protohistorische Archeologie. 9-89.

RUCKSTUHL, B. (1989) Hallstattzeitliche Siedlungsgruben aus Neunkich-Tobeläcker (SH), *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 72, 59-98.

RUOFF, U. (1974) *Zur Frage der Kontinuität zwischen Bronze- und Eisenzeit in der Schweiz,* Basel, Schweizerische Gesellschaft für Ur- und Frühgeschichte.

RYCHNER-FARAGGI, A.-M. (1993) *Hauterive-Champréveyres 9: Métal et parure au Bronze final,* Neuchâtel, Musée cantonal d'archéologie.

RYCHNER, V. (1977) Drei Vollgriffschwerter aus Auvernier, *Archäologisches Korrespondenzblatt,* 7, 107-13.

RYCHNER, V. (1979) *L'âge du bronze final à Auvernier (Lac de Neuchâtel, Suisse) : typologie et chronologie des anciennes collections conservées en Suisse,* Lausanne, Bibliothèque historique vaudoise.

RYCHNER, V. (1984) La matière première des bronziers lacustres, *Archäologie der Schweiz,* 7 (2), 73-78.

RYCHNER, V. (1987) *Auvernier 1968-1975, le mobilier métallique du Bronze final : formes et techniques,* Lausanne, Bibliothèque historique vaudoise.

RYCHNER, V. & KLÄNTSCHI, N. (1995) *Arsenic, nickel et antimoine : une approche de la métallurgie du Bronze moyen et final en Suisse par l'analyse spectrométrique,* Lausanne, Cahiers d'archéologie romande.

SALZANI, L. (2004) 5.21. Spada, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 616.

SALZANI, L. (2009) Rovigo. Notizie preliminari sulle ricerche nel sito dell'età del Bronzo di Grignano Polesine, *Quaderni di archeologia del Veneto,* 25, 37-39.

SALZANI, L. & COLONNA, C. (2010) *la Fragilità dell'Urna: I recenti scavi a Narde Necropoli di Frattesina (XII-IX sec. a.C.),* Rovigo, Soprintendenza per i beni archeologici del Veneto.

SCHAUER, P. (1971) *Die Schwerter in Süddeutschland, Oesterreich und der Schweiz I : (Griffplatten-, Griffangel- und Griffzungenschwerter)*, Prähistorische Bronzefunde 4 / 2, München, Beck.

SCHERER, P., EMANUEL (1922) Die urgeschichtlichen und frühgeschichtlichen Altertümer des Kantons Zug, *Anzeiger für Schweizerische Altertumskunde,* 22 (4), 129-45.

SCHIBLER, J., BREITENLECHNER, E., DESCHLER-ERB, S., GOLDENBERG, G., HANKE, K., HIEBEL, G., PLOGMANN, H. H., NICOLUSSI, K., MARTI-GRÄDEL, E., PICHLER, S., SCHMIDL, A., SCHWARZ, S., STOPP, B. & OEGGL, K. (2011) Miners and mining in the Late Bronze Age: a multidisciplinary study from Austria, *Antiquity,* 85 (330), 1259-78.

SCHMID-SIKIMIĆ, B. (1996) *Der Arm- und Beinschmuck der Hallstattzeit in der Schweiz : mit einem Anhang der Gürtelhaken und Gürtelgehänge der Hallstattzeit im Schweizerischen Mittelland, Jura und Wallis*, Prähistorische Bronzefunde 10 / 5, Stuttgart, Franz Steiner Verlag.

SCHMID, W. (1940) Der frühhallstättische Hortfund von Schönberg in Steiermark, *Germania,* 24, 195-204.

SCHÖBEL, G. (1996) Die Spätbronzezeit am nordwestlichen Bodensee. Taucharchäologische Untersuchungen in Hagnau und Unteruhldingen 1982-1989, in G. SCHÖBEL (Ed.) *Siedlungsarchäologie im Alpenvorland IV*, Vol. IV**,** Stuttgart, Konrad Theiss Verlag. 9-202.

SCHOPPER, F. (1995) *Das Urnenfelder- und Hallstattzeitliche Gräberfeld von Künzing, Lkr. Deggendorf (Niederbayern),* Bonn, Rudolf Habelt.

SCHUBART, H. (1972) *Die Funde der älteren Bronzezeit in Mecklenburg,* Neumünster, Offa Bücher.

SCHUMACHER-MATTHÄUS, G. (2008) Varia zum grab von Gevelinghausen, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 233-40.

SCHÜTZ-TILLMANN, C. (1997) Ein urnenfelderzeitliches Grab mit seltener Fibel aus Peising, Gde. Bad Abbach, in M. RIND (Ed.) *Von Keltenkriegern und Kirchenmäusen. Archäologie im Landkreis Kelheim 2 (1994-1996)***,** Regensburg, Buchverlag der Mittelbayerischen Zeitung. 104-06.

SCHÜTZ, C. (2006) *Das urnenfelderzeitliche Gräberfeld von Zuchering-Ost, Stadt Ingolstadt.,* Kallmünz, Lassleben.

SCHWAB, H. (2002) *Les artisans de l'âge du Bronze sur la Broye et la Thielle*, Archéologie de la 2e correction des eaux du Jura 3, Fribourg, Editions Universitaires Fribourg Suisse.

SCHWENZER, S. (2004) Pugnali da parate: *status symbol* delle *élite* locali, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla*

Preistoria all'Alto Medioevo, Trento, Castello del Buonconsiglio. 155-57.

SEIFERT, M. (1992) Zur Keramik der spätbronzezeitlichen Siedlungsstelle Zug-Sumpf, *Tugium,* 8, 64-91.

SEIFERT, M. (1997a) *Die Funde der Grabungen 1952-54,* Zug, Kantonales Museum für Urgeschichte Zug.

SEIFERT, M. (1997b) Die spätbronzezeitlichen Ufersiedlungen von Zug-Sumpf - Die Geschichte der Dörfer, *Helvetia Archaeologica,* 38 (151/152), 68-100.

SICHERL, B. (2008) Gedanken zur schwertproduktion und -distribution in der späten urnenfelderzeit am beispiel der Tachloviceschwerter, in F. VERSE, B. KNOCHE, J. GRAEFE, M. HOHLBEIN, K. SCHIERHOLD, C. SIEMANN, M. UCKELMANN & G. WOLTERMANN (Eds.) *Durch die Zeiten... Festschrift für Albrecht Jockenhövel zum 65. Geburtstag***,** Rahden/Westfalen, Leidorf. 241-57.

SIEVERS, S. (1982) *Die mitteleuropäischen Hallstattdolche*, Prähistorische Bronzefunde 6 / 6, München, C. H. Beck.

SIEVERS, S., DRESCHER, H. & ROCHNA, O. (1984) *Die Kleinfunde der Heuneburg : die Funde aus den Grabungen von 1950-1979,* Mainz/Rh. Philipp von Zabern.

SOCIÉTÉ SUISSE DE PRÉHISTOIRE (1932) Münster, *Jahresbericht der Schweizerischen Gesellschaft für Urgeschichte,* 24, 29.

SPECK, J. (1955) Ausgrabungen in der spätbronzezeitlichen Ufersiedlung Zug-Sumpf, in W. U. GUYAN (Ed.) *Das Pfahlbauproblem***,** Basel, Birkhäuser. 275-334.

SPECK, J. (1981a) Frühes Eisen in den Ufersiedlungen der Spätbronzezeit, *Helvetia Archaeologica,* 45/48, 265-71.

SPECK, J. (1981b) Schloss und Schlüssel zur späten Pfahlbauzeit, *Helvetia Archaeologica,* 45/48, 230-41.

SPERBER, L. (2004) Zur Bedeutung des nördlichen Alpenraumes für die spätbronzezeitliche Kupferversorgung in Mitteleuropa, in G. WEISGERBER & G. GOLDENBERG (Eds.) *Alpenkupfer - Rame delle Alpi***,** Bochum, Deutsches Bergbau-Museum. 303-45.

SPLIETH, W. (1900) *Inventar der Bronzealterfunde aus Schleswig-Holstein,* Kiel/Leipzig, Lipsius & Fischer.

SPROCKHOFF, E. (1934) *Die germanischen Vollgriffschwerter der jüngeren Bronzezeit,* Berlin ; Leipzig, W. de Gruyter & Co.

SPROCKHOFF, E. (1937) *Jungbronzezeitliche Hortfunde Norddeutschlands (Periode IV),* Mainz, Römisch-Germanischen Zentralmuseums Mainz.

SPROCKHOFF, E. (1956) *Jungbronzezeitliche Hortfunde der Südzone des nordischen Kreises (Periode V),* Mainz, Römisch-Germanischen Zentralmuseums.

SPROCKHOFF, E. (1966) Ein Geschenk aus dem Norden, in R. DEGEN, W. DRACK & R. WYSS (Eds.) *Helvetia antiqua : Festschrift Emil Vogt : Beiträge zur Prähistorie und Archäologie der Schweiz***,** Zürich, Conzett und Huber. 101-10.

SPROCKHOFF, E. & HÖCKMANN, O. (1979) *Die gegossenen Bronzebecken der jüngeren nordischen Bronzezeit,* Mainz, Römisch-Germanischen Zentralmuseums Mainz.

STAHL, C. (2006) *Mitteleuropäische Bernsteinfunde von der Frühbronze- bis zur Frühlatènezeit : ihre Verbreitung, Formgebung, Zeitstellung und Herkunft,* Dettelbach, J.H. Röll.

STARÈ, F. (1957) Polmesenče britve iz Jugoslavije, *Arheološki vestnik,* 8 (3-4), 204-34.

STAUFFER-ISENRING, L. & KAUFMANN, B. (1983) *Die Siedlungsreste von Scuol-Munt Baselgia (Unterengadin GR) : ein Beitrag zur inneralpinen Bronze- und Eisenzeit*, (Schweiz. Ges. für Ur- und Frühgeschichte,).

STEIN, F. (1979) *Katalog der vorgeschichtlichen Hortfunde in Süddeutschland,* Bonn, Habelt.

STEINHAUSER-ZIMMERMANN, R. A. (1989) *Der Montlingerberg im Kanton St. Gallen (Schweiz) : Funde und Grabungen von 1898 bis 1960,* Buchs, Amt für Kulturpflege des Kantons St. Gallen.

STEINHAUSER, R. A. & PRIMAS, M. (1987) Der Bernsteinfund vom Montlingerberg (Kt. St. Gallen, Schweiz), *Germania,* 65, 203-14.

STJERNQUIST, B. (1967) *Ciste a cordoni (Ripenzisten) : Produktion, Funktion, Diffusion,* Bonn [etc.], Habelt.

STÖCKLI, W. E. (2000) Die Besiedlungsgeschichte der Baarburg (Gemeinde Baar, Kanton Zug). Unter besonderer Berücksichtigung der Resultate der Prospektion mit einem Metallsuchgerät im Jahre 1997, *Jahrbuch der Schweizerischen Gesellschaft für Ur- und Frügeschichte,* 83, 7-24.

STROH, A. (1952) *Katalog Günzburg : die vorgeschichtlichen Funde und Fundstätten,* Kallmünz, Lassleben.

SUTER, P. J., JACOMET, S., RICHTER, B., SCHIBLER, J. & SCHUBERT, P. (1987) *Zürich "Kleiner Hafner" : Tauchgrabungen 1981-1984,* Zürich, Fotorotar AG.

TACKENBERG, K. (1971) *Die jüngere Bronzezeit in Nordwestdeutschland,* Hildesheim, Lax.

TAROT, J. (2000) *Die bronzezeitlichen Lanzenspitzen der Schweiz : unter Einbeziehung von Liechtenstein und Vorarlberg,* Bonn, Habelt.

TERŽAN, B. (2007) Cultural connections between *Caput Adriae* and the Aegean in the late Bronze and early Iron Age, in I. GALANAKI, H. TOMAS, Y. GALANAKIS & R. LAFFINEUR (Eds.) *Between the Aegean and Baltic seas : prehistory across borders*, Liège, Université de Liège. 157-65.

THRANE, H. (1965) Dänische funde fremder bronzegefässe der jüngeren Bronzezeit (Periode IV), *Acta Archaeologica,* 36, 157-207.

THRANE, H. (1968) Eingeführte Bronzeschwerter aus Dänemarks jüngerer Bronzezeit (Periode IV-V), *Acta Archaeologica,* 39, 143-218.

THRANE, H. (1972) Urnenfeldermesser aus Dänemarks Jüngerer Bronzezeit (Periode IV-V), *Acta Archaeologica,* 43, 165-228.

THRANE, H. (1975) *Europaeiske forbindelser : bidrag til studiet af fremmede forbindelser i Danmarks yngre broncealder (periode IV-V),* København, Nationalmuseet.

THRANE, H. (1976) A new hoard of Jensovice cups from South Jutland, *Acta Archaeologica,* 47, 168-71.

TIHELKA, K. (1969) *Velatice culture burials at Blučina,* Pragae, Národní muzeum.

TORBRÜGGE, W. (1959) *Vor- und Frühgeschichte in Stadt und Landkreis Rosenheim,* Rosenheim.

TRACHSEL, M. (1999) Are there 'Cimmerian' and 'Scythian' finds in Switzerland? The absolute dating of the early Iron Age between the Als and the Altai region, in E. JEREM & I. POROSZLAI (Eds.) *Archaeology of the bronze and iron age : experimental archaeology, environmental archaeology, archaeological parks*, Budapest, Archaeolingua. 189-205.

TRACHSEL, M. (2004) *Untersuchungen zur relativen und absoluten Chronologie der Hallstattzeit,* Bonn, Rudolf Habelt.

TSCHUMI, O. (1953) *Urgeschichte des Kantons Bern (alter Kantonsteil) : Einführung und Fundstatistik bis 1950,* Bern ; Stuttgart, Huber.

TURK, P. (2004) La prima età del Ferro nel territorio a Sud-Est delle Alpi, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 411-19.

UENZE, O. (1949/50) Der Hortfund von Allendorf, *Praehistorische Zeitschrift,* 34/35, 202-20.

ULLRICH, M. (2006/7) Urnenfelderzeitliche Friedhöfe im Obermaingebiet und der Staffelberg - Höhensiedlung und Umland, *Bericht der Bayerischen Bodendenkmalpflege,* 47/48, 100-23.

VAN IMPE, L. (1980) Graven uit de Urnenveldperiode op het Hangveld te Rekem, I: Inventaris, *Archaeologia Belgica,* 227, 9-23.

VAN WILLIGEN, S. (2011) 3.48. Chiave, in F. MARZATICO, R. GEBHARD & P. GLEIRSCHER (Eds.) *Le grandi vie delle civiltà : relazioni e scambi fra Mediterraneo e il centro Europa dalla preistoria alla romanità***,** Trento, Castello del Buonconsiglio, Monumenti e collezioni provinciali. 476.

VAN WILLIGEN, S. & MÄDER, A. (2012) Zwischen Zürichsee und Kaukasus: Die Trense von Zürich-Alpenquai, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 69 (2), 109-18.

VERGER, S. (1992) L'épée du guerrier et le stock de métal: de la fin du Bronze ancien à lâge du Fer, in G. KAENEL & P. CURDY (Eds.) *L'âge du Fer dans le Jura : actes du 15e colloque de l'Association française pour l'étude sur l'âge du Fer*, Lausanne, Bibliothèque historique vaudoise. 135-51.

VIGNEAU, H. & BOISAUBERT, J.-L. (2008) Châbles/Les Biolleyres 1, in J.-L. BOISAUBERT, D. BUGNON & M. MAUVILLY (Eds.) *Archéologie et autoroute A1, destins croisés : 25 années de fouilles en terres fribourgeoises, premier bilan (1975-2000)***,** Fribourg, Service archéologique de l'Etat de Fribourg. 277-89.

VINSKI-GASPARINI, K. (1973) *Kultura polja sa žarama u sjevernoj hrvatskoj,* Zadar, Sveučilište u Zagrebu Filozofski Fakultet Zadar.

VIOLLIER, D. (1926) Les Tumulus hallstattiens d'Ossingen (Zurich), *Jahresberichte der Schweizerischen Landesmuseums Zürich,* 35, 37-46.

VIOLLIER, D., SULZBERGER, K., SCHERER, P., EMANUEL, SCHLAGINHAUFEN, O., HESCHELER, K. & NEUWEILER, E. (1924) *Pfahlbauten, zehnter Bericht*, Mitteilungen der Antiquarischen Gesellschaft in Zürich, Zürich, Leemann.

VITAL, J. & VORUZ, J.-L. (1984) *L'habitat protohistorique de Bavois-en-Raillon (Vaud),* Lausanne, Bibliothèque historique vaudoise.

VOGT, E. (1931) Die ältesten Schlüssel, *Germania,* 15 (1), 142-45.

VOGT, E. (1952) Der Zierstil der späten Pfahlbaubronzen, *Zeitschrift für Schweizerische Archäologie und Kunstgeschichte,* 4, 193-206.

VON BERCHEM, I. F. (1998) Urnenfelderzeit. Brandbestattungen – Viele Siedlungen – Feine Keramikformen, *Vorzeit. Spuren in Rhön-Grabfeld***,** Kleineibstadt, Druckerei Schedel. 55-59.

VON BRUNN, W. A. (1953) Reichverzierte Hallstatt B-Messer aus Mitteldeutschland, *Germania,* 31, 15-24.

VON HASE, F. W. (1969) *Die Trensen der Früheisenzeit in Italien*, Prähistorische Bronzefunde 16 / 1, München, Beck.

VORLAUF, D. (1997) *Die etruskischen Bronzeschnabelkannen : eine Untersuchung anhand der technologisch-typologischen Methode,* Espelkamp, Verlag Marie Leidorf.

VUAILLAT, D. (1977) *La nécropole tumulaire de Chaveria (Jura),* Paris, Les Belles Lettres.

WAGNER, K. H. (1943) *Nordtiroler Urnenfelder,* Berlin, De Gruyter.

WANZEK, B. (1989) *Die Gussmodel für Tüllenbeile im südöstlichen Europa,* Bonn, Rudolf Habelt.

WARMENBOL, E. (1988) Broken Bronzes and Burned Bones: the transition from Bronze to Iron Age in the Low Countries, *Helinium,* 28 (2), 244-70.

WEBER, C. (1996) *Die Rasiermesser in Südosteuropa*, Prähistorische Bronzefunde 8 / 5, Stuttgart, Franz Steiner Verlag.

WEIDMANN, T. (1983) Ein reicher Ringfund der Spätbronzezeit aus Sursee, *Helvetia Archaeologica,* 55/56 (1), 179-92.

WIEGEL, B. (1994) *Trachtkreise im südlichen Hügelgräberbereich. Studien zur Beigabensitte der Mittelbronzezeit unter besonderer Berücksichtigung forschungsgeschichtlicher Aspekte,* Espelkamp, Verlag Marie Leidorf GmbH.

WILBERTZ, O. M. (1982) *Die Urnenfelderkultur in Unterfranken,* Kallmünz/Opf., Michael Lassleben.

WIRTH, S. (1999) Auf der Suche nach Eliten der späten Bronzezeit und der Urnenfelderzeit. Bausteine zum Thema aus dem Altsiedelland am unteren Lech in Bayerisch-Schwaben, in R.-G. Z. M. KOLLOQUIUM (Ed.) *Eliten in der Bronzezeit*, Bonn, Habelt. 565-604.

WIRTH, S. (1998) *Grabfunde der späten Bronzezeit und der Urnenfelderzeit von Augsburg-Haunstetten und Friedberg in Bayern : ein Beitrag zur vorgeschichtlichen Besiedlung des unteren Lechtals,* Augsburg, Bernd Wissner.

WIRTH, S. (2004) Corredo della tomba femminile 1 della necropoli di Augsburg-Haunstetten VI, in F. MARZATICO & P. GLEIRSCHER (Eds.) *Guerrieri, principi ed eroi fra il Danubio e il Po dalla Preistoria all'Alto Medioevo*, Trento, Castello del Buonconsiglio. 591.

WÜSTEMANN, H. (2004) *Die Schwerter in Ostdeutschland*, Prähistorische Bronzefunde 4 / 15, Stuttgart, Franz Steiner Verlag.

WYSS, R. (1967a) *Bronzezeitliche Gusstechnik*, Aus dem Schweizerischen Landesmuseum 19, Bern, Paul Haupt.

WYSS, R. (1967b) *Bronzezeitliches Metallhandwerk,* Bern, Haupt.

WYSS, R. (1972) *Bronzezeitliches Töpferhandwerk,* Bern, Haupt.

WYSS, R. (1981) Kostbare Perlenkette als Zeuge ältesten Fernhandels in Zürich, *Helvetia Archaeologica,* 45/48, 242-51.

ZANINI, A. & MARTINELLI, N. (2005) New data on the absolute chronology of the Late Bronze Age in central Italy, in R. LAFFINEUR (Ed.) *L'âge du bronze en Europe et en Méditerranée : sessions générales et posters / The bronze age in Europe and the Mediterranean : general sessions and posters. Actes du XIVème Congrès UISPP*, Oxford, Archaeopress. 147-55.

ZUMSTEIN, H. (1966) *L'âge du Bronze dans le département du Haut-Rhin,* Bonn, Habelt.

ZYLMANN, D. (1983) *Die Urnenfelderkultur in der Pfalz : Grab- und Depotfunde, Einzelfunde aus Metall,* Speyer, Pfälzische Gesellschaft zur Förderung der Wissenschaften.