Travelling Objects: Changing Values

The role of northern Alpine lake-dwelling communities in exchange and communication networks during the Late Bronze Age

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Abbreviations

Countries

Throughout the manuscript and enclosed Data CD abbreviations are used to denote the county in which sites are located. The abbreviations are:

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

Within the manuscript and site lists on the enclsed Data CD abbreviations are also used for repeated terms. These are:

Cty	Country
Dendro	Dendrochronology
Dendro-dated	Dendrochronologically dated
EBA	Early Bronze Age
EIA	early Iron Age
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

On the Multiple Correspondence Analysis plots abbreviations are used for the variable categories. The categories are detailed in Table 1, and the abbreviations also listed here:

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	Weapon

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All maps within the text and included on the Data CD were created in ArcGIS, using STRM global shaded relief data (© source: NASA, NGA, USGS EROS, ESRI), GTOPO30 shaded relief data (© source: USGS EROS, ESRI), and River and Lake overlays (© source: ArcWorld) included on the ESRI ® Data & Maps 9.3 Media Kit. The STRM and GTOPO30 data is also available for download from the internet (http://www2.jpl.nasa.gov/srtm/ and https://lta.cr.usgs.gov/GTOPO30).

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Section 1: Background

Chapter 1: Introduction

A tradition of building and settlement construction and occupation in the form of 'pile-dwellings' or 'lake-settlements' existed in the northern Alpine forelands between the Neolithic and the Early Iron Age. Beginning in the mid-19th century many of these settlements have been excavated, resulting in many thousands of stone, ceramic, metal, and organic artefacts being catalogued in museum collections. These investigations have shown that the long tradition of lake-settlement construction was by no means continuous, and in fact numerous breaks in the occupation of these settlements occurred. Previous interpretations have emphasised the role of climatic decline as influencing these periods of lake-shore abandonment and the final decline of the lake-dwelling tradition at the Late Bronze Age and beginning of the Iron Age.

Due to the relatively early 'excavation' of many of these lake-settlements by antiquarians, many pieces of Late Bronze Age material culture take their name from these sites, such as *Mörigen* and *Auvernier* swords, and *Pfahlbauperlen* glass beads. Despite the assumption that lake-dwelling settlements in the northern Alpine region were connected to long-distance exchange routes linking northern and southern Europe, relatively little focus has been placed on the actual role of these communities in such exchange partnerships, and the methods by which objects moved through these settlements. The basic 'questions' that this volume intends are discuss therefore:

1) How significant a role did the lake-dwelling communities of the northern Circum-Alpine region play in the production and circulation of material throughout Europe during the Late Bronze Age and early Iron Age?
2) Can the transfer of object cultural value be identified?

1.1: Structure

The spatial and temporal focus 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 regions have their own chronology (see Menotti 2001: 22-37). Chapter 1 will begin with a description of the spatial extent of the study and short summary of archaeological evidence for settlements, before describing the temporal and chronological issues requiring definition and comparison for a successful material culture study to be undertaken. The main regions under consideration 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). Based upon the occurrence of lake-settlements, these regions were defined by the SNF project 'The End of the Lake-Dwelling Phenomenon: Cultural vs. Environmental Change' run at the University of Basel between 2009 and 2013, of which this volume forms a portion of consideration of cultural changes as represented through the use of material culture. The recognition of trade routes and changing values of objects as they travelled through central Europe requires a theoretical background, detailed in Chapter 2. One of the most useful methods to recognise the changing values of objects is the principle of 'object biographies', observing the changing associations of objects in different regions as a reflection of changing social value and treatment. In order to apply such a concept to the material culture, Multiple Correspondence Analysis (MCA) was chosen as a method to recognise object and artefact associations, and a brief summary of the process is provided in this chapter. Chapter 3 provides a summary of past research on prehistoric European Late Bronze Age trade routes, and discusses some of the problems relating to the identification of imported or 'foreign' objects in communities. It is also evident that many of the materials which were exchanged during the Bronze Age are very rarely preserved in the archaeological record, for example organic materials such as furs, meat, and wax, or even people.

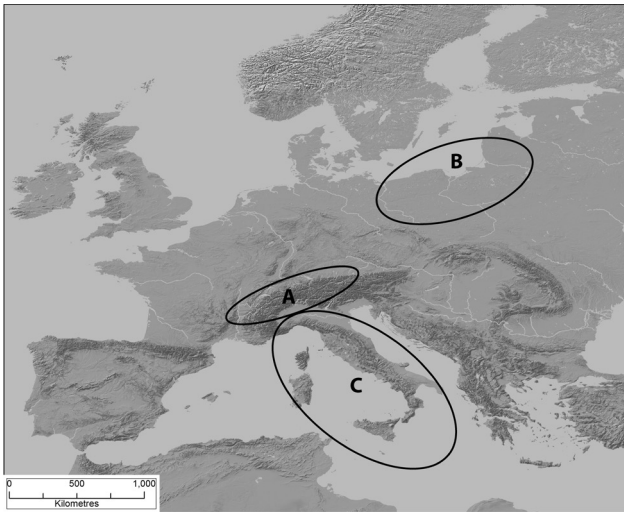


Figure 1: The three main regions of study. ***A)*** *The Circum-Alpine region;* ***B)*** *the Baltic region; and* ***C)*** *the central-Mediterranean region.*

Despite the vagaries of archaeological preservation, there are a range of materials are well represented in the material record, which is divided into non-metalwork, including glasswork, amber, and ceramics (Chapter 4), and metalwork (Chapters 5-7). A wide range of bronze work was manufactured during the Late Bronze Age, and can be broadly classified as 'Weapons' (Chapter 5), 'Tools or Equipment' (Chapter 6), or 'Accessories' (Chapter 7). Under the heading 'Weapons' are listed swords and spearheads, 'Tools or Equipment' includes objects such as knives, sickles, razors, and horse gear, while 'Accessories' includes arm-rings, fibulae and bronze buckets and cups. 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, for instance, were used as accessories or symbolic objects in addition to/instead of as weapons.

Two artefact types which have not been explicitly considered here 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 due to a lack of 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 Mainz and Frankfurt region (see Chapter 7: Metal Accessories).

Each of Chapters 4-7 is subdivided into different groups of object, and discusses various types separately, with distribution maps (labelled in text MAP #) plotted for each available on the enclosed data CD. Each subdivision also includes a discussion of the potential biography of the objects as they travelled throughout Europe, and an overview of the trade routes along which they may have travelled.

Following the consideration of metal objects, Chapter 8 provides a brief consideration of the actual process of metalwork production, where this may have occurred, and the routes by which the raw materials – tin, copper, bronze – may have travelled from the ore rich areas to those regions where objects were produced. There is a considerable quantity of evidence for bronze work production in and around the lake-dwellings in Switzerland, but it is difficult to pinpoint where exaclty these processes actually took place.

Chapter 9 then returns to the manufactured objects, and considers the varying deposition trends practised in different regions of Europe, particularly in the northern Circum-Alpine region. The possible deliberate fragmentation of artefacts, and curation of objects over successive generations, is also detailed.

In conclusion, a comparison of distribution patterns from the object categories detailed in Chapters 5-7 demonstrates regions where multiple object categories are found in close proximity, as a method of identify possible exchange routes, and nodal locations on those routes. It is also demonstrated that some lake-dwellings of the northern Circum-Alpine region formed nodal points, producing significant quantities of bronze work which travelled to other regions of Europe during the Late Bronze Age. The chapter finally suggests some areas of research which would further enhance the understanding of the lake-dwelling communities' involvement in exchange routes throughout Europe, and their attitudes and conceptions towards objects of locally manufactured and imported nature.

Enclosed on the Data CD are distribution maps for all of the object types detailed in the text, along with site lists and references. Details for each of the Multiple Correspondence Analysis plots, created using XLSTAT 2013, are provided, listing the objects categories included for each assemblage considered.

1.2: 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 Slovenia (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. For the purposes of this study Switzerland forms the main area of focus in the Circum-Alpine region.

1.2.1: Physical environment

The physical environment of the region can be separated into geography and hydrology. Concerning 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 trade partnerships flowing through the area to link northern and southern Europe. However, it is well known from archaeological finds of 'foreign' 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 (see Chapter 3: Prehistoric European Trade Routes).

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 numerous 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 within the mountain region and in the Pre-Alps, whereas the large lakes (e.g. Lakes Constance, Geneva, Neuchâtel, Maggiore, and Garda) are situated in the Pre-Alps and are much greater in size. Mountain lakes (such as Klöntalersee) are a cross between

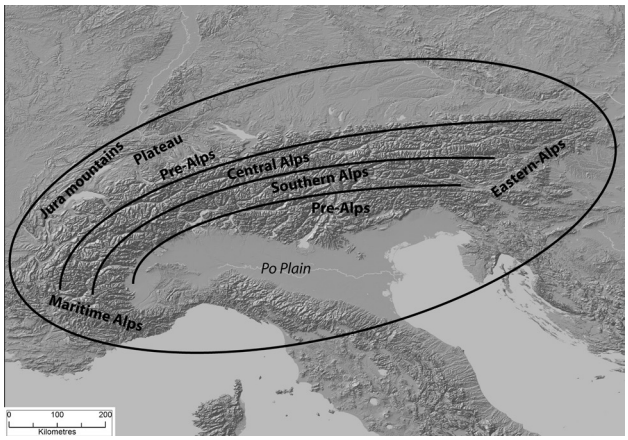


Figure 2: The Circum-Alpine region is not only about mountains; the Pre-Alps area covers broad swathes of foothills and plateau flatlands. The Po Plain forms the border between the Circum-Alpine region and the central Mediterranean.

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.

1.2.2: ARCHAEOLOGY

The first study, by Ferdinand Keller (1854), of a lake-dwelling on Lake Zurich, fostered widespread interest in this type of settlement, 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; Leuzinger 2010: 86-89; Menotti 2004b). 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 stabilization projects (Menotti 2001; Ruoff 2006). Discoveries are in fact still being made, 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 2004b, 2001).

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, CH, c. 4300 BC (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 2004a; 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, lacustrine occupation was far from continuous, and a number of hiatuses occurred throughout the entire lake-dwelling period (Gross and Ritzmann 1990; Menotti 2001; Menotti and Leuzinger 2013).

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.

Despite the high number of lake-dwellings known in the region, there is very little evidence for their burial practices during the Late Bronze Age (or any other periods). Similarly, there are relatively few hoards known from the region, resulting in the fact that many of the artefacts discussed here are recorded from lake-settlements. There are of course a number of terrestrial and hilltop settlements known, some of which show significant signs of interaction with communities south of the Alps, for example Montlingerberg, CH (Steinhauser-Zimmermann 1989). With regards to the early Iron Age, the majority of finds recorded are from burial contexts, with relatively few settlements identified, with the exception of hilltop sites such as Üetliberg, CH (Bauer, I. *et al.* 1991), and Montlingerberg.

1.3: 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 1992: 46), "central Mediterranean" (e.g. Skeates 1995), and "Southern Europe" (e.g. Coles 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, this valley feature effectively cuts a ribbon of flat land 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.

1.3.1: Physical 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 the west and south east, and in the Po Plain in the north.
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).

1.3.2: Archaeology

Prehistoric Italy cannot be seen as a homogenous region, but was a collection of regions with varying potential and cultures with different trajectories (Barfield 1994; Bietti Sestieri 2013, 1997, 1981; Nicolis 2013; Peroni 1979). 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 (Aspes *et al.* 1995; De Marinis 2009: 535; Marzatico 2004). 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 (De Marinis 2009; Köninger and Schlichtherle 2001). 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.

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; cf. 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 (De Guio 1991; Nicosia *et al.* 2011; Pearce 2000: 111). 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 (12th-9th centuries BC) and Montagnana (11th-8th centuries BC) continuing into the EIA.

Frattesina: an internationally significant manufacturing and production centre on the Adriatic coast

Four phases of settlement have been proposed for Frattesina (Figure 3), with the most important phase of occupation between the 11th and 10th centuries (Pearce 2000: 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 4.1: Amber), glass (see 4.2: Glasswork), and other objects such as ostrich egg shell, bone combs, and Mycenaean style pottery attesting to long-distance contacts (Barbarić 2010: 318; Bellato and Bellintani 1984; Bellintani, G. F. and Peretto 1984; Jones, R. E. *et al.* 2005; Pearce 2000). 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 BC (Pearce 2000). It is interesting to note that artefact distribution suggests the manufacturing and industrial areas at Frattesina 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

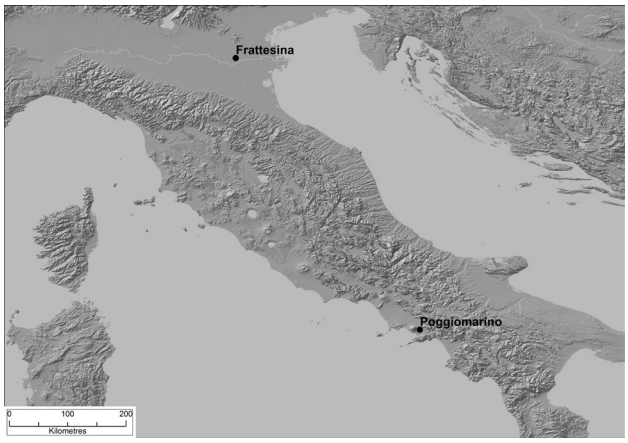


Figure 3: Location of Frattesina and Poggiomarino.

neighbours (Towle 2002: 343-344).

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

In southern Italy the riverside settlement Poggiomarino (Albore Livadie *et al.* 2005; Albore Livadie and Cicirelli 2003; Cicirelli *et al.* 2008) 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 2006). The settlement may represent an important location on trade routes to the south of Italy and the Tyrrhenian Sea (Figure 3).

Located on an ancient channel of the river Sarno, the settlement was constructed as a canalized 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. 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, as opposed to the deliberate construction of multiple islands in a semi-wetland environment.

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 4.1: Amber) and fibulae (see 7.2: Fibulae) indicate links to Central Italy, and particularly the Po Plain (cf. Watts 2013). 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 settlement 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 (Watts 2013) 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.

1.4: The eastern Baltic region

For the purpose of this research, the eastern Baltic region (hereafter also termed Baltic)[1] is taken to include Poland, Lithuania, and Latvia, and thus covers a very large area of the southern and eastern Baltic coastline and adjoining inland areas. Lake-dwellings are predominantly present in Poland, with fewer in Lithuania and Latvia, and so the majority of the following discussion is based on research from Poland.

1.4.1: Physical environment

The Baltic region 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, LT or Drūkšiai, 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 (i.e. Poland) and would have been important communication links to central Europe.

1.4.2: 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 Rossius (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 tool mark evidence as indications for the type/form of axe used to work the timber (Heydeck 1909), but the dating of many sites remains unclear (for a summary see Gackowski 2000: 9-13).

[1] In reality Denmark and northern Germany also form part of the Baltic region, but for clarity these areas will be termed Southern Scandinavia/ Denmark and northern Germany respectively.

Radiocarbon and dendrochronological techniques were slowly applied to 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; 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. Butrimas 1998; Janits 1959; Loze 1988), the late 1st millennium AD (Apals 2004/05; Urtans and Rains 2006) 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 (see Gackowski 1993a,b), very few sites have been comprehensively excavated and published (Pydyn 2007: 323-324). While Gackowski (2000) and Pydyn (2007) have summarized data for some Polish lake-dwellings, and the Luokesas, LT, settlement has been summarily published (Lewis 2007; Menotti *et al.* 2005; Pranckėnaitė 2011), there is generally little recent literature which concerns Baltic lake-dwellings when compared to the records concerning the Circum-Alpine region. Of those sites which have been investigated, many 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 (e.g. Gackowski 2000: 46-47; Krąpiec 2000: 73; Menotti *et al.* 2005; Pydyn 2005; Pydyn and Henderson 2005; Sosnowska 1995; Wilke 1996/97).

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 4).
In addition to '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 sites, Biskupin (Kostrzewski 1950), is a large fortification with high building density and grid like organisation of houses, built on a peninsula extending into Lake Biskupin. Dendrochronological analysis suggests that the fortification was built around 740 BC, partially destroyed by fire, rebuilt and occupied until around 708 BC (Ważny 2009, 1994). The settlement was subsequently used in an unfortified state until the end of the 5th century 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; Harding and Rączkowski 2010; Rajewski 1963).
- Izdenbo (Harding and Rączkowski 2010; Romanowska-Grabowska 1982), with a wooden road encircling the stronghold.
- Jankowo (Ostoja-Zagórski 1978).
- Słupca (Malinowski, T. 1958).

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 (Chochorowski *et al.* 2000; Kristiansen 1998: 295-299; Niesiołowska-Wędzka 1989). It has been suggested elsewhere that a southern (Mediterranean) influence may be evident in the organized layout of the Biskupin type settlements (Gedl 1991: 110-111; Niesiołowska-Wędzka 1989).

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 type artefacts (e.g. arrowheads and other weapons) and widespread fire horizons in settlements (e.g. Kruszynski 1991: 15-16; Malinowski, T. 1974: 196). While the idea of invading communities has largely been dismissed, with the distribution of Scythian artefacts being the result of exchange and influence relationships (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 individualization may have placed significant stresses upon social relationships (Chapman 2000: 207; Harding and Locker 2004: 198).

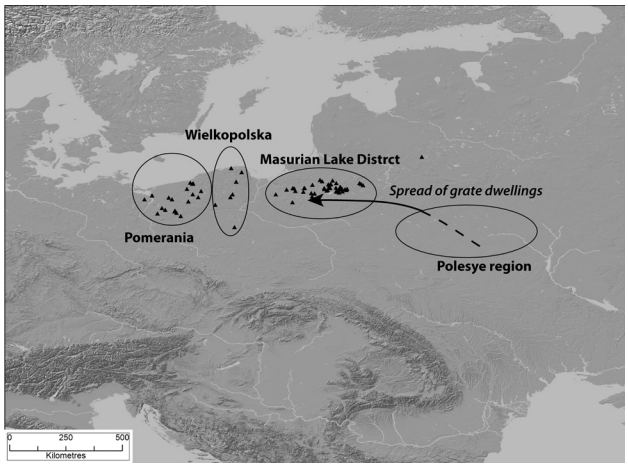


Figure 4: Lake-dwellings of the Baltic region (triangles represent sites) can be divided into three broad regions: Pomerania; Wielkopolska; Masuria. Platform grating construction may have spread from the Polesye region (Ukraine and Belarus) initially to eastern Masuria, and subsequently further to the west.

1.5: 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 (Della Casa 2013; 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-Switzerland-Eastern France group (Figure 6).

The Late Bronze Age to 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 (Della Casa 2013: 713). An earlier date for the beginning of the Iron Age, to c. 850 BC (Figure 7), 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 the ongoing debate concerning relative and typological chronologies in the area, which vary between the north-western, north-eastern, and northern/southern Po Plain areas (Bietti Sestieri and Macnamara 2007: 27-30; De Marinis 2009, 1999; Nicolis 2013; Rubat Borel 2009). 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 variously been dated to between c.1100 BC (De Marinis 2009) and 900 BC (Rubat Borel 2009), or in terms of the central European chronologies between the phases HaA2 and HaB2 (Figure 7).

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 (see Harding 2013: 394).

1.6: 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 and the Baltic region, but less frequently known from the Alpine forelands (Figure 5). 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 northern Alpine region have produced excellent research results (e.g. Eberschweiler *et al.* 2007; Köninger 2006; Jacomet *et al.* 2004; Leuzinger 2000; 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') 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

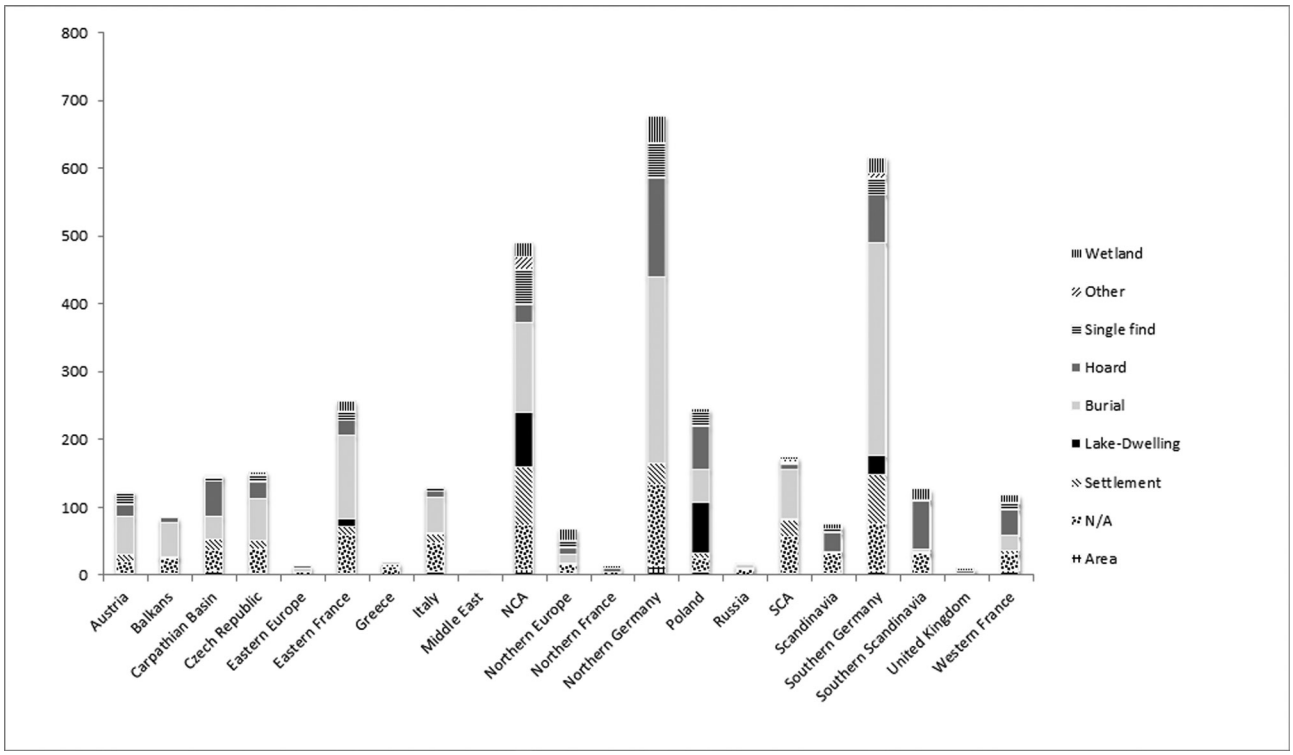


Figure 5: Comparison of prevalence of studied site types between different regions of Europe (scale represents quantities of site recorded).

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 early 'excavations' is that they may not have recognized or recorded structured depositions (e.g. hoards) which may have been placed within the vicinity of the settlement (cf. Fischer, V. 2012, 2011), 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 different types of archaeological site. For example, the many lake-dwellings known in the nCA can be seen as a result of the 19th and early 20th century interest, but lowland Alpine valley settlements remain, to an 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, allowing, in some cases, the identification of individual phases of occupation and abandonment (e.g. Billamboz 2006; Jacomet *et al.* 2004). 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 has been undertaken using published chronologies (Figure 7).

To conduct an extensive material culture study of forms present in the northern Circum-Alpine lake-dwellings, a range of appropriate literature sources have been 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 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 situations, largely covering excavations of the last quarter of the 20th century, the relevant site publications provide a high standard of information regarding the artefacts (e.g. Rychner-Faraggi 1993).

1.7: Concluding remarks

Although three main regions of interest have been identified, it is necessary to remember that trade, exchange, and communication relationships occur between zones and regions; more important than the regions themselves are

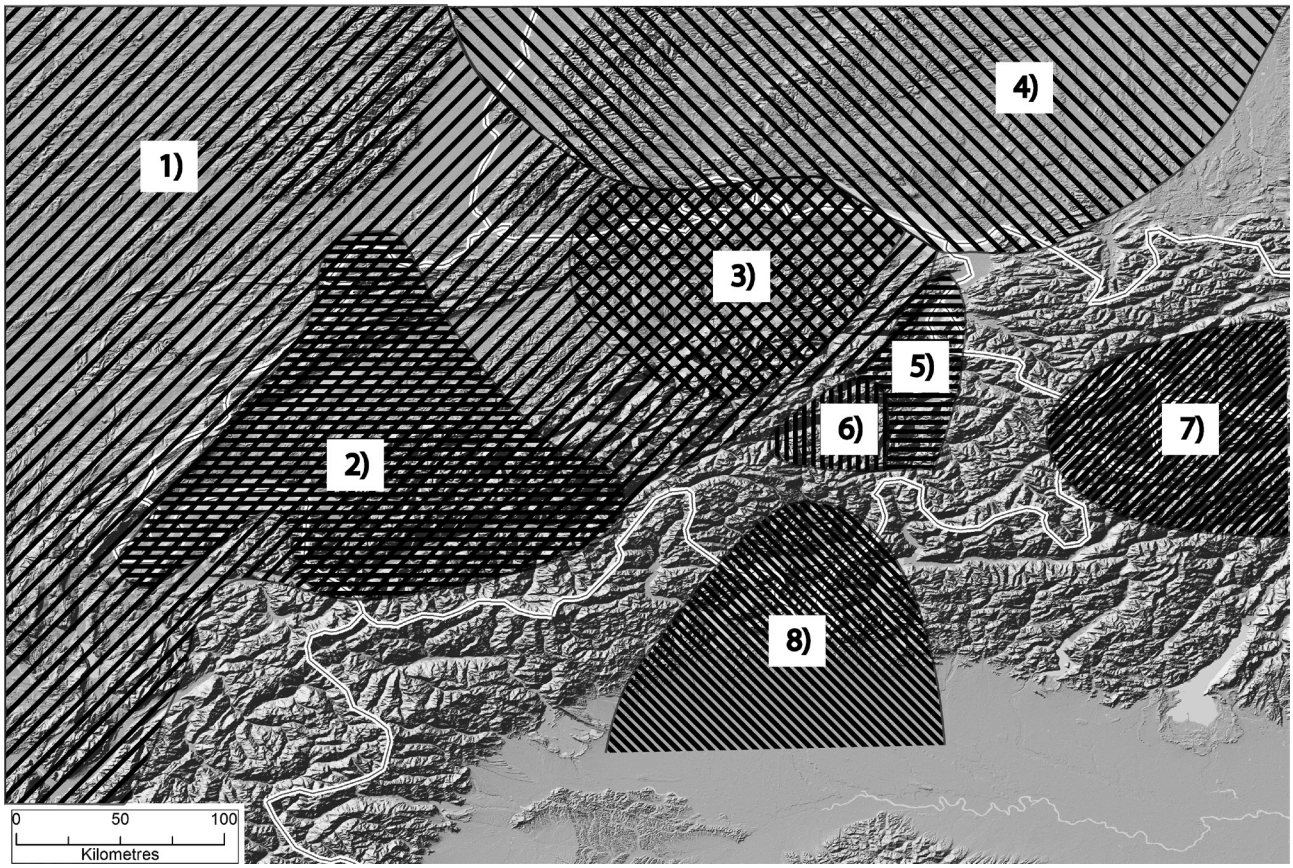


Figure 6: Urnfield cultural variant regions of Switzerland. 1) Rhine-Switzerland-Eastern France (RSFO); 2) RSFO - west Switzerland group; 3) RSFO - east and central Switzerland group; 4) Main-Swabian group (MS); 5) mixture of RSFO and MS attributes with Laugen-Melauen elements; 6) North Alpine zone with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

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 detailed above are not exclusive, objects discussed throughout this study may have originated from regions other than the three discussed here, or they may have travelled through these regions on their way to other areas, for example north-western 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, requires a well-considered theoretical approach.

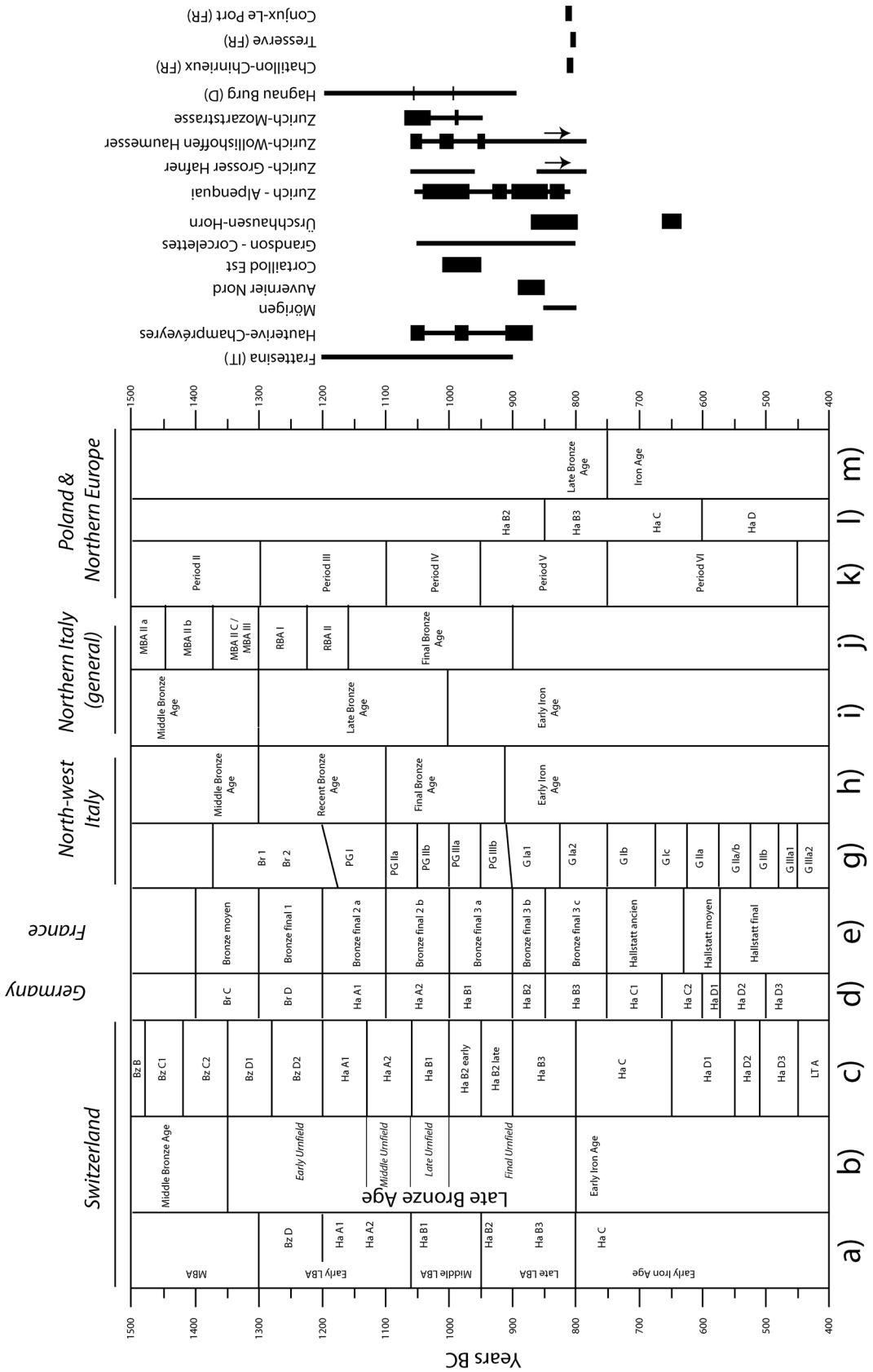


Figure 7: Different chronological systems used in the regions of study, and dating for selected lake-dwellings. Dendro-dates in thick line, typological narrow. (Data from: a) Seifert 1997; b & c) Müller, F. et al. 1999, Hochuli et al. 1998; d & e) Vital 1993; j, k & l) Pydyn 1999, Harding 2000; f & g) Rubat Borel 2009; h & i) De Marinis 2009; site dating from relevant site publications and Palafittes UNESCO World Heritage Status application DVD database v.3).

Chapter 2: Theoretical Background

The study of artefact distribution patterns can provide an indication of the route along which objects moved, but does not explain *why* they circulated between regions, communities, and cultures. On a pragmatic basis it may be argued that objects circulated as a way of obtaining resources, for instance the circulation of bronze objects was not only about the item, but also about the material: moving bronze (or its constituents) from the ore rich areas of central Europe to those areas where it is not present. Similarly, bronze could be used to acquire materials, for instance amber from northern Europe, which are not present in the copper rich areas of the Alpine region. From a social perspective, there has been much discussion about the role of 'gift giving' in prehistoric societies (e.g. Sharples 2010), as a practice of creating social identity and status, and alliances between communities. In reality it is likely that the movement of objects fulfilled both social gift and practical material resource acquisition.

The contexts in which of both local and imported origin are found provides some indication of their social value. Through analysing the deposition contexts of objects between different regions an understanding of the changing values of objects, and of their 'cultural biography' can be achieved.

2.1: The cultural biography of objects

Although the principle of the 'biography of objects' has been well discussed in recent archaeological literature, some of its basic concept can be traced back to the early 20th century. For example, Rivers (1910: 7) suggested that a method of elucidating inheritance laws in anthropological studies would be to chart the ownership of land by recording plot movements on a genealogical type tree, effectively creating an ownership history of the land: a land plot biography. In his study of the Kula exchange network, Malinowski (1922: 89-99) suggests that participants in Kula exchange can gain prestige by possessing famous objects or those that have been previously possessed by prominent or renowned individuals (see also Campbell 1983; Damon 1983; Munn 1986). The history of the arm-shell or decorated necklace remains with, and becomes a constituent part of, the item as it travelled through the Kula network: 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 (Appadurai 1986; Gosden and Marshall 1999: 170).

In the 1980s 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 the social attitudes 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: 66-67).

In the same volume, Appadurai (1986: 34) attested that the 'biographical' approach to the history of an object is well suited to the study of individual items, whether they are of a general category of objects, such as Kopytoff's (1986: 73) Suku hut, or "singularized objects" (unique/exclusive items), e.g. Kopytoff's (1986: 82) example of a Picasso painting. However, if we wish to consider a category of artefacts, as opposed to an single object, for instance all of the arm-rings of a specific type, then, he suggests that we should instead consider the 'social history' of the object group (Appadurai 1986: 34). This social history transcends the separate object biographies of an object group or class to form a whole; 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 the biographical proposal to suggest that, particularly in Western society but also in pre-modern non-capitalist societies, the commodity status of an object can vary throughout its biography/social history depending upon the context in which it is placed by individuals or society. There is a high potential for differing opinions of the value of objects, with individuals attesting a higher value (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; also Shanks 1998: 19-20).

It is desirable to avoid constructing the object biography/social life history simply as a "use 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 Sullivan's (1978) "mapping", and Schiffer's (1996: 13-23) "object life history" (see also LaMotta and Schiffer 2001: 21-24). Such an emphasis of the materialistic properties of an objects biography or life history risks losing the interpretation of an objects social meaning.

The principle of object biographies has been successfully examined in anthropology (e.g. Hoskins 1998; Miller 1998), and it is evident that the discursive nature of the biographical approach is well suited to anthropological research in which objects can be 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 artefacts, how objects can come to symbolize people, and how people can depict their life stories through those items. This returns to the principles of object biographies hinted at by Malinowski and Munn with reference to the Kula (see above), and also the principles of dividual personhood developed by Strathern (1988) and Gell (1998).

But how can object biographies be created from the 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 certainly individualized, and biographies can be created for these, for example Peers' (1999) study of the S. Black bag, or Gosden and Marshall's (1999) account of object 1940.10.54 from the Pitt Rivers Museum.

However, the fact that very few (or single) examples of an object have been found archaeologically does not mean that only a few 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. For example metal objects could have been recycled through a process of re-melting and re-casting, rather than being deposited at the end of their cultural life (e.g. Needham 1998). Through a similar process, Skeates (1995: 285) has suggested that the contrast between the prevalence of 'axe-amulets' and scarcity of stone axes discovered in Copper Age sites on the Maltese Islands may be a result of the transformation of axe blades into axe amulets; one object was 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 or recycled before deposition. For instance a broken wooden tool or bowl, 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 structural timber there is the possibility that timber was re-used as structures were re-built and modified. Such a situation is possibly suggested by dendrochronological evidence from Gachnang-Niederwil (Ebersbach 2009) and Alleshausen-Grundwiesen (Bleicher 2009: 125, Fig. 185), 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 such studies have been undertaken (e.g. Chapman 2008, 2000; Chapman and Gaydarska 2007; Frieman 2012a; Renfrew 1986; Moore 2007; Sheridan and Davis 1998; Skeates 1995; Tilley 1996). The fundamental basis for 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' (cf. Jones, A. 2007a: 76-84), but to note that an awareness of context is essential to the understanding of object associations and value changes. Through the concept of 'relational theory', it has been shown that persons and objects are mutually reflexive, and that objects reference other concepts, materials, and ideas (cf. Gell 1998; Strathern 1988). 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 during the life of the object (Jones, A. 2007a: 82). 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.

Jones (2007a: 141-161) draws influence from Gell (1998) in suggesting that we should consider artefacts as part of an *oeuvre* and use the principles of 'protention', 'retention', and 'citation' as a way of interpreting the wider networks within which objects are components, and as a method of understanding how categories of objects relate to each other. The principle of 'citation' is a method of conceptualizing 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 features.

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 (e.g. Chapman 2000: 54; Ford *et al.* 1998). 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, changing associations, and interactions. The examination of object classes or categories will produce an *idealized* biography for those 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, A. (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 proposition is too strong in suggesting that biographical approaches can only be successful if they cover an artefact (group) from their very conception to 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.

In a prehistoric context, it may not be necessary to know the original source location and manufacturing site of the amber beads found at some of the Swiss lake-dwellings (see 4.1: Amber), 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).

2.2: Theories of trade and exchange

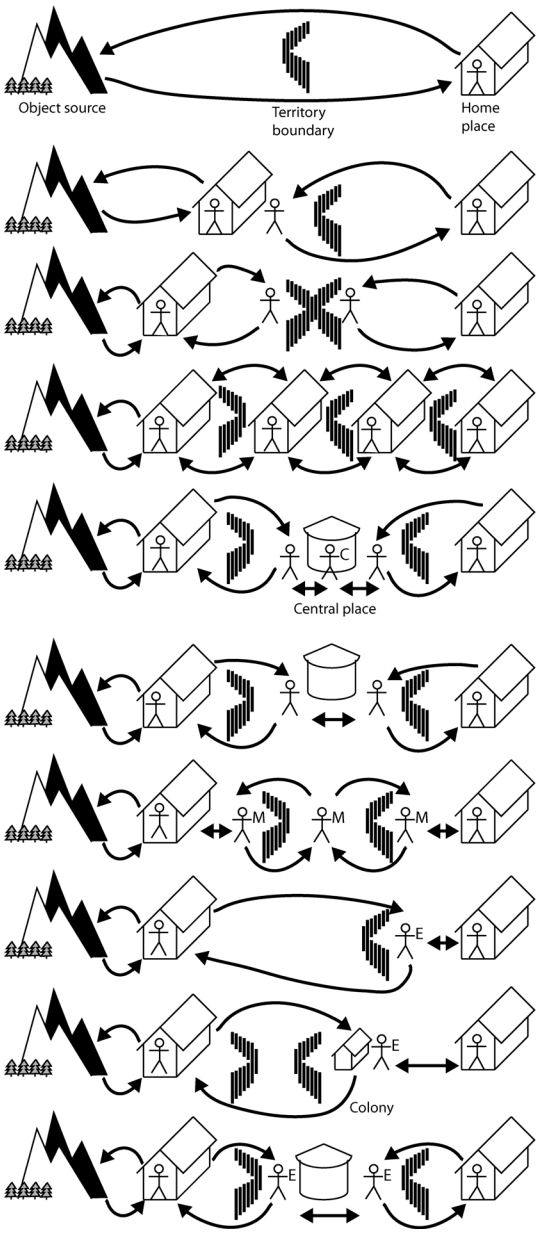
Aside from theoretical concepts relating to objects, there is one other area that requires consideration: theories of trade and exchange. This addresses one of the key aspects which archaeological investigation seeks to understand: where objects came from and how did they circulate.

The differences between 'trade' and 'exchange', 'gift' and 'commodity', the development of a 'prestige economy', and 'alienable' or 'inalienable' objects have been well covered in the published literature (e.g. Oka and Kusimba 2008: 340-342; Sahlins 1974; Skeates 2009; Strathern 1988; Weiner 1992). Here it is sufficient 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. Objects can move between the two categories, and both types of exchange occur in societies for different categories of objects (see above). 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 interchangeably.

Chapman (2008) provides a brief history of the research of trade networks, from Renfrew's (1975) ten modes of resource attainment, through Hodder's (1984) rejection of identifying these trade types by fall off patterns, to the recent reconciliation between theoretical schools on the benefits of trade and exchange studies to an interpretive archaeology. He 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." (Chapman 2008: 335).

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 8) which were initially proposed by Renfrew in *Trade as Action at a Distance* (1975). It was supposed that 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 Europe north of the Alps during the Late Bronze Age it is possible to reduce the variety of exchange methods that may have been employed; direct access, colonial enclave, port of trade, and emissary trading can be removed as methods of procurement. This leaves 'reciprocity' (home base and boundary), 'down-the-line' trade (though see Skeates 2009: 566), 'central place redistribution', 'central place market' exchange, and 'freelance trading' as exchange methods. Through the study of the distribution of types of material culture form the Circum-Alpine region, trade and exchange routes can be proposed, which linked the lake-



Direct access: materials are directly accessed.

Home reciprocity: materials are exchanged at one of the partners home base.

Border reciprocity: materials are exchanged at a border zone between exchange partners.

Down-the-line: materials are exchanged across many partners in reciprocity exchange.

Central redistribution: materials are gathered at a central place and redistributed by a central authority (C).

Central exchange: materials are exchanged directly between partners at a central place.

Freelance trade: materials are traded by independent freelance traders or merchants (M).

Emissary trade: materials are traded by an emissary (E) sent from one partner to trade with another.

Colonial centre: materials are traded at a colonial base established by one partner in a foreign territory.

Trade centre or port of trade: materials are traded emissaries at a central place in neutral territory.

Figure 8: Ten possible modes of exchange and interaction used during prehistory (re-drawn from Renfrew and Bahn 2008: 375).

dwelling communities to the wider European setting, and it may also be possible to suggest modes of interaction.

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: 348-352). If there is a gradual shift of object associations from one region to another, this may suggest a 'down-the-line' exchange mode, under which the association, meanings, and values of specific objects gradually changed as they travelled further along the route. 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.

Considering the motivations for exchange, Chapman (2008: 352) suggests that exotic objects possess a value quality: "… because of the inherent value and aesthetic attractions of the things themselves.". However, objects do not have an inherent value, as all value is culturally based. 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 (1975: 37; also Renfrew 1993: 8) 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.". 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; or b) through distance from its original source and the associated aspects of acquiring objects from great distances. 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, however, not a given that people have high value objects because they have high status, in fact, status could be generated as a result of ownership of certain 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 2007; Monna *et al.* 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. In that 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 (cf. Broodbank 1993: 326-327; Helms 1988: 263). 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 significance of translation in the adoption of foreign goods into new cultural situations is clearly evident; if the objects cannot be made to fit into pre-existing social structures there will be no place for them in the society. Therefore 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 due to their 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 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 (Miller 1982: 93). However, attempts at introduce pottery to functions for which it has no traditional use, such as musical instruments, were unsuccessful. This can be seen in terms of the potter's ability to translate their products into 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 had no social precedent, making translation more difficult and thus un-acceptable to customers.

Once materials or object types have been successfully translated into a new cultural area, the exchange practices 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: 114-116). 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. 4.1: Amber). 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.
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 contrast 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; Snodgrass 1980), 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 from the Circum-Alpine region during the La Tène period is given by Kunter (1997) 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 (see also Venclová 1983). Instead, a variant of blue glass beads is common in this region. The apparent rejection of beads due to colouring is a clear indication that there was more to the successful translation, incorporation, and utilization 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 '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 (e.g. Ambrose *et al.* 2009; Angelini and Bellintani 2005; Angelini *et al.* 2004; Arletti *et al.* 2010; Balassone *et al.* 2009; Beck and Stout 2000; Frei *et al.* 2009; Hodder and Lane 1982; Jackson and Nicholson 2010; Santi *et al.* 2009). The impact of this analysis on the reconstruction of trading patterns is clearly significant in that it is possible to suggest from where an object originated. Some studies have used such '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 (e.g. Jones, R. E. *et al.* 2002; Sheridan and Davis 2002; cf. Biehl and Rassamakin 2008).

A potential problem 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. 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 a point which requires attention: 'imports' do not always need redefining when they enter a 'new universe'. 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. 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 associations and values from their source area to distant 'new universe'. With the benefit of hindsight it is possible to observe the difference between the 'original universe' and 'new universe'. But what of the pre-historic situation?

Did Bronze Age societies view these goods as 'foreign', or were there simply local goods and ideas, exchanged through a series of local connections, without concept of their distant origin and 'identity', other than they were 'out of this universe' (cf. Gosden 2005: 198-199, 207-208; Williams 2010: 162)? Surely there was no '*origin* universe' and '*new* universe' – there was only the '*universe*', a patio-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 2005: 16-20). With reference to the earlier discussion of 'translation', 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, replication of 'foreign' material culture styles, usually as the result of contact with more 'advanced' societies and technologies. Furthermore, it is clear that the concept of 'emulation' also implies an inherent attribute in objects which causes people 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 need bare no relation to their original cultural setting. This position is advocated by Vianello (2005: 96; also Kristiansen and Larsson 2005: 12-13; Stein 2002; Thomas 1991) 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 status 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 2012b; Hurcombe 2008: 102; Knappett 2002: 108-113; Monna *et al.* 2013) addresses the more social aspects of 'incorporation'; the "meaningful imitation in one material of forms or shapes common to another" (Frieman 2010: 33). While

Frieman (2010: 37-38) considers the locations where skeuomorphs occur, the actual process of skeuomorphism is not considered (but for an extended discussion see Frieman 2012b: Chapter 2). 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" (Frieman 2010: 42), rather, they are the product of translation; for a skeuomorph to be created the 'novel object' has already been translated, reconceptualised, and localized into 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 (e.g. Saunders 1999).

Potrebica (2008: 199) suggested that "if we perceive culture as cargo, then 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 contentious 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 perceptions of the new cultural setting towards the old.

2.3: Considering exchange networks and biographies of objects in the northern Circum-Alpine region

In order to combine the dataset detailed later, and 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 of objects (see Conolly and Lane 2006; Wheatley and Gillings 2002), can be used to suggest routes along which those objects travelled from their centres of production to other areas of Europe. Utilizing 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, 24 km, would be a suitable (maximum) estimate of travelling distance for a trader travelling by foot in one day (see also Uckelmann 2013). While this distance may be a little optimistic for a small trading expedition, it would allow for vagaries of transport method, and is also not 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 6.3: Sickles), particularly around the 25 km mark (e.g. Grandson-Corcelettes ↔ Cortaillod; Estavayer-le-Lac ↔ Montilier[2]), 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 25 km has been used for the density mapping functions in the following GIS analysis.

Correspondence Analysis (CA) and Multiple Correspondence Analysis (MCA) have been increasingly used in archaeological research as a method to highlight underlying trends in assemblages and distributions (for a thorough explanation see Doppler *et al.* 2010; Shennan 2006: 308-360). While Correspondence Analysis is a statistical method best applied to absolute quantities, Multiple Correspondence Analysis 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 has been 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.

Understanding the changing value of objects as they travelled between regions is a key aspect to understanding the social biography of objects, and the way in which their value changed, for example from commodity to individualized object. Such value changes may also be able to indicate the process by which objects travelled around Europe – if their values remained constant it may be more indicative of direct exchange, whereas gradual changes could suggest down-the-line exchange.

[2] ↔ is used to denote between sites/settlements/areas, i.e. between Grandson-Corcelettes and Cortaillod or between Estavayer-le-Lac and Montilier.

The MCA charts consist of two data series plotted along two axes: *Variables* and *Observations*. In this volume 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 represent the 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 variables some objects have been recorded as single items in assemblages, and some object categories are represented by only single observations. In such situations these records are used as *supplementary* observations/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 to allow a clear observation of clustering and segregation.

To record each of the object classes for MCA would create too great a diversification, and so material objects are grouped into classes depending on their function (Table 1), and following other recognized classifications (e.g. Gauthier 2003; Verger 1992). 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).

Table 1: 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 *Pfahlbauperlen* MCA))				B
Amber/Glass/Gold	(Listed separately for specific material groups where predominant in multiple assemblages (e.g. for *Schnabelkannen* MCA))				AGG
Organics	Animal bones				R
Inorganic	Stones				I
Domestic	Spindle	Whet	Grinding stones	Calcified bread	D
	whorls	stones			
Metal working	Casting jets	Ingots	Casting cakes		M
Small metalwork	Non-descript fragments				A
Keys					K

Chapter 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 Aegean (e.g. Bouzek 1997; Cline 1994; Crewe 2007; Harding 1984; Laffineur and Greco 2005; Morgenroth 1999; Sherratt, S. and Sherratt 1993; Stampolidis 2003; Vianello 2005; Whittaker 2008). Some studies (e.g. Jurišić 2000) use artefactual evidence from shipwrecks to provide clear indications of exchange networks and the types of goods exchanged, because the objects 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 Late Bronze Age and early Iron Age overland trade routes which existed outside of the Mediterranean sphere. Some early studies of these routes considered artefacts, particularly metalwork, from southern Europe found in northern Germany and Denmark (e.g. Cleland 1927; Sprockhoff 1951; Tackenberg 1971; Thrane 1975). Such long-distance, trans-continental, trade routes, or sections thereof, have recently been re-addressed and re-interpreted (e.g. Baron and Lasak 2007; Bietti Sestieri 1997; Della Casa 2007; Lang and Salač 2002; Nash Briggs 2003; Potrebica 2008; Stary 1995; Szabó and Szónóky 2002; Winter 2008).

One of the main problems encountered by studies of overland trade routes, particularly those from northern to southern Europe, is to understand what was actually exchanged. While objects seen as indicative of trade routes flowing from the south are generally manufactured metalwork (e.g. Kristiansen 1998: 162; Struve 1979: Fig. 72; Thrane 1975), many of the items proposed as exchange objects flowing from the north are organic materials and consumables. Goods such as textiles, furs and hides, people (either as slaves or through marriage practices), animal stock, salt, wax, pitch, resin, honey, timber, wine, oil, cereals, cheese, herbs, spices, ointments and perfumes are rarely preserved in the archaeological record and so inferred trade route are created from only a fraction of the potential exchange material (Artursson and Nicolis 2007: 336; Bouzek 1997: 210; Kristiansen 1998: 180; Nash Briggs 2003; Sherratt, A. 1993: 31, 38; Stary 1995). Wiener (1991: 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, papyrus, hides, ropes, and food stuffs, in addition to the more likely archaeologically preserved materials of gold and silver.

Considering the materials which are found in the archaeological record, probably the most archaeologically visible material to have travelled 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. Bouzek 1993b; Bukowski 1988; du Gardin 1993; Galanaki *et al.* 2007), distribution maps of 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*, in which he detailed 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 (Sherratt, A. 1998, 1993). Primacy of the main route followed varied over time, dependent upon the socio-economic balance of the Mediterranean societies (Figure 9). Dominance of the regional economy by the societies on Cyprus and Crete during the early 2nd millennium BC led to the utilization and expansion of the Danubian route, flowing between the eastern 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 societies during the late 2nd millennium BC, economic contraction of the Mediterranean led to a decline, though not complete collapse or abandonment (Iacono 2013), of the Alpine route and a return to Danubian/ Carpathian links.

Renewed and intensified communication and exchange between the east and western-central Mediterranean during the early 1st millennium BC (LBA-EIA) led to a flourishing of the Alpine route (e.g. Kristiansen and Larsson 2005: 116-184; Kristiansen 1998; Pydyn 1999; Sherratt, A. 1998, 1993; Sherratt, S. and Sherratt 1993). Although such studies have focussed on the role of north-south exchange routes, it should be noted that during prehistory there were dynamic trade routes and connections crossing Europe, flowing in a multitude of 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 (cf. Pydyn 1999: 21, 56).

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 (for example) direction with few objects travelling the entire distance (Sherratt, A. 1993); however, amber

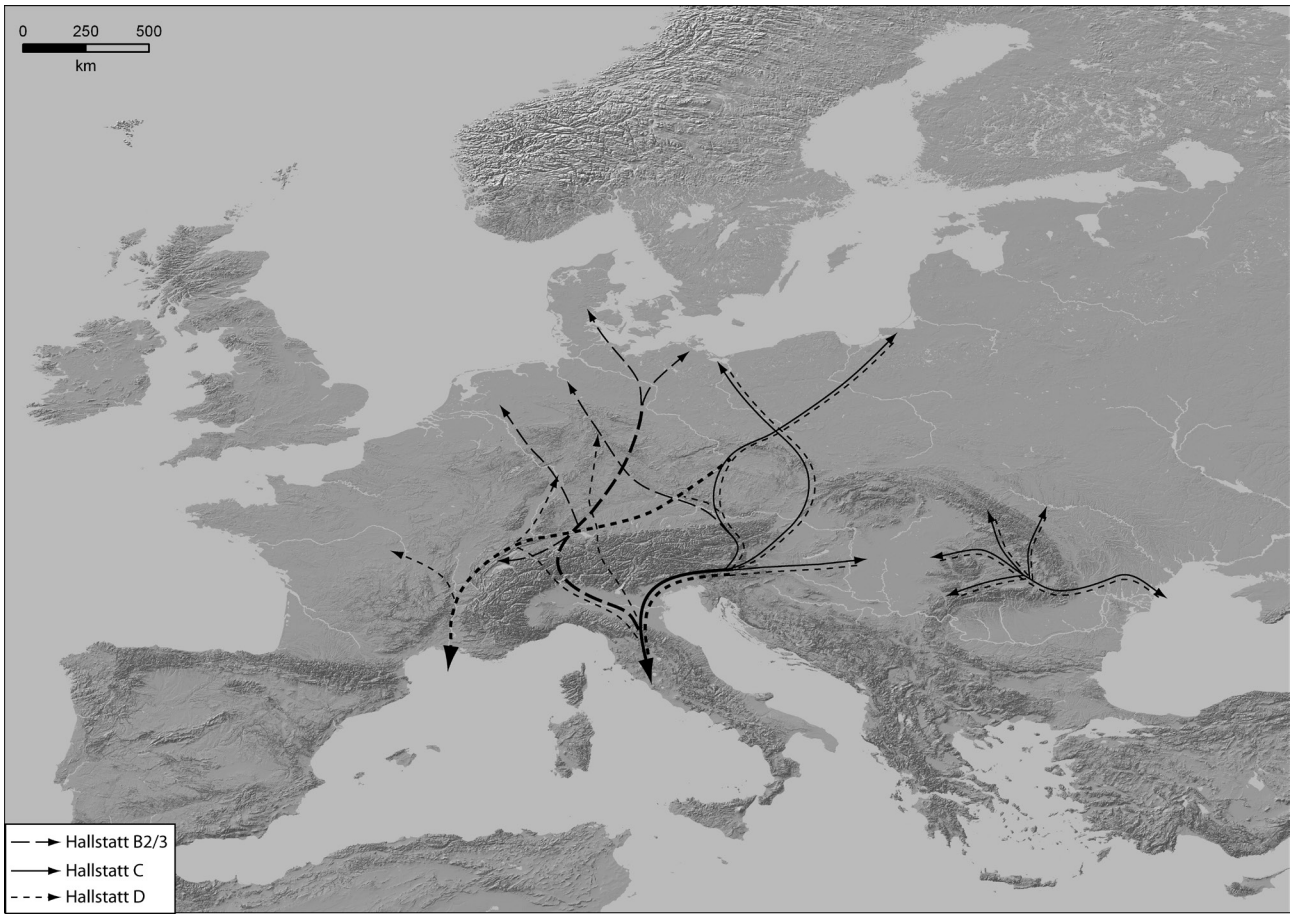


Figure 9: Schematic illustration of European trade routes of the Late Bronze and early Iron Ages. Mediterranean routes have been excluded from the illustration, but centres of manufacture and exchange should be envisaged in the Greek peninsula, southern Italy and in the Turkey (data from Sherratt 1993: Fig. 12).

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.

It is possible that communities involved in the exchange of goods and materials did not know where they went after they had traded them, or from where acquired goods originated (see Fontijn 2009: 141-142, Figs. 149.147, 149.148). As the distance from a community increases, the knowledge possessed by the community 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' Evans *et al.* 2006; Fitzpatrick 2009; or 'Ötzi' Spindler 2001; see also Jockenhövel 1991). Chains of understanding and knowledge would have been created between communities in regular contact, gradually increasing the world knowledge possessed by them. Groups in secondary, tertiary, or irregular contact would undergo less knowledge transfer, leading to a slower rate of knowledge accumulation (Figure 10). Such diffusion of knowledge, and subsequent clouding of facts, is illustrated by the classical Greek belief that amber came from the Electride 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 2007: 349). From the perspective of ancient Greek communities, far from 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 it from in, direct or in-direct, 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 Europe there is little evidence of prehistoric maps (though see the rock art from Val Camonica, e.g. Anati 1960: Fig. 35). Instead, mental maps would have been created, with individuals forming an understanding of their environment, surroundings, and significant places[3].

Individuals in positions enabling them to produce mental maps of more distant locations may have manipulated that knowledge of distant lands to further their own ends, by providing legitimization, restricting accesses to such knowledge and the goods acquired from distant locations, and through actively promoting the mingling between

[3] 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.

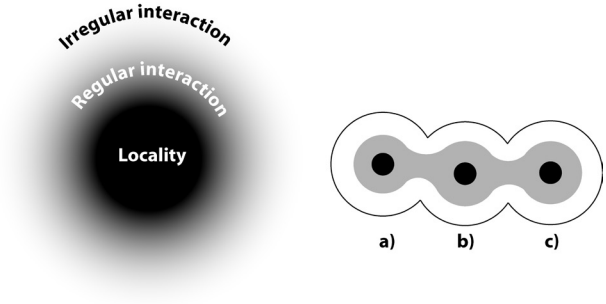


Figure 10: Community knowledge and understanding about the surrounding environment fades as distance and levels of interaction decrease from the community centre. Regular interaction may increase the knowledge held by a community of more distant regions (e.g. b to c), while, much like the school yard 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).

reality and myth of distant places (cf. Helms 1988; Kristiansen and Larsson 2007).

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 of central and northern Europe. 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 fortified hilltop sites in order to control routes of trade and exchange running through their local regions (e.g. Sherratt, A. 1993: 26-29; also Bouzek 1994; Jockenhövel 1985). Some of these fortifications such as Barca, Spišský Štvrtok, and Nitransky Hrádok, were constructed with elements of Minoan/Mycenaean influence (Kristiansen and Larsson 2005: 162).

Fortified settlements, sometimes in association with open sites, 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 exercised over trade routes. Further control of exchange systems was provided by centralizing production, particularly of metal and textile industries, effectively controlling both the groups who could manufacture objects and those who could trade objects (Kristiansen and Larsson 2005: 125; Sherratt, A. 1993: 29). Control of the trade routes should not only be seen in an active manner; 'passive' control would also occur once manufacturing centres were created. Such centres would effectively become trade 'magnets', attracting and drawing trade to the site from the surrounding region with little direct control. 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 1990; Kadrow 2007; Kristiansen 1998: Fig. 191; Schauer 1985). Trade routes flowing between the Baltic and Mediterranean via the Carpathian basin during the later Bronze Age are also attested by artefactual finds, including metalwork, Aegean references in the Füzesabony culture (Górski and Makarowicz 2007), and many artefact types throughout the Balkans (Bouzek 1994).

With the westward expansion of the Mediterranean economies during the Middle Bronze Age, the north-south trade routes also shifted westwards to incorporate 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 import/export between the two regions (Palincaş 2007). 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 (Kristiansen and Larsson 2005: 127, 211).

Many pottery finds attest to links between eastern Mediterranean societies and the Italian peninsula during the Middle Bronze Age (e.g. Bietti Sestieri 1988; Jones, R. E. *et al.* 2005; Marazzi 2003; Vagnetti 1999), and the MBA/LBA fortified settlement of Monkodonja, HR, on the northern Adriatic coast (Hänsel 2007; Teržan *et al.* 1999) illustrates the influence of Aegean communities in one portion of the Alpine long-distance exchange route. Although construction elements indicate this influence (Hänsel and Teržan 2000), the ceramic decoration retains links to the central Danubian region (Buršič-Matijašić 1998: 116).

Trade routes between central Europe, the Aegean, and the north during this period, and later, are illustrated by metalwork (e.g. Müller-Karpe 1962; Peroni 1979: 20-21), 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 fibulae (Teržan 2007). 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 (Guštin 2010; Potrebica 2008).

Just as fortified settlements constructed in the Alpine region during the Early and Middle Bronze Age were possibly connected to copper ore exploitation and metalwork production (Artursson and Nicolis 2007; Krause 2005), fortified settlements north of the northern Alps during the Late Bronze Age and early Iron Age, often occurring 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. Heske 2009; Kuhlmann and Segschneider 2004; Jockenhövel 1974b; Winghart 2000, 1998). Sites such as Wittnauer Horn, CH (Berger, L. and Brogli 1980; Bersu 1945) and Montlingerberg, CH (Steinhauser-Zimmermann 2002, 1989; 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 fortified settlements in exchange relationships, as particularly shown by the Heuneburg, D, with a Mediterranean influenced fortification wall, and imported Attic pottery (e.g. Gersbach and Boom 1996; Gersbach 1995; Kimmig and Böhr 2000; Pape 2000). 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 such activities (Wells 1995: 236; cf. Sharples 2010: 106). The routes by which goods reached the Heuneburg differed somewhat from the north-south routes of the Late Bronze Age (Figure 9); 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 (e.g. Guggisberg 1991). The distribution of Greek and Etruscan pottery suggests that over Alp routes were utilized at the same time (see 4.3: Pottery).

Cultural transmission and exchange of burial practices and disposal of the dead through, though not incorporating, the Circum-Alpine region is suggested by the contemporaneous occurrence of 'house urns' in the Etruscan region of Italy, southern Scandinavia, northern Germany, and northern Poland (e.g. Kristiansen 1998; Sabatini 2013, 2007; Malinowski, T. 1971: 109-110; Müller, R. 2002). 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 utilization, as the symbolic associations differ between the two areas (see also Sabatini 2013, 2007). Given the contemporaneous use of the urns in the two regions it is difficult to argue for independent innovation, instead the differences in symbolism and significance should be interpreted as the translation of the house urn to local contexts and practices 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.

Although the urns are indicative of two 'end-zones' involved in long-distance communication routes extending from the Italian peninsula to northern Europe and the Baltic, other objects, such as Nordic belt buckles and *Pfahlbaulanzen*, show a gradual distribution, and led Kristiansen to discuss the rise of the "*Pfahlbau* route"[4] between Italy and southern Scandinavia during the early 1st millennium BC (Kristiansen 1998: 161, 1993: 143; Sprockhoff 1951).

[4] The "lake-dwelling route".

3.2: The lake-dwelling link

Evidence from the Neolithic and Early Bronze Age suggests that lake-dwelling communities of the Circum-Alpine region participated in exchange systems with communities in northern Italy and the Mediterranean. The distribution of Neolithic flint axes, pintandera and various ceramics clearly suggest exchange routes across the Alps, and extending further across Europe (Leuzinger 2010: 100-101; Köninger and Schlichtherle 2001; Pétrequin 2011). Objects circulated in the Bronze Age, such as needles, crucibles and pottery, suggest similar communication patterns (e.g. Della Casa *et al.* 1999; Köninger and Schlichtherle 2001; Primas and Schmid-Sikimić 1997; Schnekenburger 2002; Wyss 1990). These objects do not relate to material from the eastern Mediterranean, and such material should not be expected to have reached the northern Alpine region along polythetic routes (see below).

One of the most interesting objects to have been found at the lake-settlement Bodman-Schachen I, D, is a *'Brotlaibidol'*[5], 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. Interpretations of these 'idols' have varied from talismans or cultic objects (Cornaggia Castiglioni 1976) to implements used in trade partnerships (Bandi 1974). Their use in such partnerships 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 their surface, given there is an apparent numerical system to the markings (Fogel and Langer 1999; Zanini and Martinelli 2005). Many of the Brotlaibidole have been excavated in a fragmented state, which has also led to the suggestion that the tablets were deliberately broken once a trading partnership or agreement was established or concluded.

3.2.1: Riverine and lacustrine systems as trade networks

Given the importance that has been attached to riverine routes for trade and exchange during prehistory (Gambari 2004; Haughey 2013; Nymoen 2008; Sherratt, A. 1996), it is not surprising that lake-dwellings were involved in the circulation and exchange of materials over long-distances. Trade routes flowing across the Alpine region would have found relatively 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 established, for example, at the outlet of Lake Zurich (Figure 11).

[5] 'Loaf-of-bread-idol' or 'tavolette enigmatiche'.

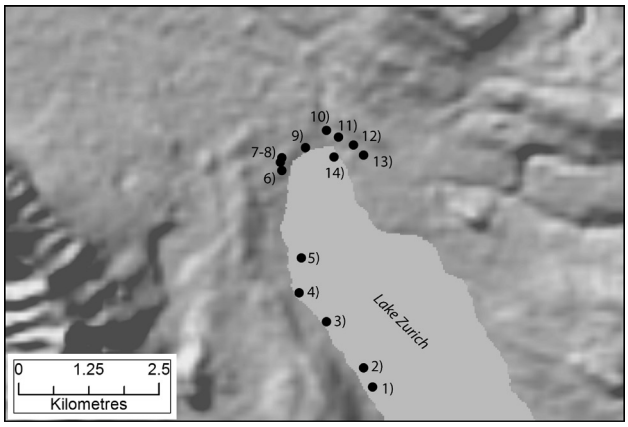


Figure 11: A clustering of lake-settlements around the outflow of Lake Zurich is evident compared to their more dispersed occurrence further around the lake-shore. 1) Kilchberg-Bendlikon; 2) Kilchberg-Mönchhof; 3) Zurich-Wollishofen Horn; 4) Zurich-Wollishofen Bad; 5) Zurich-Wollishofen Haumesser; 6) Zurich-Mythenschloss; 7 & 8) Zurich-Breitingerstrasse; 9) Zurich-Alpenquai; 10) Zurich-Bauschanze; 11) Zurich-Kleiner Hafner; 12) Zurich-Mozartstrasse & -Opera; 13) Zurich-Seefeld; 14) Zurich-Grosser Hafner. (Data from database of the Palafittes UNESCO World Heritage Site application 2009).

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 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, 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 at Poggimarino suggests such a use, see Cicirelli and Albore Livadie 2012; Menotti 2012: 163). However, it is likely that watercraft would have been used to perform a number of functions, and the transport of goods over both short- and long-distances 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 (e.g. 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. 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, 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, D, and Grandson-Corcelettes, and Cortaillod, CH (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 guided land routes along their banks, flood plains and valleys.

It is simplistic to interpret lake-dwellings and lake-side settlements as areas of interaction between land- and water-borne systems of communication and exchange, particularly when as some lake-dwellings were not on major river and lake systems, (e.g. Greifensee-Böschen and Ürschhausen-Horn, CH) 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 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 on 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.

3.3: Concluding remarks

Forms of material culture – 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 previously discussed, the exchange of organic objects remains largely invisible in the archaeological record. Even the exchange of raw metal, e.g. copper and tin, remains difficult to observe because they were cast into objects (see Chapter 8: Metal Working in the Northern Circum-Alpine Region). However, a range of materials, both of fossilized organics, i.e. amber, and manufactured, e.g. glass, bronze, are frequently preserved in the archaeological record. The disparity between the natural occurrence of these materials, e.g. amber in the Baltic region, 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.

Many Late Bronze Age lake-settlements are known from the northern Circum-Alpine region, and many different forms of artefact have been recorded from them. Recording the European wide distribution of objects of different types will provide an indication of the routes along which those pieces travelled, and by extension, the exchange routes and partnerships in which the lake-dwelling communities were involved. Furthermore, the quantities of objects found at the lake-dwelling sites, and their density distribution, may suggest the relative importance of the lake-dwellings, and different exchange routes, in the circulation of objects.