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In memory of
Ian Alexander George Shepherd

This Volume is dedicated to the memory of Ian Alexander George Shepherd (1951–2009), who contributed so much to the study of Scotland's Chalcolithic and Bronze Age and who supported this book and the conference that gave rise to it.



Frontispiece: Ian, with wife Alexandra (Lekky, author of Chapter 17, far left) and colleague Moira Greig (centre) during the experimental cremation of a pig at Archaeolink, September 2004. Photo: Alison Sheridan



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Growth and Expansion: social, economic, and ideological structures in the European Chalcolithic

Volker Heyd

A long-term and ongoing evolutionary progress is attested for prehistoric Europe between the mid-5th and late 3rd millennium BC. Deep-reaching social and ritual changes transform the existing pattern as early as the first Chalcolithic horizon in south-east Europe. Similar changes occur in the western half of the continent though manifested in different ways and based on other materials. The period 3600–2500 BC sees then the revolution in terms of subsistence economy. Lines of interconnections in Europe and a new stage in the human–animal symbiosis are crucial for our understanding of the ideological changes that shatter the continent in these centuries. The Europe-wide Bell Beaker Phenomenon of the mid–later 3rd millennium is only the apex of this ideological domination. In such, it completes the process of the Chalcolithisation of Europe.

European prehistory is social, economic, and ideological evolution. In this paper, I outline some of the paradoxes involved when we talk of the European Chalcolithic, and try to move beyond the standard topics such as ‘identity’, ‘autonomy’, and ‘social structure’.

The term ‘Chalcolithic’ throws into stark relief its origins in an evolutionary model, one however where we need to separate *causal processes* that lie behind social changes, from mere *correlations* of changes with artefacts. On the whole, prehistoric archaeologists fall too easily into the error of asserting correlations as causes. The matching of climatic changes with cultural ones is such an example; managerial

models of social exchanges are another; emphasising determined technologies such as metallurgy is a third.

To move beyond narrative and correlation, and examine social, economic, and ideological evolution, three structures are needed. The first is an economic *infrastructure* featuring the progressive intensification of food production, leading to systematic surpluses. The second is the deployment of these surpluses for schemes of social promotion, which in turn stimulates the *superstructure* of hierarchies and cults, prestige goods, and metallurgies. The third, the over-arching *hyperstructure*, is finally the creation of the right environment for

exchange, communication, and the spread of innovations and ideas, culminating in fashionable ideologies. All structures rest upon an empirical framework which can be tested; and by this I do not mean assembling more data of the same sort as we already have but, rather, introducing fundamentally new science to determine cause and discount correlation.

It was the genius of Andrew Sherratt to propose a model for understanding the Chalcolithic as a process of economic intensification, then of the creation of new social worlds, and finally of charismatic ideologies and cults that spread across the continent: thus was the Secondary Products Revolution created. In a complementary manner, Jan Lichardus has rightly confronted us with the early start of the causal process and the true European dimension of this transformation. He also guided us through its social and ritual implications, thus constituting the *Kupferzeit* as an historical epoch, after the Neolithic and before the Bronze Age.

My starting point for assessing this process of ‘Chalcolithisation’ is not the one that most scholars have taken when looking at its presumed beginnings. Instead, I will open the record at its end, just before the beginnings of the Early Bronze Age in Europe. And here it is the Bell Beaker Phenomenon, spreading over much of Europe, that grabs our attention.

The third quarter of the 3rd millennium BC: the pan-European Bell Beaker Phenomenon as a Chalcolithic network

The Bell Beaker Phenomenon pertains, over most of its distribution area, to the period between *c.* 2500 and 2200 BC. In a few regions, we see Beaker traditions continuing until the 21st century BC but by 2000 BC, by and large, even the very latest beakers have ceased to be made. As for its beginnings, it is only on the Iberian Peninsula that we have secure radiocarbon evidence for an early Bell Beaker emergence. This reaches back as early as *c.* 2700 BC (eg. Harrison & Heyd 2007).

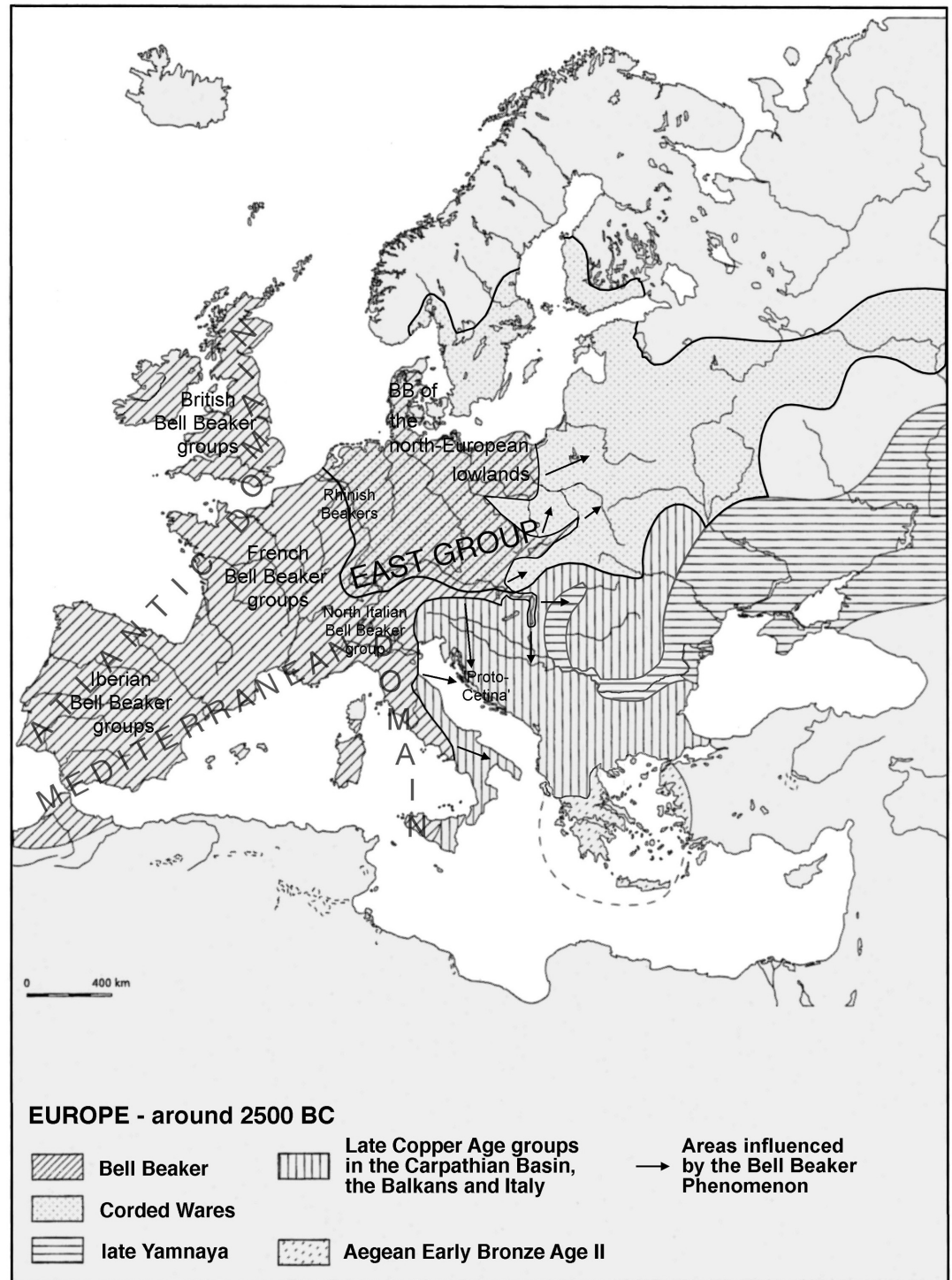
This formation phase contains basic elements: characteristic Bell Beakers are the tall-narrow monotone comb-stamp decorated, so-called *Maritime* beakers. Additionally, the all-over-corded Beakers (AOC Beakers) also seem to have had an early start, perhaps even as

early as the *Maritime* beakers. This early Iberian Bell Beaker tradition is apparently confined to the peninsula for over a century. At this early stage, the Bell Beaker ‘package’ (Burgess & Shennan 1976) is not yet fully developed, lacking, for example, two of its most prominent components: the tanged copper daggers and the wristguards. It was around 2600 BC when the phenomenon seemingly altered its ideas, imaginations, values, and world-view (ie, ideology), and an expansionistic drive – almost missionary in its appearance – became the dominant element. This is the moment when the first Bell Beaker vessels, and the people regarding them as their common symbol, were bypassing the Pyrenees along the Atlantic and Mediterranean coastline, reaching, for example, the mouth of the Rhône river or Brittany, during the 26th century BC. From now on, the Phenomenon accelerates dramatically, with more people being involved and taking the chance to promote themselves by adopting the, by now well-defined, package of novelties, and with the community of Beaker users growing. At the same time, around 2500 BC, Bell Beakers expand geographically to encompass more distant regions, and in transforming the traditions of an increasing number of local populations, the Phenomenon was itself being transformed, from being the driver of change to being a part of more established regional cultures with their own distinct flavour. This, in turn, shaped the course of developments over the succeeding centuries.

The Bell Beaker Phenomenon thus became pan-European in nature (Nicolis 2001), with its centre of gravity located firmly in the western half of the continent (Fig 7.1). The distribution of the expansion clearly follows the Atlantic and Mediterranean coasts and the main river systems, such as the Rhône, Rhine, and Danube, and their tributaries.

When trying to overview the distribution, four larger geographical entities can be discerned: an Atlantic domain, a Mediterranean one, the Central European or East Group, and a Beaker tradition in the western part of the great Northern European Plain, also including southern Scandinavia (Heyd 2007a). Within these entities, regional Beaker networks can be recognised. Here the British Beaker groups find their place, with their closest neighbours in the lower Rhine. In some entities, such as the East Group, different provinces can be

Figure 7.1: Distribution of the Bell Beaker Phenomenon in Europe; with regional groups, peripheries and some mentioned sites in the margins (map based on Heyd 2007a; 2007b; with modifications)



distinguished, and even within the provinces differences can be demonstrated, sometimes going down to the county level.

Beside these four domains, a kind of eastern periphery has recently come under our radar (Heyd 2007b). This is in the form

of syncretistic cultures: ‘adopting different components of the Bell Beaker ideology and the package in its repertoire ..., transforming it together with parts of their own traditional inventory to build a new identity’ (*ibid.*, 102) in a zone north to south roughly between 15°

and 20° eastern longitude. These syncretistic Beaker/local cultures start about 100–200 years after the more western regional Beaker cores but become very much the dominant regional players in the following Early Bronze Age. Representatives from north to south are the archaeological cultures of Iwno/Trzciniec in the western Baltic region; Chłopice-Veselé in Lesser Poland, western Slovakia and eastern Moravia; Pitvaros/Maros in the south-eastern Carpathian basin; Proto-Cetina/Cetina in the Adriatic basin; and the Grotta Cappuccini aspect of the Laterza-Cellino San Marco culture in south-east Italy. This eastern periphery and the adjacent margins (Rahmstorf 2008; Demchenko 2009) as more distant parts of the Bell Beaker idea are making it a truly European phenomenon. If one adds the structurally similar Corded Ware/Single Grave Culture/Battle Axe cultures (Buchvaldek & Strahm 1992) as well as the Yamnaya of the steppes (Anthony 2007; Heyd 2011) then the continent is covered by three interrelated phenomena from the Urals to the Atlantic

Bell Beaker and metals

Copper and gold objects are found in Beaker contexts, but always in low numbers. For example in the Bell Beaker East Group metal has only been found in approximately 8% of all graves, and the figures seem similar in other parts of the Bell Beaker distribution area. Moreover, Bell Beaker metal objects are almost all rather small: all the gold objects ever found amount to not much more than 250 g, while the copper objects amount to just over 10 kg. Three categories of object are represented in Bell Beaker graves mostly, but are occasionally found in settlement contexts: weaponry, exclusively associated with males; tools, almost exclusively associated with female and craftsman's graves; and finally jewellery known to be used by both sexes.

Jewellery constitutes the largest group of Bell Beaker objects, in copper and gold, and occasionally silver. Surprisingly, there is not much variety as most objects only belong to three groups, namely: i) hair-rings in the form of simple rings or spirals; *Noppenringe* (fine wire rings or spirals having a U-turn in the twist); and the basket-shaped hair rings of Britain and Ireland; ii) simple rectangular or oval plates of gold and/or copper, sometimes decorated; and iii) beads of various forms (Carozza &

Mille 2007). Additional gold objects include strips, which are likely to be band-shaped head diadems; little *tutuli* (foil cones); and the small but massive V-perforated buttons from Nin-Privlaca in Dalmatia. Rather questionable, however, are the gold *lunulae* of the west and north-west, for which a Beaker relation has often been suggested (eg, Taylor 1980). The origins of lunulae, remain a matter for debate (O'Connor 2004).

There can be no doubt that the metallurgy that lies behind these objects is the result of a full metallurgical chain, from ores and their regular exploitation to the wider distribution and the consumer, including also a specific technical know-how and the rules for the final deposition. The copper mine at Ross Island in south-west Ireland finds its place here, as do some others in western Spain/eastern Portugal (Müller & Cardoso 2008), and surely there are others awaiting discovery soon in central Europe and northern Italy. These arguments make it apparent that the Bell Beaker Phenomenon of the period 2500–2200 BC represents a metal society: people understood its sources, valued it, desired it, exchanged it, and deposited it with care and by following distinct rules.

Social and economic achievements beyond metals

Social exchange networks and growing economic activity lie behind the expansion of the Bell Beaker West and East Groups. They include the beginning of social stratification, seen particularly when analysing cemeteries and assessing customs in grave good deposition, highlighting the unequal deposition of objects of special symbolism, prestige, and perhaps even status.

Here, the concept of over-equipment (Hansen 2002) finds its application, since lavishly equipped children's graves play a role, as indicators of inherited status: boys perhaps in the role as first-born sons and heirs of capital and wealth, and girls for exogamic marriages to peers (Heyd *et al.* 2005; Vander Linden 2007). At the same time, the practice of displaying the deceased's individual social role was progressing from the east to the west and became manifested in the grave context (Salanova & Heyd 2009); and – at least in central Europe – a core family social order is established, perhaps as a tradition stemming

from Corded Ware society (Heyd 2007a; Haak *et al.* 2008; Müller *et al.* 2009).

The complexity of the subsistence economy deserves attention. Stock, and cattle in particular, seem to play the predominant role (Harrison & Mederos Martín 2001; Dörfler & Müller 2008). Other Beaker communities specialised in different livestock: the horse herders of the Beaker Csepel group in Hungary are famous for this, and in central Spain it also seems that there is a close link between the regional Bell Beaker development and the domestication of horses (Harrison 2007, 186ff). The same might account for sheep farmers and the early exploitation of wool, when more scientific data are available. Compared with stock, agriculture seems to play a reduced role. Emmer and barley were widely used, as well as spelt (*Triticum spelta*) as a newly emerging crop species, making it possible to bring marginal lands under cultivation (Jacomet 2008). Nevertheless more grassland for growing stock numbers is attested by pollen (Dörfler 2008).

The distribution and exchange of exotic and rare raw materials are reaching an unprecedented scale at this period from 2500 to 2200 BC, such as amber from the Baltic, Mediterranean shell, variscite gemstones from Catalonia, ostrich egg shells and elephant ivory from Africa and the Levant (Harrison & Gilman 1977; Schuhmacher *et al.* 2009), walrus tusk and sperm whale teeth from the north Atlantic, special stone varieties (porphyry; tuff) for wristguards in central Europe and Britain (Woodward *et al.* 2006), and also gold, copper (eg, Needham 2002; Matuschik 2004), and – last but not least – the first tin-bronzes (in central Europe: Krause 2003). Only a little jet however, perhaps from Yorkshire and other continental sources (Needham 2005; this volume), was in use in the 25th–23rd century BC. Nevertheless, it must be evident that this degree of communication and exchange, and the internationality of this period, can only be achieved through an increased human mobility as well.

It is in this context that the fortified sites in south-west Europe need to be mentioned. From smaller circular enclosures in the French Midi (Guilaine *et al.* 2001, 244–6), to middle-sized fortifications such as Leceia, Alcalar, and Zambujal in Portugal (Cardoso 2000; Kunst 2001), finally to the ‘macro-villages’

of Spain (eg, Valencina de la Concepcion; Marroquies Bajos; Los Millares: Díaz-del-Río 2004a; 2004b); Beaker users keep on occupying them. No doubt they act as central places in a landscape that operated to a settlement system that was at least two-fold in nature.

The same continuous occupation of monuments, with episodes of refurbishment and extension, is also well known for the Atlantic domain. This includes the many megalithic monuments from Galicia to Brittany (Salanova 2000; Prieto Martín & Salanova 2009), as well as the ritual sites of Britain and Ireland and their landscapes, of which Stonehenge and Avebury only representing the upper echelons (Sheridan 2008).

So, the European Bell Beaker Phenomenon is far from being a close-knit entity. Janusz Czebreszuk (2003) is surely right in saying that all is ‘similar but different’. Also, much of it may be restricted to the *Zeitgeist* of the mid- and 3rd quarter of the 3rd millennium, but there are also Beaker achievements that need to be acknowledged, such as the establishment of the full metallurgical chain, the advanced social and economic system, the outstanding internationality and interchangeability of this period, and – not least – this expansionistic ideological drive behind the use of Beakers.

The first half of the 3rd and the second half of the 4th millennium BC: the ‘Chalcolithic’ aspects of Andrew Sherratt’s ‘Secondary Products Revolution’

By moving backwards into the first half of the 3rd millennium and roughly the second half of the 4th millennium BC, we are entering the arena where the late Andrew Sherratt’s ‘Secondary Products Revolution’ finds its stage. No doubt, his brilliant concept from 1981 (1983; 1997a; see also 2004; 2006) still stands as the emblematic economic model of later European prehistory (Fig. 7.2). What we understand much better since the early 1980s, however, are the relative and absolute chronologies. Sherratt asserted correlations of his components rather than proving their contemporaneity, and generally did not go into much chronological detail (eg, Chapman 1982; Lichardus 1991a, 20). His chronological attribution derived mainly from his knowledge

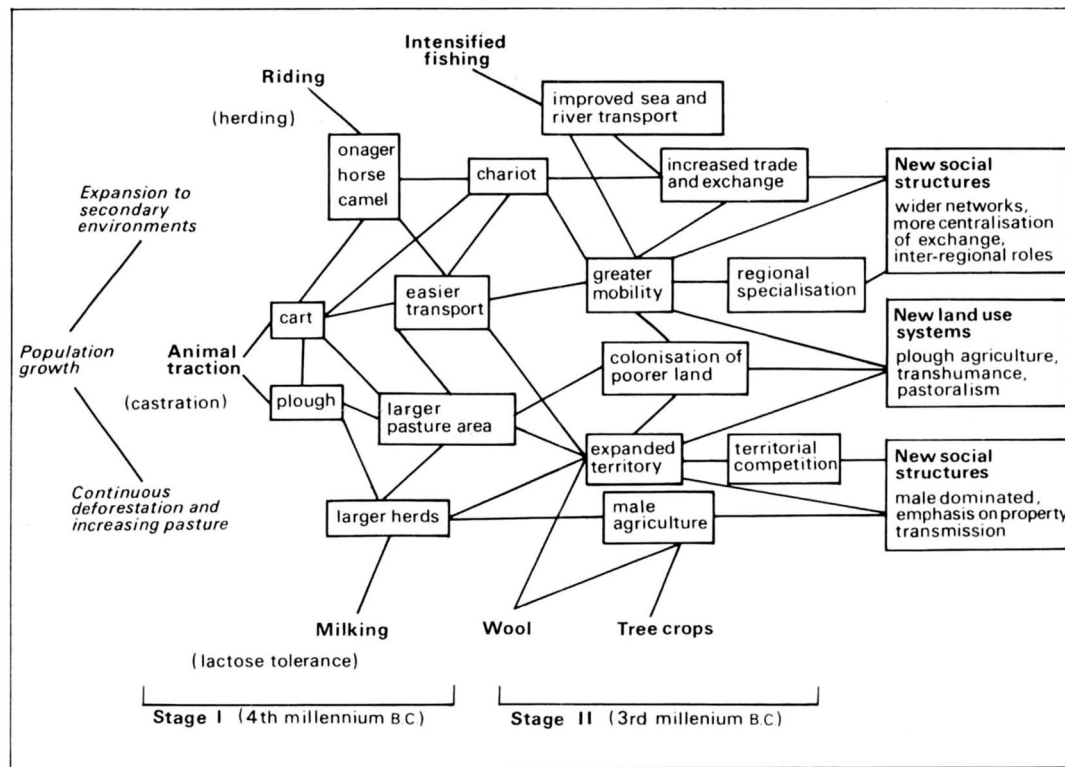


Figure 7.2: Andrew Sherratt's graph of the 'Interaction of the components of the secondary products complex through time' (Sherratt 1981, fig. 10.16)

of the absolute chronologies of Mesopotamia and the Near East, and his perspective that many of those innovations, if not all, originate ultimately in Mesopotamia. Indeed, the traction complex of wheel, cart, yoke, wagon, and plough as a key innovation/invention of his 'Secondary Products Revolution' has been proved empirically valid: it has a secure appearance in the record from c. 3600 BC (generally Fansa & Burmeister 2004 and Pétrequin *et al.* 2006). However, in contrast to his traction complex, his dairy complex seems invalid, since milking and the use of dairy products have now been confirmed to have taken place much earlier and over a wide geographical extent (Evershed *et al.* 2008).

Still controversial are the issues of horse riding and the domestication of the horse, as well as the introduction of the woolly sheep (eg, Anthony 2007). At least both innovations and their wider dissemination in Europe certainly fall into the period between around the mid-4th and the first half of the 3rd millennium. All over central Europe, woolly breeds of sheep must have been widely exploited by the last two centuries of the 3rd millennium at the latest, as shown by the many and diagnostic copper and bone pins from Early Bronze Age

(Reinecke A1) grave contexts. Their position in relation to the skeleton (and to the corpse thus represented) can only indicate the former existence of a woollen cloak or cape that must have become desirable for people of a certain social position. However, as for the chariot and the spoked wheel – further inventions in speed, flexibility, and warfare, as mentioned in Sherratt's graph (1981, fig. 10.16) – there is now sufficient evidence to date their appearance to a much later period, around or after 2000 BC (eg, Anthony 2007, 371ff.; Kristiansen 2007).

The 'Secondary Products Revolution' still describes very well an advanced stage that is different from the Neolithic (cf. Harrison 1985 for Iberia). In this, traction, dairy farming, horse riding, and wool production represent innovations. But Sherratt takes the argument further, setting the agenda for consecutive, more processional effects such as economic and social complexity, population growth and density pressure, expansion to secondary environments, deforestation and increasing pasture, as well as easier transport, greater mobility, regional specification, etc. We can arguably take his argument still further and even claim a major dependency on animals for subsistence and a much closer and more complex

animal–human symbiosis than is suggested by secondary products and traction from the mid-4th millennium onwards. This would also include the attribution of a new esteem to the indirect and symbolic value of stock. If properly thought through, the consequences of this model would be even more dramatic than those proposed by Sherratt, since this new emphasis on stock, and subsequent changes in the economic foundations, would require a different lifestyle and settlement organisation, with enhanced mobility and communications. In turn this would trigger a complete change in all social systems, affecting ritual and spiritual beliefs and cult practices, including burial and hoard deposition. This would then lead to significant new paramount ideas, a different world-view and ideology, reflected not least in a new material culture and pottery. Nevertheless, what Sherratt is offering is a socio-economic definition of a mature stage of the Neolithic. Metals are not necessary for his concept of economic intensification, and play no primary role in it. No wonder, then, that he does not mention them.

Chalcolithisation: three stages of cultural change in Europe

For Sherratt his ‘Secondary Products Revolution’ is very much a counterbalance to, and European response to, V. Gordon Childe’s famous ‘Urban revolution’ of the Near East (Childe 1934; 1936). However, despite many subsequent claims, Near Eastern connections with, and influence over, Europe during this period are virtually non-existent, except in the Caucasus region (Kohl 2007; Hansen 2009). So, the big cultural change and breakdown of the ancient ‘Danubian’ tradition, from c. 3600 BC, must have had another background. This background can only be the scenario, described above and materialised in the newly formed, rapidly expanding value and symbol systems that we name after pottery forms and two key sites where they occur: ‘Cernavodă III’ in Romania and ‘Boleráz’ in Slovakia (Roman & Diamandi 2001; Sherratt 2003; Furholt *et al.* 2008). It was probably the ever-increasing interaction between culturally different groups of herders of the Pontic Steppe belt and their advanced sedentary neighbours at the lower Danube and the eastern Carpathians that triggered fresh values and symbols of wealth, prestige and power. This was probably

also the routeway for the transmission of the domesticated horse, and potentially also of the woolly sheep.

The next stage is reached by the Baden-Coţofeni from c. 3350 BC as well as the contemporary emerging Globular Amphora culture. This super-regional system dominates half of the continent for half a millennium. Even in northern and Central Greece and in north-western Anatolia, we find typical Baden relations in the pottery assemblages (Maran 1998; Roodenberg & Thissen 2001; Nikolova 2008), also confirming that the observed cultural changes are European and not Asian in their origin. In the north-west, Globular Amphora culture pottery can be found as far as the river Rhine, forming here a kind of ideological periphery (Szmyt 2003; Salanova & Heyd 2009). In the French Midi, Spain, and Portugal, this period 3500–3250 BC is seen as the beginning of a Mediterranean Chalcolithic in established terminological tradition (eg, Gocchi Genick 1996; Díaz-del-Río 2004a; 2004b; Guilaine 2007). Arguments for its establishment are an increase in production, a change in herding practices, intensification in agriculture, population growth, trends towards a hierarchical society, nucleation of the settlement organisation, political centralisation, and, of course, copper extraction and its processing and distribution (Roberts 2008).

The third stage, immediately preceding the Beaker Phenomenon, is signalled by the infiltration of the Yamnaya population from the Pontic steppe into areas of south-east Europe in the early 3rd millennium (Anthony 2007; Heyd 2011), bringing with them a distinct package of innovations (Harrison & Heyd 2007). Next, we see neighbouring societies responding to this package. This is seen as the beginning of a Late Copper Age. The deepest social transformation occurs however, north of the Carpathians. Here societies gradually react against groups of Yamnaya people migrating up the rivers Prut, Dnestr, and Dnepr. The result is the emergence of a distinctive new lifestyle, economy, settlement and social organisation, called the Corded Ware Complex. This dominates the record 2900–2100 BC between the Volga river and the Rhine (cf. Buchvaldek & Strahm 1992).

Enclosures, central places, and copper

Hillforts, enclosures, and consequently the

question of central places and a hierarchical settlement organisation are terms well-attested for much of Europe in the later 4th and early 3rd millennia (Gibson 2002; Harding *et al.* 2006; Zápotocký & Zápotocká 2008). Key examples can be named in regions as far away from each other as the western Mediterranean (where they form the basis for the later Beaker occupation mentioned above), the southern Carpathian basin and Transylvania (as at the site of Vučedol, for instance), the Aegean, and several spots in southern Scandinavia of what is there termed the 'Late Early Neolithic' and the whole of the 'Middle Neolithic' (eg, Sarup on Fyn island, Stävie in Scania and Búdelsdorf in Schleswig-Holstein).

The period of the second half of the 4th millennium BC is said to show a break, or depression, in metal production and circulation. This certainly accounts for the south-east of Europe and the Carpathian basin, where this horizon coincides with the end of use of the heavy copper holed axes, having dominated the record for more than a millennium. Gold also disappears completely from the record here, as does most of the silver in the Aegean. However, flat axes continue to be used (eg, Dobeš 1989) and daggers even flourish in some regions in the east (Vajsov 1993). Jewellery continues as well, but is rarer. One reason for this 'metal depression' might be a change in depositional practices, since copper hoards and single deposits of axes disappear, and graves are no longer properly furnished.

Further to the east, in the Caucasus region, the pattern goes in the opposite direction: here we now see a variety of new metal forms appearing in the record in larger quantities. A peak is reached with the famous Majkop princely grave, and several other well-furnished tumulus graves (Sherratt 1991; Hansen 2009), displaying a variety of copper weapons and tools, as well as prestige objects and jewellery of gold, silver and copper. Some jewellery and metal vessels show distinct Mesopotamian connections. This led the Russian scholar Evgeni Chernikh to define his second metallurgical province, the 'Circum-Pontic Metallurgical Province' (*passim*, eg, Chernikh 1992; Chernikh *et al.* 2000) which finds its stage here in this environment. However this distinct metal package only occasionally leaves its Caucasus catchment zone towards the north and west. This situation changes only

from 3000 BC onwards, when the Balkans and Carpathians see the reappearance of the single edged shaft-hole axes, along with the tanged dagger, distinctive awls, and hair-rings.

To the west, in central Europe, 'the metal depression' after 3600 BC did not have the same effect as in the south-east of Europe. One reason for this is the fact that metal had not been that prominent in this part of Europe: any comparison must take into account this disparity in scale. Also, some copper axes continue to be used, albeit in different forms. Even innovations appear in this period, as shown by the early flanged copper axe possessed by the 'Iceman'.

There is, surprisingly, another European region that sees a flourishing of metal circulation in this period between *c.* 3600 and 3300 BC: southern Scandinavia, with more than 50 copper objects, most of them flat axes as single finds, but several coming from TRB graves and hoards (Klassen 2000). This distinct hoarding tradition extends into Poland (Łęczycki 2004). All of the copper is imported from the south, probably mostly from the Eastern Alps and the Slovakian ore mountains, roughly 1000 km away. But metal is only consumed here and not produced.

What I have tried to demonstrate, in this review of the process of Chalcolithisation in the three time horizons prior to the Bell Beaker Phenomenon, is that metal is not the primary signal. Instead, it is the advanced socio-economic structure that really matters. In this, Andrew Sherratt has paved the way with his subsistence model and Jan Lichardus (see below) has broadened it by adding social arguments. Speaking in traditional terminology, Europe in the second half of the 4th and the first half of the 3rd millennium BC is now a tripartite continent: by that time, an advanced south-east and east-central Europe has already experienced a Chalcolithic for more than a millennium. South-central and south-west (Mediterranean) Europe are both rapidly transforming, and there is good reason to describe this period as an *Ètà del Rame/Chalcolithique/Calcolítico*. It is the west-central, north-west, and north regions, that are seen to contain societies that are more reluctant, or else are too far away from the then centres of innovation. But, as demonstrated above, this is only partly the case and Europe during this period is already sharing many common traits.

<p>A. Society</p> <ol style="list-style-type: none"> 1. Emergence of sharply organised settlement centres and fortifications along traffic roads. 2. Advance of a hierarchised social order. Existence of a regional and super-regional upper class, tied to distinct families. Inclusion of children in the hierarchical system. 3. Emergence of first status symbols and signs of power. 4. Erection of first monumental burial grounds through the accumulation of earthen mounds. 5. Segmentation of the society based on the specialisation of labour: prospectors, miners, craftsmen, traders, beside a population with an agro-pastoral life subsistence. 6. Pronunciation of the different role of both gender in society also through a gender differentiated burial custom. 7. Application of metric systems as well as an astronomical knowledge.
<p>B. Economy</p> <ol style="list-style-type: none"> 1. Specialising in stock elevation and creation of larger herds, indications of a new sheep race. 2. Begin of horse elevation and use of the horse as riding and traction animal. 3. Utilisation of animals for transport and use of their power for soil cultivation 4. Introduction of the ard (<i>Hakenpflug</i>) and through it the possibility of a more efficient soil cultivation. 5. Careful tillage with a systematic suppression of weed. 6. Cultivation of spices and herbs. 7. Increased salt production 8. Exploitation of flint, copper ores (and gold?) in mines. 9. Specialised craftsmanship, visible particularly in the highly developed gold and copper metallurgy, also by an altered flint technology 10. Sharp cutback of wood and production of charcoal as presupposition for a systematic metallurgy. 11. Organisation of transport and the dissemination of raw materials, emergence of trade, also with regions farer away. 12. First-time appearance of wheel models as a sign of knowledge about wagons. 13. Innovations in boat construction make possible secure transport also along the coastal shores.
<p>C. Religion</p> <ol style="list-style-type: none"> 1. First occurrence of cult places outside the settlement houses. 2. Construction of large ditch systems with cultic depositions in the ditch or in the enclosed area. 3. Orientation of other-world imaginations to the model of a strongly segmented societal order. 4. Changes in the burial cults, arise of partial burials, collective and multiple burials with funeral succession (<i>Totenfolge</i>). 5. Rise of new cult practices, connected with sun worship, with stock elevation and intensified with the male gender. 6. Introduction of new hoarding customs.

Table 7.1: *Compilation and English translation of the 26 bullet points under the headings 'society, economy and religion' (from Lichardus 1991b, 787–8)*

The first half of the 4th and the 5th millennium BC: the socio-economic 'Kupferzeit als Historische Epoche' of Jan Lichardus

The first third of the 4th and the 5th millennia BC form the period that the German scholar Jan Lichardus had in mind when he suggested his package of innovations, effects, and achievements, which he discussed in detail and then summarised under 26 bullet points (Lichardus 1991b, 787–8; see a primary definition in Lichardus *et al.* 1985; more recently, the ideas had been repeated, refined, and widened in an article by Marion Lichardus-Itten in 2007). Several of his points can already be found in Andrew Sherratt's arguments from the early 1980s. But Lichardus's list (Table 7.1) and argumentation goes beyond Sherratt, and

it is probably accurate to describe both concepts as complementary.

Lichardus's starting point lies in the south-east of Europe. Here, societies have already achieved an elevated degree of cultural complexity, obvious in the form of the tell settlements themselves and, as shown by recent fieldwork, their defences and contemporary outer settlement and satellite sites (eg, Hansen *et al.* 2007; 2008). Kodžadermen-Gumelnița-Karanovo VI, Tripolye-Cucuteni, and the Tiszapolgár-Bodrogkeresztur-Hunjadi Halom sequence are the most important of these (Parzinger 1993; Whittle 1996; Bailey 2000; Chapman 2000). The famous cemetery of Varna and the Tripolye 'mega-villages' are the gemstones in the centre. Varna and the south-east of Europe, with their gold in abundance and a typical copper inventory of thousands of hammer-axes, mattocks, and different

types of flat axes, also form the heartland of Colin Renfrew's 'Autonomous Southeast European Copper Age' (1969; 1978) and Chernikh's first metallurgical province, his 'Balkano-Carpathian-Metallurgical Complex'. However Lichardus's concept is intended to go beyond the south-east European Chalcolithic. He assembled many good arguments – in particular social ones – that fit a definition of the Chalcolithic that extends beyond metals and, geographically, beyond this traditional early Chalcolithic south-east/eastern-central Europe core area. He is also right in tracing these social achievements back not only into the 5th millennium but also in the western half of Europe where traditionally a Neolithic nomenclature system is applied. For example, settlement centres and fortifications are well-attested west and north-west of the Carpathian basin for the period between the later 5th millennium until *c.* 3600 BC, in the form of hillforts (eg, Zápotocký 2000), ditch systems, and enclosures, often causewayed (eg, Gojda 2006). The same is true for his 'Erection of first monumental burial grounds through the accumulation of earth mounds' (Lichardus 1991b, 770 *passim*) demonstrated by the long-barrows and related structures in a wide geographical zone of the north and north-west between north-central Poland, southern Scandinavia, Atlantic France, and Britain and Ireland.

Along with these monumental grave markers goes a change in the symbols and signs of prestige and power. The most striking examples are the polished stone axes. These are no doubt regarded as key components of the Neolithic package, irrespective of whether their users live in the Fertile Crescent, or later in south-east Europe, or later still in southern Scandinavia and in Britain and Ireland (Klassen 2004; Pailler & Sheridan 2009). The transformation, and a new period, starts when the axes are made of an exotic material with special colour and brilliance, and are acquiring a polish, form, and size that render them unsuitable for felling trees. From that moment on, the object has acquired a socially valorised function. The famous Alpine jadeitite axes and their wide European distribution network (eg, Pétrequin *et al.* 2003) are the key example for this process in the west. Roughly contemporaneously, a similar transformation happens in the south-east of Europe when flat axes here become

cast in the brilliant and shiny, but rather soft, copper of more than 99% purity (see also Klassen 2004).

Copper and gold

Metal objects peak in frequency from 4000 to 3700/3600 BC in the Carpathian basin (eg, Schubert 1965; Klassen 2000, fig. 115). This is why Hungarian tradition calls this period the 'high Copper Age'. It is also in these four centuries around and after 4000 BC that we see exports of this metallurgy to regions further to the west, triggering a dependent local Alpine metallurgy, one expression of this centred around the Austrian Mondsee and another with the Swiss Pfyn (Bartelheim 2007). The furthest exports of flat axes extend to eastern France (Klassen *et al.* 2007) and perhaps even as far as the Atlantic west (Briard & Roussot-Larroque 2002, 156–7, figs 10–12). The famous gold lozenge from a richly furnished grave at Pauilhac in Aquitaine, geographically in the Atlantic zone and dated to around 3800 BC (Roussot-Larroque 2008), seem to belong to the same trajectory (Fig. 7.3), and there can be no doubt that this piece is a far-away offspring from a cluster of such gold lozenges and plates in Hungary and Romania (Makkay 1989; Hansen 2007). The same Carpathian centre is simultaneously radiating towards the south-west and the first copper artefacts also enter the southern Alps and the Po valley (Gleirscher 2008), activating a first independent Italian metallurgy there soon after. The situation described here is similar for the north and the north-west when axes of this Carpathian manufacture reach the northern European plain (Müller 2001; Łęczycki 2005) and, in Klassen's phases 1 and 2, southern Scandinavia (Klassen 2000, figs 111–13), prior to or contemporary with the advent of the Neolithic package. The only difference is the lack of copper ore sources here. Therefore independent TRB metallurgy can hardly develop.

Sharing practices in hoarding and technology

Hoarding is also mentioned by Lichardus, and this period sees the first pure metal hoards as well as the beginnings of hoard deposition outside settlement sites (Lichardus-Itten 1991; 2007, 14). But it was Pierre Pétrequin who illuminated the geographical differences between hoarding stone objects and metal

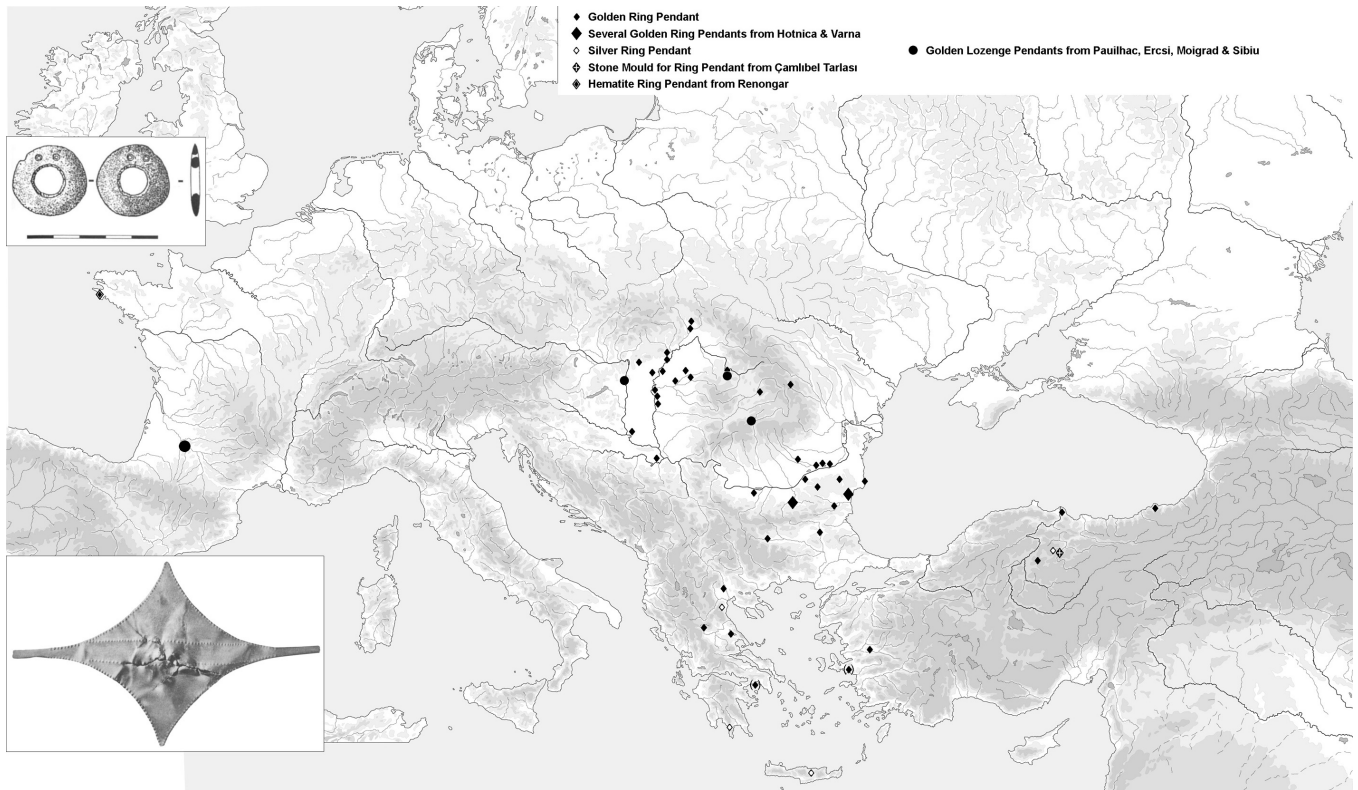
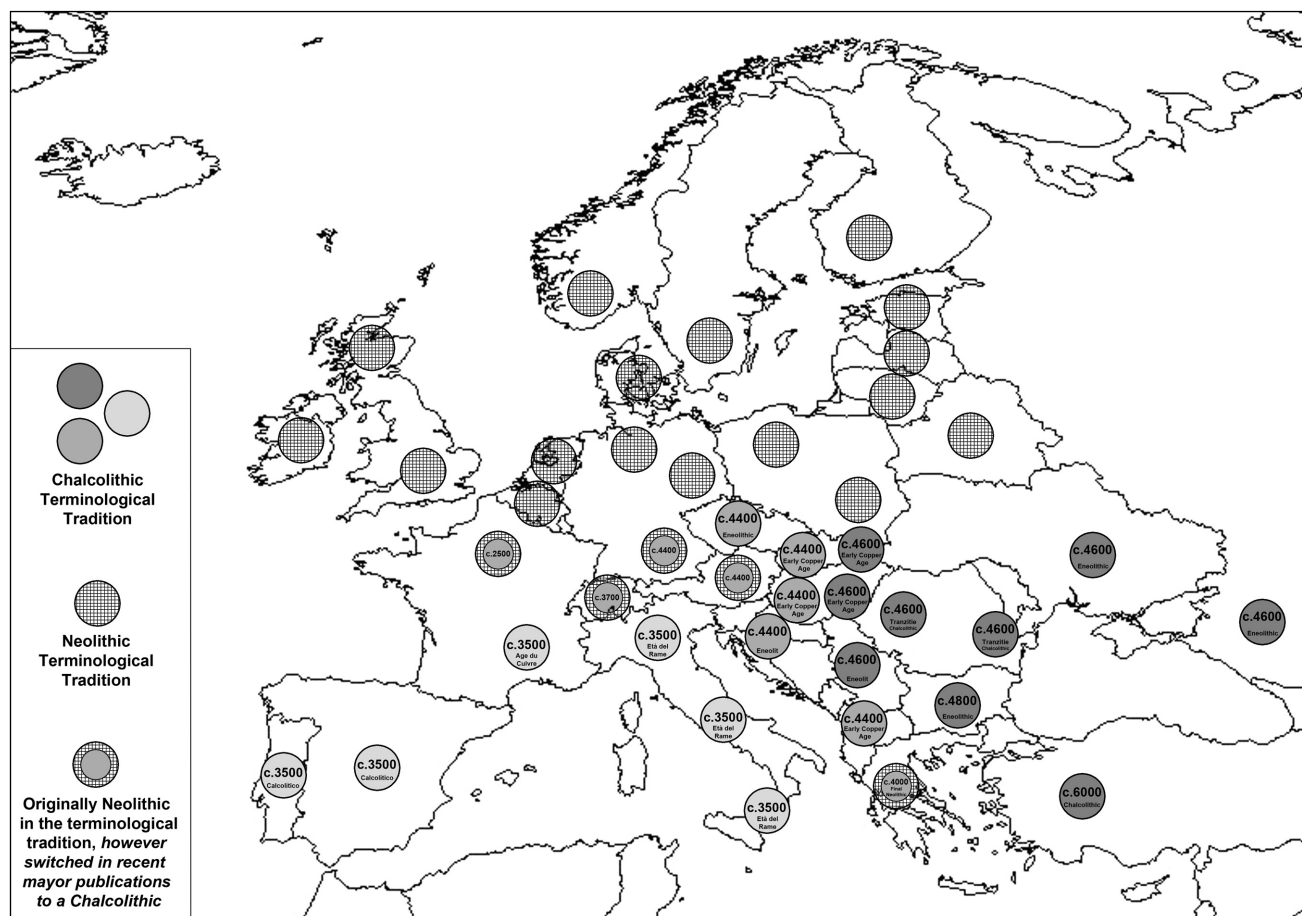


Figure 7.3: Distribution of the gold, silver and copper ring-pendants and the golden lozenges of the Early Chalcolithic horizon (c. 4600–37/3600 BC); added is the haematite pendant from Renongar in Brittany (based on a map provided by Hansen 2007, fig. 175; and Zimmermann 2007, fig. 1; golden lozenges by information from Makey 1976 (*Acta Archaeologica Hungarica* 28, 251–300) and Bona 1986 (*Veszprém megyei múzeumok közleményei* 18, 21–81; all modified and with additions)

objects, thus creating a picture – somehow contrary to the one of interconnection presented here – of a western *Stone Age* Europe versus a eastern *Copper Age* Europe (Pétrequin *et al.* 2002). Interestingly the border between the two ‘worlds’ is approximately along the river Rhine, a frontier line of eastern and western influences already named in the previous chapters on several occasions for the later 4th and 3rd millennium BC periods. Pétrequin’s map of the different areas of hoarding practice is indeed an impressive and powerful picture. Nevertheless it is one-dimensional because single metal axes go further west beyond the respective distribution zones, as noted above, just as single jadeitite axes reach as deep as into the heart of Chalcolithic south-east Europe. Indeed, a hoard consisting solely of Alpine jadeitite axes seems recently to have been identified in Bulgaria, along with further hoards of polished stone or flint (Pétrequin *et al.* in press) Despite these clarifications, it is clearly to the credit of Pierre Pétrequin, and Marion Lichardus-Itten, to have opened our eyes to a common hoarding practice, uniting the east and west of Europe in the 5th and early 4th millennium, irrespective of whether

the hoards contain metal, stone, or both. Indeed, the same situation can be seen with the flint mines of this period, and with salt exploitation (Lichardus-Itten 2007, 14–16).

One should, therefore, highlight the message that specialised stonework and simple metallurgy share technological similarities, rather than stressing that they are different materials, and that *skeuomorphism* between them is common. This is best demonstrated, again, by the tomb at Pauilhac in the French south-west. Here, it is not only the golden lozenge that is outstanding, but also the over-sized stone axes and flint blades, which can only be pure prestige objects. Both stone axes, made from Alpine jadeitite, have cutting edges imitating copper ones. Likewise, the outsize flint blades find their best parallels in the cemetery of Varna. Julia Roussot-Larroque (2008) concludes that copper also plays a role, because of the copper micro-traces left by a tipped flaking tool, used to shape the flint blades by controlled pressure flaking (Pelegrin 2006). Similar analogies exist for the haematite (another brilliant semi-precious stone) ring pendant from the long-barrow of Renongar (Plovan; Finistère) in the extreme west of Brittany (Cassen 2003; Paillet & Sheridan 2009).



Without the golden pendants of the south-east European Chalcolithic (cf. Fig. 7.3), like those from the settlement hoard of Hotnica in Bulgaria, 2500 km away, its form could not be understood.

Yet this makes it clear that even as early as 4600 BC, prehistoric Europe was more closely interrelated than the technological differences between metal and stone imply. For all this Lichardus has set the agenda in synthesising these transformations in the social sphere, from lavishly equipped graves, structured tell settlements and mega-villages in the southeast to grave monumentality, hillforts, and causewayed enclosures in the centre and north-west, clamped together by a similar system of prestige and symbols of power, of practices and technologies. The only component which is not shared between the two 'worlds' is – as it seems – their preferred materials.

Defining progress in human culture: a final word

Clearly, then, we can trace a long-term and ongoing evolutionary progress. Traditionally, prehistoric archaeology has used materials – flint, stone, and different metals – and their sequence of appearance in order to define stages within this evolution. For a long time this was the easiest way to divide up the past, and one which was reflected in the material record. However, since then, the concept of progress has also made it into the archaeologist's way of looking at the past, of its definitions and methods. Crucial to this has been the application of various sciences, and their input in helping us to understand the past, not least as regards prehistoric economy and subsistence strategies. Consequently, it has been the Neolithic period that has been separated out from this material-based tradition, now being successfully defined by – primarily – its mode of subsistence, plus – secondarily – its set of cultural, social, and

Figure 7.4: Traditional terminology in the European countries with regard to a Neolithic and/or Chalcolithic nomenclature; for those countries using the term 'Chalcolithic', the absolute date of its approximate beginning is given

ritual novelties. Thus, polished stones and pottery have rightfully become third-class criteria for determining Neolithic societies. Similar efforts are also underway for defining the Bronze Age: we are now beginning to eschew the introduction of tin-bronze as the key driver, and to appreciate that its mode of use differs considerably from that of other aspects of material culture. This leaves us focusing more on the socio-economic sphere and on matters of cultural complexity.

For the Chalcolithic, the current situation in Europe and its c. 50 recognised countries (Fig. 7.4) seems to display a kind of geographically and chronologically staggered introduction: from the 5th millennium in south-east and central east Europe, followed in the mid-/later 4th millennium by central south and south-west Europe, while much of central Europe, the north and north-west of the continent and the Atlantic façade is still described as being 'Neolithic' at this time. Occasionally, as in Austria, Germany, Switzerland, and France, one accepts here the truly Chalcolithic nature at least for the 3rd millennium and the Bell Beaker Phenomenon.

As neat and convincing as this model might seem, built as it is on local traditions, this tripartite Europe does not actually reflect past reality. From as early as the mid-5th millennium onwards, prehistoric Europe is so interconnected and has reached such a level of social and economic complexity that it is a different world from the period of its Neolithisation and first expansion some 50–100 generations previously. Throughout the 1500 years, from the later 5th to the early 3rd millennium, societies in both the east and west experienced significant population growth, resulting in larger sites and denser and more structured settlement networks, and in inland colonisation and further outside expansion, as in the case of southern Scandinavia and Britain and Ireland. Key innovations are making it into everyday life and this period sees *the revolution* in economic and subsistence terms. Parallel to this goes the growing importance of animal husbandry, triggering a series of fundamental changes in general mobility pattern, in communication networks, and exchange of goods, genes, information, and ideas. Human beings must react in this system. Archaeologically, we see in it a new material culture and new rites and customs, culminating

in a complete social reorganisation and a new way of life, with implications and challenges for the whole system of ideas, imaginations, values, symbols, and terms. The end result of this, in Europe, is major ideological changes and the emergence of the novel, expansionistic, and thus super-regional phenomena of Boleráz-Cernavodă (with the Baden sequence), the Globular Amphora Complex and indeed the whole Corded Ware Complex.

The apex of this Chalcolithic Europe is then reached when the Bell Beaker Phenomenon extends, together with the structurally associated Corded Ware Complex, shortly after 2500 BC from the Urals to the Atlantic, from Norway to Africa. The ideological component is now the dominating factor. Communication, mobility, exchange, as well as a common material package and its super-regional recognition, become unprecedented in Europe. No matter whether you look into the record of southern Scandinavia, Britain and Ireland, the lower Rhine, or Atlantic France and Spain, Beaker Europe is – despite its existing regional flavours – basically interchangeable in its core programme and its achievements. At last, Europe as a whole has arrived in the Chalcolithic.

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