THE BRONZE AGE IN EUROPE

An introduction to the prehistory of Europe
c.2000–700 BC

Edited by
J. M. Coles & A. F. Harding

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Volume 18

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Routledge
Taylor & Francis Group
LONDON AND NEW YORK

First published in 1979

This edition first published in 2015
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

and by Routledge
711 Third Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN: 978-1-138-79971-4 (Set)
eISBN: 978-1-315-75194-8 (Set)
ISBN: 978-1-138-81303-8 (Volume 18)
eISBN: 978-1-315-74841-2 (Volume 18)

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A. F. HARDING

METHUEN & CO LTD

First published in 1979
by Methuen & Co Ltd
11 New Fetter Lane London EC4P 4EE
Typeset by CCC and
Printed in Great Britain by William Clowes & Sons Limited,
Beccles and London

ISBN (hardbound) 0 416 70640 1
ISBN (paperback) 0 416 70650 9

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Preface

This book was written because of the continuing lack of general surveys of the European Bronze Age, and the persistent difficulties both students and teachers had in obtaining and reading the enormous literature concerned with Bronze Age matters. Gimbutas wrote in 1965: 'This year is not yet the date for a fluently readable book on the Bronze Age of Europe', and though this may still be true we have decided to take the plunge. The task of covering so vast a topic posed, as can be imagined, many problems, and some of these we have managed to overcome with the help of those friends and colleagues whose names appear below; others may turn out to have been insuperable. We have relied on the published work of many people, and we hope that we have accurately represented both the factual evidence and their views. Wherever possible, we have visited sites and museums to inspect the material at first hand; we have visited and worked in almost every country considered here, J.M.C. in the west, north and south, A.F.H. in the south, east and central areas. The main exception as far as detailed study is concerned is the Soviet Union.

Because the literature on the European Bronze Age is so vast, we have naturally had to be selective, and important sites and controversies have had to be omitted because of lack of space. On the other hand, there are certainly other useful reports which we have simply failed to find. The literature is not always readily available, either in Britain or abroad, and the proliferation of journals and monographs continues at a rate which often exceeds the ability of libraries to purchase and readers to read. We have attempted to provide a bibliography of some important works of reference, and we refer to these using the Harvard system within footnotes at the end of each chapter; the many other references simply cite journal number and page, or monograph title.

The difficulties of relating chronological divisions as proposed for many areas have been overcome, we hope, by ignoring the minutiae of periods,

horizons, phases and groups (except insofar as they are appropriate to individual chapters) and by adopting an arbitrary Early Bronze Age and Late Bronze Age (sometimes more accurately if tediously called earlier and later) for each area; for this we have used a combination of radiocarbon dates, periodization schemes and stratigraphies where available; the appearance of central European Urnfields has been taken as a prime indicator of the start of the Late Bronze Age.

Radiocarbon dates for the Bronze Age are increasingly important as they begin to appear in sufficient quantities to allow greater precision and reliability. There are still gaps, of course, but the overall picture of the total life of certain groups is becoming clear. Although the publication of radiocarbon dates is still sporadic, with many dates not appearing in *Radiocarbon*, or quoted elsewhere without laboratory number or s.d., we have assembled as many as were available and reliable and these appear at the end of the relevant chapters.

The regions described have been devised where possible using geographical, not modern political, boundaries, as well as Bronze Age distributions of material that may reflect territorial constraints. In each of the two main sections of the book there are five chapters: central Europe (from the Rhine to the Carpathians), eastern Europe (including European Russia and the eastern Balkans), southern Europe (the Adriatic shores and the central Mediterranean), western Europe (the Atlantic countries and islands) and northern Europe (the north European plain and highlands). We have found it convenient to treat the central European area first, and in considerable detail, because we believe that this vast region created many of the developments of the European Bronze Age, it is central to the whole, and it is far more fragmented in terms of the current available literature.

Both authors have read and discussed every part of the book, but the original composition of the chapters was divided as follows:

Central Europe (chapters 2 and 7): A.F.H. with contributions from J.M.C.

Eastern Europe (chapters 3 and 8): A.F.H.

Southern Europe (chapters 4 and 9): J.M.C. and A.F.H.

Western Europe (chapters 5 and 10): J.M.C.

Northern Europe (chapters 6 and 11): J.M.C.

Introduction and Conclusion were written jointly.

For each region we have attempted to include the most important sites on a location map; other sites can be found, with luck, in any good atlas by reference to the district names which follow them. These are of varying size and significance, depending on the unit of local administration within each country; in general they are either of district size (e.g. German

Kreis) or of county size (e.g. French *département*); sometimes both are provided, as with the Soviet Union. In some cases, sometimes deliberately for the purposes of the book, or inevitably because the precise location could not be found, sites are less accurately located by reference to larger geographical or political areas, such as the German *Länder* or French regions. These wider geographical areas are useful when discussing cultural or economic zones or boundaries.

Many of the illustrations have been taken from published works and their quality is regrettably varied; a number have been redrawn. It is sad that so many illustrations of important sites and material are still published without scales and details. A few of our own illustrations have had to suffer in this way.

The balance of evidence for the Bronze Age is not uniform through our areas, and each chapter has deliberately been designed to suit its own area evidence rather than forced into an arbitrary overall design. Nonetheless, each chapter contains some discussion on settlement and economy, distributions, burial customs, material culture, art, religion and ritual behaviour. These headings are not the most suitable, given a free choice of data, but they have to reflect the work done and published. Our own interest in and concern for future developments in Bronze Age studies are expressed in the conclusion.

Many people have helped us during the writing and preparation of this book, and though we cannot mention them all, we are sincerely grateful to them. We particularly thank Dr Jan Bouzek of the Charles University, Prague, for his unfailing guidance and help, especially over the central European Bronze Age. Most of his suggestions have been included here. Among those who read and commented on various parts in draft, we thank Drs L. Barfield, J. Bill, J. Butler, J. C. Chapman, G. Eogan, B. Gräslund, D. W. Harding, R. J. Harrison and S. Shennan. For help in museums, supplying off-prints or other data, for discussion on particular points and correspondence, we thank A. Beneš, V. Furmánek, J. Hrala, O. Kytlicová, E. Neustupný, J. Ondráček, J. Paulík, I. Pleinerová, E. Plesl, J. Poláček and J. Vladár (Czechoslovakia); G. Behm-Blancke, R. Breddin, D.-W. Buck, W. Coblenz, H. Kaufman, K. Kroitzch, K. Simon and K. Peschel (DDR); A. Jockenhövel, H. Koschik and H. Müller-Karpe (BRD); T. Kemenczei, T. Kovacs, A. Mozsolics and I. Stanczik (Hungary); I. Aldea, I. Ordentlich, D. Popescu and T. Soroceanu (Romania); P. Doluchanov (Soviet Union); P. Pavlov (Bulgaria); K. Wardle (north Greece); A. Ammerman, A. M. Bietti Sestieri, G. Barker, C. Gamble, T. Potter, L. Vagnetti and R. Whitehouse (Italy); M. Korkuti and F. Prendi (Albania); B. Gediga, M. Gedl, W. Hrebenda, K. Jażdżewski, Z. Kaszewski, J. Kraussowa, L. Krzyżaniak, J. Machnik,

J. Ostoja-Zagórski, T. Sulimirski, T. Wegrzynowicz and W. Wojciechowski (Poland); G. Burenhult, D. Damell, B. Gräslund, A. Hyenstrand, C.-A. Moberg, J. Nordbladh and S. Welinder (Sweden); E. Lomborg, K. Randsborg and H. Thrane (Denmark); A. Siiriäinen and J. P. Taavitsainen (Finland); J. Briard (France); P. Ashbee, O. Dickinson, F. Lynch, J. J. Taylor, J. Turner, G. J. Wainwright, D. Gurney and many others (Britain); J. A. Bakker, J. J. Butler, S. J. de Laet, P. Modderman, J. D. van der Waals and H. Waterbolk (Low Countries); A. ApSimon, H. Case, L. Flanagan, and P. Harbison (Ireland); M. Almagro, R. Chapman, O.-H. Frey, R. Harrison, E. Sangmeister and H. Savory (Iberia). For drawings and maps we thank Y. Brown and B. Gill; for photographic copies of line-drawings we thank G. Owen and T. Middlemass. We are grateful to several museums and other persons who supplied plates, which are acknowledged separately.

A great deal of literature could only be consulted in the library of the Institute of Archaeology, London, and to its Director and Staff we are most grateful. A.F.H. further has to thank the Research Fund Committee of the University of Durham and J.M.C. the University of Cambridge for grants which made possible the travel necessary for the writing of this book.

Our most particular thanks go to our wives for much help during the writing, typing, editing and preparation of the book for the press.

July 1977

J.M.C
A.F.H

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(Radiocarbon dates are expressed in years bc; calendar dates are expressed in years BC.

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Transliteration of Cyrillic

а	a	п	p
б	b	р	r
в	v	с	s
г	g (even in Ukr.)	т	t
д	d	у	u
е	e	ф	f
ж	ž	х	ch
з	z	ц	c
и	i (even in Ukr.)	ч	č
й	j	ш	š
і	i (Ukr.)	щ	šč
ї	ji (Ukr.)	ъ	”
к	k	ы	y
л	l	ь	’
м	m	э	ė
н	n	ю	ju
о	o	я	ja

Ukrainian and other scripts have slightly different values for some letters (e.g. и, г - strictly y, h) but to avoid complication we have used the Russian system throughout. Place-names are transliterated directly unless a familiar English usage exists (e.g. Moscow, Belgrade for Moskva, Beograd). Ukrainian place-names are mostly given in Ukrainian.

Abbreviations

AAA Szeged	*Acta Antiqua et Archaeologica.* Szeged
AAC	*Acta Archaeologica Carpathica.* Kraków
AAH	*Acta Archaeologica Academiae Scientiarium Hungaricae.* Budapest
AE	*Archaeologiai Értesitö.* Budapest
AFSB	*Arbeits- und Forschungsberichte zur sächsischen Bodendenkmalpflege.* Dresden
AJA	*American Journal of Archaeology.* Concord, N.H.
AJPME	*A Janus Pannonius Múzeum Évkönyve. Pécs*
AK	*Archeologija.* Kiev
AMFME	*A Móra Ferenc Múzeum Évkönyve.* Szeged
AMN	*Acta Musei Napocensis.* Cluj
AR	*Archeologické Rozhledy.* Prague
Arch.	*Archeologija.* Sofia
Arch. Aust.	*Archaeologia Austriaca.* Vienna
Arch. Iug.	*Archaeolgia Jugoslavica.* Belgrade
Arch. Polski	*Archeologia Polski.* Warsaw
Arch. Sbor.	*Archeologičesky Sbornik.* Leningrad
Arh. Mold.	*Arheologia Moldovei.* Iaşi
ARR	*Arheološki Radovi i Rasprave.* Zagreb
AuF	*Ausrabungen und Funde.* Berlin
AVMMK	*A veszprém megyei múzeumok közleményei.* Veszprém
BCSP	*Bolletino del Centro Camuno di Studi Preistorici.* Capo di Ponte
BIA	*Bulletin of the Institute of Archaeology.* London
BBVF	*Berliner Blätter für Vor- und Frühgeschichte.* Berlin
BPI	*Bulletino di paletnologia italiana.* Rome

BRGK	*Bericht der römisch-germanischen Kommission.* Frankfurt a/M
BROB	*Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek.* Amsterdam
BSA	*Annual of the British School of Archaeology at Athens.* London
BUSS	*Buletin per Shkencat Shoqërore.* Tirana
B Vgbl.	*Bayerische Vorgeschichtsblätter.* Munich
CAH	*Cambridge Ancient History.* Cambridge
EAF	*Ethnographisch-archäologische Forschungen.* Berlin
ESA	*Eurasia Septentrionalis Antiqua.* Helsinki
FA	*Folia Archaeologica.* Budapest
FAP	*Fontes archaeologici Posnanienses.* Poznań
FvfD (Führer...)	*Führer zu vor- und frühgeschichtlichen Denkmälern.* Mainz
Fundb. aus Baden-Württ	*Fundberichte aus Baden-Württemberg.* Stuttgart
Glasnik Kos i Met.	*Glasnik muzeja Kosova i Metohije.* Priština
GNAMP	*Godišnik na narodnija archeologičeski Muzej Plovdiv.* Plovdiv
GZMS	*Glasnik zemaljskog muzeja u Sarajevu.* Sarajevo
IAI	*Izvestija na archeologičeskija Institut.* Sofia
INMV	*Izvestija na narodnija muzej-Varna.* Varna
Inv. Arch.	*Inventaria archaeologica.* By countries
IVAD	*Izvestija na varnenskoto archeologičesko družestvo.* Varna
JAS	*Journal of Archaeological Science.* London
JFA	*Journal of Field Archaeology.* Boston
JIES	*Journal of Indo-European Studies.* Butte
JIVUF	*Jahresschrift der Institut für Vorgeschichte der Universität Frankfurt am Main.* Frankfurt a/M
JMV	*Jahresschrift für mitteldeutsche Vorgeschichte.* Halle/Saale
JVSTL	*Jahresschrift für die Vorgeschichte der sächsisch-thüringischen Länder.* Leipzig
KSIIMK	*Kratkie soobščenija instituta istorii material'noj kul'tury.* Moscow
KSIAM	*Kratkie soobščenija instituta archeologii.* Moscow
KSIAK	*Kratkie soobščenija instituta archeologii.* Kiev
KSAMO	*Kratkie soobščenija o polevych archeologičeskich issledovanijach.* Odessa
Mat. Arch.	*Materiały Archeologiczne.* Kraków

Mat. Starož.	*Materiały starożytne.* Warsaw
MCA	*Materiale şi cercetări arheologice.* Bucharest
MIA	*Materialy i issledovanija po archeologii SSSR.* Moscow
Mitt. der präh. Komm.	*Mitteilungen der prähistorischen Kommission der Akademie der Wissenschaften.* Wien
Mon. Ant.	*Monumenti Antichi.* Rome
Not. Scavi	*Atti della Accademia nazionale dei Lincei-Notizie degli scavi di Antichità.* Rome
PA	*Památky Archeologické.* Prague
PBSR	*Papers of the British School at Rome.* London
PPS	*Proceedings of the Prehistoric Society.* Cambridge
Preist. Alp.	*Preistoria Alpina.* Trento
Przeg. Arch.	*Przegląd Archeologiczny.* Poznań
PZ	*Prähistorische Zeitschrift.* Berlin
RSP	*Rivista di scienze preistoriche.* Firenze
RVM	*Rad vojvodjanskich muzeja.* Novi Sad
SA	*Sovetskaja Archeologija.* Moscow
SAA	*Soviet Anthropology and Archeology.* New York
SbČSSA	*Sborník československé společnosti archeologické.* Brno
SCIV	*Ştudii şi cercetări de istoria veche.* Bucharest
Sl. A.	*Slovenská archeológia.* Bratislava
SNMP	*Sborník narodního muzea v Praze.* Prague
Stud. Alb.	*Studia Albanica.* Tirana
ŠZ	*Študijné Zvesti AÚ-SAV.* Nitra
TGIM	*Trudy gosudarstvennogo istoričeskogo muzeja.* Moscow
TP	*Trabajos de Prehistoria.* Madrid
UISPP	*Union international des sciences pré- et protohistoriques.*
WA	*Wiadomości Archeologiczne.* Warsaw
WMBH	*Wissenschaftliche Mitteilungen aus Bosnien und Hercegovina.* Sarajevo
ZfA	*Zeitschrift für Archäologie.* Berlin
ZSAK	*Zeitschrift für Schweizerische Archäologie und Kunstgeschichte.* Zürich

1 Introduction

This book has as its theme the development of the Bronze Age in Europe outside the Aegean area. In geographical terms, the territories surveyed range from the Atlantic islands and maritime coastlands to the Carpathians and the Black Sea, and from the great river valleys and plains of the north to the coasts of the Mediterranean. Within this great variety of environments we have attempted to describe some of the important developments in European prehistory from *c.*2000 to *c.*700 BC.

We do not see the European Bronze Age as a period that can be easily separated from preceding or succeeding prehistoric developments, and in many ways the divisions Neolithic – Copper Age – Bronze Age – Iron Age become more and more artificial as cultural and environmental evidence for continuity accumulates through landscape as well as typological studies. However, for the purposes of this book, we have had to adopt a chronological framework based upon an arbitrary definition for the Bronze Age. What we have taken as defining features are the regular occurrence of metal-working in many communities, and a general date of *c.* 2000 BC for certain areas where metallurgy was never, or only later, established as a major industry.

Copper had been used since the earliest Neolithic in those parts of Europe where its appearance on the surface was most obvious, and the later Neolithic groups in east-central Europe are more properly termed Copper Age, so great was the quantity of implements produced. But metal forms in the Copper Age are simple and restricted: awls, ornamental discs of sheet bronze, hammered flat and perforated for attachment to clothing, tanged daggers, spectacle-spiral pendants, spiral beads, and – in greatest profusion – shaft-hole axes and axe-adzes of massive appearance. Hand in hand with this production of copper went that of gold, which was used in quantity for ornaments, especially ring pendants, spiral beads and a few other forms. Copper Age communities in central Europe built fortified villages by lakes or on hilltops, and many settlements

were placed near copper ore deposits; there is much evidence for local metallurgy, as well as general similarity throughout the region in total industrial assemblages. The differences between this Copper Age evidence and that of the traditional Bronze Age are often minimal in certain areas, and this is why Müller-Karpe would have us now take a large part of the traditional 'Early Bronze Age' as 'Copper Age',[1] but we feel it is still possible to draw a line between an 'Incipient Metal Age' and a 'Full Metal Age', regardless of the actual alloys used. It will be objected that such a line will be as arbitrary as any other, including Müller-Karpe's, and to this we can only reply that in the first place changing the established system will be misleading, and, in the second, a simple and reasonably objective test may help to eliminate these difficulties. In Central Europe the criterion of a Metal Age should be that *most* of its tools and weapons and at least *some* of its ornaments, should be of metal; and that there should be evidence of extensive and local extraction and working of metal.[2]

In Central Europe, hoards of tools (for it is on hoards and not single finds that one should depend) continue, right up to the threshold of the Bronze Age, to be made of stone and bone. In Austria, for example, the Lengyel and related Late Neolithic groups like Wolfsbach and Kanzianberg contain large stone-axe and flint collections, as does the succeeding Baden group.[3] Only with the advent of the late Copper Age groups like Ossarn does metal start to appear in any quantity, and not until the time of the *Ringbarren* hoards can we speak of an absolute predominance in tool and weapon types of metal over stone.[4]

The vast increase in the quantities of metal found as tools and implements is a natural reflection of increased working of copper veins at the main mining centres of central Europe. It is now forty-five years since Pittioni concluded that the famous mines of the Bischofshofen-Mühlbach area in upper Austria started to be exploited intensively during the period of the *Ringbarren* hoards, that is, in the Early Bronze Age.[5] The finds from the settlement on the Klinglberg near St Johann in Pingau included pottery with slag inclusions and the association of these sherds with a flanged axe clinched the matter. It now seems quite clear that the extensive mining of copper, such as we have discussed elsewhere (p. 63), is, in central Europe, the concomitant, if not actually the cause, of the development of the Early Bronze Age in the area. The date of this transition to the Bronze Age is likely to be in the late third millennium BC, although naturally it will always remain impossible to pinpoint the exact time and place of our artificial transition to the Bronze Age. A further help, however, can come from the recognition of the alloying of copper with tin or arsenic, to produce the metal bronze, and here the analyses of

metal objects (noted below) can be of value; using these, we may point to the first objects made of tin-bronze, or the first two-piece moulds, and suggest these as general *termini ante quos* for the Bronze Age. Such beginnings, however defined, were not of course uniform over the European continent, either in time or amplitude, and previous and recent studies of material of Copper Age and Bronze Age character, utilizing terminologies based upon local finds and sites, have led to the identification of a bewildering variety of differing cultural groups in the early stages of the Bronze Age of central Europe and elsewhere. We have tended to avoid the proliferation of names of archaeological groups in this book wherever possible.

Fig. 1 Opening of the Trindhoj barrow in 1861, under instructions of King Frederik VII of Denmark. The oak coffin exposed had already been emptied before the archaeologists Worsaae and Herbst, anatomist Ibsen and artist Kornerup (whose drawing this is) had arrived on the scene. Further in the mound lay another oak coffin with a clothed body (see fig. 92 for reconstruction).
(From *Skalk*, 1963, no. 3)

The history of Bronze Age studies is concerned with two main aspects. The first, in the earlier nineteenth century, resulted in the excavation of thousands of burial monuments (fig. 1), and the destruction of evidence of all kinds; there were few areas possessing museum facilities and adequate provision for storage of records, and many of the outstanding monuments were rifled for precious metals. The early conservation of organic materials from a few burials in the north are a

welcome exception.[6] These matters are referred to in the relevant chapters below.

The second major aspect of Bronze Age studies, initiated in the nineteenth century and continuing up to the present time, is the attention paid to typology, particularly of metal products but also pottery and stone.[7] The fine quality of workmanship, the opportunity to express local stylistic preferences in shape and decoration, the deposition of products in hoards or graves with other objects, all have created the chance to describe and discuss the evolution of types, the changing fashions and preferences of Bronze Age communities, the regular association of objects and the possible trading patterns developed for the dissemination of products. These studies, and there are thousands of them, can create opportunities for the further understanding of Bronze Age societies, but not if they are taken in isolation and treated as end products in themselves. In this book we have attempted to reduce the typological content to an acceptable minimum, while emphasizing that such studies are still vital to an overall picture of the Bronze Age. A short survey of the major forms appears elsewhere in this Introduction.

The surviving evidence for the Bronze Age is massive. Apart from the many thousands upon thousands of metal artifacts and pottery vessels, quantities of flint and stone work exist, and the decorated rock surfaces as well as clay and metal objects also form a body of data suitable for study. Cemeteries of inhumed or cremated remains abound, from a few burials to many hundreds. Settlements in a variety of situations are becoming increasingly well-known through discoveries of new sites and further examination of the old. Although stratified settlements are not widely distributed, the tell-type occupations in east-central Europe, and cave sites in the west, allow some measure of stratigraphical detail which is lacking from the open flat settlements so characteristic of many areas in Bronze Age Europe. Lake-side settlements, preserved by peats or muds, create their own unique opportunities. Increasingly, environmental data and organic remains are becoming available for study, through re-examination of old sites and selection of new areas for research. The development of patterns of land-use, the take-up of new land, and the methods of exploitation for food-production, all of these are under examination in many areas of Europe, and this is one of the most encouraging aspects of Bronze Age studies.

Closely related to these landscape studies are questions of alterations in natural conditions through land-take (*landnam*) and land-exhaustion, through forest clearances, alterations in water levels, and through climatic changes. Some of these matters are referred to elsewhere in this book. In terms of climate, the Bronze Age falls within Pollen Zone VIII

(in the Blytt-Sernander system), that is, the Sub-boreal period which lasted about 2,500 years, *c.* 3000–500 BC. A variety of approaches have shown that the climate of the Sub-boreal was warm and rather dry, with considerable variation in humidity, in contrast to the warm but wet conditions of the preceding Atlantic period and the cooler, wetter conditions of the succeeding Sub-atlantic.[8] During the Sub-boreal, brown soils predominate, and the process of podsolization was temporarily halted; the growth of peat bogs similarly slowed down, and periodic desiccation occurred in them. Lake levels fell considerably but still fluctuated wildly; sea levels were generally higher than before but close to present-day values.

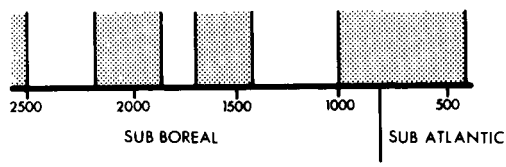

Fig. 2 Climatic oscillations during the later Sub-boreal and early Sub-atlantic phases in Europe. Stipple represents relatively cool and/or moist episodes; unstippled areas represent relatively warm and/or dry episodes.
(After Frenzel 1966, fig. 4)

Within the limits of the Sub-boreal, numerous smaller oscillations occurred (fig. 2).[9] Three main cool and/or moist spells have been recognized: the first a century either side of 2000 BC, the second around 1600–1500 BC and the third early in the first millennium and carrying on into the markedly wetter conditions of the Sub-atlantic. The date of this last deterioration is not certain: in central Europe it appears to have been around 800 BC, in some other parts, including Britain, rather earlier. The impact of such an alteration in climate had serious consequences in many parts of Europe.

There are other approaches to the study of Bronze Age Europe that might reward modern studies. Among these are the problems of the racial affinities and physical characteristics of Bronze Age populations.

The great majority of anthropological studies of the skeletal remains of Bronze Age populations have proceeded by means of metrical analysis, in particular of skulls.[10] The 'cranial index' is still frequently quoted although it is now widely agreed that it is of little value in distinguishing large-scale patterns. More recent analyses quote large numbers of

measurements and ratios, but so far little homogeneity has been found in the skeletal types of populations attributable to the same culture. At Grossbrembach (Sömmerda), for instance, four main skull types were distinguished, but these accounted for under 50 per cent of the population; the remainder were 'mixed forms'.[11] It is also clear that Bohemian, Moravian and Thuringian Únětice groups varied considerably from each other; there is no question of distinguishing a single skeletal type attributable solely, or even mainly, to groups making Únětician artifacts. In our opinion the time is still far off when sensible conclusions can be reached concerning the racial affinities of Bronze Age populations, but current work may well begin to differentiate physical groups through large scale sampling of completely excavated cemeteries.

The question of the racial identity of the earliest Bronze Age populations is the subject of an important and widely-accepted theory whose principal proponent has been M. Gimbutas.[12] Broadly speaking, this involves the spread of people on a large scale out of the south Russian steppe into eastern and central Europe at the end of the Neolithic. The archetypal monument of these people is burial of the dead in a grave-pit under a mound of earth (Russian *kurgan*). Such barrows are widely found in south Russia and the Ukraine in the late Neolithic where they are referred to as *Pit Graves*, part of the *Pit Grave culture*. Other features said to be typical of the 'Kurgan culture' include the dismemberment of the corpse before burial, the orientation of the grave so that the face looked east or south and the practice of sprinkling red ochre over the corpse. Tumuli containing some or all of these features are found in Eastern Europe in the Eneolithic and even more so in the Early Bronze Age; it is therefore assumed that the people who erected barrows like this to bury their dead were related to – in fact descended from – the late Neolithic groups on the Russian steppe. Round barrows do not normally appear in the Neolithic; how natural then to assume that a new people was responsible for their introduction in the Bronze Age.

Once this step is accepted, everything else follows. The Corded Ware groups of Europe can be seen as descendants of the 'Kurgan culture'; barrow-graves of the Early Bronze Age similarly. Gimbutas can thus postulate a 'Kurgan' origin for the Coţofeni and Monteoru groups in Romania, the Otomani group in east-central Europe and the generalized Únětice groups in west-central Europe. Since the middle and late phases of the Bronze Age can be shown, in the west at any rate, to have followed on the early phase without a significant cultural break, the people living then must have been of Kurgan origin too; and since one cannot descry any major invasion of people into central Europe between the Urnfield period and the (presumably Celtic) Early Iron Age, it follows that all

these groups must be ancestral to the Celts, in other words of Indo-European stock. For this reason Gimbutas can view the 'great Kurgan expansion which proceeded out of the European steppes into Europe and the Near East' as 'Proto-Indo-European'. In the same way tumulus burials in Albania and Greece have been regarded as the distinctive hallmarks of the Indo-European 'Kurganers', arriving there during the third millennium BC and thus responsible for the arrival of the Greeks in Greece.[13]

How can this hypothesis be tested? It seems to us that there is only one sure way, and that is by absolute dating. If the south Russian tumuli can be shown to be consistently earlier than the central and eastern European, then the theory can stand. If not, then it must fall. At the time of writing some forty radiocarbon dates are available for Pit Graves and another six for the late variant called Catacomb Graves (table, p. 154). The great majority fall between 2400 bc and 1700 bc, though a very few are earlier (only a couple significantly so). The only dates for 'Ochre Graves' in east-central Europe are very similar – 2315 ± 80 bc from Kétegyháza, 2140 ± 160 and 2110 ± 160 bc from Baia-Hamangia. Dates for Corded Ware fall in much the same bracket (the range is 2600 – 2100 bc) although it is remarkable that many of these come from the opposite end of Europe and are not from barrows. Broadly speaking, the supposedly derivative groups in Europe are in fact *contemporaneous* with the Pit Graves in south Russia, and not appreciably *later* than them.

Further dates will help to clarify this picture which is still far from complete; other considerations encourage the scepticism that this pattern suggests. Should the spread of a particular burial type be taken as an indication of racial affinities? Could not the barrow be taken rather as a fashion, just as supine inhumation in a coffin with grave-stones at head and foot has been the prevailing fashion in Europe for centuries, more an indicator of the Christian religion than of anything else? Barrow burial occurs in many areas, especially in western Europe, where a primary spread of 'Kurgan people' cannot possibly have occurred. Even if one interprets the Wessex group of southern England as of Kurgan derivation, how is one to explain the occurrence of round barrows and cairns in the Neolithic of Britain, Ireland and Brittany? The fact is that barrow-burial is widespread in time and space and cannot possibly be taken as indicative of a unitary racial situation. That it has been is proof of the force of habit – the habit of introducing invaders from the east, and in particular from the vast unknown of Asiatic Russia, to account for change in the cultures of Europe.

Instead, we see little in the Bronze Age of Europe that needs external influence either to initiate or sustain its unique character. The distribution

of Bronze Age occupation in Europe is essentially that of the preceding Neolithic, except that a greater density of population seems attested, by size and number of settlements and cemeteries and by the taking of new lands hitherto uncultivated. The economic practices and industrial processses of the Bronze Age are also logical progressions from the European Neolithic, although there are one or two aspects of significance.

The first is that metallurgy, although known before, created opportunities for the accumulation of material wealth, however that is interpreted. Copper and gold products, unlike stone and clay, were still valuable even when broken or worn, as they could be put back into circulation through the melting-pot or hammer. In time, therefore, more and more metal came into circulation, as more natural supplies were exploited without accompanying wastage. A second feature of the Bronze Age, not seen before, was that for the first time regions in Europe had to create some mechanism to ensure regular and ample supplies of a raw material, metal, which was only available well outside their territories;[14] the precise arrangements by which northern Europe, for example, acquired copper, tin and gold throughout the second millennium are a continuing subject of research.

The metal resources of Europe were otherwise quite widespread (fig. 3). Copper in accessible deposits is reported from the Atlantic coasts, the Alpine area and Bohemian Ore mountains, the Carpathians, the southern Balkans and the Caucasus, and there are other smaller sources as well.[15] Only the northern parts of Europe were well outside the spread of copper-bearing deposits. Tin, however, was much more restricted, and its sources seem to have been limited to the Atlantic coasts, to the Bohemian Ore mountains and to north-western Italy. These supplies, or some of them, must have been quite rapidly discovered and exploited,[16] and mechanisms developed to allow for wider distributions of this essential element in bronze-casting. Gold, highly-valued for its ornamental qualities, was available in north-western Europe, in the Carpathian region, in east Germany and central Jugoslavia, with perhaps other smaller sources as well.[17]

The importance of European metallurgy, in terms of invention and character, when compared with the evidence from the near and middle East, should not be forgotten; copper, tin and gold all occur in the near East, and in Egypt as well, but their exploitation was by no means earlier than, or superior to, that of the European continent. The denigration of coppersmiths in Egypt, with fingers like a crocodile and a smell like fish excrement, may not relate to the standing of metal-workers in Europe, but the importance of such craftsmen should perhaps not be exaggerated. Specialized work with wood, stone, flint, clay, glass and amber is also

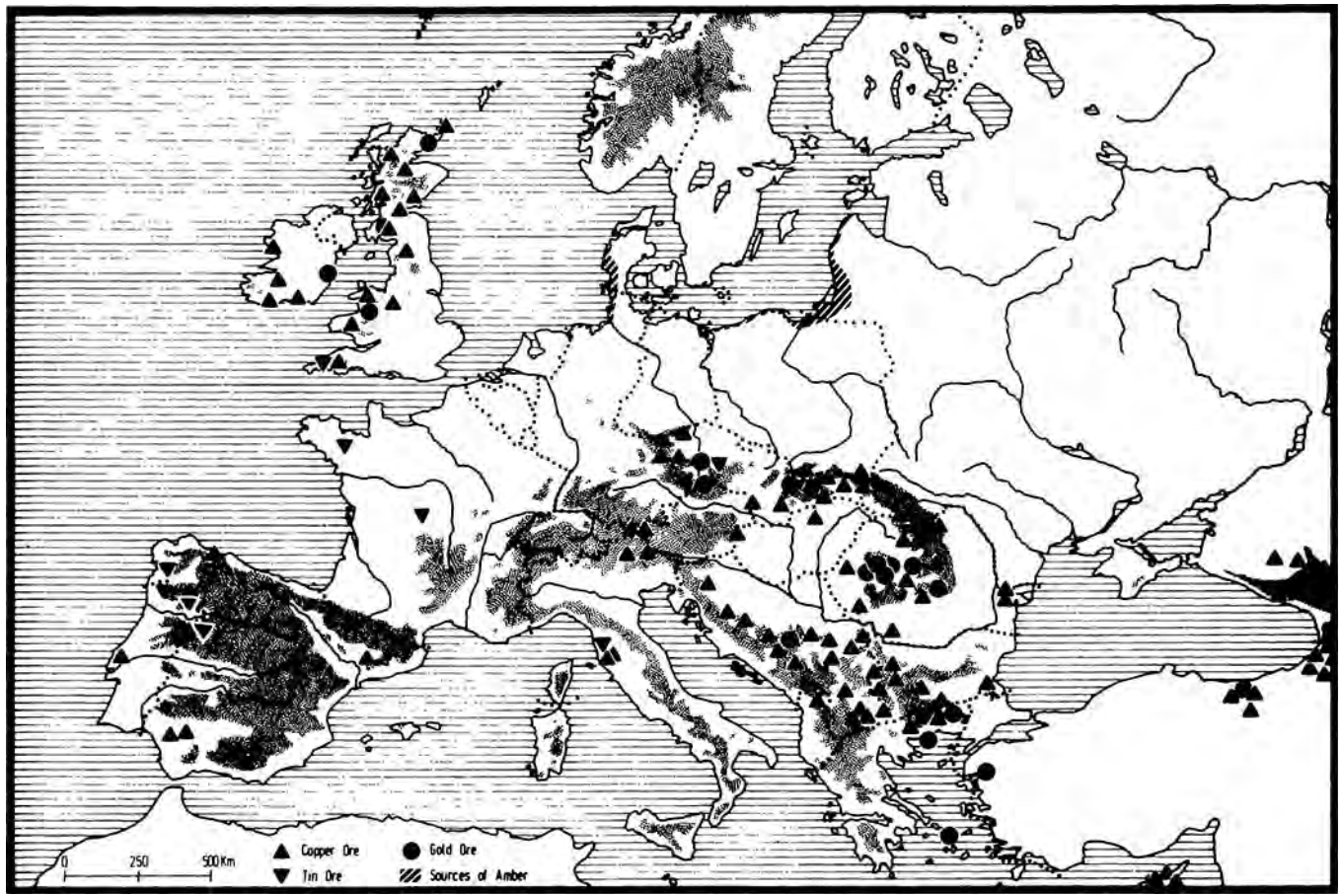

Fig. 3 Sources of copper, tin, gold and amber in Europe. (After Gimbutas 1965)

well-attested from the European Bronze Age, and the position of the individuals capable of producing objects in any of these materials may have been equal to that of the metal-worker. The processes for the production of bronzes, pottery and glass, involving control over heat and draught and time, were broadly similar, and the winning of ores, stone and flint also involved comparable techniques of prospect, quarrying and preparation.

The precise methods used for the production of the many thousands of bronzes have been the subject of experiment and theory for many years,[18] but the work of Pittioni and others, in tracing the actual mines and the separating and smelting places in the Austrian Alps (fig. 4), should perhaps be singled out as a major contribution.[19] The processes of smelting oxide ores, roasting and smelting the deeper sulphide ores,

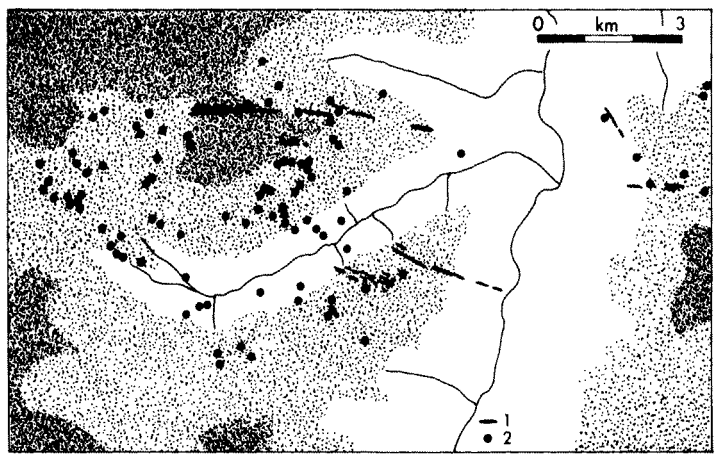

Fig. 4 Mining hollows (1) and smelting places (2) at Mühlbach, Salzburg, Austria, near the Salzach River. Contours at 1,000 and 1,500 m.
(Based on Zschocke and Preuschen 1932)

melting and casting, and cold-working the product to harden and embellish it, are well known and need not be elaborated here except to emphasize that some form of kiln was required for both smelting and melting. The importance of tin as an element which, at about 10 per cent of the finished product, created a much harder artifact, is also a standardized feature of Bronze Age technology.[20]

Another and quite remarkable feature of the Bronze Age is the uniformity in the development of metallurgical techniques and products throughout the various natural regions of Europe. In almost every area the development of metallurgy proceeded in much the same way. The

first copper tools were simply hammered into shape; the first moulds were shallow depressions on blocks of stone, and only at a later stage did finely-made two-piece moulds with valves come into use. The natural result was that similar types of implements were produced in different areas at the same time; or, at any rate, that assemblages contained a comparable variety of implements. This is most obvious in cemetery material in the earlier period – compare the metal finds from, say, Kisapostag (p. 83) and Adlerberg (p. 53) – but by the middle of the second millennium, hoards, too, had similar contents (sickles, palstaves or flanged axes, bracelets, etc.). The invention of a new form, like the sword, spread rapidly throughout the continent so that its first appearance in Austria more or less coincided with that in Romania. The most obvious correspondences in hoard content come in the later Bronze Age; by the thirteenth century a hoard in Transylvania contained similar classes of object to a hoard in Saxony, though not, of course, identical types. We may notice a progression from an earliest phase, during which simple flat objects of pure copper were made – tanged daggers, flat axes, occasional beads – through a period when arsenic or tin was starting to be used, and triangular daggers, flat racket-headed pins, spiral beads, and simple finger-rings of doubled and folded wire were commonly found in graves; to a full 'Bronze Age' development with the regular deposition of large amounts of metal in hoards – flanged axes and *Ringbarren* to start with, then palstaves and spiral-ended bracelets or leg-rings, and finally swords, flange-hilted daggers and sickles, fibulae, solid bracelets of round, hemispherical and lozengic section, leaf-shaped spearheads, bronze vessels, winged and socketed axes, and so on. The list is seemingly endless.

Grave-finds also show close correspondences. Grave assemblages with simple flat sheet or folded wire ornaments (earrings or bracelets), bone beads, faience beads, spiral bronze beads, and triangular daggers may appear anywhere in central Europe in the earlier part of the 'Early Bronze Age'; while trapezoidal-hilted dirks and daggers, long pins with ribbed shank, spiral-terminal leg-rings and heart-shaped pendants characterize the period traditionally called 'Tumulus'. A wide variety of related forms may occur; yet in spite of regional differences, there *is* an overall pattern to be found, and the experienced worker has little difficulty in putting an unfamiliar hoard or grave-find into its correct time-bracket, simply because most bronze forms, in one shape or another, are ubiquitous. Not so with pottery, of course; a closer acquaintance is needed to slot pots into their appropriate pigeon-hole; yet even here a modicum of order may be found. The Early Bronze Age in central Europe produced a very characteristic cup shape, with low belly and funnel-like neck, that appears everywhere; the Tumulus culture is most often characterized by bowls

with incised geometric decoration, pedestal bases, and, often, peaked rims; while in the Late Bronze Age cinerary urns, often biconical or with globular body, cylindrical neck and flaring rim, were the universal form. Such forms serve as chronological indicators to the trained eye, while the more exact attribution of types to phases, and their relation to one another, is a matter for the local specialist.

By such specialized typological study, various distributions of related materials can be seen, and production centres and exchange mechanisms suggested. The problems with such an approach are several. We must rely upon known distributions with all their uncertainties about uniformity of discovery, equal degrees of research and recognition, and similar preservation of evidence, in different areas. We must also recognize that burial of such material as bronzes, or pottery, may have been made for very different reasons, and simple uncorrected comparisons of find-spots may well be totally unjustified; a glance at a few possibilities for the disposal of objects will show some, but doubtless not all, of the differences in the ultimate place where objects came to reside.

Deposition of objects

	local areas	*foreign areas*
contemporary use	in grave in votive deposit loss during use thrown away abandoned in settlement	gift plunder tribute exchange or sale
future use	in scrap metal hoard unused in hoard inheritance	in scrap metal hoard unused in hoard

Burial with the dead or loss during use, for example, should reflect the chronological and cultural spheres of the producing society, but acquisition through plunder, or inheritance, or exchange mechanisms, may take material out of its original position in space or time, and it may then again be subject to various methods of and reasons for deposition. Distribution maps which take no account of such variation must be of uncertain value.

One way by which archaeologists have attempted to arrange their material, and to find the sources of the products, is by analysis of the metal composition. Spectographic analysis can determine if the metal is a deliberate alloy (of copper and tin) and can identify and measure the impurities in the metal.[21] When comparisons are made with the possible or probable ore bodies themselves, as has been done in Austria, it theoretically allows a direct correlation between mine and product, and

the importance of this need not be stressed. Many different analytical studies have been made of Bronze Age metals, and among these studies we might single out the ambitious Stuttgart programme which now encompasses many thousands of Early Bronze Age objects.[22] Using five main elements, nickel, bismuth, arsenic, antimony and silver, in varying proportions, the analyses are grouped and distributions plotted. Various regional metal-groups are identified, and although there are some groups so heterogeneous that they cannot possibly be attributed to a single source or industry, others are restricted to geographical areas and can, for the moment, be claimed to represent the major and probably local metal source for that area.[23]

There are many other programmes of analyses, none so ambitious as the Stuttgart studies, but more rewarding in terms of locally-defined groups.[24] The work of Pittioni and Neuninger in Austria has already been noted; here the absolute quantities of the elements are not measured, only their presence, or a trace, or absence; comparisons with the ore bodies have readily been made.[25]

The problems with these programmes of analysis are many. They include the demonstrable fact that the composition of the ore varies with its position in the parent rock and can be affected by weathering, smelting, melting and casting; the analytical techniques can vary and produce different results. Much current work attempts to assess these uncertainties, and to devise more consistent procedures. Most heavily criticized has been the Stuttgart school, but this is mainly directed towards the interpretation of results rather than the analytical data.[26]

For gold, the analytical work has proved useful if also controversial. Analysis of many hundreds of gold objects has allowed the identification of a number of groups which may relate to local gold sources. The products of the Bronze Age workshops centred near the gold-bearing deposits of Brád and Verespatak in Transylvania are readily identified by composition and character (fig. 5) and the correlation of Irish Bronze Age products with Irish Wicklow gold is a useful if undramatic revelation.[27]

These programmes of analyses must be seen as only one small part of the study of Bronze Age communities in Europe. They may provide a guide to the mechanics of industry in certain areas, but the whole question of the interpretation of metalwork in the European Bronze Age is unresolved. Basically, the evidence of Bronze Age societies suggests a large number of small communities almost entirely self-sufficient and under little pressure. Within and between these societies there is a range of materials, mainly metal, which sometimes demonstrates long-distance distribution of raw metal or finished products. The mechanisms by which

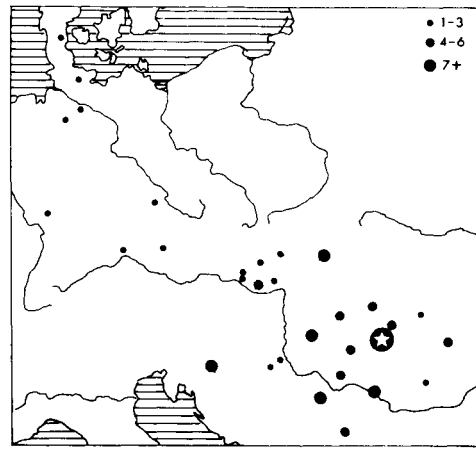

Fig. 5 Distribution of gold finds of Groups A3 according to Hartmann 1970. The gold source at Brád is shown as a star, and the majority of large finds lie close to source in the middle Danube region.

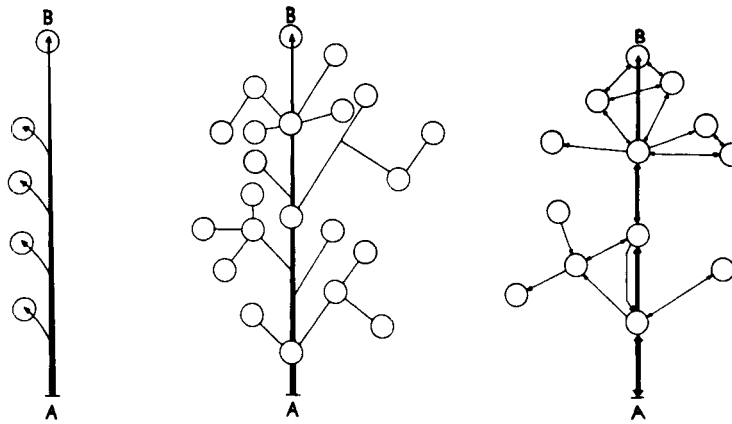

Fig. 6 A model of distributive mechanisms which may reflect the ways by which Bronze Age objects were spread out from source A to destination B through direct or indirect means. The circles represent intermediate or diversionary destinations.
(After Stjernquist 1967 and Thrane 1975, fig. 117)

such materials were obtained, worked and distributed are not well-known, and although ethnographic evidence may provide some suggestions,[28] the situation of Europe in the Bronze Age was unique and we cannot attempt to create an artificial model without much more evidence at our disposal to guide us towards the most appropriate theoretical position. We may talk of random exchange, local redistributions, highly organized regional and longer-distance trade (fig. 6), and many maps of Bronze Age materials purport to demonstrate these systems (fig. 7). But we suggest that much more work on sources, analyses, settlement locations and geographical territories is required before we can begin to assess the importance or otherwise of the movement of objects and materials over appreciable distances.[29]

Important as metals and their procurement were to the peoples of Bronze Age Europe, we would not wish these remarks to imply that we believe such things to have been their main preoccupation. While a fair

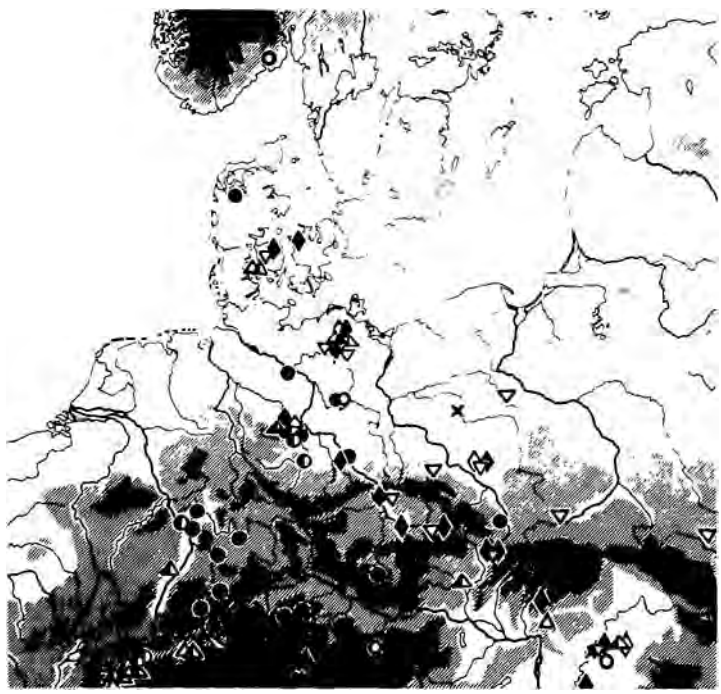

Fig. 7 Distribution of beaten metal cups of various Late Bronze Age types, perhaps produced in several centres, or disseminated from a single source.
(From Thrane 1975, fig. 81)

number of people must have been engaged in the various processes that led from the extraction of ore to the distribution of finished products, many more must have been involved with metals only peripherally. Though objects of metal conferred a degree of 'wealth' on their owner by reason of their intrinsic value both as raw material and as artifact, such wealth was presumably restricted in its distribution through society. One can hardly doubt, indeed, that for the majority of people inhabiting small agricultural villages of the types we describe in this book, the procurement and possession of metal was of little concern: the demands of the farming year would afford little time, and the returns of agriculture little opportunity, for active seeking after wealth. Metal tools, where functionally superior, would naturally be in demand, and Bronze Age farmers must have tried to ensure their availability by providing other commodities for barter, including their own labouring services. For such people, the aspects of life that would remain of unchanging importance would be the provision of food, clothing and shelter, and the more abstract factors that determine social relationships and emotional responses. In archaeological terms, it is the evidence for settlement, for economic practices and for social division that probably encapsulate, more than any number of metal finds, the essence of Bronze Age life. It is in the study of these aspects, then, that we expect the most informative insights to occur.

Much has been written in the past purporting to demonstrate population chnge on the basis of artifact typology. Such attitudes are no longer tenable, at least not in the simplistic guises under which they have generally appeared.[30] Instead, the evidence for population continuity on the basis of settlement forms, economic patterns and religious practices has mounted, and once freed from the shackles of the simple equation artifact change = population change, typological study can often be used to refute the supposition of change where formerly it was employed to support it. Archaeologists are becoming increasingly aware that what they view in the artifactual record is essentially a static landscape, a frozen moment in time, whereas what should more properly be sought is the dynamic aspect, based on the processes of development in the various interlocking subsystems of the whole. It is with the study of these processes—the processes by which cultural systems alter and adapt to take on the various tangible shapes we see before us—that archaeology, including that of the Bronze Age, will be principally concerned.[31]

We can make no claim, nor was it our aim, to have interpeted the material remains of Bronze Age Europe from any strict 'processualist' standpoint. This book presents the results of other people's researches and excavations; it is mainly a review of the current state of Bronze Age

studies, and processualist interpretations have so far had little impact in this area of prehistory. At the same time, we have attempted to avoid simplistic interpretations of artificial remains and to present a broad spectrum of evidence which will be amenable to a variety of approaches. At the very least, we would like to think that we have cleared the decks for further study.

Notes

1 Müller-Karpe 1974. It is interesting, though perhaps fruitless, to speculate on the absolute percentage figure which would be required for an objective standard by which to judge a culture 'Full Metal Age' rather than 'Incipient Metal Age'. Different figures would no doubt be obtained for different areas, and it would in any case depend on what materials one was using (whether hoards alone, or graves etc.). Theoretically it would be convenient to imagine a 50 per cent metal level for graves (more than 50 per cent of the non-ceramic content) but the numerous 'ametallic' Bronze Age finds would render this impossible. Some such estimate in combination with a 'hoard coefficient' might be more satisfactory.

For a recent detailed discussion of terminology (from a Marxist standpoint) see L. S. Klejn, *Neolithische Studien* 1 (1972), 7–29. And see R. Pittioni, *Norddeutsche Affinerie* (April 1966), 33–9, for a view of the significance of metal.

2 The situation in Northern Europe is clearly different (p. 283).

3 Pittioni 1954, 164, 170ff., 200 etc.

4 Pittioni 1954, 206, 284ff., 288, 290.

5 R. Pittioni in Zschocke and Preuschen 1932, 155–68.

6 Glob 1974.

7 Among many, the works of Montelius and Reinecke; descriptions and references occur in relevant chapters.

8 Several papers in *Proceedings of the International Symposium on World Climate 8000–0 BC*, Royal Geographical Society, London, n.d. (1966), especially L. Starkel, B. Frenzel, S. Jelgersma; for a reconstruction of atmospheric circulation *c.* 1200 BC, H. H. Lamb *et al.*

9 Frenzel 1966, 106ff.

10 The standard view is C. Coon, *The Races of Europe*, 1939, 154ff, 162ff.

11 Ullrich 1972, 112ff.

12 Gimbutas 1956; 1965, 21ff., 185ff., 250, 259 etc., *JIES* 1–2 (1973), 163–214.

13 Hammond 1967.

14 Other materials (flint, obsidian, stone and shells, for example) were quite widely distributed in parts of Europe in the fourth or third millennia, but were perhaps not quite so dominant materials as bronze eventually became. The possible agencies of distribution, and a useful set of maps, are discussed by A. Sherratt, in *Problems in Economic and Social Archaeology* (ed. G Sieveking, I. H. Longworth and K. E. Wilson), 557–81, London 1976.

15 The utilization of surface ores probably took place at an early date. Deeper mining in the areas with the richest deposits, however, was in progress in the early centuries of the second millennium BC. The ore mountains of the Carpathians (especially the north side of the Transylvanian Alps, the Munţii Metalici near Hunedoara and elsewhere),

Jugoslavia (in various parts of the mountainous zone, notably the mines in the Carpathian extension near Rudna Glava) and the central Alps (the Salzburg district) were intensively exploited.

16 By panning rather than by mining, according to analytical evidence.

17 Gold-panning was probably the most common method of retrieval of the metal, but mining was also practised in the Transylvanian region of eastern Europe: Hartmann 1970. See also H. Neuninger, E. Preuschen and R. Pittioni, *Archaeol. Austriaca* 49 (1971), 23–35.

18 R. Tylecote, *Metallurgy in Archaeology*, 1962;
R. Forbes, *Metallurgy in Antiquity*, 1950;
A. Oldeberg, *Metaltechnik und förhistorist Tid*, 1942—3;
H. Drescher, *Der Uberfangguss*, 1958;
W. Lorenzen in *Helgoland und das früheste Kupfer des Nordens*, 1965, 13–19;
H. Coghlan *Pitt Rivers Occas. Papers Technology* 4 (1951) are but a few of the substantial contributions.

19 R. Pittioni, *Der urzeitliche Kupferzbergbau im Gebiet um Kitzbühel. Stadtbuch Kitzbühel* 2 (1968); Zschocke and Preuschen 1932.

20 Antimony, lead and arsenic (the last within the ore itself and not as a separate toxic and volatile metal) were used on occasion as substitutes, but none as successfully as tin. Arsenical copper was an important source of metal in the early Bronze Age; see H. McKerrell and R. F. Tylecote *PPS* 38 (1972), 209–18; E. R. Eaton and H. McKerrell, *World Archeol.* 8 (1976), 169–91 with refs. The temperatures required for most processes must have involved some form of kiln: smelting copper ores, *c.* 1100°C; melting copper *c.* 1100°C; melting gold, *c.* 1050°C. The processes of smelting oxide ores such as cuprite and malachite:

$$2\,CuO + C \rightarrow 2Cu + CO_2;$$

for sulphide ores such as chalcopyrite (copper pyrites), roasting before smelting:

$$2\,Cu_2S + 3O_2 \rightarrow 2Cu_2O + 2\,SO_2$$
$$2\,Cu_2O + Cu_2S \rightarrow 6Cu + SO_2$$

H. Hodges *Artifacts* (1964) chapter 4.

21 In general, the trace elements found in an object of bronze are assumed to have come in the copper ore and not in the tin.

22 Junghans, Sangmeister and Schröeder 1960, 1968 (hereafter JSS).

23 Summarized in A. Hartmann and F. Sangmeister, *Angewandte Chemie* 11 (1972), 620–9; S. Junghans and H. Schickler, *Germania* 46 (1968), 1–19; *Ausgrabungen in Deutschland* 1 (1975), pt. 3.
We may most conveniently summarize the results from central Europe. Throughout the Copper Age (JSS use this term in the traditional sense) the most important metal group was E 00, but E 01 and E 01A were also in use, especially for flat axes. In the Early Bronze Age proper, the situation becomes much more complicated, though certain features stand out. Ingot torcs, for instance, overwhelmingly cluster in group C2, with high figures for FC as well. There is no clear preponderance for the Early Bronze Age in south-east central Europe in the early phases, though C2 is high and A, B2, E11A and E11B are fairly high. The south-west part shows a clear dependence on groups A and A1, the north part on A and C2, but with many others as well. In the later stages of the Early Bronze Age the definition of objects by given metal-groups is impossible, for nearly all

of them are represented; but there are indications that new groups, like FA and FB1, were coming into use, a trend which Tumulus bronzes continued.

What do these groups mean in geographical terms? Metal-group E 00 is widely distributed throughout Europe and cannot be attributed to a given source. E01 and E01A both show a marked preference for Iberia, but occur widely elsewhere. The important group C2 is impressively homogeneous and is almost certainly to be attributed to the Austrian ore-sources. It is interesting, therefore, to observe that objects of metal-group C2 occur all over central Europe, and further east as well if the analyses are to be believed. Group A in the Early Bronze Age is more northerly-oriented, showing a concentration on the lower Elbe, but with a fair scatter around central Europe as well. E11A looks as if it may have a strong Scottish-Irish bias; E11B, A1 and B2 are not restricted to any one area, and the same is true of the later FA and FB1 groups. It appears, then, that only C2, and possibly E11A, are attributable to particular ore-sources, and therefore trade; it is unfortunately impossible to distinguish from the remainder any clear pattern.

24 E.g. H. Coghlan and H. Case, *PPS* 23 (1957), 91–123; H. Case, *Palaeohistoria* 12 (1966), 141–77 for Ireland; D. Britton, *Archaeometry* 4 (1961), 39–52 for south Britain; H. T. Waterbolk, *Helinium* 5 (1965), 227–51 for the Netherlands and a widely accepted method of presentation of analyses in graph form; J. M. Coles, *PPS* 35 (1969), 330–44 for Scotland; M. A. Smith and A. Blin-Stoyle, *PPS* 25 (1959), 188–208 for Late Bronze Age Britain; P. R. Giot, J. Bourhis and J. Briard, *Travaux du Laboratoire d'Anthropologie Préhistorique* 1964–65, 1969, for Brittany; A. Boomert, *Helinium* 15 (1975), 134–61 for Gemeinlebarn, Austria; F. and E. Schubert, in A. Mozsolics 1967, 185–203 for Hungary; E. Sangmeister, in A. Mozsolics 1973, 215–49 for Hungary; F. R. Hodson, *World Archaeology* 1 (1969) 90–105 for a multivariate technique for clustering analyses.

25 R. Pittioni, *Arch. Aust.* 26 (1959), 67–95 as well as continuing series of analyses reported in the same journal.

26 A. Boomert, *Helinium* 15 (1975), 134–6 gives a useful summary, and full bibliography of reviews; one of the first reviews of the Stuttgart school was J. J. Butler and J. D. van der Waals, *Helinium* 4 (1967), 3–39.

27 Hartmann, 1970; A. Hartmann, *Germania* 46 (1968) 19–27; A. Hartmann and E. Sangmeister, *Angewandte Chemie* 11 (1972), 620–9. H. Neuninger, E. Preuschen and R. Pittioni, *Arch. Aust.* 49 (1971), 23–35.

Critical review of Irish evidence: P. Harbison, *J. Roy. Soc. Antiq. Irel.* 101 (1971), 159–63.

28 E.g. M. J. Rowlands, *World Archaeology* 3 (1971), 210–24; Rowlands 1976; Stjernquist 1967.

29 We do not further pursue the varying schools of thought about the existence and role of 'specialist smiths', 'itinerant merchantmen', 'travelling salesmen', 'craft schools' and the like, although all of these have had their support from a wide variety of prehistorians: V. G. Childe, *The Bronze Age*, 1930; C. F. C. Hawkes, *The Prehistoric Foundations of Europe*, 1940; Clark, 1952; D. L. Clarke, *Analytical Archaeology*, 1968; Gimbutas 1965.

30 Originally set out by J. G. D. Clark, *Antiquity* 40 (1966), 172–89; the

debate continued by W. Y. Adams, *Antiquity* 42 (1968), 194–215.

31 For tentative applications to Bronze age Europe, C. Renfrew, *The Emergence of Civilisation*, 1972, and in C. B. Moore (ed.), *Reconstructing Complex Societies*, 1974.

PART I
Earlier Bronze Age

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2 Central Europe

By central Europe, we mean the area called in German *Mitteleuropa*: extending from central Germany to the edge of the Carpathians and the Vistula, from Berlin and Warsaw in the north to the Austrian and Hungarian borders in the south; comprising the whole of Austria, Czechoslovakia and Hungary, and most of East Germany and Poland. We also wish to consider here some of the earlier Bronze Age groups on the western fringes of central Europe – mainly in the Rhine valley, which touches on western and south-western Germany, eastern France and northern Switzerland.

Geographically, central Europe falls into a number of distinct zones.[1] In the north (northern Germany and Poland) is the vast tract of low-lying land that comprises the north European plain, interspersed with lakes and extensive forests. Glacial action has rendered many of the soils sandy or boggy. South of this area lie the hills that border on Germany and shut in Bohemia and Moravia, rolling upland country with intermittent forest, brown forest soils, and in many parts a thin layer of loess. To the south again one comes to the Danube valley, and in Austria and Switzerland to the foothills of the Alpine massif, where the brown forest soils give way to poorer mountain soils, and where the relief is naturally more marked as the mountains become higher. To the west, the long valley of the Rhine stretches southward from the North Sea, some 600 km (as the crow flies) to the Alps; in its central area the rolling hills and plains provide fertile soils. The upper Rhine valley, like that of the Danube, is dissected by many streams flowing from the mountains and high plateaux of south Germany.

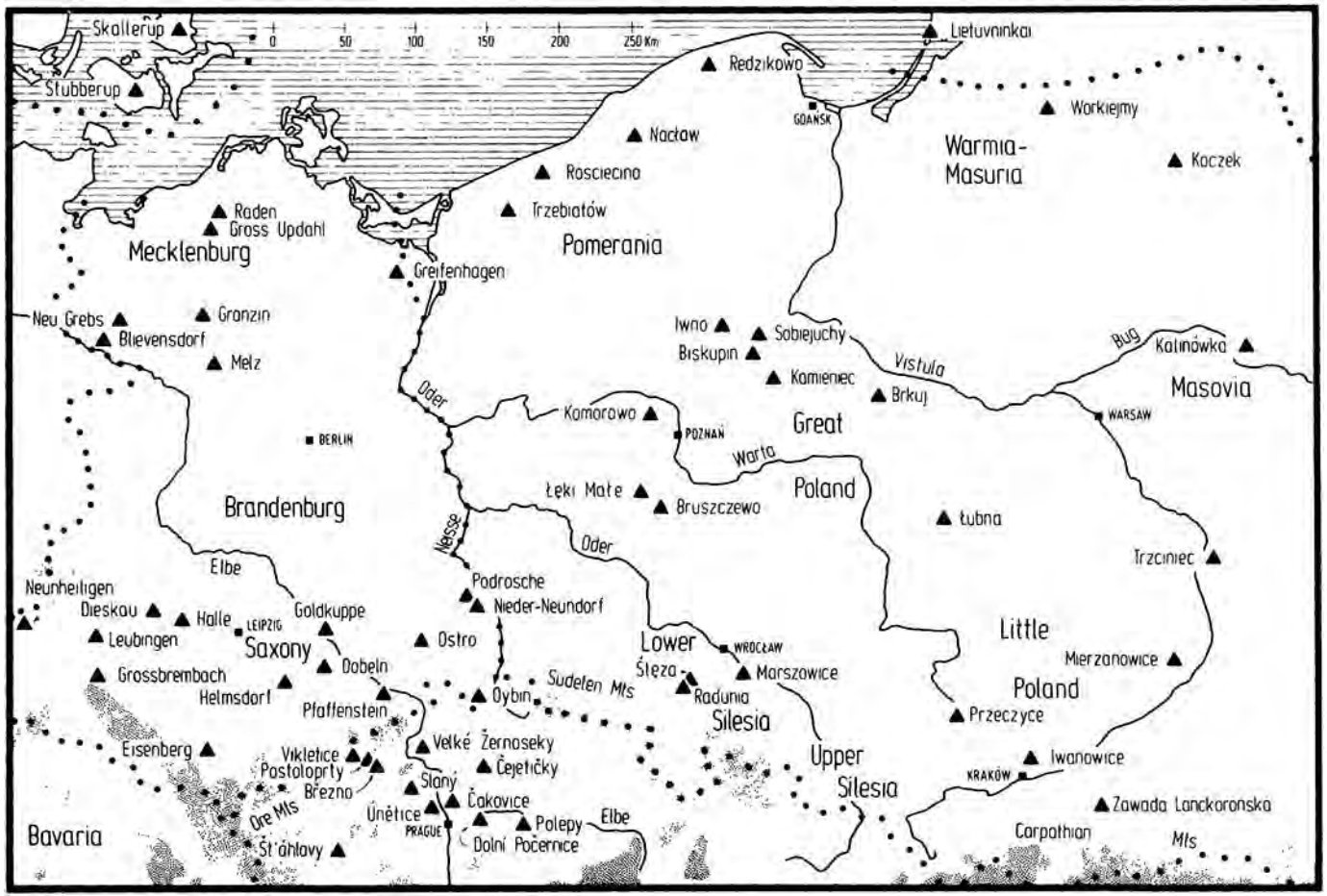
Terminology[2]

The attribution of archaeological finds in central Europe to a 'Bronze Age' started in the second quarter of the nineteenth century, following

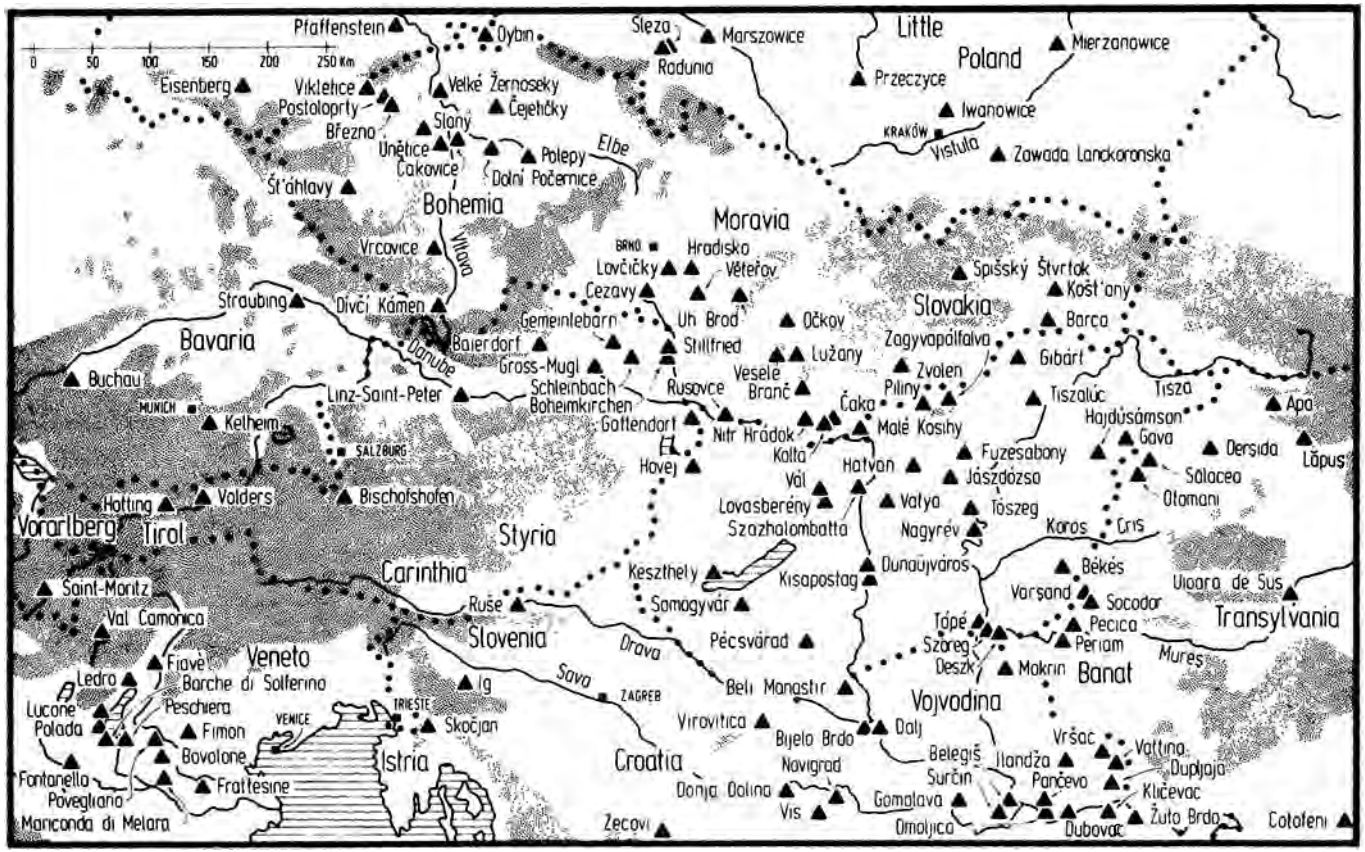
C. J. Thomsen's invention of the Stone–Bronze–Iron sequence. By the latter decades of that century it had become apparent that there were many sub-phases within the Bronze period; in particular it was evident that the earlier part was characterized above all by inhumation burial, often in a barrow, and the later part (usually referred to as the Hallstatt period in the early German literature) characterized by cremation. We now know that the second phase should be sub-divided again, so that the earlier part of it (Hallstatt A and B) belongs to the Late Bronze Age, the later part (C and D) to the Early Iron Age. Although it was realized from an early stage that internal development was discernible in each main period, precise definition – or at any rate labelling – of the phases was not attempted until Paul Reinecke, living in Munich and working in south Bavaria, applied a series of phase-letters to the material. Each period, Bronze and Hallstatt, was divided into four – A to D – on the basis of typological development of hoards and grave material; but although the system came into general use during the first quarter of this century, Reinecke never gave more than an outline of the suggested characteristics of each stage.[3]

The ordering of the 'Bronze Age' into A, B, C and D was in general correct, as is shown by the fact that the scheme continues in use today; but even in its home area it is restricting, and when applied to more distant lands it becomes no more than a general framework onto which material can be pinned. As long as one knows what one means by the individual phases, this system can greatly aid the understanding of sequences of material in areas other than Bavaria. In general, Br A refers to what is traditionally called the Early Bronze Age, and B and C to the Middle, or Tumulus, Bronze Age; D (the 'Late Bronze Age' in the old sense) witnessed the start of widespread cremation burial and is nowadays taken as the early part of the ensuing 'Urnfield' period.[4]

Reinecke himself subdivided his phases A and C, and a good deal of shuffling of material between periods has gone on since then. Br A was divided into A1, which included material from flat inhumation cemeteries like Straubing and Adlerberg as well as hoards with metal-hilted daggers like Gaubickelheim (Oppenheim) and Neunheilingen (Langensalza), and A2, which was composed of hoard material like that from Trassem (Saarburg), Langquaid (Rothenburg) and Tinsdahl (Hamburg-Rissen), characterized by daggers and rapiers with ogival blades, flanged axes, socketed spearheads, and pins with perforated spherical heads. In 1960 a third phase, A3, was suggested by Milojčić;[5] Točík and Vladár,[6] among others, later amplified this to account for a collection of material identified by them in south-west Slovakia, patently later than the usual A2 but earlier than B1. The usage Br A3 has not, however, found its way far into



Map 1 **Bronze Age sites in north-central Europe.**



Map 2 Bronze Age sites in south-central Europe.

the literature, even though the material (Ilvesheim, Ackenbach, Bühl etc.) is clearly anomalous.

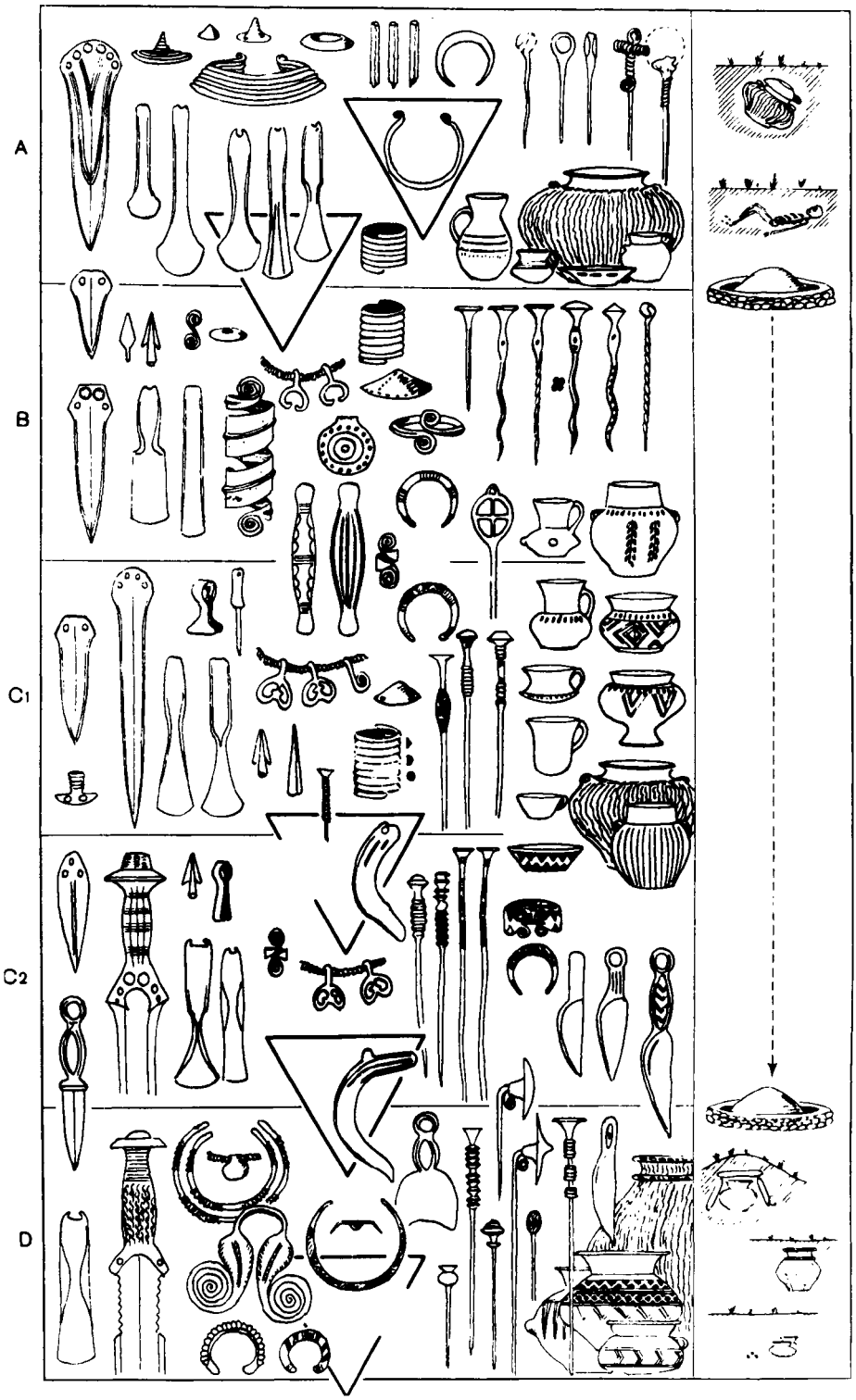
The B and C periods were also sub-divided by Reinecke and again by Holste; their systems included illogicalities, however, and only considerably after the event has Torbrügge established a more or less accepted scheme for Bavaria[7] (fig. 8).

These outline schemes provide a broad framework for the study of the period in central Europe, but they are based almost entirely on typology, and mostly that of bronze objects. Since these are the most numerous and distinctive artifacts found, they naturally act as a focus of attention; they do not, however, account satisfactorily for other cultural manifestations, like pottery, ornaments or grave forms. To try to fill this gap, several other schemes have been adopted. Christlein[8] has worked out a fourfold, and Stein[9] a threefold, development of the Early Bronze Age at Gemeinlebarn on the basis of the horizontal stratigraphy at the cemetery there; only in the final phase do graves contain material comparable to that of Br A2 (fig. 9). Adler,[10] by the use of incidence tables of the artifacts in graves, was able to divide the material at Linz-St Peter into three chronological groups, the main innovation being a late phase of Br A1 which seemed to be transitional to A2. Moucha's work proceeds mainly by means of pottery typology;[11] he distinguishes six phases in the Únětice group in north Bohemia (fig. 10). Other authors have also provided pottery sequences for individual areas.[12]

Proceeding from a metallurgical viewpoint, Schubert[13] has distinguished four phases of metal-working in the Early Bronze Age on the middle Danube, going from the simple wire and beaten sheet ornaments of early Nitra and related groups, through a phase characterized by more elaborate, but still fairly small, forms, to the main period of metallurgical production: characteristic forms are large knot-headed pins, finger rings (*Noppenringe*) and ingot torcs. Finally comes a late phase transitional to Middle Bronze Age.

The name that dominates the study of the early part of the Bronze Age in central Europe is that of *Únětice* (in German, *Aunjetitz*). Únětice is a village a few kilometres north-west of Prague,[14] not far from the Vltava. In the second half of the nineteenth century a cemetery of sixty flat graves was excavated by the local doctor, and the material from them was seen to be typical of many such cemeteries in Bohemia – triangular daggers, ring-headed and eyelet pins, leg- or arm-spirals, spirally-folded finger-

Fig. 8 (*overleaf*) Bronzes, pottery and tomb types typical of the earlier Bronze Age in the upper Palatinate. A-D phases after Reinecke etc.; triangles contain types found in hoards.
(After Torbrügge 1959a)


A
B
C1
C2
D

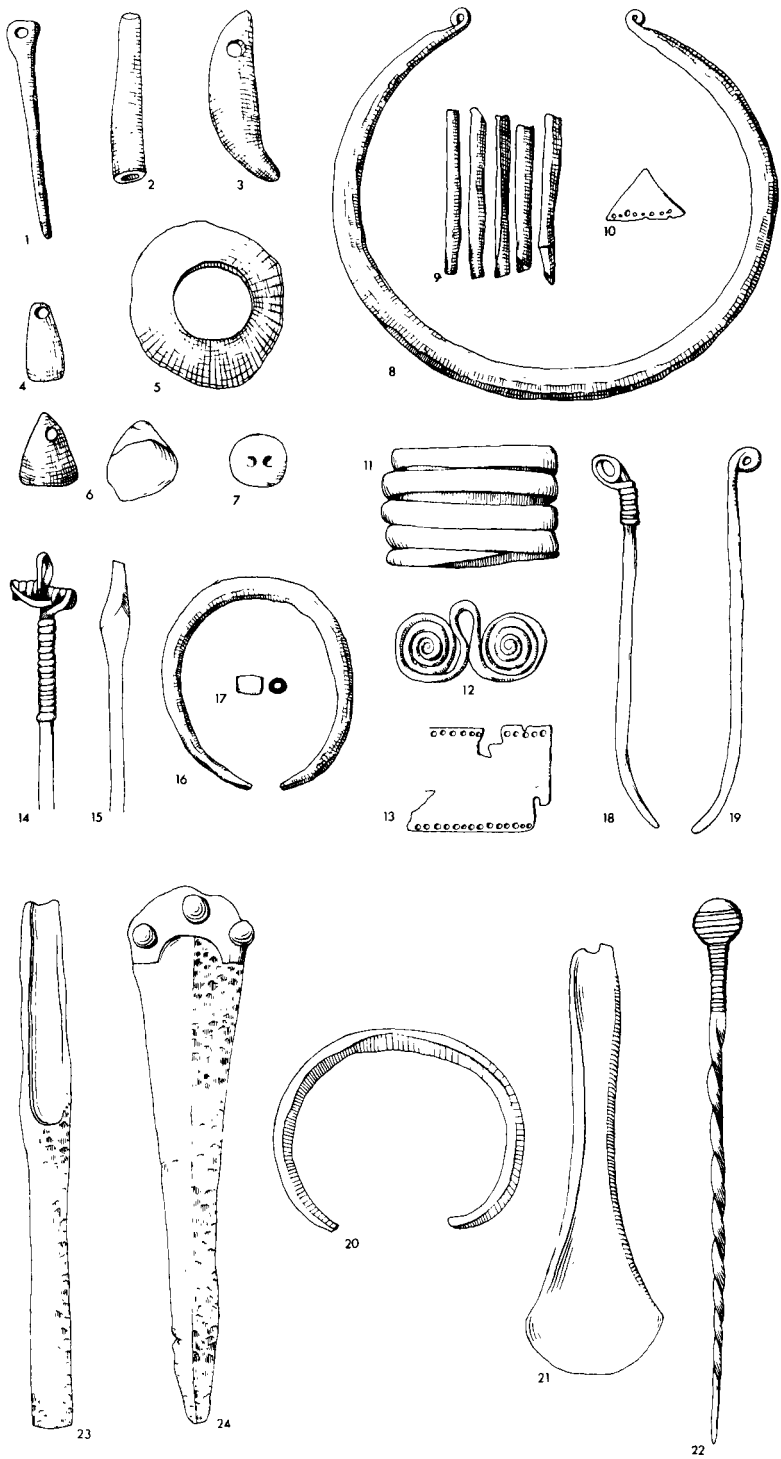


Fig. 9 Types found in graves at Gemeinlebarn (St Pölten) with the suggested fourfold division of Christlein (1964). 1–7, phase 1; 8–13, 18–19, phase 2; 14–17, phase 3; 20–24, phase 4. Varying scales.

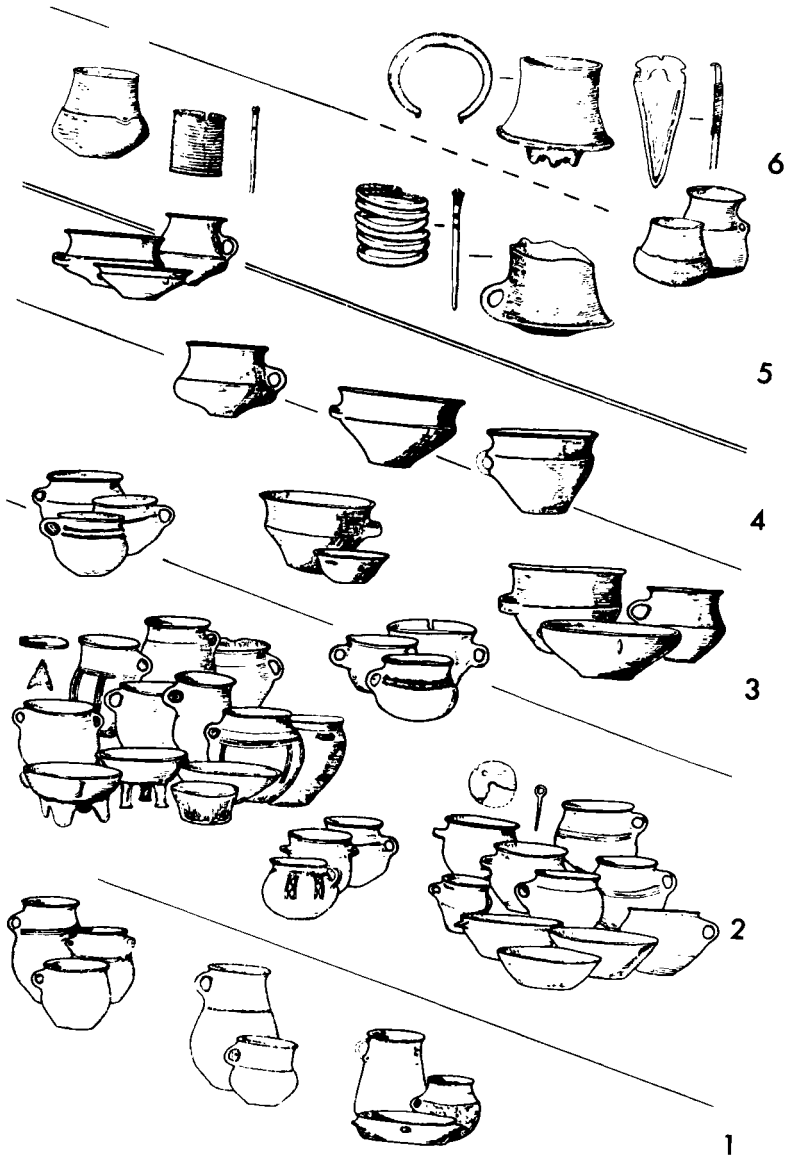


Fig. 10 Grave-groups from Velké Žernoseky, north Bohemia, with the suggested sixfold division of Moucha (1961).

rings known as *Noppenringe*, 'droplet' earrings, spiral beads, amber beads of various shapes, and a variety of cups and jars, notably 'hour-glass cups' and miniature vessels. This collection, when amplified by other finds from Bohemia, was seen to be analogous, or in some cases identical, to material in Moravia, as well as western Slovakia, Austria, Bavaria, Thuringia, Saxony and Silesia, so that the cultural name was applied to the whole area covered by these provinces. More recently, some authors have applied the term further afield – to eastern Slovakia and even Hungary and Romania – though in a loose sense only. Strictly speaking, material like that from the classic cemeteries of the Únětice area is found only in Bohemia and the immediately adjacent areas; even the famous 'princely graves' are not a Bohemian phenomenon, and certainly not paralleled at Únětice itself. But it is convenient, and not seriously misleading, to refer to the wider area – up to the boundaries of the Hungarian province – as that of Únětician culture or, more accurately, group of cultures. In Reinecke's terminology this corresponds to Br A; the early, mostly metal-less graves being A1, and the rich graves of the classic phase being A2. The latest finds form a separate group, sometimes called A2/B1 and sometimes A3, though the universal validity of such a phase is by no means certain (cf. above, p. 24).

In the succeeding period, the traditional name 'Tumulus Bronze Age' (*Hügelgräberbronzezeit*) indicates that the period was one in which graves were situated under barrows, and in many areas this is the prevailing form. The concept of a culture characterized solely by graves is not, today, an appealing one; nor are the reasons why these graves are separated from Únětice graves intelligible without an understanding of the historical development of Bronze Age studies. The period and its phases were defined by Reinecke on the basis of certain closed grave groups (Lochham, Göggenhofen, Asenkofen and Riegsee) at a time when settlement material was virtually unknown and scholarly interest centred around attribution of types to given phases of development. Reinecke pretended to do no more than this; and his attributions were, in their relative order, more or less correct. The 'Tumulus Bronze Age', however, was a period of at least 200 years, during which people lived as well as died; the importance traditionally attached to it can be seen from the fact that it is often simply called 'Middle Bronze Age'. By the end of the Tumulus period, that is by Br C2/D, the first signs of a different tradition, involving cremation as the dominant funeral rite rather than inhumation, are beginning to appear; it is at that point that we will stop in this chapter.

It is our intention in this survey to make regular use of none of the chronological systems we have described, which we believe are inappropriate for general study of the European Bronze Age. It will be found

necessary, however, to have some familiarity with them since they are normally used in the literature. Our framework is to be much looser, and we will in general refer only to events or sites as being part of the 'earlier' or the 'later' Bronze Age, the dividing line being drawn at around 1300 BC. Sometimes more precise definition is called for, and here we have occasionally introduced elements of the traditional framework (especially that of Reinecke in central and Montelius in northern Europe). In these cases, reference can be made to table 1.

Table 1 Comparative chronological schemes for central Europe: earlier Bronze Age

Reinecke (modified)	*Montelius (North Europe)*	*Bóna (Hungary)*	*Hachmann (North Europe)*
		(EBA)	
Br A1		MBA 1	
			Horizon I
A2		MBA 2	
	I		Horizon II
(A3)			
B1		MBA 3	Horizon III
B2/C1	II	LBA 1	Horizon IV
C2		LBA 2	
D	III	Transitional	

Environment

Environmental evidence from pollen analysis has provided a fairly full and consistent picture for central Europe over many years. We can do no more than touch on these matters here, for the literature is truly vast.[15] The Sub-boreal, in central Europe pollen zone VIII, is identified by palynologists as the period of the spread of the beech in the mixed oak forest.[16] Such is the picture obtained from very many lowland areas,[17] though of course the sequence is rather different in the mountains; there hornbeam flourished in this period. Numerous diagrams show that forest clearance was under way, and continued to take place sporadically between phases of regeneration. Cereal pollen is usually present throughout, as well as cultivation weeds like *Plantago*; occasionally charcoal layers appear. Climatically, it is thought that the decrease of the mixed oak forest and the increase in shade-loving species indicates a cool period, with some increase in precipitation perhaps around 2000 BC.[18]

During the course of the earlier Bronze Age there were apparently two oscillations that brought about cooler, wetter conditions (cf. above, p. 5), though it is not possible at present to correlate these with known archaeological events.

Western Part

The later Copper Age in west-central Europe was dominated by the companion and complementary cultural groups, Corded Ware and Bell Beakers. Copper objects, especially tanged daggers and simple ornaments, appear in graves of these groups with some regularity; but it is not that fact that leads one to consider them of paramount importance in the formation of the local Early Bronze Age groups, but rather the remarkable similarity in pottery forms. Both groups are, in central Europe, known mainly from inhumation cemeteries; and though in some areas they must have overlapped in time, the evidence is unequivocal that Corded Ware started earlier than did Bell Beakers.[19] Elements of both groups were apparently available when the crystallization of the succeeding Bronze Age groups took place. In central Germany, Poland and Slovakia the inheritance was from Corded Ware; in Bohemia, Moravia and southern Germany it was from Bell Beakers. Pottery forms from both go through virtually unchanged, and in widely separated areas: for instance the Chłopice-Veselé group in south Poland and north Slovakia,[20] and those elements of early Únětice which used to be called 'Marschwitz' (Marszowice) by German scholars,[21] are clearly of Corded Ware derivation – indeed in some cases the pot forms have not changed at all – while cemeteries like Straubing and München-Sendling in Bavaria,[22] or Polepy in northeast Bohemia,[23] show a clear continuation into the Únětice culture-group of the simple one-handled cup or polypod bowl. Some cemeteries are in fact 'transitional' from Bell Beaker to Early Bronze Age,[24] and it has been shown that Beaker and (to a lesser extent) Corded Ware grave furnishing continued on into the Bronze Age.[25] There can be no doubt – at least insofar as artifacts can lead to historical conclusions – that direct local development from Corded Ware and Bell Beakers led to the formation of the cultural groups of the Early Bronze Age of west-central Europe.

Settlement

Early Bronze Age houses in central Europe have left few traces. Often they seem to have been no more than rough shacks erected over simple pits, in which grain storage, and in some cases cooking, took place. For the earliest phases – 'proto-Únětice'[26] – knowledge of settlements is

negligible, and settlement patterns have to be deduced from cemetery distributions. Only with the development of the period are more sites found[27] but it is still quite rarely that regular house-plans occur, and Bohemia is among the most prolific areas for them. Postoloprty (Žatec), with sixteen houses known and a possible total of forty in the village (not all contemporary), is the most notable, but the same area of north-west Bohemia has produced many other finds.[28] The two houses of the earlier period at Postoloprty were rectangular (about 6 × 4 m; fig. 11); one had four central posts that were taken as a support for a ridge roof, the other also had four posts, but the middle two were deeper, suggesting a higher central construction.[29] The excavator suggested that twenty to thirty houses were in use at one time, with a population of 100 to 200. More recently, excavations at Březno (Louny) have revealed a series of Únětician houses; the total is not yet known but runs into some tens – composed of posts inserted very close together forming rectangular structures up to 20 m long, and mostly oriented east–west: both internal and external storage and rubbish pits are numerous.[30] Březno was occupied continuously from the early Neolithic to the Iron Age, so that its situation, on light sandy loess, and only a few hundred metres from the River Ohře, is of importance; this is typical for Early Bronze Age settlements in north Bohemia. Raised sites beside rivers were also typical for Silesia,[31] where the settlement type was indistinguishable from that current in the Neolithic.

North Bohemia is an area where open settlements of this (and many other) periods abound, in contrast to the situation in most of the lands occupied by the Únětice culture-group. Isolated pockets of denser settlement do occur: in north Austria, for instance, the Salzburg area has produced a disproportionately large number of habitation sites,[32] important through their connection with the exploitation of the nearby copper sources. In Austria, again, is the well-known site of Grossmugl (Korneuburg) where six house-plans were recovered,[33] but the irregular placing of these and their 'semi-subterranean' nature does not inspire confidence that a true picture was obtained from excavation, though the site was undoubtedly used as an Early Bronze Age settlement as well as a later Bronze Age urnfield.

North of the Únětician area, an interesting enclosure comes from Biskupin (Żnin: not to be confused with the late Lausitz stockade nearby, p. 356).[34] A roughly pear-shaped area 90 m long was enclosed by a ditch, broken at two points, and no doubt a bank; abundant settlement debris included pottery named after the type-site of Iwno. The site has been interpreted as a stock enclosure, and is estimated to have been able to hold 500 cattle (p. 287).

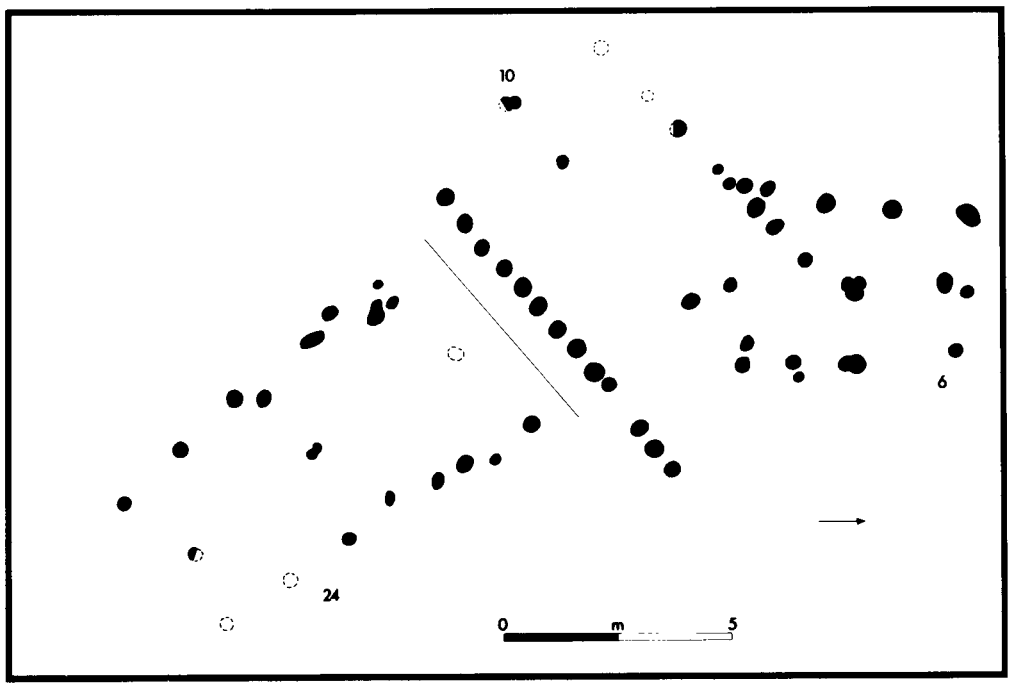


Fig. 11 Únětician house-plans (24, 10 and 6) from Postoloprty (Louny). (After B. Soudský, *AR* 5 (1953))

At the end of the Únětice Bronze Age, especially in that late part of it named after Věteřov, settlements changed from being low-lying open sites on terraces beside rivers to being fortified sites, often on steep and highly defensible hill-tops. At Vinoř north of Prague the settlement, which contained part of a house 6 × 2.8 m, was fortified by a ditch and possibly a palisade.[35] At Vrcovice (Písek) the site occupies a rocky promontory above the river Otava and a tributary stream, extending over 1 ha.[36] Two ramparts, built of clay and stone, with a substantial ditch between cut into the rock, extend a distance of about 60 m. Burnt daub and charcoal were found in quantity in the make-up of the inner rampart. Rather scanty traces of occupation were found on the sloping area inside, and a burnt layer shows how the site was destroyed.

Further down the Vltava, the site of Dívčí Kámen ('Maiden's Stone', Český Krumlov), though enigmatic, has provided a wealth of material of unusual variety and richness.[37] The site is on a steep rock perched high above the upper Vltava, and is today surmounted by the ruins of a medieval castle which no doubt cover the central settlement area. Traces of prehistoric occupation occur round the edges of the castle, at the top of the steep southern slope, and on the terraces of the gentler eastern side. Slight traces of rough stone-built structures are found, and in some parts a dense occupation layer is found at a depth of 1.1 m. Though a considerable quantity of pottery (mostly of Bavarian types) and bronzework was recovered, it is the stonework that sets Dívčí Kámen apart. At one point a hoard of over 120 quernstones occurred (pl. 5), at another a huge cache of sling-stones. There are also miniature perforated stone axes, hammers and gouges, which are far too small to be functional and are interpreted as part of a game; there are flint arrowheads and saws. In one of the soundings massive boulders were found, and the excavator interprets these as part of the defensive system – presumably for rolling down onto attackers.

Fortified sites of the late Únětice or Věteřov phase are also well-known from Moravia. At Cezavy near Blučina (Židlochovice) a double stone rampart and ditch enclosed a habitation area with house remains and pits; several other such sites are known.[38] A similar situation prevails at Hradisko (Kroměříž), where a multi-phase settlement on a low hill dominates the undulating countryside.[39] In the lowest level sherds of local later Únětice type were found: part of this level was covered by a rampart and cut by a ditch, both of which are attributed to the second main period on the site. Thus while continuity of occupation is attested, there is some evidence (for the rampart was insubstantial) for a break, with defensive measures being taken at a time that coincides with the end of Únětice.[40] In the second layer, the excavator identifies elements in the

pottery (notably bossed ornament) that link it with the succeeding Lausitz culture, and comparable sherds have been found at other sites in the district.[41] The succession is clearly an important one, but it is hard to deduce historical conclusions from the evidence that Hradisko provides. The fact of fortification, and the transitional nature of the middle layer ceramics, are not enough, in our view, to suggest an 'invasion' of Lausitz people; it is the continuity of settlement and pottery types that should be stressed. The same situation, leading either to Lausitz or to 'Danubian Tumulus' settlement, may be seen in Austria, Bohemia and Slovakia.[42]

Settlement sites of the Tumulus period are less well-known though such evidence as there is suggests that they continued much as before. Indeed a number of sites have been found which actually span the transition from Únětice to Tumulus, like Meclov-Březí (Domažlice) where a series of post-holes formed a roughly trapezoidal house; the total settlement area was 2,722 sq m, and it included four hut-plans and ovens, with over 200 pits and post-holes.[43] Many other comparable sites are known.

Fortified sites continued to be occupied in this period; among these we may mention Přítluky in Moravia, with ditch and double rampart, and traces of occupation inside; a fire had brought an end to settlement.[44]

North of the area of the Tumulus groups, in Poland, some extensive and important sites are known from this period (Montelius I–II). One such is at Bruszczewo (Kościan, Leszno) in Great Poland.[45] The site is a low peninsular mound in flat open country, and was once surrounded by water. From its numerous pits came large quantities of pottery as well as the usual settlement debris – wattle-and-daub remains, stone tools including weights, axes, grinders etc., bone handles and hafts, as well as large numbers of animal bones. Five open hearths delimited by stone circles 1 m in diameter were recovered; a bank surrounded the whole site and is supposed to represent a means of enclosing stock. Perhaps the most important finds from Bruszczewo, however, are the tools of trade of a bronze-smith – tuyères, a clay crucible, clay mould supports, a stone mould, slag fragments and so on.

Such a site seems clear evidence of permanent settlement based on agriculture. The relative scarcity of settlements in the Tumulus area, however, has led some authorities to envisage a pastoralist basis for the Tumulus population, without permanent habitation sites. We do not believe this to have been the case. Tumulus settlements are now much better known than they used to be, and tend to occupy the same situations as in the Early Bronze Age. Material culture, which we discuss below, similarly suggests an agricultural economy, with finds of sickles, grain storage pits etc. It is in any case intrinsically unlikely that a well-

established agricultural community should suddenly take to pastoralism as its economic foundation. Any possible change visible is much more likely to have been connected with the apparent change in the climate during the fifteenth and fourteenth centuries BC (p. 5).

Burial

So far we have been looking at areas where settlements predominate, but there are many more where cemeteries are the only sites found. It is in general true to say that the standard rite in western central Europe at this time was inhumation, but there are numerous exceptions, particularly in the later part of the Únětice period. The burials are most commonly flat (i.e. not under barrows) and the bodies contracted, laid on one or the other side: frequently this was according to sex, men on their left sides, women on their right.[46] Later Únětician burials could be in large barrows, but such burials are uncommon and the exception rather than the rule; nor do they appear in the central Únětician area.[47] In general, Únětician cemeteries contained several tens of graves (seventy-seven at Dolní Počernice, sixty at Únětice itself), but they could go into hundreds.

Burial types vary not only according to geographical location but also through time. Typical early graves – that are clearly Únětician, but have little or no metal in them – come from cemeteries like Dolní Počernice[48] (Prague – rural, north), where simple pits were used, and the dead, more or less tightly contracted, placed on their right sides, usually one to each pit. Variations on this may be seen at Velké Žernoseky[49] (Litoměřice) in north Bohemia, where stone settings are found lining the grave pits (fig. 12) or at Hlízov (Kolín) where multiple burials occurred in a hut-like construction.[50] In Moravia, similarly, pit-burial was the standard grave-form in the earliest ('proto-Únětician') cemeteries as well as the early classical ones.[51] As the period progressed, grave forms began to diversify and though the commonest single form was still the contracted inhumation in lined or unlined pits, double graves,[52] burials in storage pithoi,[53] wooden coffins,[54] storeyed graves,[55] grouped graves or graves in rows,[56] and other forms are found.

The information that can be obtained from scientific excavation of one of these cemeteries is potentially very great: the cemetery of Grossbrembach (Sömmerda) in Thuringia is especially important.[57] It started in the early phases of Únětice and went on to the late, though not the latest. The head typically pointed to the south and looked to the east (that is, the body lay on the right side); and in some cases burials took place directly above each other (storeyed graves), but strangely enough the bodies in such cases were usually male. A horizontal stratigraphy has been

established by the excavator, but the most important conclusions concern the existence of family groups, which more or less correspond to the location of the graves in the cemetery. Among eighty-one graves and 108 skeletons five of these groupings were observed, based on physiological characteristics (like metopic sutures or wisdom teeth) as well as the position of the graves; and inside these larger units even smaller groupings were observable, which are taken on the basis of close anatomical similarities to represent first-degree kinship. Forty-seven such families were present, and the total population at any one time, assuming an average age at death of between twenty and thirty, is estimated at something over 100. These figures compare well with those obtained for other Únětician cemeteries where both smaller and larger familial groupings may be distinguished.[58] It seems that, in the larger cemeteries at least, the positioning of burials depended not on temporal sequence but on kinship. To demonstrate, as some have attempted, that the positioning depended also on social structure, is much more difficult, and in our view

Fig. 12 Burial-types from the Únětician cemetery at Velké Žernoseky (Litoměřice).
(After Moucha 1961)

possible only in rare instances. Cases where the individual was bound with rope – as at Roggendorf and Schleinbach (Nö) – may be indicative of slaves or criminals: at Schleinbach the skull of the skeleton, which was female, had been deliberately smashed.[59]

Detailed analysis of Early Bronze Age grave forms in Saxo-Thuringia[60] has demonstrated the unity of this area with Únětician Bohemia, at least so far as burial form is concerned. The great majority of cemeteries are 'flat', and granted a twofold division of the period it is possible to attribute a massive preponderance of simple pit or cist graves to the early phase, with walled stone graves and barrows becoming more common as time went on. The orientation of the body, as in Bohemia, is strictly north–south (head at the south). On occasions traces of wooden constructions, grave stelae (tombstones) and other elaborations can be descried, features which recall the 'mortuary chambers' of Leubingen or Helmsdorf. Cremation is almost unknown; double and multiple burials occur commonly, for instance in the cemetery at Nohra (Nordhausen):[61] there they date to the early part of the period. A few pithos burials are also known, as in Bohemia.

The aspect of burial traditions in Early Bronze Age central Europe that is usually associated with the 'classic' phase of Únětice is a group of unusually large and rich barrows in the northern part of the area, though in fact neither the burial rite nor the grave-goods are typical of the Únětice culture properly so-called. These unusually large barrows in Saxo-Thuringia are often called 'princely burials', and they are remarkable not merely for their internal construction but also for their extraordinarily good state of preservation. The massive cappings of stone inside the barrows at Leubingen (Sömmerda) and Helmsdorf (Hettstedt) enabled wood to survive, rotting but plainly discernible, until excavation in 1877 and 1906 respectively. It is not impossible that if similar conditions had prevailed elsewhere wooden 'mortuary chambers' would be a better-attested phenomenon.

The barrow at Leubingen[62] was 34 m in diameter and 8.5 m high (pl. 3; fig. 13, 2). The central cairn was delimited by a ring-ditch 20 m in diameter and estimated to contain 209.5 cu m of stones – a considerable quantity in view of the fact that the immediate vicinity is completely stoneless. The stones of the cairns were large overlapping slabs that successfully kept dampness out of the wooden chamber underneath. Eighteen wooden posts were set in a rectangular arrangement 3.9 × 2.1 m, seven each side leaning in to a ridge-roof, and four supporting one end (the southern); the other, northern, end was left open. In the middle of the south end a massive upright beam supported the ridge-roof. In both this and the ridge-pole, mortice-holes had been cut to receive the supports

leaning in from the sides. Similarly the side-supports had the planks for the floor recessed into them. Above each of these side-supports was a wide wooden board which almost joined with its neighbours; gypsum mortar was smoothed into the cracks. Above this roofing was a layer of thatch and above that the stone cairn.

On the oaken floor (all the timber was oak) lay the extended skeleton of a man who was judged by the state of his teeth and the gouty condition of his joints to be 'old'. Across his hips, at a right-angle, lay another body, in a very poor state of preservation: from the slenderness of the bones this was considered to be an adolescent or even a child. The original report stated this skeleton might be female on account of the gold jewellery found in the grave, but this is not certain. At the left side of the man's feet was a globular pot, rusticated in its lower half, surrounded by a setting of stones; nearby were a whetstone and serpentine pick. At various other points were a halberd with one rivet surviving in the fragments of the wooden haft, three small triangular daggers, two flanged axes, three chisels (both of the latter groups no doubt useful for constructing wooden chambers) and a group of gold objects: two massive eyelet pins, one spiral bead, one massive bracelet and two *Noppenringe* (pl. 3).

The barrow at Helmsdorf[63] was about 34 m in diameter, and had been constructed over earlier Corded Ware burials (fig. 13, 1). An encircling stone wall retained the central cairn. Under this lay a massively solid wooden grave-chamber. The floor area, 3.9 m long, was paved with sandstone slabs at the north end, and merely covered with reeds at the south. The ridge-roof was constructed of oak planks which leaned in to fit against each other at the centre without a ridge-pole; stone revetment held them in place at the bottom, and the exterior was sealed with a brownish material that had turned into sandy loam, and with a layer of thatch. To prevent the whole construction being crushed by the weight of the cairn an extra-strong outer roof of massive oak beams was erected over this whole area, ten to each side and joining in a central ridge.

The corpse was laid on a wooden bier on the paved part of the floor. The skeleton, which was barely preserved, was contracted and lay on its right side, head to the south, looking east; it was judged to be that of an adult man. The grave goods consisted of a large and very smashed pot in a stone setting on the floor, a diorite hammer, a flat bronze axe, two bronze objects that were probably a dagger and a chisel, a massive gold bracelet, two gold earrings, a gold spiral bead, and two gold pins. All the small grave-goods were found on the bier.

Everywhere were found traces of ash and burning. The fill of the chamber was ashy, and there were specks of burnt material here and there. The skull showed signs of scorching, while it was suggested that

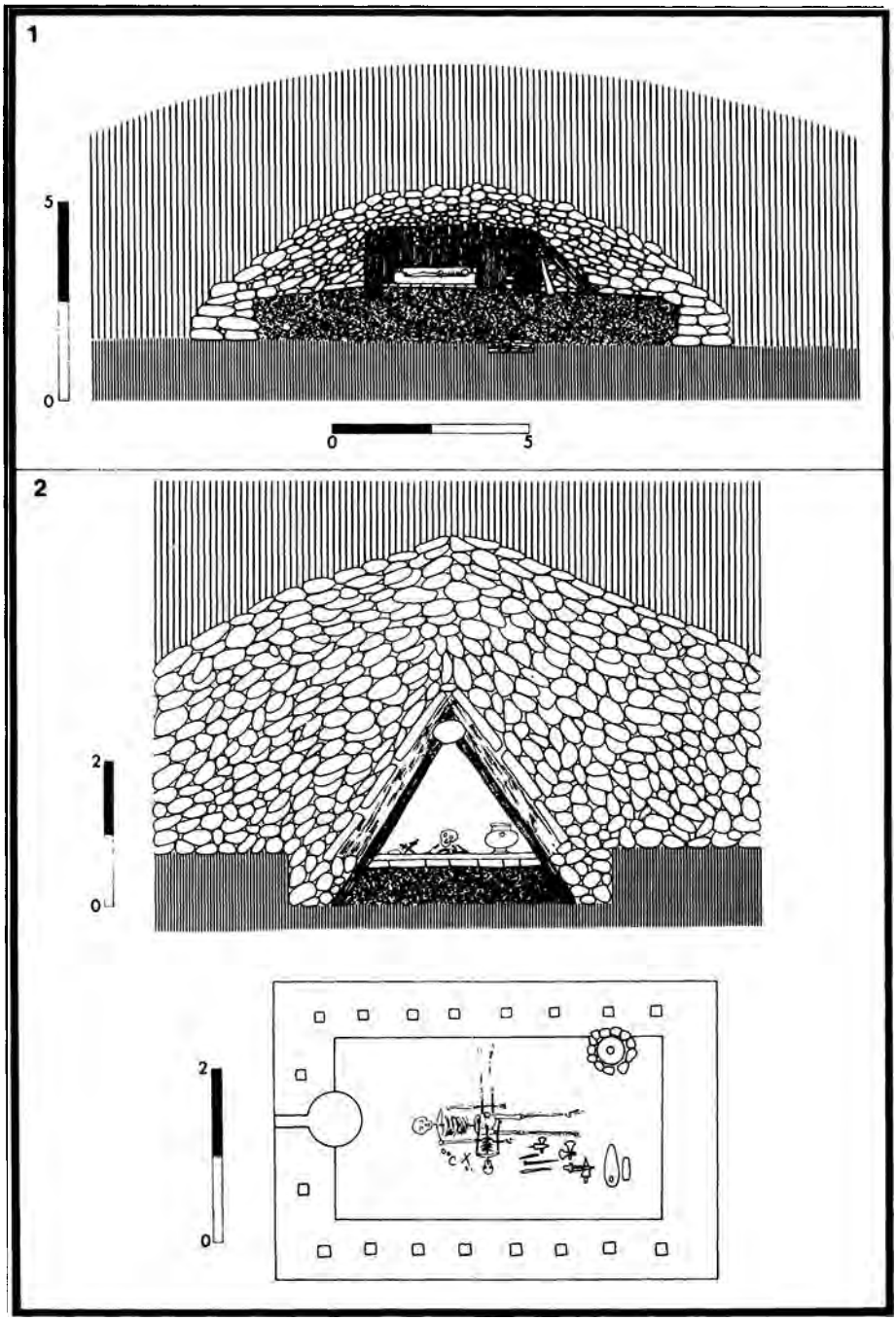


Fig. 13 Rich Early Bronze Age barrows from Saxo-Thuringia. 1. Helmsdorf (Hettstedt). 2. Leubingen (Sömmerda).
(After H. Grössler, *JVSTL* 6 (1907); P. Höfer, *JVSTL* 5 (1906))