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## CHRONOLOGY IN CENTRAL EUROPE AT THE END OF THE BRONZE AGE

by

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The intention of this article is to provide a brief introduction to research on chronology in a large area, including Central Europe, central and northern Italy and the Balkan peninsula. The synthesis offered here (Tables I–III) only gives a broad outline of the most important results: whereas fine chronology is a valid aim for local sequences, supra-regional chronologies are necessarily less precise. The following pages therefore concentrate on the broad chronological developments in the 10th, 9th and 8th centuries BC, ignoring the finer chronological detail which has sometimes been achieved. The resulting chronological framework is schematic; it should be clear that the rigid “chest of drawers” structure (see Tables I–III) does not imply that this wide area was convulsed by change only at phase transitions, every hundred years or so. In fact, dendrochronology has demonstrated that material culture generally changed gradually – although there are certainly important exceptions.

Regional sequences are constructed using all available artefacts (ceramic, lithic, metallic etc.) which are often of local character, and can generally be tied into more general chronological schemes most reliably by

using metal types. The inter-regional chronology discussed in this article is therefore based chiefly on the study of bronze artefacts. This methodology relies on the tendency for bronze artefact types to have a wider distribution than non-metallic ones. It follows that supra-regional chronological phases will tend to be more successful when such objects were both intensively and widely circulated. This was certainly the case in the Late Bronze Age, when there were very active systems of bronze exchange; the geographical extent and validity of each Late Bronze Age phase is a reflection of the range and intensity of exchange and deposition practices.

We know that certain typical bronze objects of the recent Urnfield period (Ha B1) allow a chronological horizon to be followed across much of Europe. The wide-reaching applicability of this phase can only be accounted for by the efficient functioning of long-distance communication networks, which could involve the production, exchange, display, thesaurisation, destruction and deposition of bronze. This was the time – in the middle and recent Urnfield period – when the “Urnfield phenomenon” attained, in its

various regional guises, its greatest geographical extent: reaching from Moldavia in the east to the Low Countries and the north-eastern Iberian peninsula in the west (1). After this time of widespread inter-regional contacts, regional cultural groups tended to become less involved in long-distance exchange networks – particularly at the start of the Iron Age, but already to some extent in the late Urnfield period (Ha B2/3). The Bronze Age/Iron Age transition typically saw the collapse of earlier traditions of bronze production, exchange and consumption; it is important to understand this change in the circulation of metal objects, to appreciate some of the problems encountered in chronology at the end of the Bronze Age.

We will turn first to a brief comment on earlier work, before discussing in part II changes in the light of more recent research informed by dendrochronology. In part III the state of research in different regions will be reviewed.

I

The publication in 1959 of H. Müller-Karpe's "Beiträge zur Chronologie der Urnenfelderzeit nördlich und südlich der Alpen" (2) profoundly influenced the course of subsequent research. There can be no doubt that this piece of scholarship is the single most important milestone in the course of post-war research on the Late Bronze Age in Central Europe. While much of his work has stood the test of time, it is clear today that there are certain crucial faults in his scheme. In a lesser work, this would not have been important, but because the "Beiträge" have been so influential, these faults have contributed to a widespread misunderstanding of the chronology at the Bronze Age/Iron Age transition.

Müller-Karpe's problem was to match the chronological developments north and south of the Alps. His solution was to equate Ha B1 with late Protovillanova, Ha B2 with Villanova I and Ha B3 with Villanova II:

Table I. Chronological scheme for the Italian and Balkan peninsulae.

	Pontecagnano	Vell	Bologna	Golasecca	Esie	Picenum	Coastal Croatia	Glasinac	Macedonia	Hoard (Carpathian Basin)
1000	Bronzo finale 3								IA (Vergina II)	IV
900	IA	IA-B	IA	IA1	I	I	I	IA	IB (Vergina III)	V
800	IB	IC	IB							
		IIA	IIA	IA2-early	IIA-B	IIA				
		IIA					II	IB	IIA (Vergina IV)	VI
		IIA	IIA	IA2-late	IIA	IIA				
		IIA	IIA							
		IIA	IIA							
700	III	IIIA	IIIA	IB	IIIA	IIIA	III	II		

Ha B1=late Protovillanova=10th century BC  
 Ha B2=Villanova I=9th century BC  
 Ha B3=Villanova II=8th century BC

At that time the equation of Ha B3 with Villanova II seemed beyond question, bearing in mind the late Urnfield objects (especially cast-hilted swords) found in a number of rich late Villanovan graves. The equation of Ha B1 with late Protovillanova was also founded on numerous comparisons, particularly between bronze objects in Italian and Central European hoards. Against this background it is clear why Ha B2 played an integral role in Müller-Karpe's scheme: to bridge the gap which had opened between the 10th and 8th centuries BC.

Müller-Karpe's phase Ha B2 soon came under attack from a variety of authors (3). Kelheim phase III ("Ha B2") dissolved under critical inspection, and the "Ha B2" phase at Ruse (Maria Rast) is unconvincing. Despite the fact that most specialists did not accept Ha B2 as a supra-regional phase, the extent of the problem caused by the collapse of this crucial element of the chronology was not explored. If it is accepted that the equation of Ha B1 and late Protovillanova is correct, then the question follows: should Ha B3 be equated with Villanova I or Villanova II, or both? Few scholars realised that there was a "floating chronology" in Central Europe at the end of the Late Bronze Age!

The sheer authority of Müller-Karpe's scholarship exacerbated the problem. In those regions where the late Urnfield phase (Ha B3) is clearly recognisable, but direct links with Italy are extremely rare (e.g. eastern France, southern Germany, Bohemia, southern Moravia, northern Austria), Müller-Karpe's authority led to the persistence of the (incorrect) equation of

Ha B3 with Villanova II. In those regions which did not belong to the late Urnfield cultural zone, only rarely had Ha B3 metalwork, but had relatively close links with Italy (e.g. much of the western Balkans), it was, by contrast, often quite obvious which phases should be equated with Villanova II – but now such phases were often labelled "Ha B3" because, on the authority of Müller-Karpe, Ha B3 belonged to the 8th century BC. This uncritical application of Müller-Karpe's chronological system means that caution is required when dealing with phases which have in the past been labelled "Ha B3". This term has been used in two ways: as a typological assemblage (pins with small vase-shaped heads, cast-hilted swords of Möriegen, Auvernier, Tachlovice, Weltenburg and Tarquinia types, ribbed decoration etc.), and as a phase equated with the 8th century BC and Villanova II. Only the former is correct.

1. The typical middle and recent Urnfield burial rite, with its apparent reluctance to give expression to differences in wealth or to high social standing (so-called "Ideology of Denial"), must – in turn – presumably be related in some way to the similar rites in Protovillanovan Italy and contemporary Submycenaean and Protoegeometric Greece.
2. *Römisch-Germanische Forschungen* 22 (1959).
3. See, for example, U. Ruoff, *Zur Frage der Kontinuität zwischen Bronze- und Eisenzeit in der Schweiz* (1974) Anhang II. – A. Jockenhövel, *Die Rastmesser in Mitteleuropa*. *Prähist. Bronzefunde VIII/1* (1971) 22f. – M.K.H. Eggert, *Die Urnfelderkultur in Rheinhessen*. *Geschichtliche Landeskunde* 13 (1976) 87ff.

Table II. Chronological scheme for the circum-alpine regions.

	Este	Ljubljana	Ruse (Suimital)	Stilfied-Podol	S. W. Bohemia	Kelheim-Obereching	N. W. Alpine zone	Hoards (N. of Alps)
1000	Br. f.	IA2	I	I	Nynice I	I	(early) Ha B1 (full) (late)	IV
900	I	IB	II	II	Nynice II	II	(early) Ha B2/3 (full) (late)	V
800	IIA-B	IIA	III (IA)	III	Kostelík	Ha C-early	Ha C-early	(VI)
	IIIC	IIIB		Kalenderberg/Horákov				
700	IIIA	IIIA	(IB)		Ha C-full	Ha C-full	Ha C-full	



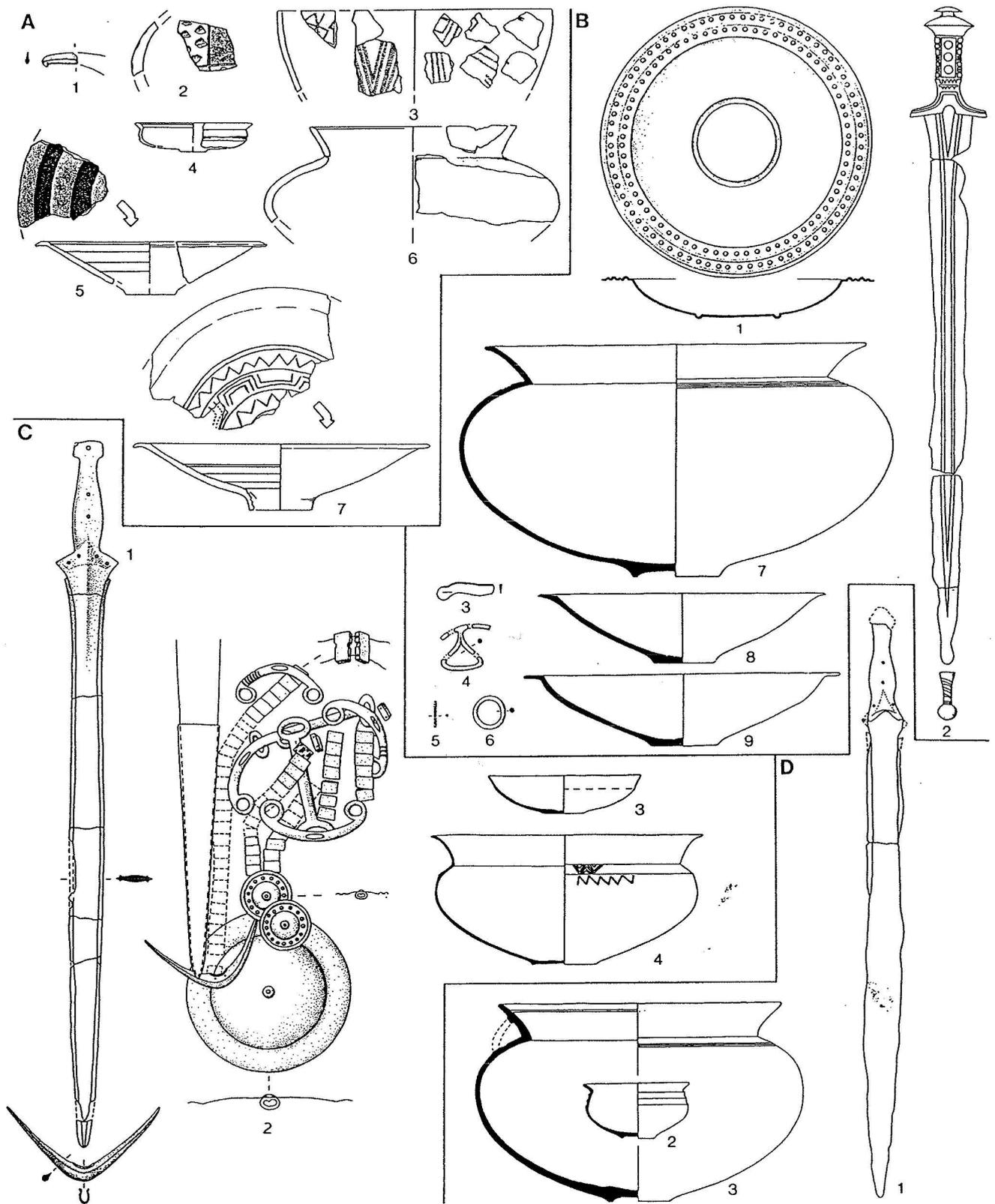


Fig. 2. Selection of finds from early Hallstatt complexes in central and eastern France: A: Sinzelles-Caramantron, Dép. Haute-Loire (after Vital, see note 9). B-D: Chavéria, Dép. Jura (after Vuailat, see note 10). B: tumulus 9. C: tumulus 16. D: tumulus 4. A1, B1-6, C1, D1: bronze, C2: bronze and boar's tusk, otherwise pottery. - Scale: A1-2=1:2, otherwise 1:4.

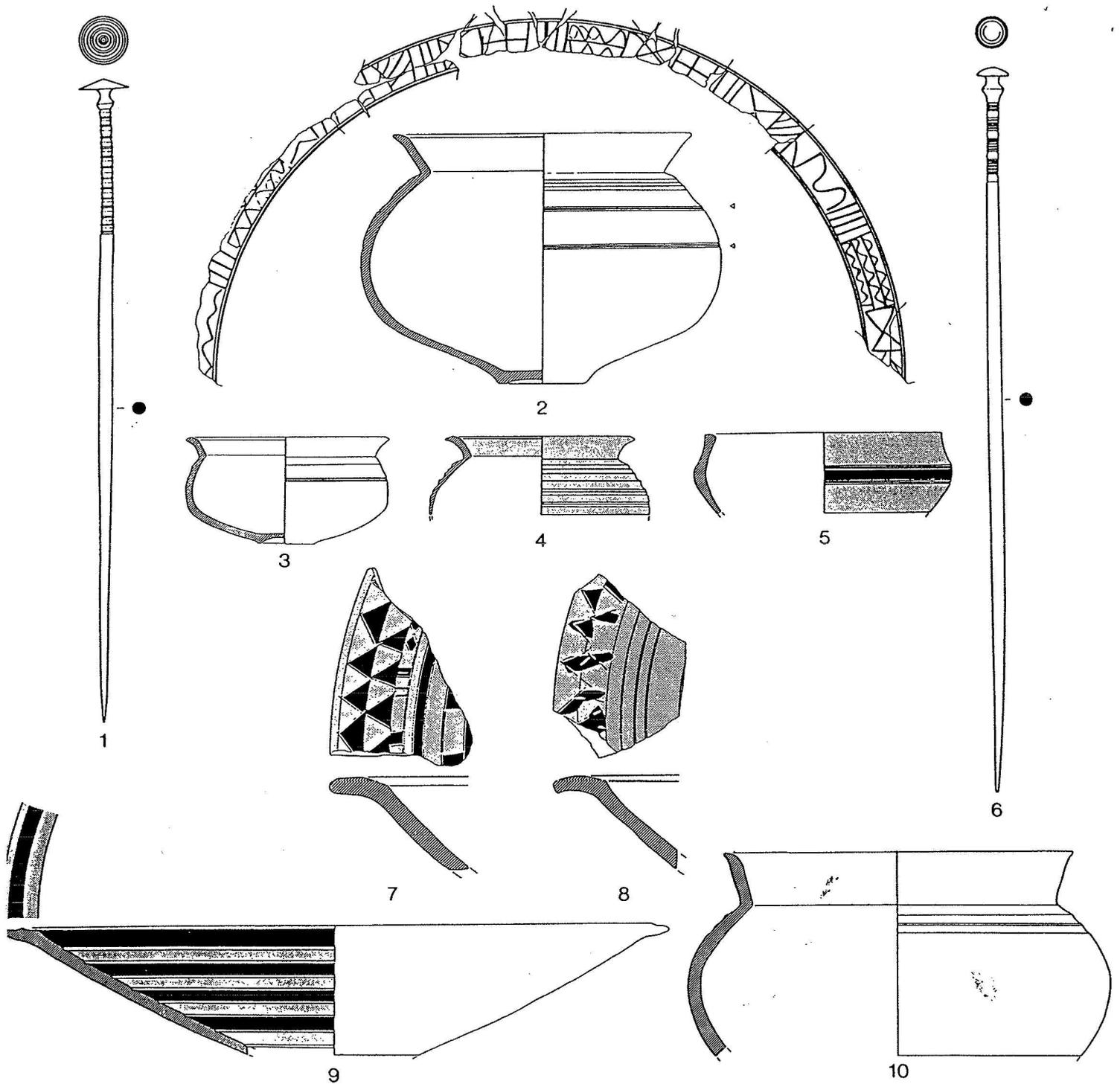


Fig. 1. Selection of finds from Chindrieux-Châtillon, Lac du Bourget, Savoie (after Billaud *et al.*, see note 8); Black: graphite paint, stipple: red paint. - Scale: bronze=2:3, pottery=ca. 1:3.

provided the latest Urnfield tree-ring dates (Fig. 1) (8), with pottery of the earliest Hallstatt phase from finds such as the cooking-pit from Sinzelles-Caramontron, Dép. Haute-Loire (associated with an 'A'-type chape fragment) (9) and Chavéria, Dép. Jura, tumuli 4, 9 and 16 (10) (Fig. 2). Although the early Hallstatt pottery can be distinguished by a preference for more depressed (lower and wider) forms, the close relationship to its late Urnfield fore-runners is unmistakable. From the upper levels of Chindrieux-Châtillon come sherds with rich painted decoration, a fashion which increased in popularity in the later part of Ha B3, and which remained popular in early Hallstatt (e.g. Fig. 1, 4-5, 7-9).

Rich painted decoration is even more prevalent at the end of the Bronze Age in the region between north-east Switzerland and the Breisgau (11). The late Urnfield graves from eastern Switzerland (especially Ossingen) reflect the development within Ha B3 noted in the lake-side settlements, involving among other things an increasing use of black and red paint on pottery (compare Fig. 3, 1-8 with Fig. 3, 9-24). This reaches a climax in early Ha C, when graves such as Hemishofen tumulus X (12) and Eendingen (13) include vessels with complex geometric painted ornamentation (Fig. 4a-b). Apart from the trapezoidal razor from Eendingen, it is also worth mentioning the pin from Hemishofen (Fig. 4b, 5), which can be related to examples from the Bologna region,

where they are typical of the first half of the 8th century BC (Bologna IIA; compare Fig. 7, column 3).

Early Ha C pottery from the area of the Alb-Hegau cultural group (centred on southern Württemberg and Bavarian Swabia) bears a comparable rich geometric decoration. Here, however, the painting is supplemented, or rather dominated, by a wholesale adoption of incised linear and 'Kerbschnitt' decoration. Examples are illustrated on Fig. 5 from three graves with Gündlingen swords: Münsingen-Dottingen tumulus 11 (14), Tannheim tumulus 22 (15) and Unterstall tumulus 13 (16). The most important early Alb-Hegau style pottery ensemble is doubtless that from the wagon-grave from Wehringen "Hexenberg" (Fig. 6a-b). In these early Ha C examples, the pottery is easily distinguishable from that of full Ha C; in the latter phase, new decorative elements are found, such as hatched triangles and bundles of parallel lines separating alternating plain fields of black and red paint. A good example of a set of full Ha C pottery comes from Dautmergen tumulus 1, dated by dendrochronology to  $667 \pm 10$  BC (17). The most characteristic set of early Ha C pottery vessels from Lower Bavaria comes from Steinkirchen tumulus 1, again associated with a Gündlingen sword and 'A'-chape, but this remains largely unpublished (18). Another typical tumulus of early Ha C was excavated in 1909 at Wolfsbach-Haiderhäusl (19).

It is possible to trace the existence of the early Ha

8. Y. Billaud, A. Marguet and O. Simonin, Chindrieux, Châtillon (Lac du Bourget, Savoie), ultime occupation des lacs alpins français à l'Age du Bronze? In: *Archéologie et Environnement des Milieux Aquatiques, Actes du 116e Congrès National des Sociétés Savantes, Chambéry* 1991 (1992) 227-310.
9. J. Vital, Un four-dépotoir du VIIIe/VIIe siècle av. J.-C. à Sinzelles-Caramontron (commune de Polignac, Haute-Loire). *Revue Archéologique du Centre de la France* 27, 1988, 43-60.
10. D. Vuaillet, *La nécropole tumulaire de Chavéria (Jura)*. Annales Littéraires de l'Université de Besançon 189 (1977).
11. See for example Ossingen, Kt. Zürich: Ruoff (note 3) pl. 1-8. - Gündlingen and Ihringen, Kr. Breisgau-Hochschwarzwald: W. Kimmig, *Die Urnenfelderkultur in Baden*. Römisch-Germanische Forschungen 14 (1940).
12. W.U. Guyan, *Das Grabhügelfeld im Sankert bei Hemishofen*. Schriften des Institutes für Ur- und Frühgeschichte der Schweiz 8 (1951) 32; 33, fig. 13, X. - These finds are in the Schweizerisches Landesmuseum, Zürich (Inv. No. 26378-26390); the author would like to thank Dr R. Degen for his help while drawing the original objects.

13. *Badische Fundberichte* 18, 1948-1950, 243-246; pl. 43.
14. H. Zürn, *Hallstattzeitliche Grabfunde in Württemberg und Hohenzollern*. Forschungen und Berichte zur Vor- und Frühgeschichte in Baden-Württemberg 25 (1987) 143; pl. 263, D; 266, C; 267.
15. M. Geyr von Schweppenburg and P. Goessler, *Hügelgräber im Illertal bei Tannheim* (1910) pl. 8-9. - P. Schauer, *Die Schwerter in Süddeutschland, Österreich und der Schweiz* I. Prähistorische Bronzefunde IV/2 (1971) 200; pl. 99, 632; 124, 9.
16. G. Kossack, *Südbayern während der Hallstattzeit*. Römisch-Germanische Forschungen 24 (1959) pl. 42, 17-20. - A. Jockenhövel (note 3) 240, no. 575.
17. H. Reim, *Hallstattforschungen im Vorland der Schwäbischen Alb bei Balingen, Zollernalbkreis (Baden-Württemberg)*. *Köthner Jahrbuch für Vor- und Frühgeschichte* 23, 1990, 721ff.; figs 6-9. - M. Friedrich and H. Hennig (note 6) 291.
18. A few of the finds are illustrated by G. Kossack (note 16) pl. 132, 4-7.
19. G. Kossack (note 16) pl. 126, 1-3.6-15 (the iron spearhead probably came from a secondary grave).

the beginning of Bronze final IIIb in Savoie by around 937 BC is likely. Judging from this evidence, we can therefore estimate that the transition from the recent to the late Urnfield period was happening around 950–920 BC – but it is impossible to be more precise because well dated sites from the second half of the 10th century are still lacking. The latest dated Urnfield lake-side settlement, Chindrieux-Châtillon, with tree-ring dates reaching down to 814 BC, shows that the Urnfield period certainly lasted till the end of the 9th century BC.

This short resumé obviously does not reflect the complexity of the typological developments in the north-west Alpine lake-side settlements. In fact, the dendrochronological dates have shown clearly that changes were gradual – without the sharp phase-transitions generated by traditional chronological research. It is also important to note that developments are even visible within individual phases. This is certainly true for Ha B3, as various authors have recognised (5). Most tree-ring dated lake-side settlements were abandoned around the middle of the 9th century BC (e.g. Auvèrner-Nord, Unteruhldingen-Stollenwiesen, Hagnau-Burg etc.). Finds from some settlements which have not yet been dendrochronologically dated seem to have a more developed character than those known from the dated sites of the first half of the 9th century BC (see Table II).

While such late Ha B3 settlements, together with Chindrieux-Châtillon, suggest that the late Urnfield period continued through the second half of the 9th century, a recently published dendrochronological

date from Wehringen “Hexenbergle” tumulus 8 (estimated at  $778 \pm 5$  BC) makes it likely that the Hallstatt period started early in the 8th century (6). The dendro-date for this grave corresponds perfectly with the 8th century date suggested for Wehringen and a series of other graves with Gündlingen swords, which have been assigned to an early Ha C phase, before the appearance of full Ha C (7). The existence of the early Ha C phase first became apparent from analysis of wagon-graves. The typical wagon-graves of full Ha C contain iron wagon fittings, iron Mindelheim swords, developed chapes (Kossack’s type B), rich sets of horse-gear and services of pottery and bronze vessels. Gündlingen swords, which are mostly made of bronze, hardly ever occur in wagon-graves. The only exception is the tree-ring-dated grave from Wehringen, with completely different wagon fittings made of bronze. Detailed analysis of the associations of Gündlingen swords and ‘A’-chapes led to the recognition of further types of bronze artefact which seem typical of early Hallstatt C, for example short bronze horse-bits without end-rings (types A–C) and trap-ezoidal razors.

The sword-graves of early Ha C are generally not richly furnished with metallic grave goods and, for this reason, pottery is most important for chronological purposes. This subject is complex, and only a few examples of the varied regional styles of early Ha C pottery can be reviewed here.

In eastern France it is instructive to compare a selection of pottery from the lake-side settlement of Chindrieux-Châtillon, Lac du Bourget, which has

4. V. Rychner, Stand und Aufgaben dendrochronologischer Forschung zur Urnenfelderzeit. In: P. Schauer (ed.) *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*. Römisch-Germanisches Zentralmuseum, Monographien 35 (1995) 455ff. – See also the article by V. Rychner in these proceedings.
5. Rychner (note 4) 484. – M. Primas, Stand und Aufgaben der Urnenfelderforschung in der Schweiz. In: P. Schauer (ed.) *Beiträge zur Urnenfelderzeit nördlich und südlich der Alpen*. Römisch-Germanisches Zentralmuseum, Monographien 35 (1995) 213f.
6. H. Hennig, Zur Frage der Datierung des Grabhügels 8 “Hexenbergle” von Wehringen, Lkr. Augsburg, Bayerisch-Schwaben. In: B. Schmid-Sikimić and P. Della Casa (eds) *Trans Europam, Festschrift für Margarita Primas*. Antiquitas, Reihe 3, Band 34 (1995) 129ff. – M. Friedrich and H. Hennig, Dendrochronologische Untersuchung der Hölzer des hallstattzeitlichen Wagengrabes 8 aus Wehringen, Lkr. Augsburg und andere Absolutdat-

en zur Hallstattzeit. *Bayerische Vorgeschichtsblätter* 60, 1995, 289ff.; see particularly p. 300: “Die Hölzer der Grabkammer und die Hölzer des Wagens sind alle zeitgleich, wahrscheinlich stammen Hölzer der Kammer und des Wagens sogar aus ein und demselben Baum”.

7. C.F.E. Pare, Wagenbeschlüge der Bad Homburg-Gruppe und die kulturgeschichtliche Stellung des hallstattzeitlichen Wagengrabes von Wehringen, K.r. Augsburg. *Archäologisches Korrespondenzblatt* 17, 1987, 467–482. – Ibid., *Swords, Wagon-Graves and the Beginning of the Early Iron Age in Central Europe*. Kleine Schriften aus dem Vorgeschichtlichen Seminar Marburg 37 (1991). – In this article, the term ‘full Ha C’ is used instead of Ha C1. In my view, use of the terms Ha C1 and Ha C2 causes confusion – especially considering the present uncertainty about the transition from Ha C to Ha D.

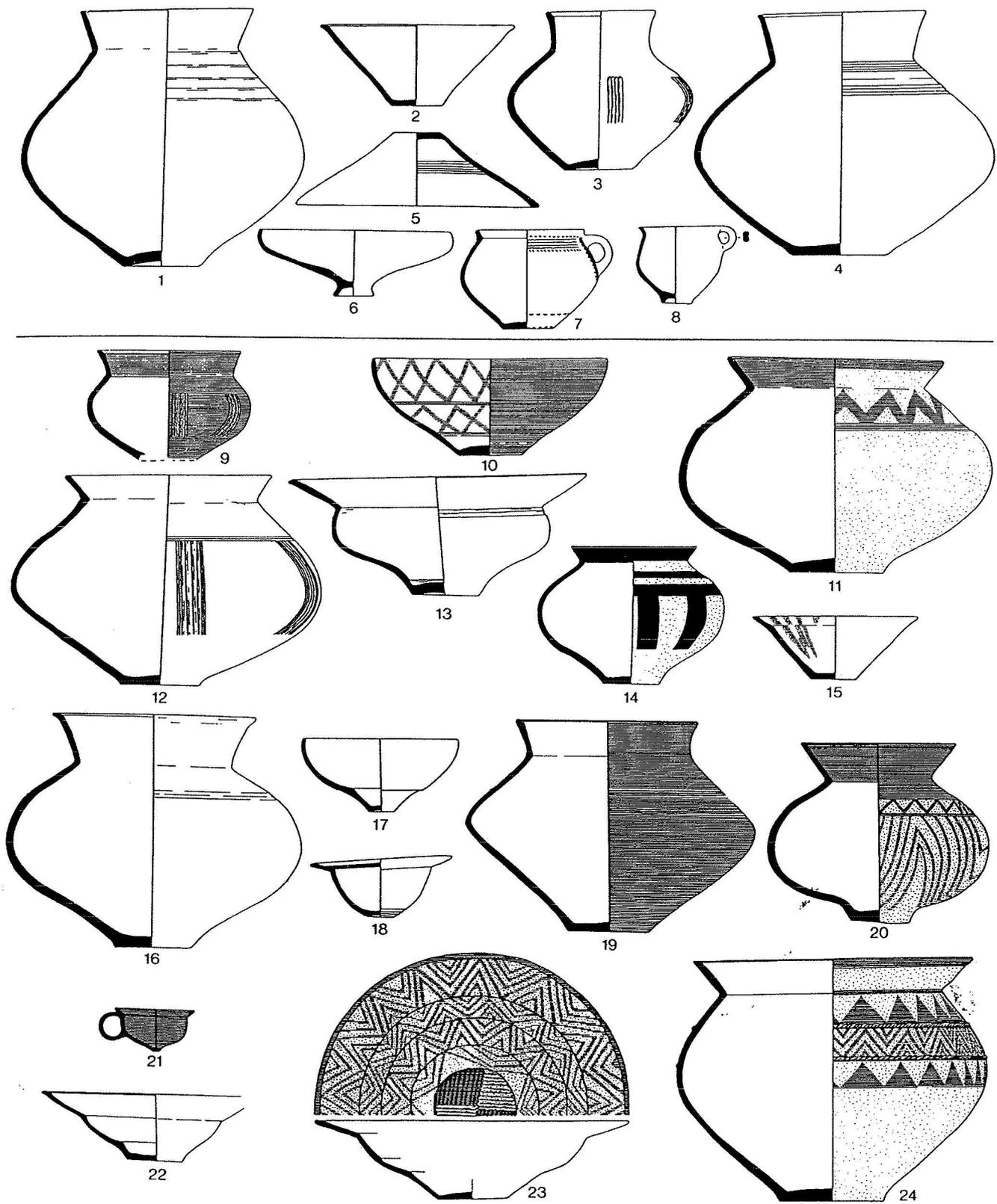


Fig. 3. Selection of pottery finds from Ossingen, Canton Zürich after Ruoff, see note 11 : 1: tumulus 13b; 2, 5: tumulus 7; 3, 4, 8: tumulus 4; 6, 7: tumulus 5; 9-15: tumulus 12; 16-20: tumulus 8; 21-24: tumulus 6. Horizontal shading: graphitic paint, light stipple: red paint. - Scale 1:6.

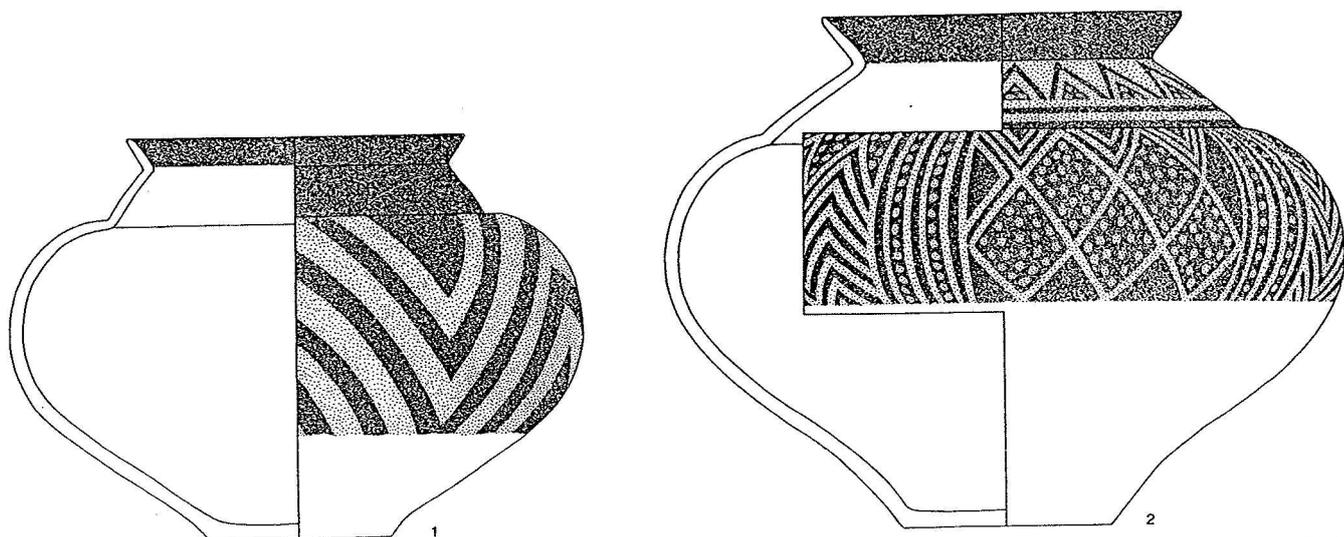
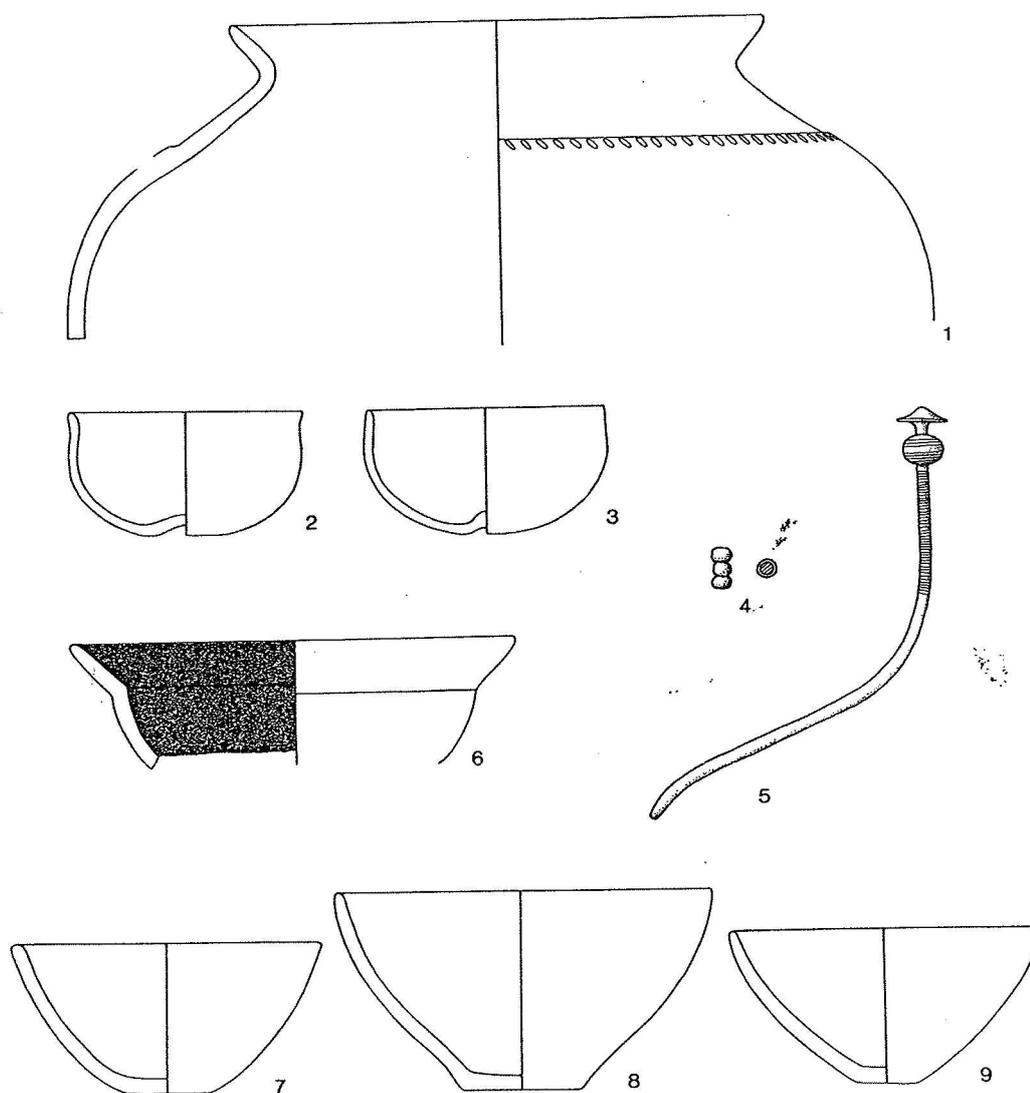


Fig. 4a. Finds from Hemishofen, Canton Schaffhausen, tumulus X: Pottery. Dark stippling: graphite paint, light stippling: red paint. – Scale 1:4.



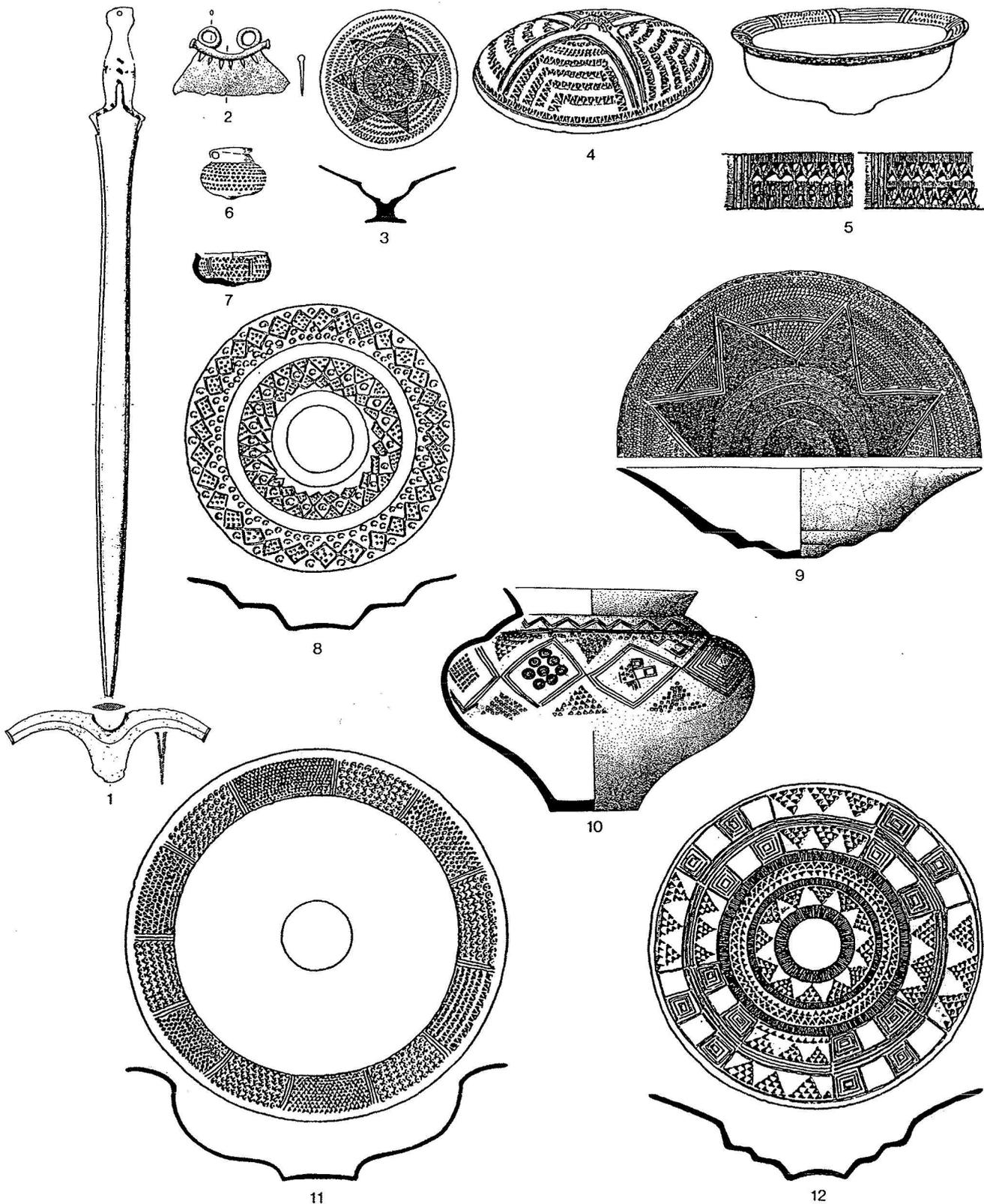


Fig. 4b (to the left). Finds from Hemishofen, Canton Schaffhausen, tumulus X (continued): 4: bronze with an iron core, 5: bronze, otherwise pottery. - Dark stipple: graphite paint. - Scale: pottery=1:3, metals=1:2.

Fig. 5. Selection of finds from early Ha C graves with Alb-Hegau pottery: 1, 7, 9, 10: Münsingen-Dottingen, Kr. Reutlingen, tumulus 11 (after Zürn, see note 14). 2, 6: Unterstall, Kr. Neuburg a.d. Donau, tumulus 13 (after Kossack, Jockenhövel, see note 16). 3-5, 8, 11, 12: Tannheim, Kr. Biberach, tumulus 22 (after Geyr and Goessler, see note 15). 1-2: Bronze, otherwise pottery. - Scale: 2=1:3, otherwise 1:6.

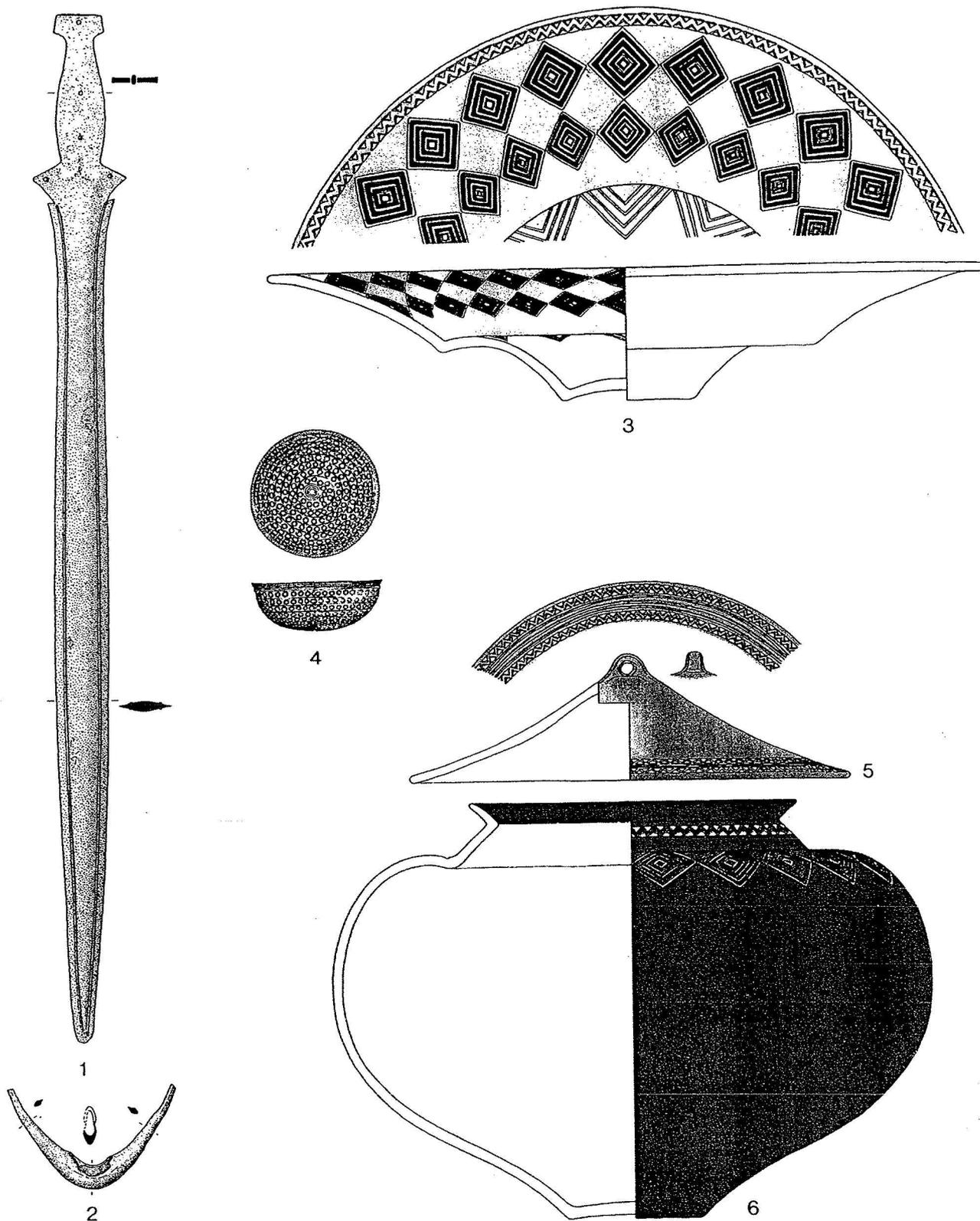


Fig. 6a. Selection of finds from Wehringen, Lkr. Augsburg, "Hexenbergle", tumulus 8 (after Hennig, see note 6): 1-2: bronze, 4: gold, otherwise pottery. - Dark stipple: graphite paint, light stipple: red paint. - Scale 1:4.

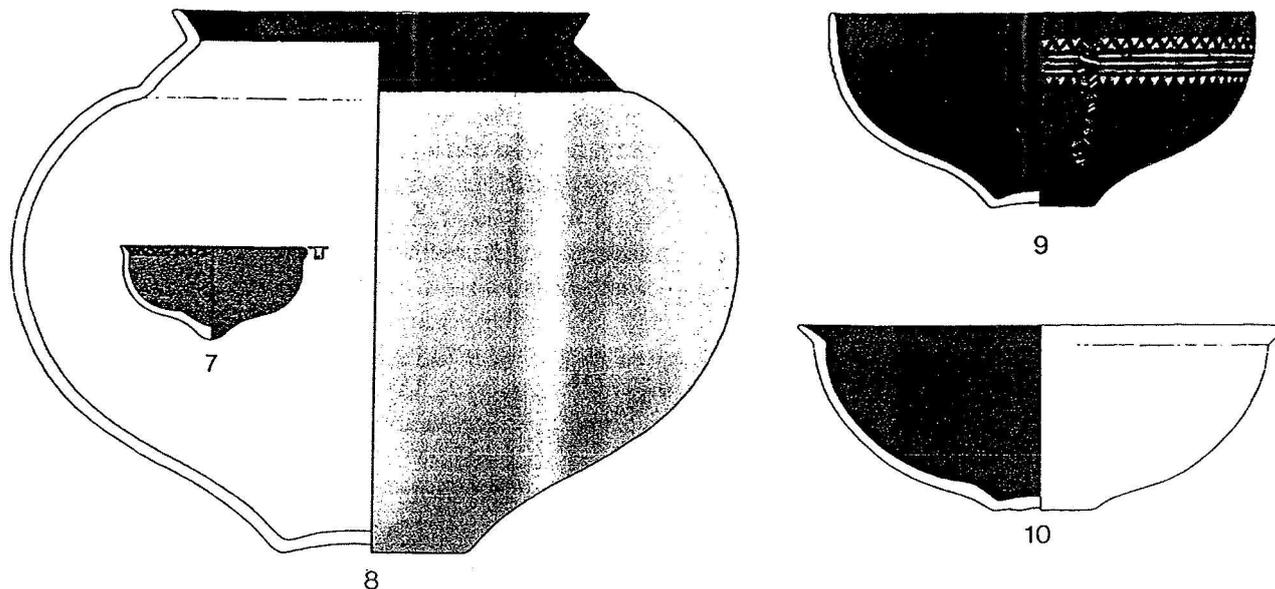


Fig. 6b. Selection of finds from Wehringen, Lkr. Augsburg, "Hexenbergle", tumulus 8 (after Hennig, see note 6): Pottery. Dark stipple: graphite paint, light stipple: red paint. - Scale 1:4.

C phase over a large part of the West Hallstatt zone. But despite concerted attempts it remains true that the number of graves which can be allocated to early Ha C remains small in comparison with those of late Urnfield and full Ha C. A number of reasons may be put forward to explain this:

1) Early Ha C pottery generally has a well defined character, easily distinguishable from late Urnfield and full Ha C wares; this surely indicates a phase of considerable duration. But we do not know the precise length of time occupied by early Ha C, and it may have been shorter than the preceding and following phases. The transition from early to full Ha C should approximately be equated with the Villanova II/III and Este II/III transition (ca. 720 BC), as numerous links between Italy and Central Europe in full Ha C indicate (for example horse-gear, pins with 'Faltenwehr' etc.). As we do not know precisely when the Bronze Age/Iron Age transition occurred, it follows

that early Ha C may have lasted considerably less than 80 years.

2) Early Ha C graves may have been less obviously noticeable to early excavators. Indeed, it is remarkable how many Gündlingen swords lack well documented associated finds (20). This may be explained by the relative simplicity of the grave furnishings - mainly consisting of pottery vessels, with few metal objects.

3) Only a small section of society was buried in tumulus graves; the majority may, for example, have been cremated and buried in flat graves (near the tumuli?) with hardly any furnishings (21).

Any of these explanations could be valid, and a combination of all three factors would account for the paucity of well-documented finds.

Owing to the present state of research and publication, it happens to be more easy to construct chronological sequences for the region stretching

20. See, for example, the catalogue of Gündlingen swords in south Germany, Austria and Switzerland: P. Schauer (note 15) 198ff. (Steinkirchen, Muschenheim, Lengenfeld and Weichering types).

21. A review of flat cremation graves in southern Germany is provided by W. Löhlein, *Früheisenzeitliche Gräber von Andelfingen, Gde. Langenenslingen, Kreis Biberach. Fundberichte aus Baden-Württemberg* 20, 1995, 463; see particularly the examples

from Bopfingen-Trochtelfingen, Großebstadt and Kallmünz-Schirndorf. - A Bohemian example of a cemetery with richer inhumations in grave chambers (originally under tumuli?) and poorer flat cremation graves is described by D. Koutecký and Z. Smrž, *Pohřebiště Bylanské Kultury v Polákách, okr. Chomutov, I. Díl. Památky Archeologické* 82, 1991, 166ff. (see especially 168, fig. 2).

from the north-west Alpine lake-side settlements, through southern Baden-Württemberg and southern Bavaria. But finds from sites further to the north, such as Schirndorf (22), Demmelsdorf (23), Muschenheim (24) etc., show that an early Hallstatt phase is also to be expected in other regional groups. However, it should already be apparent that the pottery of early Ha C varies quite markedly from region to region. This means that much work remains to be done on local pottery styles, to apply and test the new chronological system in areas which are today less susceptible to analysis.

In summary, it deserves to be emphasised that the two major Ha B phases recognised by Müller-Karpe – Ha B1 and Ha B3 – have survived the test of time more or less unscathed. Ha B2 is not a phase of general relevance: it is only recognisable in certain regional groups, where it can be understood as a moment of transition to the late Urnfield period. The recent Urnfield period started only a few decades earlier, the late Urnfield period, by contrast, a full 120–150 years earlier than apparent in 1959, before the application of dendrochronology. The 8th century accommodates the early Hallstatt phase, which is followed in the late 8th and 7th century by the richer finds of the full Ha C phase (see Table II).

### III

In the following paragraphs, I will attempt to sketch out schematically how the late Urnfield-early Hallstatt sequence, described above, can be related to developments at the Bronze Age/Iron Age transition

in other areas of Central and southern Europe. Whereas the former sequence is based around dendrochronology, the other areas lack the benefits of tree-ring dating; the only other method presently available to gain absolute dates is by linkage to the Aegaeon Protogeometric and Geometric pottery chronology. A full treatment of this subject is being prepared for publication in the *Jahrbuch des Römisch-Germanischen Zentralmuseum* (25), but an introduction to chronology at the Bronze Age/Iron Age transition can be gained from recent publications by S. Stegmann-Rajtár, C. Metzner-Nebelsick and B. Teržan (26). An impression of the suggested correlation of the results of regional chronological studies can be gained from Tables I–III.

#### 1) CENTRAL ITALY

In central Italy, the start of the Iron Age has traditionally been set at 900 BC. However, there are no absolute dates available for the Protovillanova/Villanova transition, and 900 BC has always been understood as an estimate. In recent work, Italian scholars have sought to date the start of their Early Iron Age by linking it to the tree-ring dates of the north-west Alpine lake-side settlements. M. Bettelli (27) has put forward a surprisingly high chronology of the Italian Iron Age, but this is founded partly on L. Sperber's rather misleading use of the term Ha B2, and partly on incorrect dendro-dates from the eastern Mediterranean (28). Whereas in 1989 (29) and 1990 (30) Italian scholars still adhered to the estimated date of 900

22. R. Hughes, *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit in Schirndorf, Lkr. Regensburg*. In: P. Schauer (ed.) *Archäologische Untersuchungen zum Übergang von der Bronze- zur Eisenzeit zwischen Nordsee und Kaukasus. Regensburger Beiträge zur Prähistorischen Archäologie* 1 (1994) 141ff.
23. P. Ettl, *Zum Übergang von der späten Urnenfelder- zur älteren Hallstattzeit in Oberfranken*. In: P. Schauer (note 22) 165ff.
24. H. Polenz, *Gerät oder Waffe? Fundberichte aus Hessen* 15, 1975, 229–251.
25. The author wishes to use this opportunity to express his gratitude to the Römisch-Germanisches Zentralmuseum (and especially K. Weidemann and M. Egg), where he was able to work intensively on this subject. The research project was supported by a grant from the Deutsche Forschungsgemeinschaft.
26. S. Stegmann-Rajtár, *Spätbronze- und früheisenzeitliche Fundgruppen des mittleren Donaugebietes. Bericht der Römisch-Germanischen Kommission* 73, 1992, 29ff. – C. Metzner-Nebelsick,

Die früheisenzeitliche Trennentwicklung zwischen Kaukasus und Mitteleuropa. In: P. Schauer (note 22) 383ff. – B. Teržan, *The Early Iron Age in Slovenian Styria*. Kat. in Monogr. 25 (1990). – See also the Regensburg conference proceedings edited by P. Schauer (note 22).

27. M. Bettelli, *La cronologia della prima età del ferro Laziale attraverso i dati delle sepolture. Papers of the British School at Rome* 62, 1994, 49ff.
28. The so-called "Midas tomb" from Gordion is now dated around 718 BC instead of 757 BC, see Daily Telegraph 3.7.1996, 18.
29. R. Peroni, *Protostoria dell'Italia continentale. La penisola italiana nelle età del bronzo e del ferro. Popoli e Civiltà dell'Italia Antica* 9 (1989) 404.
30. C. Belardelli, C. Giardino and A. Malizia, *L'Europa a sud e a nord delle Alpi alle soglie della svolta protourbana* (1990) 459, fig. 125.

## 3) PICENUM

Whereas the Este group plays a crucial role in the chronology of the south-east Alpine region, this function as a chronological link to Central Italy is played by Picenum for the eastern shore of the Adriatic Sea. Sadly, a site like Frattesina, which could provide evidence of developments during the Protovillanova period, is not available for Picenum. For the finds from the cemetery of Pianello, with over 500 graves excavated in 1912, documentation on the grave-groups has not survived, which renders them almost worthless for chronological purposes (40). It is only in the Early Iron Age that we have Picene finds from many closed grave assemblages. Although the number of graves (some of which are urn-graves) from the first Early Iron Age phase (Picenum I) is limited, they form a clear group which can be paralleled with Villanova I (41). For Picenum II the finds from Novilara, located on the northern fringe of the Picene region, provide a reliable chronological foundation (42). Novilara I (Picenum IIA) can be linked to Bologna IIA, and Novilara II (Picenum IIB) can clearly be equated with Bologna IIB and Este IIC; the following phase Novilara IIIA is contemporary with the oldest Orientalizing period. From the 9th century BC onwards, therefore, the finds of the Picene group, with its close connections to the Villanova and Venetic groups, provide a reliable chronological framework for related finds further to the east (Table I).

1989 nell'abitato protostorico di Frattesina di Fratta Polesine. *Quaderni di Archeologia del Veneto* 6, 1990, 64ff. – L. Salzani, Necropoli dell'Età del Bronzo Finale alle Narde di Fratta Polesine. Seconda nota. *Padusa* 26–27, 1990–91, 125ff.

40. R. Peroni, Dati di scavo sul sepolcreto di Pianello di Genga. *Arch. Anzeiger* 1963, Heft 3, 362ff. The results of the later excavations remain unpublished.
41. The most important treatment of finds of Picenum I is still D.G. Lollini, Tomba ad incinerazione dalla necropoli di Numana. *Atti del primo simposio internazionale di protostoria italiana, Orvieto* 1967 (1969) 89ff.
42. K. Beinbauer, *Untersuchungen an den eisenzeitlichen Bestattungsplätzen von Novilara* (1985).
43. The close relations between the various cultural groups west and east of the Adriatic are well documented in the literature. As an example we may take the cremation burials in urn graves of the Iapodic region, which show remarkable similarity with Picene cremations – e.g. Kompolje grave 2/1955–56: R. Drechsler-Bižić, *Vjesnik Arheološkog Muzeja u Zagrebu* 3, 1961, 67ff.; pl. 26.

## 4) COASTAL CROATIA

Because of the relatively small number of closed grave assemblages from the so-called Dalmatian, Liburnian and Iapodic cultural groups, contacts with Italy offer a welcome aid in their relative and absolute chronology. In coastal Croatia bronzes of Italic and especially Picene type are associated with local objects (43).

A detailed discussion of the chronology of this region is not possible here. However, the broad outlines of the sequence have been described in a number of important studies by Š. Batović (44).

## 5) GLASINAC

Since the fundamental studies by A. Benac and B. Čović (45), the most important results for the development of the chronology of the Glasinac group have been published by N. Lucentini (46). Lucentini was able to put forward a clear definition of Glasinac IB, which corresponds roughly with Benac and Čović's phase IVA. Although she did not discuss phase IA in detail, it is possible to recognise a series of graves (mainly of Benac and Čović's phase IIIC2) which clearly pre-date IB, have close links with phase I of the Croatian coast, and can even be related to Picenum I (47). Lucentini's Glasinac IB can, in turn, be equated with Early Iron Age II of coastal Croatia and Picenum (see Table I).

44. For example: Š. Batović, Iz ranog željeznog doba Liburnije. *Diadora* 1, 1959, 37ff. – Ibid., Die Eisenzeit auf dem Gebiet des illyrischen Stammes der Liburnen. *Archaeologia Jugoslavica* 6, 1965, 55ff. – Ibid., Pregled željeznog doba na istočnoj jadranskoj obali. *Vjesnik za Arheologiju i Historiju Dalmatinsku* 68, 1966, 47ff. – Ibid., L'Età del Bronzo Recente sulla costa orientale dell'Adriatico. *Godišnjak Centar za Balkanološka Ispitivanja* 18, 1980, 21ff. – Ibid., Dalmatska kultura željeznoga doba. *Radovi Fil. Fak. Zadar* 25, 1986, 5ff. – Ibid., Le relazioni culturali tra le sponde adriatiche nell'età del ferro. *Jadranska obala u protohistoriji. Simpozij Dubrovnik 1972* (Zagreb 1976) 21ff. – *Praistorija Jugoslavenskih Zemalja* IV (1983) 271ff.; V (1987) 339ff.
45. A. Benac and B. Čović, *Glasinac I* (1956). – Ibid., *Glasinac II* (1957).
46. N. Lucentini, Sulla cronologia delle necropoli di Glasinac nell'età del ferro. In: R. Peroni (ed.), *Studi di Protostoria Adriatica* 1 (1981) 67ff.
47. See, for example, the grave from Drvar: F. Fiala, *Wissenschaftliche Mitteilungen aus Bosnien und Hercegovina* 4, 1896, 170ff. with figs 4–10.

## 6) MACEDONIA

At this point a short digression will be made to consider briefly the contribution of Macedonia to the chronology of Central Europe. The importance of Macedonia for our purposes lies on the one hand in the similarity of its bronze finds with those further north, and on the other hand in the possibility of anchoring Macedonian chronology to the sequence of Aegean Protogeometric and Geometric painted pottery. In fact, the relative and absolute chronology of Macedonia in the early first millennium BC is sadly still rather uncertain – nevertheless the potential of Macedonia for future research deserves to be emphasised.

The most important contribution to this subject is by K. Kilian (48), who studied the available grave assemblages (particularly those from Vergina and Chauchitsa) in detail. Owing to the present state of publication, it is difficult to evaluate the validity of some of Kilian's proposed phases, but for an understanding of the metal finds this is perhaps not absolutely necessary. In fact, the metallic grave goods indicate the succession of certain fairly obvious broad phases: an early stage with arched fibulae, a second stage with simple jewellery made of bronze wire and bronze sheet (Macedonia IB, including arched fibulae with a large decorated foot, spectacle fibulae, twisted neck-rings etc.), and a third stage with cast bronze jewellery (Macedonia IIA, including Bouzek's 'canonical Macedonian bronzes').

Whereas the beginning of phase IB (Vergina IIIA) is today assigned to the second half of the 10th century BC (49), the date of the start of the cast 'Macedonian bronzes' is controversial. In 1975 K. Kilian suggested a date around 700 BC, while J. Bouzek has

argued for a much earlier start, around 800 BC (50), and the earlier dating – if not certain – does seem more likely.

It is clear that the Macedonian chronology is still beset with serious problems – and this is specially true for the 8th century BC. Nevertheless, the graves published by M. Andronikos from Vergina provide invaluable information for the late 10th and 9th centuries (51); among these finds, the typical female jewellery of Vergina IIIA–B is of most importance. Vergina shows that this type of costume-set (52), which is known over a wide region of the western Balkan peninsula (see Tables I and II: Coastal Croatia I, Glinac IA, Ljubljana IB, Ruše II, hoard horizon V etc.), must start as early as the second half of the 10th century BC. This horizon of metallic finds is linked, in turn, to the Central European phase Ha B2/3 which – remarkably enough! – is similarly dated by dendrochronology.

## 7) LJUBLJANA

The cemetery of Ljubljana (53) plays a particularly important role for chronological purposes, because clear links can be traced between its finds and those of north-east Italy, the western Balkan peninsula and the Central European late Urnfield culture. The importance of this site has been augmented by a number of excellent studies, especially by S. Gabrovec (54). The relative chronology of the phases IB, IIA, IIB and IIIA is confirmed by horizontal stratigraphy. The relatively close network of circum-adriatic contacts allows us to construct a reliable chronological system based on the sequences of Este and Picenum as far to the north-east as Ljubljana (see Table II).

48. K. Kilian, Trachtzubehör der Eisenzeit zwischen Ägäis und Adria. *Prähistorische Zeitschrift* 50, 1975, 9ff.
49. I. Kilian-Dirlmeier, *Die Schwerter in Griechenland (außerhalb der Peloponnes), Bulgarien und Albanien*. *Prähistorische Bronzefunde* IV/12 (1993) 124f.: "Contacts between Vergina and southern Greece are definitely documented by imports and local imitations of wheel-turned pottery (skyphoi with concentric circles, semi-circles or zig-zags in the shoulder field) for the late 10th and early 9th century BC. However, this dateable pottery appears first in burials of the developed phase (Kilian: Vergina IIIA–B) ...".
50. J. Bouzek, *Graeco-Macedonian Bronzes* (1974) 163ff. – *Ibid.*, *Památky Archeologické* 65, 1974, 318, note 39. – *Ibid.*, *Eirene* 18, 1982, 35ff. – *Ibid.*, *Arch. Ephemeris* 1988, 47ff. – See also the discussion by C. Rolley, *Revue Archéologique* 1985, 277ff.

51. *Vergina I* (1969). – Further material from Vergina is published in: K. Rhomiopoulou and I. Kilian-Dirlmeier, *Neue Funde aus der eisenzeitlichen Hügelnekropole von Vergina, Griechisch Mazedonien*. *Prähistorische Zeitschrift* 64, 1989, 86ff.
52. For an important discussion of this subject, see: B. Teržan, *The Early Iron Age chronology of the central Balkans*. *Archaeologia Jugoslavica* 24, 1987, 7ff.
53. F. Starč, *Ilirske najdbe železne dobe v Ljubljani*. *Dela SAZU* I/9 (1954). – I. Puš, *Žarnogrobišna nekropola na dvorišču SAZU v Ljubljani*. *Razprave SAZU* VII/1 (1971). – *Ibid.*, *Prazgodovinsko žarno grobišče v Ljubljani*. *Razprave SAZU* XIII/2 (1982). – M. Budja, *Situla* 20–21, 1980, 85ff.
54. S. Gabrovec, *Der Beginn der Hallstattzeit in Slowenien*. *Arheološki Vestnik* 24, 1973, 338ff. – *Ibid.*, *Zum Beginn der Hallstattzeit in Slowenien*. In: H. Mitschna-Märheim, H. Friesinger

## 8) RUŠE AND THE SULMTAL GROUP

Directly to the north of Ljubljana, we finally reach the Central European Urnfield culture, in the guise of the Ruše group of Slovenian and Austrian Styria. These finds are distributed in a ca. 50 km section of the Drave valley between Ormož and Ruše. Since Müller-Karpe's study of Ruše (Maria Rast) (55), a large number of very important grave assemblages has been excavated and published (56). This more favourable database has rendered Müller-Karpe's chronological scheme for Ruše obsolete. A reappraisal of the evidence allows the recognition of three main phases: Ruše I (recent Urnfield), Ruše II (late Urnfield) and Ruše III (early Ha C). The importance of Ruše III for our purposes lies in its links to Ljubljana II, indicating that the late Urnfield period (Ha B2/3) belongs before the 8th century BC.

Closed grave assemblages of the phases Ruše I and II are known from Austrian Upper Styria (Wildon), but these have not yet been published. In Ruše III, however, there are important finds from Kleinklein (57). C. Dobiak, who published a major study of these finds, grouped them together with graves of the full Ha C phase (Kleinklein I). Today it is clear that the pottery from the older (Ruše III) graves differs markedly from that of the full Hallstatt period (58), so that a division of Kleinklein I is possible (Kleinklein IA = early Ha C; Kleinklein IB = full Ha C).

and H. Kerchler (eds), *Festschrift für Richard Pittioni I. Archaeologia Austriaca*, Beiheft 13 (1976) 588ff. – See also H. Parzinger, *Chronologie der Späthallstatt- und Frühlatènezeit. Quellen und Forschungen zur prähistorischen und provinzialrömischen Archäologie* 4 (1989) 24ff.

55. Müller-Karpe (note 2) 115ff.

56. See for example Brinjeva Gora (V. Pahič, *Arheološki Vestnik* 39–40, 1988–89, 181ff.), Lepa Ravna (B. Teržan [note 26] pl. 53–62), Ormož (M. Tomanič-Jevremov, *Arheološki Vestnik* 39–40, 1988–89, 277ff.), Pobrežje (S. Pahič, *Pobrežje*. Kat. in Monogr. 6, 1972), Ptuj-Rabeljeja vas (M. Strmčnik-Gulič, *Situla* 20–21, 1980, 61ff.), Ruše (S. Pahič, *Drugo žarno grobišče v Rušah*. Razprave SAZU IV/3, 1957; J. Kaerner, *Arheološki Vestnik* 39–40, 1988–89, 217ff.).

57. C. Dobiak, *Das hallstattzeitliche Gräberfeld von Kleinklein und seine Keramik*. Schild von Steier, Beiheft 1 (1980), e.g. Forstwald 16 and 17, Leitengritschwald 45, Ofenmacherwald 29, Preckwald 8, 10, 13 and 14, Tschoneggerfranzlwald 4, Höchschusterwald 8, 12, and 47 etc.

58. The full Ha C phase is characterised by pottery with rich black and red painted decoration, pins with 'Faltenwehr', elements of 'rich' horse-gear etc.

59. The important grave 169 from Brno-Obřany belongs at the transition from the late Urnfield to the early Hallstatt period:

## 9) THE STILLFRIED-PODOLÍ GROUP

The numerous grave assemblages of the Stillfried-Podolí group from Lower Austria and southern Moravia allow a clear definition of the recent and late Urnfield phases (Stillfried-Podolí I and II). These phases can without difficulty be paralleled with Ruše I and II. It is more problematical to isolate a phase comparable with Ruše III (59). However, it seems that in the Stillfried-Podolí group, as in the Ruše group, the 8th cent. BC is characterised by the emergence of tumulus burials, at the same time as the urn-grave rite continued in flat cremation cemeteries. The most important early Ha C grave assemblages come from the eponymous cemetery of Stillfried, where a number of urn-graves contain characteristic pottery (distinct from that of Stillfried-Podolí II), together with metal objects which can be related both to hoard horizon VI and grave finds of Este II and Villanova II (60). It is likewise possible to isolate a phase before the full Hallstatt period among the tumulus finds of the Kalenderberg group. The most important site is Sopron (Ödenburg), where Patek's phases I–II and Eibner-Persy's phase I belong to the same chronological horizon as the urn-graves of Stillfried-Podolí III (see Table II) (61).

## 10) THE NYNICE GROUP

The cemetery of Nynice still remains the most im-

the large conical-necked vessel is paralleled in Stillfried-Podolí II, but the metal objects are related to finds from hoard horizon VI in the Carpathian Basin. – See S. Stegmann-Rajtár, *Neuerkenntnisse zum Grab 169 von Brno-Obřany (Mähren). Hallstatt Kolloquium Veszprém 1984. Mitteilungen des Archäologischen Instituts*, Beiheft 3 (Budapest 1986) 211ff.

60. M. Kaus, *Das Gräberfeld der jüngeren Urnenfelderzeit von Stillfried an der March. Ergebnisse der Ausgrabungen 1975–1977*. Forsch. Stillfried 6. Veröffentl. Österr. Arbeitsgemeinschaft Ur- und Frühgeschichte 16 (1984) – for example graves 6, 13, 26, 31, 38, 43 and 45; the rich grave with 'pre-Scythian' objects also belongs to this phase, see M. Kaus, *Kimmerischer Pferdeschmuck im Karpatenbecken – das Stillfrieder Depot aus neuer Sicht. Mitteilungen der Anthropologischen Gesellschaft in Wien* 118–119, 1988–1989, 247–257. – Contemporary graves from southern Moravia include Brno-Obřany grave 140 (F. Adámek, *Pravěk Hradisko u Obřan*. [1961] pl. 128–129) and graves 41, 78 and 114 from Klentnice (J. Říhovský, *Das Urnengräberfeld von Klentnice*. *Fontes Archaeologici Pragenses* 8 [1965]).

61. E. Patek, *Neue Untersuchungen auf dem Burgstall bei Sopron. Bericht der Römisch-Germanischen Kommission* 63, 1982, 105ff. – e.g. tumuli 81 and 83. – A. Eibner-Persy, *Hallstattzeitliche Grabhügel von Sopron (Ödenburg)*. *Wiss. Arbeiten Burgenland* 62 (1980) – e.g. tumuli 71 and 139.

portant site for the chronology of the recent and late Urnfield period in south-west Bohemia (62). Another important cemetery has recently been excavated at Radčice, which began in the Milavče phase (Ha A) and contains over 100 graves of the Urnfield period, but this remains unpublished. For Nynice, we are fortunate in being able to make use of the important studies of V. Šaldová, O. Kytlicová and S. Stegmann-Rajtár. The tripartite division of the chronological development of the cemetery, originally proposed by V. Šaldová, has recently been corrected by Šaldová and Kytlicová (63). The first and third phases are unchanged, only the middle phase was dissolved, its graves being reassigned to the other two phases. Now the Late Bronze Age development of the cemetery is simply divided into two phases, Nynice I and II, which correspond to the recent and late Urnfield periods. Stegmann-Rajtár made certain further corrections to this sequence (64).

V. Šaldová argued that between the latest Urnfield graves (Nynice II) and the oldest Hallstatt graves from Nynice there is a chronological gap, which she filled with finds from tumuli such as Kostelík, Beztehov, Újezd and Horní Kamenice. In broad terms, Šaldová was certainly correct in suggesting an interim (Kostelík) phase between late Urnfield and full Hallstatt – the most typical finds being those from Kostelík tumuli 7 and 8 and Újezd. However, it now seems that this type of pottery can, in fact, be discerned at Nynice (65), and the horizontal stratigraphy of the cemetery supports the succession of the Nynice I, Nynice II and Kostelík phases.

This chronological sequence for south-west Bohemia is supported by comparisons linking Nynice I with Stillfried-Podolí I, Nynice II with Stillfried-Podolí II, and Kostelík with Stillfried-Podolí III (see Table II). It should be noted, however, that only a handful of graves can be assigned to the Kostelík phase (66); nevertheless, it does seem to be the case here, as in the Stillfried-Podolí and Ruše groups, that early Ha C saw both the emergence of tumulus burial as well as the continuation of urn burial in flat cemeteries.

#### 11) THE KELHEIM-OBERECHING GROUP

The Kelheim-Obereching group is centred on Lower Bavaria (67), and is characterised by typical pottery and bronze artefacts from a large number of Urnfields. Recognition of the recent and late Urnfield phases of this group (Kelheim-Obereching I and II) is not a problem, and is confirmed by horizontal stratigraphy at certain sites (most clearly at Kelheim, but also at Obereching). It has, however, only recently been recognised that some of these Urnfields continued in use into the early Hallstatt period – for example at Künzing, Obereching, Stephanposching, Kelheim and Schirndorf (68). The type of early Ha C pottery from these Urnfields can be paralleled in early Hallstatt tumuli such as Steinkirchen, mentioned in part II. Once again, as in the groups discussed above, the early Hallstatt period sees burial in flat urn-graves diminishing in popularity, and richer tumulus burials emerging; the latter rite becomes dominant in the full Hallstatt C phase.

#### 12) THE REGION NORTH-WEST OF THE ALPS

Owing to the existence of reliable tree-ring dates from lake-side settlements in south-west Germany, Switzerland and eastern France, the chronology of Ha B in the region north-west of the Alps is not open to such controversy as in other areas. The grave finds play a less important role for chronological purposes. Apart from the over-riding importance of the lake-side settlements, this can partly be explained by the absence of large Urnfields of the sort discussed above, such as Kelheim, Obereching, Nynice, Klentnice, Franzhausen, Hadersdorf, Ruše, Pobrežje etc. The chronology of grave finds is particularly difficult for the middle and recent Urnfield periods, when flat cemeteries are rare and normally contain only a few urn-graves. The situation changes radically in the late Urnfield period, with the appearance of a large number of tumulus burials, some of which are quite richly furnished. A number of late Urnfield graves contain typical Ha B2/3 bronze artefacts which facilitate the

62. V. Šaldová, Westböhmen in der späten Bronzezeit. Das Gräberfeld von Nynice I. *Památky Archeologické* 56, 1965, 1ff. – Ibid., Die hallstattzeitliche Hügelgräber in Westböhmen. Das Gräberfeld Nynice. *Památky Archeologické* 59, 1968, 297ff.

63. O. Kytlicová, Der Schild und der Depotfund aus Plzeň-Jíkalka. *Památky Archeologické* 77, 1986, 450, note 13.

64. S. Stegmann-Rajtár (note 26) 112ff.

65. For example graves 57, 130, 151, 180 and 181.

66. There may, however, be as many as 10 more in the Radčice cemetery. The author wishes to thank Dr. D. Bástová, Plzeň, for this information.

67. This group is also represented in the northern Salzburger Land, in southern Upper Palatinate, and in the eastern part of Upper Bavaria.

definition of this phase. The late Urnfield tumulus burials are very important for an understanding of chronology at the Bronze Age/Iron Age transition, because this rite continued to be practised in the early Hallstatt period – whereas the lake-side settlements were abandoned and bronze hoards ceased to be deposited.

### 13) THE PROBLEM OF THE LATE URNFIELD PERIOD IN SOUTH-EAST CENTRAL EUROPE

The discussion so far has attempted to show how analysis of grave finds can reconcile the absolute dating evidence available from the lake-side settlements and tumuli north-west of the Alps, 8th century Italy and Early Iron Age Macedonia. Another important contribution to the formation of this chronological scheme can be gained from a study of hoards (depositions of metal objects). Obviously, hoards and their contents vary considerably from region to region, and they must be studied on a regional basis. Nevertheless, it is possible to correlate regional developments and recognise a broad succession of hoard horizons in Central Europe: horizon IV corresponding to the recent Urnfield period, V to the late Urnfield period, and VI to the early Hallstatt period (69) (Table III).

As already mentioned in the introduction, horizon IV marks a major phase of bronze circulation (and deposition) in large parts of Europe, and this treatment of bronze seems to form an important element of the communication network which supported the so-called “Urnfield phenomenon”. In the following horizon V, hoard depositions are even more richly represented in the region of the late Urnfield culture (70). Further east, by contrast, hoard deposition fell out of fashion in many areas – concentrations are only known in the extreme north-east and south-west

parts of the Carpathian Basin (71). It seems that at this time (ca. 950/920–800 BC), the Carpathian and lower Danube region became disengaged from the communication network of the Urnfield culture. Metallic finds of so-called pre-Scythian type indicate that the region experienced an eastward reorientation of its cultural affinities. To what extent do local cultural sequences reflect the important change detected in metal production and deposition?

The intense circulation and deposition of bronzes in hoard horizon IV presumably required an efficient communication network within the Carpathian Basin. This may, indeed, help understand the emergence of a vast *koinè* of pottery production known as “kanelierte Keramik” (fluted pottery) (72). This term refers to the inter-related cultural groups distributed between east Slavonia and the Voivodina in the south-west, east Slovakia in the north-west, and the lower Danube, Carpatho-Ukraine and Dnestr in the east. The formation of this group presupposes a period with particularly intensive communication over a very wide area. The obvious hypothesis is that the formation and expansion of the *koinè* of fluted pottery is related to the climax of bronze production and exchange visible in the hoard depositions. But it is a matter of controversy whether the dissolution of the *koinè* of fluted pottery may be related chronologically to the interruption of bronze circulation and deposition at the transition from hoard horizons IV to V.

The paucity of grave assemblages means that pottery chronology is based on settlement evidence – and this does not allow fine dating. However, it is clear that the *koinè* of fluted pottery was succeeded by a number of regional groups, often with quite different pottery decoration (73). Thus the fluted pottery of eastern Hungary (Gáva group), Voivodina, north-Serbia and the Banat (Belegiš II group), southern Oltenia

68. F. Schopper, Gräber der späten Urnenfelder- und der frühen Hallstattzeit aus dem Landkreis Deggendorf. *Archäologische Arbeitsgemeinschaft Ostbayern/West- und Südböhmen*, 3. Treffen, Juni 1993 (1994) 17, fig. 3, A (Künzing-Ost, grave 85). – P. Höglinger, *Das urnenfelderzeitliche Gräberfeld von Obereching*. *Archaeologie in Salzburg* 2 (1993) pl. 58 (Obereching grave 140). – K. Schmotz, *Die vorgeschichtliche Besiedlung im Isarmündungsgebiet*. Materialhefte zur Bayer. Vorgesch. Reihe A/58 (1989) pl. 35, C (Stephanposching grave 5). – R. Hughes (note 22) 141ff. (Kelheim, Am Urnenfeld, grave 11 and Schirndorf).

69. For a recent study of hoard chronology in the Carpathian Basin, see C. Metzner-Nebelsick (note 26) 408ff. – Hoard horizon IV corresponds to von Brunn's Rohod-Szentes phase, the So-

motor-Lúčky phase in Slovakia, the Hajdúböszörmény phase in Hungary, the Moigrad-Tăuteu phase in Romania etc.

70. The eastern boundary of the typical late Urnfield culture is formed by the Ruše and Stillfried-Podolí groups in Styria, eastern Austria, western Transdanubia, south-west Slovakia and southern Moravia.

71. There was a resurgence of hoard deposition in horizon VI in the Carpathian Basin, but the different kind of hoard composition (sets of costume ornaments, horse-gear etc.) seems to reflect new deposition practices.

72. For an introduction to this subject, see B. Hänsel, *Beiträge zur regionalen und chronologischen Gliederung der älteren Hallstattzeit an der Unteren Donau* (1976) 88ff.

(Hinova-Vîrtop group), Dobrogea (Babadag I group) and Moldavia (Corlăteni-Chișinău group) is succeeded by various types of engraved and stamped pottery (Gornea-Kalakača, Insula Banului, Babadag II and Cozia groups), and the eclectic pottery of the Mezőcsát and Teleac groups (see Table III).

While the relative chronological development is more or less clear, the absolute chronology is controversial. While B. Hänsel and his collaborators (74) have argued for the emergence of Kalakača and related pottery before the end of the 2nd millennium BC, Gumă and Vulpe (75) suggest a later date, corresponding to the transition from hoard horizons IV to V, and Kemenczei sees Gáva pottery continuing till Ha B1 (76). Whereas the recently published stratigraphy of the settlement of Teleac (77) appears to support the later date, this seems to be precluded by the association of "proto-Kalakača" pottery with early Urnfield club-headed pins at Feudvar (78). It is not my purpose to discuss this question in more detail, although I should perhaps note that – in my opinion – more evidence supports a later dissolution of the fluted pottery *koinè* (see Table III).

In the framework of this article I merely intend to indicate what, to me, seems the most crucial chronological question at the transition from the Bronze Age to the Iron Age in south-eastern Central Europe. However the settlement chronologies are resolved, it remains to emphasise once again the profound cultural break in these regions around 950/920 BC – at a time when the Urnfield culture was passing gradually from its recent to late phase further to the west. Judging from the rich bronze production of hoard horizon IV, the Carpathian region was certainly "in the Bronze Age" at this time. The collapse of bronze production and exchange at the time of hoard horizon V, however, could mark the start of an Iron Age technology, involving the development of a new kind of communication and exchange network and a radical cultural re-orientation.

73. For a useful review, see A. Vulpe, *Die Kurzschwerter, Dolche und Streitmesser der Hallstattzeit in Rumänien*. *Prähistorische Bronzefunde* VI/9 (1990) 102ff.

74. B. Hänsel and P. Medović, *Bericht der Römisch-Germanischen Kommission* 72, 1991, 62; 119ff.; 135; 148.

75. M. Gumă, *Civilizația primei epoci a fierului în sud-vestul României* (1993). – A. Vulpe (note 73) 102ff.; pl. 62.

#### IV

Having reviewed these regional chronologies, and shown how they may be linked together in a schematic supra-regional system, we may now briefly turn to a more general view of behaviour at the Bronze Age/Iron Age transition. As we know, there is a chronological "gradient" in the adoption of iron technology. In Italy, much of the Carpathian Basin, the lower Danube and the north Pontic regions, this step seems to have been taken at some time around the second half of the 10th century BC. In the area stretching from western Transdanubia to central France, the end of the Bronze Age corresponds to the Urnfield/Hallstatt transition, and dates to around 800 BC. Further to the north and west, Bronze Age practices continue into the 8th, 7th or, in some areas, even into the 6th century BC, as the hoards of Per. VI, the Armorican axe hoards and the hoards of "Launacien" type show.

In fact, it seems that the Bronze Age/Iron Age transition is *typically* marked by the cessation or marked decline of hoard deposition. I suspect that hoard deposition, like deposition in watery places, was an activity intimately linked to the exchange, display and thesaurisation of bronze. Deposition – whether in hoards, rivers, marshes or settlements – was a final option available in a variety of different cult activities involving bronze. But this behaviour disappeared at the Bronze Age/Iron Age transition. When the "common denominator" of the Bronze Age communication and exchange networks ceased to exist, regional groups were forced to develop new cultural orientations, and élites were forced to display and compete using other measures of wealth.

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76. T. Kemenczei, *Die Spätbronzezeit Nordostungarns* (1984) 86. – *Ibid.*, *Communicationes Archaeologicae Hungariae* 1990, 120f.

77. V. Vasiliev, I.A. Aldea and H. Ciugudean, *Civilizația Dacică Timpurie în Aria Intracarpatică a României. Contribuții Arheologice: Așezarea Fortificată de la Teleac* (1991).

78. See note 74.

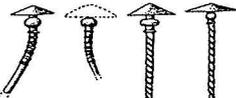
				
				IA
				IA/IB
				IB
				IIA
				IIB

Fig. 7. Occurrence of selected pin types in Early Iron Age graves from Bologna and its Hinterland (phases IA, IB, IIA, IIB). Pins after G.L. Carancini, *Die Nadeln in Italien. Prähist. Bronzefunde IX/12* (1984). – Not to scale.

BC, R. Peroni now sets the start of Golasecca IA, Este I, Bologna I etc. at ca.1020 BC. It seems that the root of this change is again to be sought in the stubborn belief of Italian scholars in Müller-Karpe's Ha B2 phase. In fact, the best available means of dating Iron Age I in central and northern Italy is by its links with finds of the late Urnfield period (Ha B2/3). As an example of this, I will take the pins with small vase-shaped heads (31). These are very typical of Ha B2/3 and are found in a series of graves around Bologna, dating mainly to Bologna I (Fig. 7, column 1). In phases IB and IIA a local Bolognese variant was developed, having heads with more complex ribbing (Fig. 7, column 2). Judging from the former pins, it seems justified to link Bologna I with Ha B2/3 (ca. 950/920–ca. 800 BC); Bologna IIA would then correspond with early Ha C north of the Alps – as the pin

with conical head of Bolognese type from Hemishofen would suggest (compare Fig. 4b, 5 with Fig. 7, column 3; see also Tables I and II).

In the 8th century, Italian chronology becomes much more reliable. The phases of north Italy and Picenum can be linked to chronological sequences at sites with imported Geometric pottery, such as Veii "Quattro Fontanili", which has been analysed by J. Toms (32). The state of research on absolute chronology has recently been summarised by B. d'Agostino, in the framework of the Pontecagnano publication (33) (Table I). Absolute dates for Villanova II are on the one hand gained from the earliest pre-colonial Euboean imports (e.g. from Veii "Quattro Fontanili": Middle Geometric II chevron skyphoi), on the other hand by comparison with finds from the horizon of the first Greek settlements in the west (Pithekoussai,

31. Also discussed by M. Bettelli (note 27).

32. The relative chronology of the Villanovan cemetery of Quattro Fontanili at Veii. *Annali, Sezione di Archeologia e Storia Antica* (Napoli) 8, 1986, 41ff.

33. In: S. De Natale (ed.) *Pontecagnano II. La necropoli di S. Antonio: Propr. ECI. 2. Tombe della Prima Età del Ferro* (1992) 39–43.

Cumae – Late Geometric I). Following this the earliest Orientalising phase (e.g. Veii IIC/IIIA, Pontecagnano IIB-Orientalizzante Antico I) is paralleled with the time of the “second generation” of Greek colonies (early Protocorinthian pottery). Whereas the later Villanova period in central Italy is fairly securely anchored by Greek imports, such close links with the eastern Mediterranean were lacking in Villanova I. The generally accepted date for the transition from Villanova I to II (800 BC) must therefore be understood as an estimate.

## 2) NORTH ITALY

For the chronology of the Golasecca culture, the works of R. De Marinis are fundamental (34). The published finds are still too few to construct a fine chronological sequence for this group, and both the relative and the absolute chronology are based largely on comparison with the more secure sequences from Bologna and Este (Table I).

Since the work of R. Peroni and his team on Este (35), there have been important new publications which demand a reappraisal of their chronological scheme for the Veneto. Apart from editions of important cemeteries (36), studies of multiple burial are worth special mention, leading to the presentation of a new chronology for the 8th to 5th centuries BC by

A. Vanzetti (37). The most important new developments, however, have occurred in the early part of the Venetic sequence. Apart from the increasing numbers of finds from Este I (38), the most important discoveries are without doubt the settlement and graves from Frattesina near Fratta Polesine (39). The grave finds found north-west of the settlement in loc. Narde play a key role for chronological studies. The excavation of a tumulus uncovered well over 550 simple urn graves. During the use of the tumulus, the mound was enlarged several times, allowing the excavator, L. Salzani, to assign the graves to five layers. Apart from the tumulus in loc. Narde, there is another cemetery east-south-east of the settlement in Fondo Zanotto, with finds which are slightly later. Taken together, the Narde and Zanotto cemeteries offer a large number of grave complexes from the middle Protovillanova phase to the transition to the Early Iron Age. Some of the bronzes from the Narde tumulus find parallels in the Central European Urnfield zone, including pins which are comparable to examples from Swiss lake-side settlements of the mid 11th century BC. The graves from Frattesina therefore allow, for the first time, a secure chronology for the middle (arched fibulae) and late (serpentine fibulae) Protovillanova phases, and their parallelisation with the middle and recent Urnfield phases of Central Europe.

34. For example R. De Marinis, Note relative alla cronologia della cultura di Golasecca. *Rassegna Gallaratese di Storia e d'Arte* 29, 1970, 3–33. – Ibid., La necropoli della Ca' Morta alla luce delle ultime scoperte. In: *Età del Ferro a Como*, exhibition catalogue, Como 1978, 65–92. – Ibid., La tomba 289 della Ca' Morta e l'inizio dell'età del ferro nelle necropoli dei dintorni di Como. In: B. Schmid-Sikimić and P. Della Casa (note 6) 93ff.
35. R. Peroni, G.L. Carancini, P. Coretti Irdi, L. Ponzi Bonomi, A. Rallo, P. Saronio Masolo and F.R. Serra Ridgway, *Studi sulla cronologia delle civiltà di Este e Golasecca* (1975) 21ff.
36. E.g. A.M. Chieco Bianchi and L. Calzavara Capuis, *Este I. Monumenti Antichi* 51, Ser. Monogr. 2 (1985). – Note the important discussions of chronology in this book.
37. G. Bergonzi, A. Boiardi, P. Pascucci and T. Renzi, Corredi funebri e gruppi sociali ad Este e S. Lucia. In: R. Peroni (ed.), *Necropoli e usi funerari nell'età del ferro* (1981) 95ff. – A. Vanzetti, Le sepolture a incinerazione a più deposizioni nella protostoria dell'Italia nord-orientale. *Rivista di Scienze Preistoriche* 44, 1992, 115ff. Vanzetti's new chronology is, however, flawed – with some graves clearly wrongly dated (Ricovero grave 154, for

example, is assigned to Este III).

38. E.g. Garda (Prov. Verona): L. Salzani, La necropoli di Garda (Verona). *Boll. Mus. Civ. St. Nat. Verona* 11, 1984, 113ff. – Montagnana (Prov. Padova), Ca' Nogare: E. Bianchin Citton and M. De Min, *Il Museo archeologico e il lapidario di Montagnana* (1990) 20ff. – Pra' d'Este (Prov. Padova) and Desmontà (Prov. Verona): *Il Veneto nell'antichità* (1984) 626f.; 632f. – with illustrations. – Angarano (Prov. Vicenza): E. Bianchin Citton, *I reperti della necropoli di San Giorgio di Angarano nel museo civico di Bassano del Grappa* (1982).
39. *Il Veneto nell'antichità* (1984) 651ff. – M. De Min, La necropoli protovillanoviana di Frattesina di Fratta Polesine (Ro). *Padusa* 20, 1984, 475ff. (and other articles in *Padusa* 20). – *L'Antico Polesine, testimonianze archeologiche e paleoambientali*. Exhibition catalogue, Adria and Rovigo (1986). – M. De Min, La necropoli protostorica di Frattesina di Fratta Polesine. In: G. Bergonzi, A.M. Bietti Sestieri and A. Cazzella (eds), *Prospettive storico-antropologiche in archeologia preistorica. Quaderni di Dialoghi di Archeologia* 3, 1987, 277ff. – L. Salzani, Necropoli dell'Età del Bronzo Finale alle Narde di Fratta Polesine. Prima nota. *Padusa* 25, 1989, 5ff. – A.M. Bietti Sestieri, La campagna di scavo