

HALLSTATT: DRY BONES AND FLESH

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IN discussing the British Iron Age, Wheeler frequently needed to refer, however obliquely, to Hallstatt. In his Maiden Castle report, for example, Hallstatt is mentioned as often as ten times on a page (1943, e.g. p. 289). However, there, and in most general accounts of the Iron Age in Europe, Hallstatt figures not so much for its own significance but as a label, whether for pottery, swords, phases, or cultures. The site is well known for its prehistoric salt mine and for its cemetery with exotica reputedly exchanged for this salt, but it tends to be regarded as anomalous and of secondary general significance, and the validity of research carried out there by previous generations has been challenged: 'Die Geschichte des Gräberfelds von Hallstatt und seiner Erforschung diene als Beispiel und Mahnung!' (Pauli, 1975, 23).

Over the past decade I have had the privilege of working with colleagues in Vienna in an attempt to assess this dismissive judgement of Hallstatt and its European significance (cf. Barth and Hodson, 1976; Hodson, 1980a; Nebehay, 1980). At the same time an attempt has been made to use, assess, and if necessary develop, new techniques for dealing with archaeological data that may be grouped under the general heading of Information Technology. In this paper I will attempt to summarize a more extended account of this work (Hodson, forthcoming).

A favourite metaphor of Wheeler's was to contrast the dry bones with the flesh of archaeology. He in no way played down the former at the expense of the latter and he required for both, prompt and comprehensive publication. The first and major problem with Hallstatt has proved to be with the dry bones, and most of this paper must be concerned with the quality of the primary evidence.

This enquiry must concentrate on the work of a single personality who may fairly be regarded as Wheelerian, although

active a century before him: Johann Georg Ramsauer was born in Hallstatt in 1795 and without any obvious family influence he rose through apprenticeship in the State Salt Mines to become director by the age of 36. His training had included surveying and draughtsmanship, and at 16 he was already given the responsibility of surveying for construction work in the mines (Pertlwieser, 1980). His excavations in the Hallstatt cemetery (1846–63) were conducted alongside his professional responsibilities. He also produced twenty-two children that survived childbirth. His Wheelerian desire for the comprehensive publication of his excavations was apparently thwarted, but he produced regular, voluminous and well-illustrated reports that are only now being resurrected and studied in detail by Barth (1979; Barth and Nebehey, forthcoming). Based on these initial reports, Ramsauer also produced a more or less standardized summary of his entire excavations. This was copied by hand for private circulation, and two copies of this 'Protokoll' are known in Britain, one in the Society of Antiquaries, London, the other in the Ashmolean Library, Oxford (Barth and Hodson, 1976).

Since Kromer's comprehensive publication of the Hallstatt cemetery in 1959, which included the first satisfactory account of Ramsauer's work, the remarkable character of these Protokolle has become well known. The quality and detail of both text and illustrations inspire confidence and it is easy to forget that they reflect techniques of excavation and recording appropriate to their time, even if practised by an exceptionally gifted pioneer. Some of Ramsauer's procedures have been generally bemoaned, most notably his failure, evidently with professional museum approval, to recover and preserve the large quantities of pottery and bone that he found (cf. Kromer, 1959, 9). Literally, indeed, the dry bones of Hallstatt have been irretrievably lost. But other aspects of his approach, critical for the recovery of valid grave associations, have been assumed by some archaeologists to merit complete confidence, and elaborate interpretations have been built on them (e.g. Peroni, 1973). However, even in his 1959 publication, Kromer was able to point to many inconsistencies in the Ramsauer archive as then available for study in Vienna: objects showing signs of cremation but attributed to inhumations (e.g. graves 124 and 422), or objects that were considered to be of different periods 'associated' together (e.g. in graves 52, 59, and 217). Other perhaps more convincing chronological anomalies would be the Late La Tène key reported with Hallstatt phalerae in grave 976 and the Roman or later cow bell attributed with

Hallstatt fibulae and a dagger to grave 765 (cf. Kromer, 1959, 181, 154).

The discovery of some hitherto unknown Ramsauer documents in Munich in 1972 pointed to further anomalies of this kind and in his publication of this Munich 'Separatum' Pauli (1975) took the extremely pessimistic view cited above, in effect rejecting the entire Ramsauer archive as a valid primary source.

Between these two extremes, uncritical acceptance and total rejection, a third middle course has been sought. The intention is to search for the cause of any obvious anomalies, to locate the sources of error and then to down-grade all the evidence likely to be corrupted by the same source. Tests of consistency on all or parts of the evidence may then be applied.

A major source of error has in fact been traced to the curation of finds in Vienna between their reception from Ramsauer and their final location in the then newly built Naturhistorisches Museum. It is clear that many objects lost their Ramsauer labels during this period and that some were renumbered and re-allocated to graves on the verbal description alone of the Protokoll. Fortunately, a working catalogue of the time, the Krauss Zwischenkatalog, allows such false attributions to be recognized and eliminated from the inventory (Barth and Hodson, 1976).

When these post-Ramsauer errors have been eliminated it is possible to concentrate on inconsistencies in the Ramsauer bequest itself. Some of these may be attributed to copyists' mistakes and eliminated by comparing different versions of the Protokoll. Other anomalies must be attributed to the difficulties which Ramsauer suffered as a pioneer excavator confronted with a complicated, disturbed site. With hindsight it is possible from his sketches and verbal descriptions and from grave inventories to understand how he sometimes confused the limits of graves where a primary grave setting was disturbed by secondary or even tertiary graves.

His treatment of graves 135-9 is instructive (see Pl. V). Although not entirely consistent, the majority of the finds attributed to single graves (Kromer, 1959, pls. 11, 18-19, 24) makes their archaeological relationship quite clear: a primary cremation of the Ha C phase (probably seventh century BC) found in a collapsed burial chamber (grave 135); a secondary, east-west Ha D inhumation of the sixth century BC (grave 136); two or three Early La Tène inhumations roughly north-south and probably of the fifth century BC (graves 137-9). The last were doubtless further accessory burials in the same low tumulus as graves

135 and 136, since they were recorded as $1\frac{1}{2}$ feet above them (the metric system was not yet in use!).

Ramsauer could hardly be expected, in the mid-nineteenth century, to understand what is clear to us from his sketch (Pl. I), but his interpretation is instructive: he described graves 135 and 136 as a family group ('eine Familien Grabstätte') in the same 'clay coffin'. The superposition of graves 137-9 he attributed to a landslip ('durch Abrutschung'). In other words, the spatial proximity of graves 135 and 136 was assumed to reflect social proximity and contemporaneity, and disturbance of earlier burials by later was either not perceived (graves 135-6) or attributed to natural rather than human intervention (graves 137-9). It is not surprising that the inventories of some other closely neighbouring graves turn out to be anomalous, and it seems prudent to treat all such associations a priori as suspect. Indeed, the same scepticism seems appropriate for all those graves described by Ramsauer as 'very disturbed', whether the cause of disturbance is given or not.

After applying these various corrections and safeguards a few clear anomalies still remain unexplained (the iron key in grave 976, for example) and a definite element of unpredictable error must be conceded. Fortunately, the informal tests of consistency to be described below suggest that this is relatively unimportant.

Before discussing these tests and their results it may seem relevant to extend Wheeler's bones and flesh analogy a little further, and to consider the primary archaeological data from a site like Hallstatt as not only dry but unarticulated. Most, if not all, archaeological research requires a distinct stage of articulation between the raw evidence and an interpretation. This same stage may be seen in a slightly different guise as the middle ground between an excavation archive and the excavator's published summary. This middle ground is especially relevant nowadays when fewer and fewer primary data are being published and when their relegation to a 'computerized archive' seems to be the rule. It seems legitimate to relate analyses of the following kind to these general problems of presentation and publication. The articulation of the dry bones should reveal just the kind of structure that allows primary data to be compressed and summarized without distortion.

The first of these analyses was published some years ago (Barth and Hodson, 1976). Disturbed and closely neighbouring graves were ignored and counts of co-occurring types made for the remainder. Calculation of a simple coefficient of association

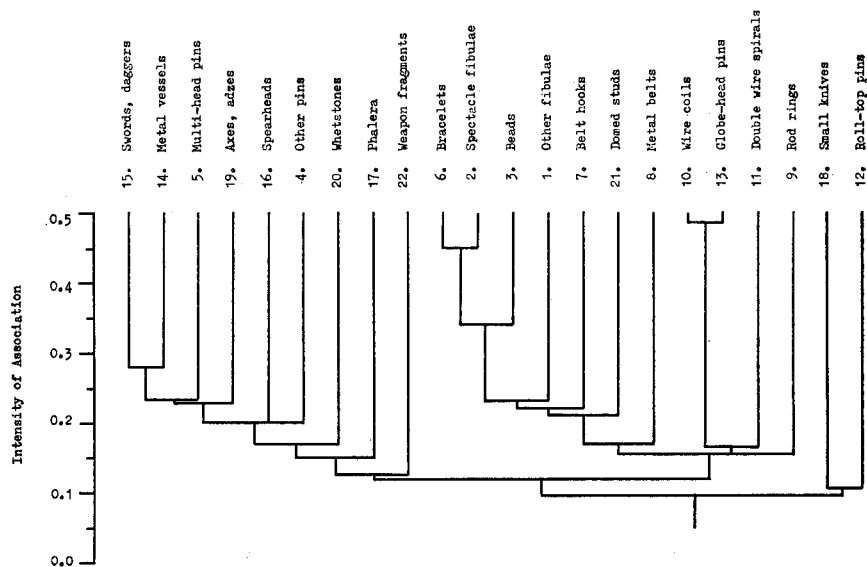


FIG. 1. Grouping of functional classes of objects in graves at Hallstatt (Barth and Hodson, 1976).

allowed a diagram to be constructed that expressed the overall relationship between the most common functional types. The skeleton here articulated (Fig. 1) reveals a clear, simple structure of two broadly distinct groups, and inspection of their make-up strongly suggests that these correspond to male and female grave goods.

This may seem an obvious result that would be clear without any need for quantification, and it was indeed approximated by Hoernes as early as 1921. However, this male/female dichotomy was not accepted by Kromer (1958; 1959) and there is no hint from Ramsauer that he recognized this fundamental patterning of the grave goods. This analysis, then, has confirmed one of two conflicting archaeological hypotheses. It has also shown that the Ramsauer archive is sufficiently trustworthy to answer important, general questions about Hallstatt and so further, more detailed research seemed justified.

A second series of analyses has consequently been performed to deal with the chronology of the cemetery. It is sometimes suggested that radio-carbon dating and dendrochronology have removed the need for the traditional methods of relative dating. This ignores the purpose of archaeological time scales, which is to provide dates not for artefacts or geological strata, but for archaeological assemblages and contexts which, if suitably defined

and interpreted, may be expected to have social, economic, and historical significance. A relative chronology of traditional form is of interest not merely for any time sequence which it may provide, but because it presupposes the classification of items and contexts into a framework that may in turn be translated into patterns of human development. Absolute dates are needed to calibrate such a framework, but absolute dates by themselves have no more than antiquarian interest. The ineptness with which relative chronologies have sometimes been constructed in the past does not invalidate the concept itself, but rather the methods that have been used. As in other aspects of archaeology, these methods have changed greatly over the past decades (cf. Hodson, 1980*b*).

This is not the place to discuss the mechanics of typology and seriation as they have evolved in the computer age, nor their detailed application to the Hallstatt cemetery, but Fig. 2 may be taken as a sample of the approach, since it bears on the general themes of this paper: on the validity of the Ramsauer archive and on methods for summarizing archaeological data for publication.

Fig. 2 compares two alternative sequences of the same set of stylistic types from female graves. The two sequences are obtained by dividing the total sample of relevant graves into two groups and performing a seriation on each group independently. The seriation procedure is mainly concerned with ordering graves, but an ordering of types is given as a by-product and since many types are common to both series, the two results may be directly compared. On Fig. 2 horizontal or near horizontal lines imply exact or close agreement between the two type sequences.

Many factors would be expected to cause the two series to differ: the irregular acceptance of new fashions within the original prehistoric community; confusion of grave inventories through natural and human disturbance; failure by Ramsauer to excavate and record surviving associations correctly; inadequacies of the specific seriation procedure followed. It is difficult to lay down rules for judging such an outcome (specifying a mechanical measure of correlation such as 0.58 for tau, the Kendall rank correlation coefficient, between the two series and suggesting that it is statistically significant do not really relate to the unusual background of such a comparison). Yet it is perhaps fair to conclude that the degree of agreement shown on Fig. 2 is surprisingly good, and that none of the expected distortions, including a possible Ramsauer effect, has proved serious.

A fresh aspect of the Ramsauer archive, the possibility of assigning objects to detailed stylistic categories beyond the general

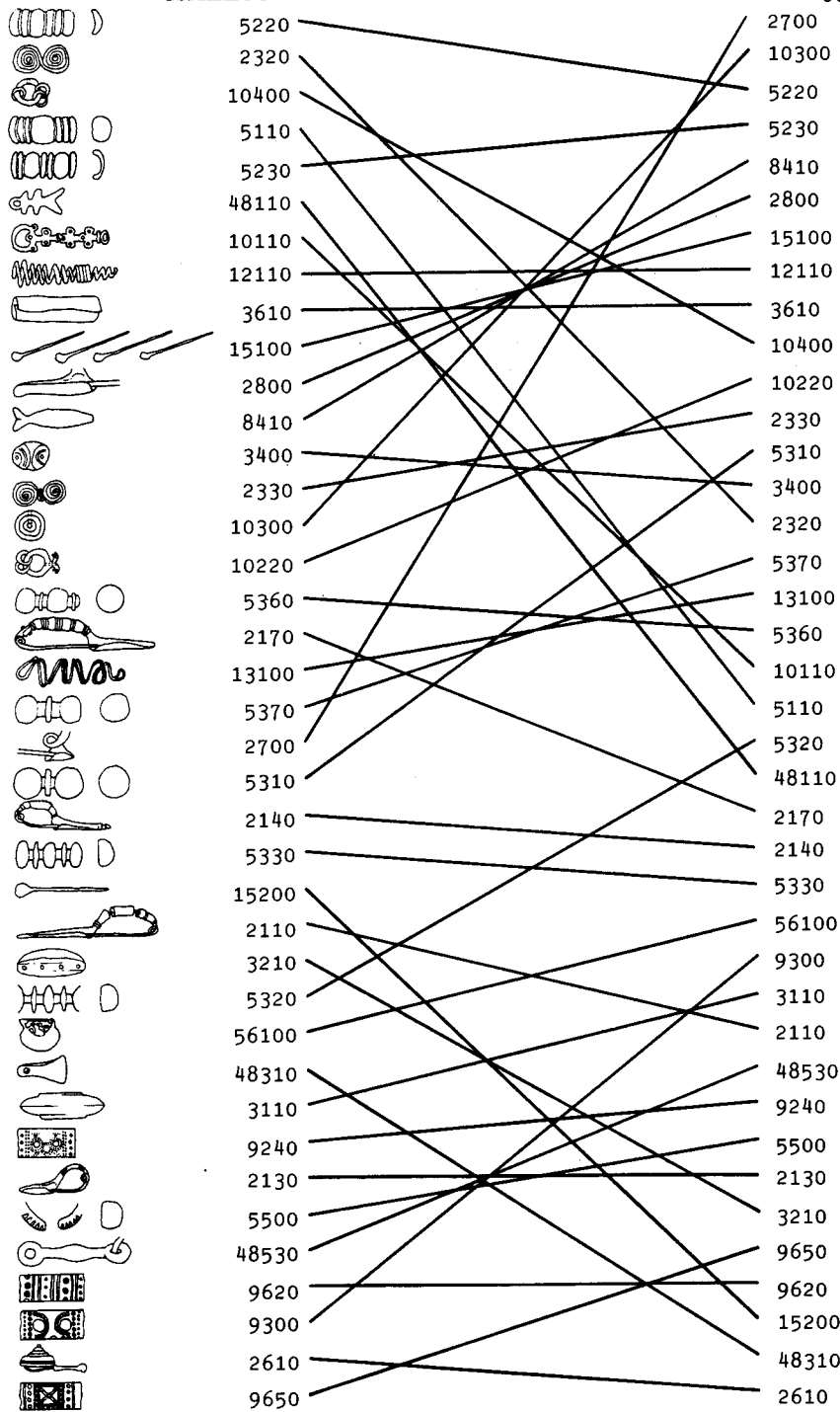


FIG. 2. Comparison between two sequences of types of object from female graves at Hallstatt. Each sequence is derived from a different sample of graves.

functional classes of Fig. 1, is thus established. In addition, the basis for deriving a minimal but strong relative chronology of female types is achieved. A much more detailed, although clearly less reliable, chronology may be, and has been produced by seriating the whole sample of female graves together.

Establishing a relative chronology for male graves and types at Hallstatt is far less straightforward, since the number of graves where more than one stylistically distinctive type of male object may be recognized is small, roughly 70 as against the 200 or so equivalent female graves. This disparity is largely caused by the preponderance in most male graves of iron tools and weapons, which were rather poorly preserved and not paid the attention which they deserved by Ramsauer, often being recorded merely as 'rusty iron fragments'. Splitting such a small sample of graves as this into two is clearly excluded, and the required check on the male sequence of types has to come from a less direct source: from the rather ill-defined horizontal stratigraphy of the cemetery (cf. Hodson, 1980a, figs. 1-5). At least this seems sufficient to validate, what has been disputed, the existence of distinct stages within the continuous development seen in the early phase of the cemetery (roughly corresponding to the seventh century BC).

A further, contrasting articulation of the Hallstatt evidence is required for studying the apparent variations in social status implied by grave contents beyond the initial distinction between male and female. This kind of archaeological analysis is less standardized than seriation and there is no agreed procedure for constructing status tables or diagrams from the contents of graves. I have attempted to devise a procedure which compresses all the available data into a summary for publication, but which at the same time helps to formulate and assess hypotheses about the significance of grave differences. The assumptions behind the procedure and a more detailed result for Hallstatt will be presented elsewhere (Hodson, forthcoming). Briefly, the approach has developed from a first attempt published in 1977. The main principle is to order functional classes of object into a status hierarchy according to whether they occur regularly in graves with few or many other functional classes. When added to their sex-linkage, this order for types suggests different ways to order graves. Fig. 3 illustrates one favoured method. It represents a sample of 100 graves taken at random from the total but listed in the order assigned to them by the full analysis. Following a different rationale from the 1977 version (Hodson, 1977), a grave is located within its sex-group first by the highest status type which

it contains. A secondary ordering is then provided by the sum of the other status types. The main sex groups appear in Fig. 3 in the order male, female, uncertain (a few graves with non sex-linked types), and mixed male and female. Additional information not used to order the graves (burial rite, likely quality of the grave as an association) has been added in the first columns of the diagram to assist interpretation.

For each of the two main series of graves, male and female, there appears evidence for a continuous, incremental pattern of progressive grave complexity. The contrast between levels of status at the beginning and end of each group is marked, but a steady progression from one extreme to the other is also clear. While it may prove difficult to justify splitting a continuum like this on numerical grounds alone (Orton and Hodson, 1981), qualitative arguments may be added and supported by independent evidence. For example, it is tempting to break the male series at a point where swords and daggers appear in graves, since they have stylistic, symbolic elaboration likely to mark prestige rather than utility. This point in the sequence turns out to be marked also by the independent evidence of burial rite: before this point inhumation and cremation ('I' and 'C' in Fig. 3) roughly balance out; beyond it cremation is all but exclusive. Within this higher status group there seem archaeological grounds for separating a final, élite series of graves (very poorly represented in this small sample) that are characterized by special symbols such as miniature axes with equine heraldry, hearth equipment, elaborate armour and also, apparently, some specialized craftsmen's tools. The males in three of these highest status graves (299, 504, 507) may have been accompanied by an actual or symbolic female attendant. If the graves without grave goods are taken as a first, lowest status group, then four grades of male status would thus be implied.

Similar qualitative arguments could be used to split up the female series also into four grades, the first with bracelets and/or fibulae but little else, the second with, in addition, such items as necklaces and belts with metal fittings. A third grade would be characterized by special symbols: head-dresses and a variety of symbolic jangles, and a final, small proportion stand out through having, as well as all these features, metal vessels (otherwise confined to male graves) and gold jewellery. Grave 505 (Pl. VI) would represent an extreme example of this élite female grade.

Less specifically this diagram may be taken to illustrate two stratagems by which Information Technology may help not only

to record and retrieve data, but also to produce an instructive summary for publication. The first stratagem is by simple ordering procedures to impose on an unstructured mass of material (here from 1,000 graves) a structure that has been engineered to correspond with a likely archaeological significance. The second stratagem is to sample from the total complex configuration so that the general structure is not only summarized by compression but made more obvious.

The choice of material to highlight in a publication is just as much a sampling problem as choosing an area to excavate or environmental material to analyse. Curiously, sampling schemes have been given great prominence recently in field research, especially random sampling which must often be quite inappropriate, but principles for sampling the recovered and recorded remains for illustration and publication, whether by a random or any other procedure, have been neglected.

In suggesting divisions within the status continuum of graves at Hallstatt I have already taken a step beyond the articulation of dry bones and provided some flesh. But the real flesh and blood of Hallstatt must involve not only the cemetery but the salt mine; unfortunately, the settlement of this period is notoriously elusive.

Since 1960 the Hallstatt salt mine has been the subject of a major research project of the Prehistoric Section of the Natural History Museum, Vienna, first under Karl Kromer and more recently under Fritz Eckart Barth. Work is still in progress, but Barth has provided a summary of recent work and a revolutionary but convincing interpretation of the early stages of mining at Hallstatt and their chronological relationship with the cemetery (Barth, 1983), and he has enabled Hallstatt to be related convincingly to its pan-European context.

Barth's most striking result has been to demonstrate two contrasting stages of early salt extraction. These are spatially distinct (a northern and an eastern group) and are characterized by contrasting ranges of equipment and clothing. But they also reveal different mining technologies. The northern group which is the earliest according to radio-carbon dates (Barth *et al.*, 1975) involves low, inefficient mining shafts better fitted for extracting ores from narrow seams than salt, while the later, eastern group has more appropriate, roomier galleries like that recently conserved in the Stügerwerk (Barth, 1982). It is only this second stage of exploitation that Barth relates to the cemetery. This interpretation is supported not only by radio-carbon dates, which have a rather large latitude for this period, but also by the first

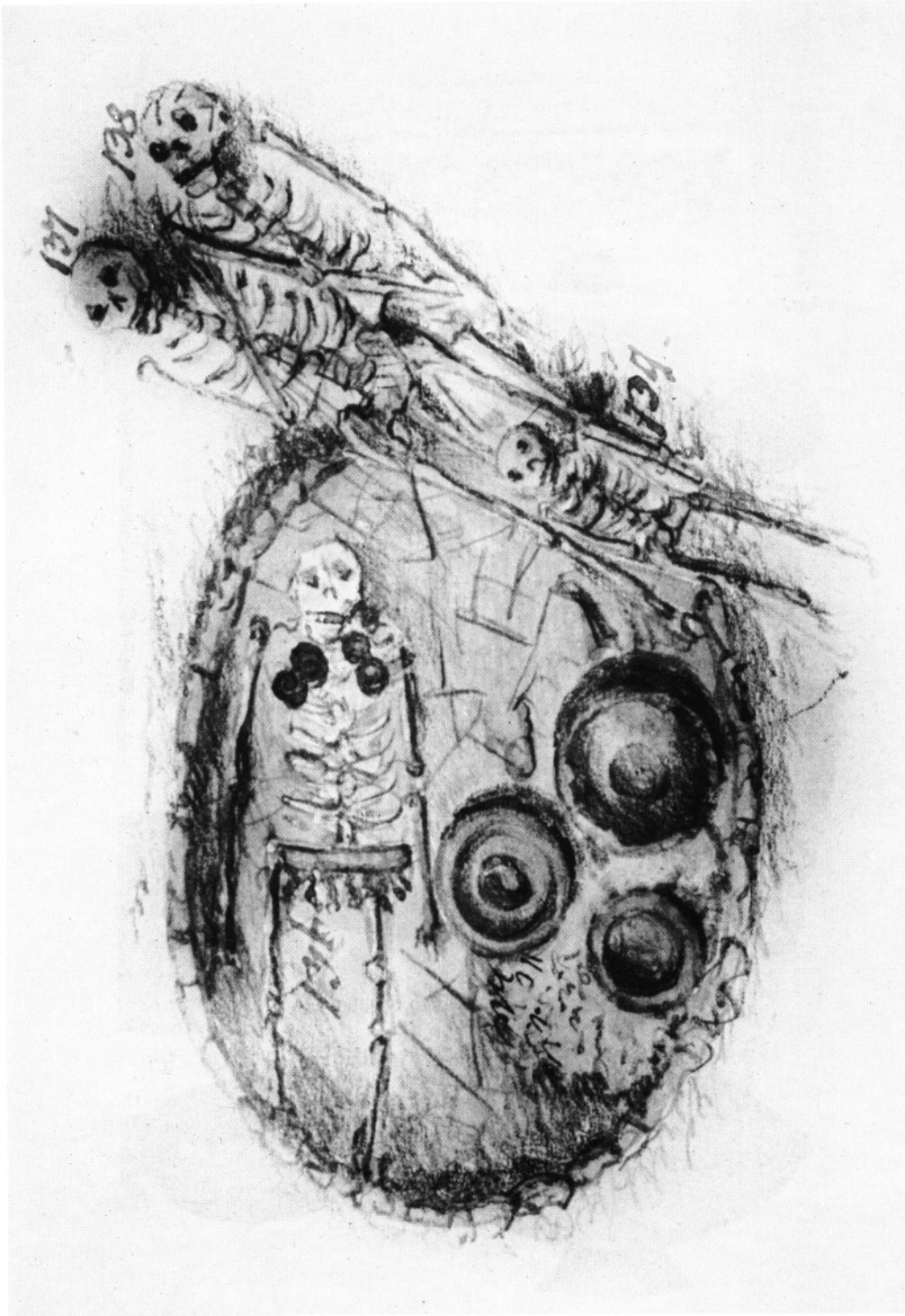
dendrochronological dates so far published from a major, comprehensive dating programme. Here, too, there are still some doubts about exact bridging of ring sequences for this period, but the most recently published correction would give dates of 727 BC for two samples and 731 BC for one sample (Hollstein, 1980; Pilcher *et al.*, 1984). On traditional archaeological dating, the earliest graves, such as 288 (Kromer, 1959, 82, pl. 46; cf. Fig. 4), would date from just about this period (Ha B 3).

Thus, a possible and perhaps a likely scenario for Hallstatt would be a first stage of salt mining with primitive, inappropriate techniques, possibly carried out by the same mining fraternity that exploited the copper ore seams of the Austrian Alps. The copper mining sites of the Late Bronze Age are well known (Pittioni, 1954, 523 ff.). None of them is associated with cemeteries that display signs of conspicuous wealth and distinction as seen in the Hallstatt cemetery, and the Hallstatt cemetery, as we know it, does not seem to begin in this context. The impression, on admittedly slender evidence, is of non-permanent, doubtless seasonal exploitation by groups perhaps engaged at the same time in transhumance, since a few contemporary scattered finds from the same general area, but away from the mines would relate (Abrahamczik, 1967).

The second stage of salt mining at Hallstatt represents a very different picture: a new and appropriate mining technology and evidence of a complex burying community with wide differences of status for males, females, and children. Evidence for seasonality of work in the mines is not yet available, but even if augmented seasonally, it is difficult to consider the buried at Hallstatt as a small, impermanent group of non-specialists.

The earliest graves in the cemetery, both male and female, already demonstrate a range of social status and the widespread contacts that characterize the cemetery at its most developed. Grave 288 just mentioned (Fig. 4) already represents a male of no mean status with two swords and paired discs from armour of a type recognized, although not at Hallstatt, by Schauer (1982). This important grave has led to confusion since it contains some material that is patently late (animal fibula, rod-link chain with danglers, bracelet), but these are all female types and doubtless belonged with the decorated pottery to an unobserved, shallower secondary burial two centuries or so later than the 288 cremation.

This warrior's grave and some early female graves with large quantities of amber suggest a qualitative change in society and economics accompanying the change in mining technology. This



Hallstatt cremation grave 135 (not labelled) and inhumation graves 136-9 (plate II of the 'London Protokoll').



Contents of Hallstatt cremation grave 505 (plate XX of the 'London Protokoll').

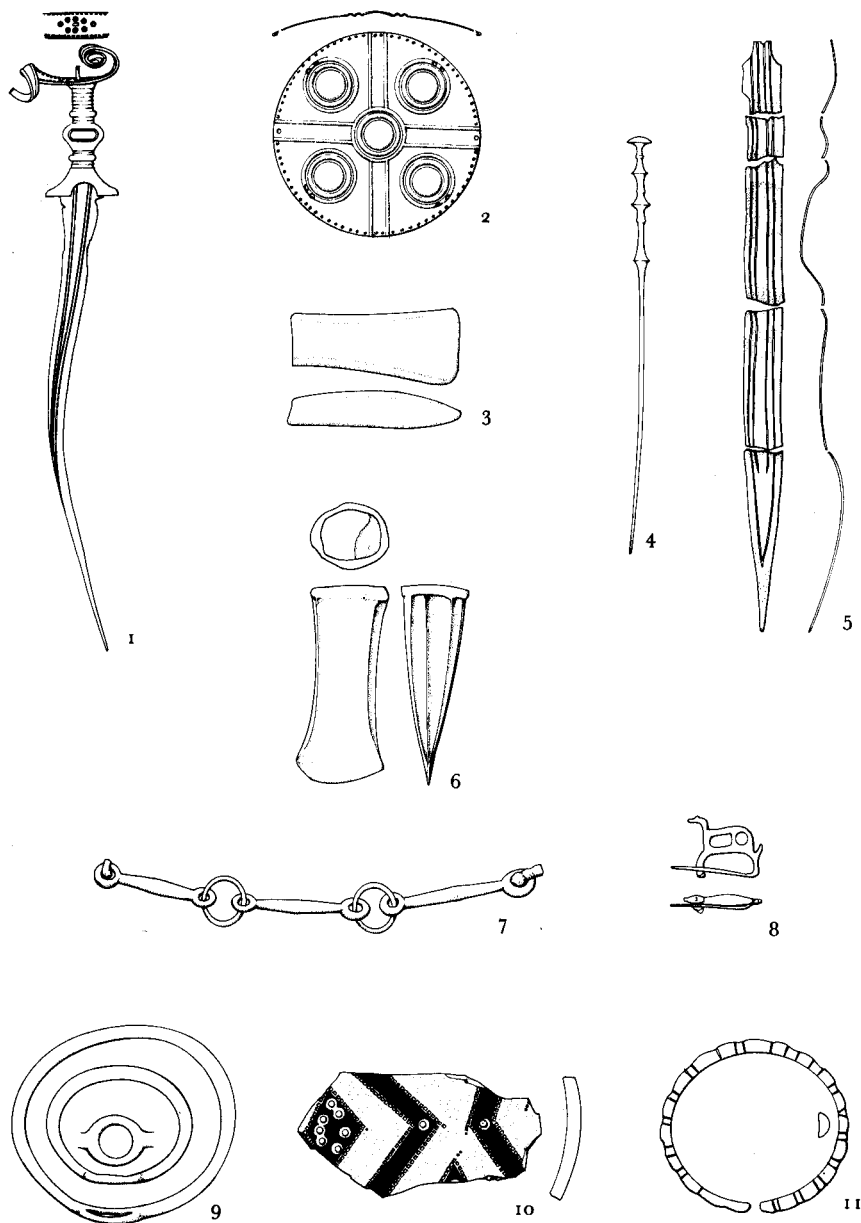


FIG. 4. Hallstatt, grave 288. 3, stone, 7, bronze and iron, 10, clay, the rest bronze. Scales: 1 and 6, 1:6; the rest, 1:3. 1-6 could represent an early, male cremation; 7-11 could be intrusive (see text).

development on both fronts should date from the eighth century BC or at the latest from the early seventh.

A similar major change in the pace and nature of prehistoric development has been documented further west than Hallstatt at settlements, 'Fürstensitze', like Heuneburg and Mont Lassois, and in graves, 'Fürstengräber' like Hochdorf and Vix. Here too there is evidence for an increasing exploitation of raw materials, for wide ranging contacts and trade and for a marked social hierarchy (Frankenstein and Rowlands, 1978; Frey, 1980; Biel, 1982; Härke, 1982). In this west Alpine zone these changes are generally considered to have taken place in the sixth century BC and to have been stimulated by Greek enterprise at newly founded Massilia.

At Hallstatt there is good evidence for an equivalent change in economy and society: more long range contacts, increasing importance of the control of raw materials and a marked hierarchy in grave furniture, but here the changes take place a century or more before the foundation of Massilia in 600 BC.

It would be unrealistic to propose alternative facile explanations, for what is clearly the result of many complex, interacting forces, but two provisional conclusions may be drawn. First, in studying the major changes that took place in temperate Europe at the beginning of the Iron Age and that provide the background to what is generally thought of as early Celtic society, far more attention must be paid to some of the central and eastern Alpine groups. Second, in studying these areas, Hallstatt and Ramsauer must be brought back from the periphery of archaeological interpretation and reinstated at the centre.

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