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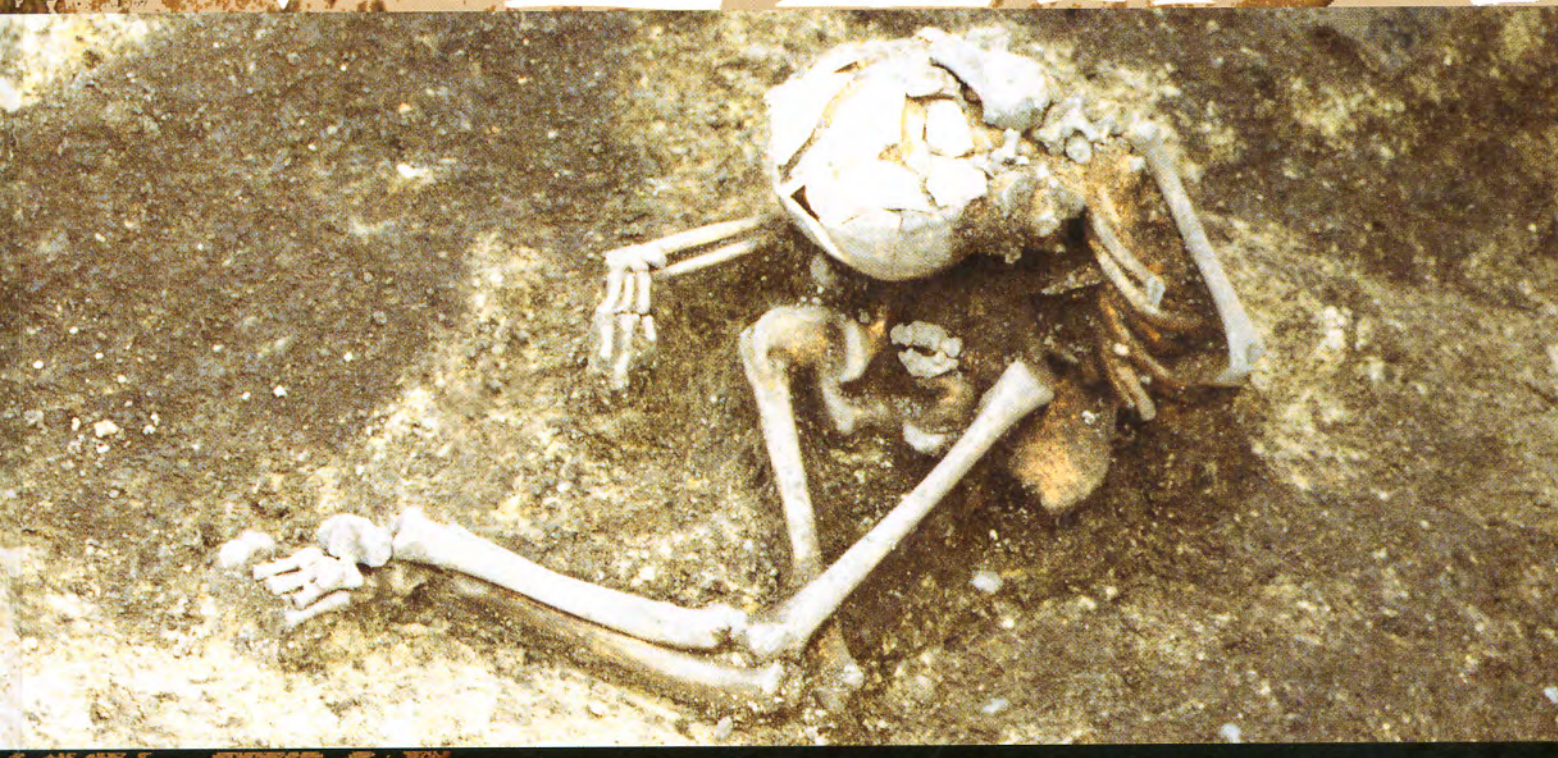

VIOLENCE AND DEATH IN BRONZE AGE BOHEMIA

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VELIM

VIOLENCE AND DEATH IN BRONZE AGE BOHEMIA

The results of fieldwork 1992-95, with a consideration of peri-mortem trauma and deposition in the Bronze Age

by

Anthony Harding
Radka Šumberová
Christopher Knüsel
and Alan Outram

With contributions by Carol Palmer, Stephanie Knight, David Dungworth and Robert Shiel

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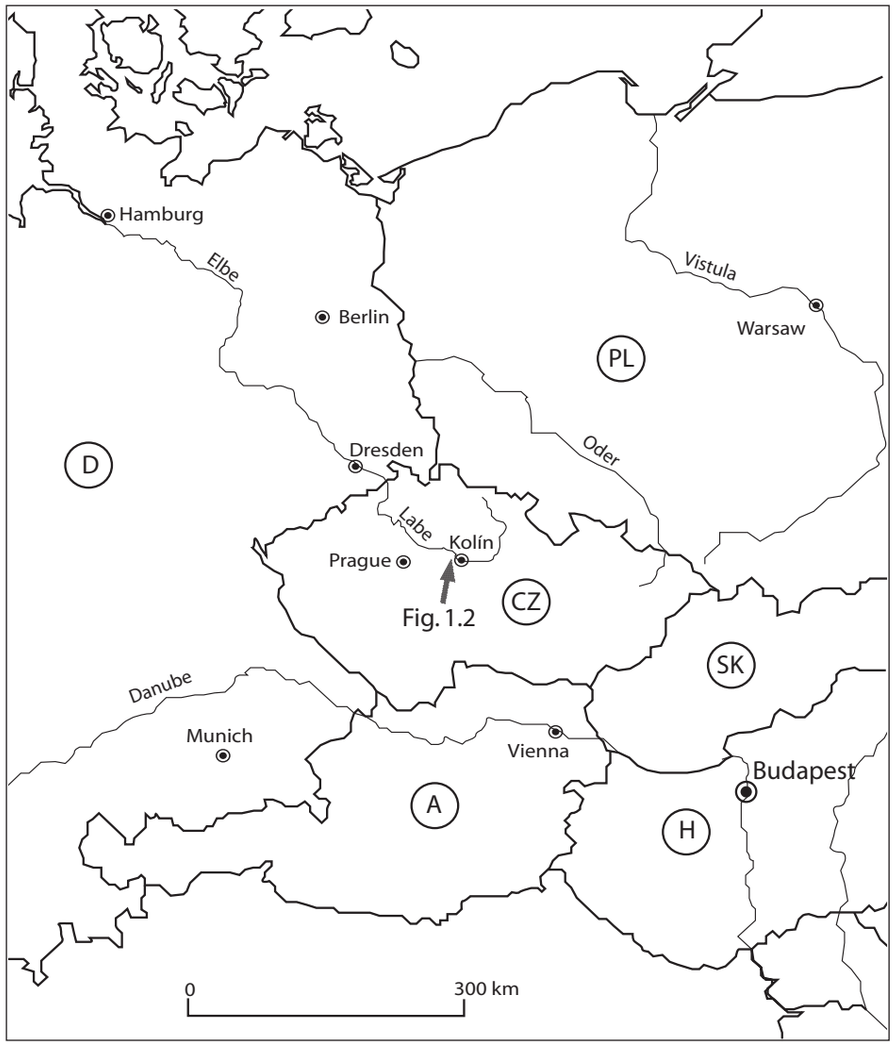
The finds drawings were originally done in pencil on location, the majority by Harding, and subsequently inked in by a team under the supervision of Sandra Rowntree. Without their enthusiastic help the task would have been much harder and we offer our thanks to all the group.

The finds and site archive will be deposited in the Kolín Regional Museum, and the electronic archive with the Archaeology Data Service. This includes the context and finds databases, the geophysical survey data, and electronic versions of the text and illustrations.

Chapter 1. Introduction

Velim is a village in east-central Bohemia, around 60 km east of Prague and 5 km north-west of the industrial town of Kolín, the regional centre and seat of the district administration (Figs. 1.1; 1.2).[1] Still preserving its medieval core, including the fine Gothic church of sv. Bartolomej (St Bartholomew), Kolín was the home town of one František Dvořák, doctor of medicine and notable archaeologist of the Kolín region.[2] It is to Dvořák that we owe much of our knowledge of the early history of archaeological investigation at the site of Skalka, the subject of the present work. In recent times, Velim, or more particularly that part of it known as Dolní Nouzov, has been home to a factory producing confectionary, the largest employer in the village (now owned by Nestlé). The village lies on the main railway line east and south-eastwards from Prague, in the direction of Brno and Olomouc, and on the secondary roads connecting the nearby villages to the regional centre of Kolín.

Fig. 1.1. Location map showing the position of Kolín in central Europe



Skalka, where the Bronze Age site lies and the subject of the present report, is a low hill, rising some 10 m above the flood-plain of the Labe (Elbe), and lying on the eastern edge of Velim, close to Dolní Nouzov (Fig. 1.3). The hill is a Cretaceous formation, and consists of an underlying rock formation of mica schist and gneiss, which outcrops in various places where the overburden has been removed, overlain by marl, gravel and sand with a loess topsoil. The gneiss was until recently exploited in the quarry to the south-east, which is where early finds were made and which has destroyed a significant part of the Bronze Age site. This quarry began work in the middle of the 19th century and was operating until the early 1990s. Old photographs (republished

1 Velim lies in okres Kolín, středočeský kraj (district Kolín, central Bohemian region).

2 Dvořák was born in the nearby village of Červené Pečky in 1896 and also lived there when he practiced as a doctor, from 1923 to 1941. Following his arrest in 1941 he was imprisoned and then executed by the Nazis for "high treason" in Dresden in 1943. Obituaries were written by, among others, Jan Filip (Filip 1936/46), and a memoir of his life was published by Ladislav Jouza in 1996 (Jouza 1996). His tragically early death at the age of 47 robbed Czech archaeology of one of its leading lights, and the investigation of Velim-Skalka of its main protagonist. His activities added enormously to the archaeological collections of the Kolín Museum in the 1920s and 1930; in addition to Velim he excavated the well-known sites of Polepy and Hradenín, among many smaller excavations.

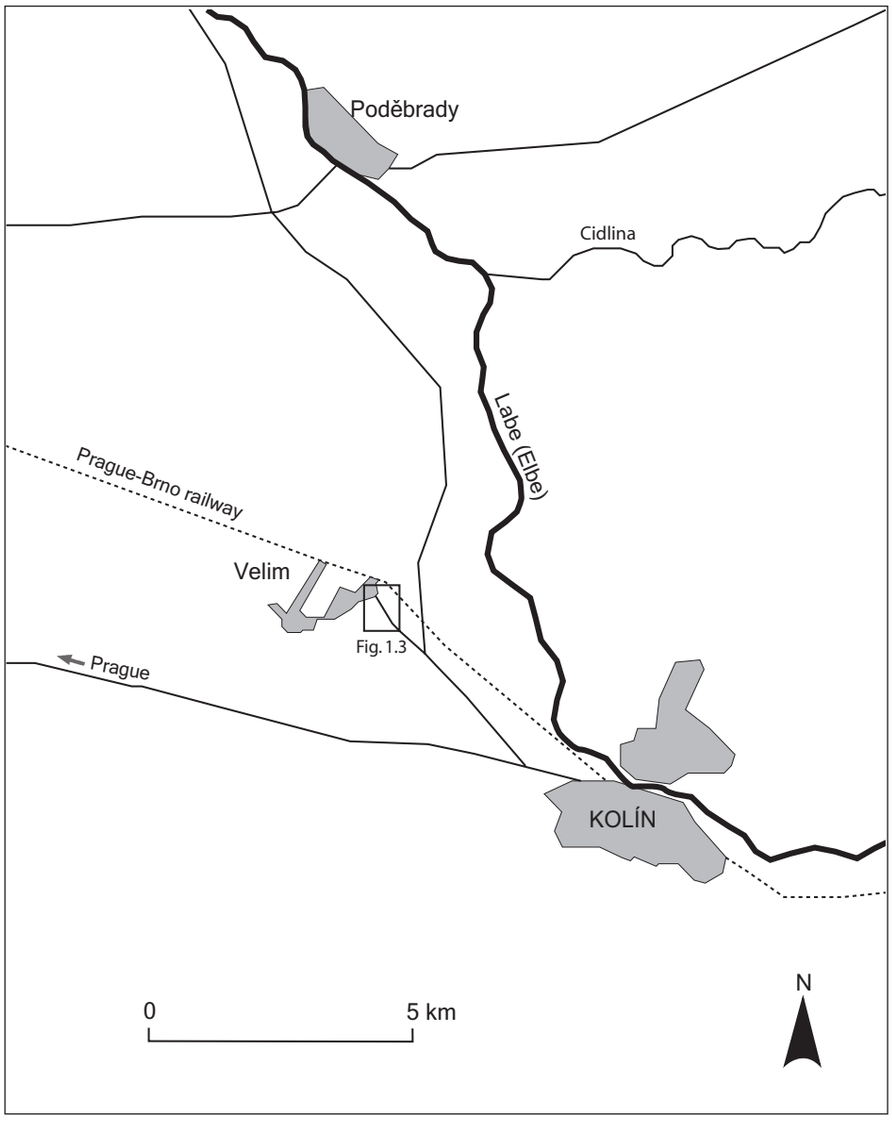


Fig. 1.2. Location map for Velim in east-central Bohemia

in Hrala *et al*. 2000, 261) show fingers of rock protruding from the edge of the quarry face, suggesting that the area was a notable landmark in earlier times. Today, however, the site as seen from the fields below does not look remarkable in any way. The quarry is disguised from view by trees and only becomes apparent when one walks uphill from Velim in a south-easterly direction, or travels along the Kolín road towards the village of Nová Ves I.

Skalka hill represents the first terrace of the Labe flood-plain of the Labe (Elbe),, which the river today lies lying some 2 km distant but at various times in the past has flownrunning closer to nearer the site (cf Chapter 1100). It is striking that Skalka, at around 210 m above sea level, is by no means the highest ground in the vicinity. One kilometre to the south lies the hill of Bedřichov, which rises to 232 m asl and overlooks Skalka; further south again the ground rises further, to reach some 330 m asl on the heights at Křečhoř from where in 1757 Marshall Daun commanded the Austrian army at the battle of Kolín, and where today the monument to the battle stands. The relatively insignificant height on which the site of Skalka lies is a matter to which we shall return in the discussion of the function of the site (below, Chapter 109). The areas which are the subject of this account lie on the northern extremity of the hill, where the ground slopes down towards the village of Velim. Survey work by both the Czech and the British teams and by Czech colleagues has shown, however, that the site as described here lay at the centre of a much bigger establishment, to which its relationship is unclear-known (see Chapter 30).

A full account of early work at Velim is unnecessary since several versions, two of them in English, have already been published (Hrala *et al*. 1987; 1992; 2000). We may briefly recapitulate the main points. The site came to prominence in 1885 when a hoard of gold spirals was found in a pot by an agricultural worker near the quarry. Another hoard was discovered by children in 1909, consisting of golden spirals, a bronze axe, an anvil, and three two-part moulds. In 1923-24, František Dvořák conducted excavations at Skalka, recovering pottery and bone that remains to this dayis still on display in Kolín Museum, and which gave its name to the "Velim type" of pottery that showed clear similarities to late Tumulus forms. A third gold hoard was discovered shortly afterwards. In 1947 and 1948, two short campaigns of excavation were conducted by Václav Spurný from the Institute of Archaeology in Prague, with the aim of assessing the Dvořák work and establishing the character and importance of the site. This work was short-lived and unfortunately never published.[3] Following this, the northern slope of the hill was used as a military training area. Wooden barrack blocks were built on the level ground at the foot of the hill, with a football pitch adjoining; the hill

3 A short memoir was published in 2002 (Spurný 2002).

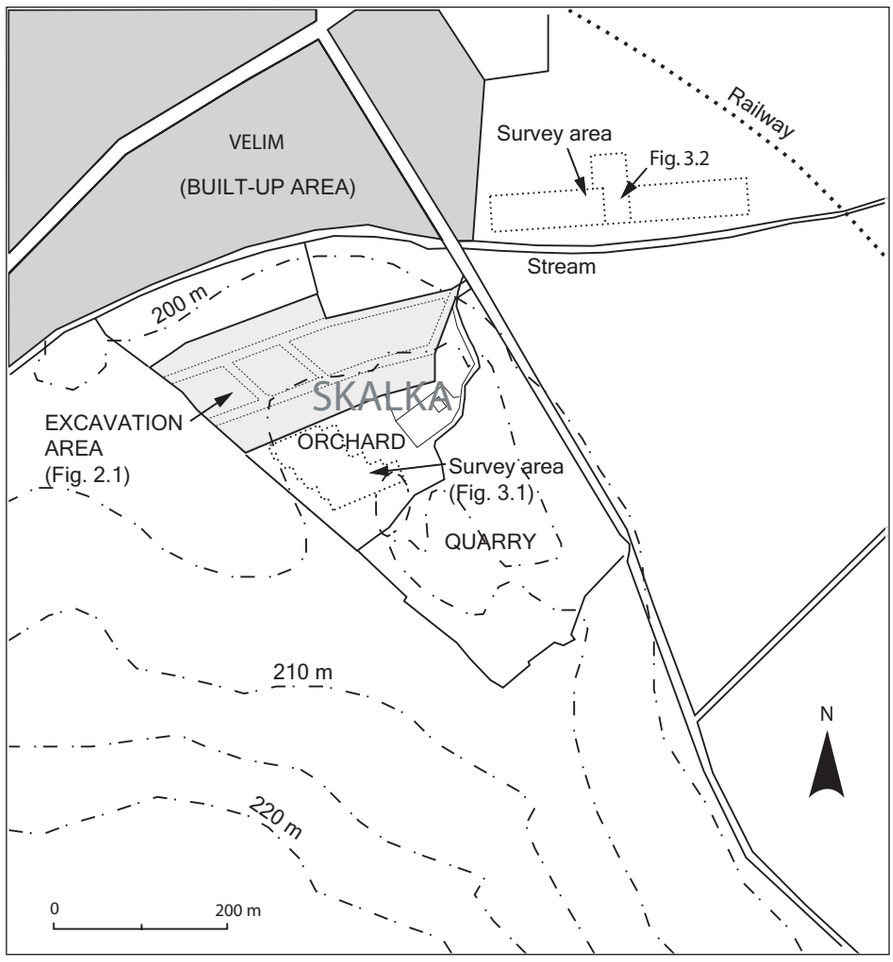


Fig. 1.3. Skalka hill showing excavation and survey areas discussed in this report

itself was used for practice trench-digging, so that no archaeological work was possible. It is quite clear, however, that tThese trenches cut straight through the archaeological deposits, and must have disturbed numerous features including deposits of human bone. In the archaeological work that has taken place since 1984, the signs of military activity are everywhere, usually in the form of trenches filled with rubbish of various kinds (metal objects, asbestos, wood etc)..

Spurný, with Zbyněk Sedláček of Kolín Museum, conducted a further small excavation in 1974 following the chance discovery of human bones and pottery, and at various times other finds of pot and bone were made and reported to the Museum. The character of the site remained essentially unknown, though it was clear that there were numerous finds of human bone, which, taken with the gold and bronze hoards and the specific pot forms, suggested that the site was a cemetery of the latest Tumulus period.

In the early 1980s, the local mayor was instrumental in getting the Skalka hill designated as an area for housing development – which in the event turned out to be owner-occupied self-build development, the plots being sold off to individual buyers. In spite of representations made by the Institute of Archaeology, it proved to be impossible to reverse this decision and rescue excavations began in 1984. These were initially on a fairly large scale, with teams of students and summer "brigade" workers numbering up to several score. The work was directed by Jiří Hrala and Miloš Vávra of the Prague Institute of Archaeology, with Zbyněk Sedláček of Kolín Museum. The overall direction was in the hands of Hrala, as the senior partner, with Vávra running the day-to-day excavation work and Sedláček providing back-up from the Museum.[4] Work continued in this fashion all through the 1980s, but by 1990 the strain on resources was beginning to tell, and although much had been achieved, the site's enormous scope meant that huge amounts of archaeology remained untouched, while the plot owners were keen to start or continue building their houses. At the same time, financial resources were becoming stretched, with the government reluctant to give more money to pure research institutions such as Institutes of the Academy of Sciences, and the old-style "permanent" excavations conducted by the Institute, with staff spending months at a time in the field on a single site, becoming harder and harder to sustain.

With the change of government of 1989, and the consequent removal from office of the then Director of the Archaeological Institute, changes began at Velim. The newly elected Director, Evžen Neustupný,

4 Jiří Hrala died in 2002 at the age of 71, while still employed by the Institute of Archaeology. His kindness and scholarship were a constant source of inspiration to all who took part in the Velim excavations. We express our gratitude here, and our sorrow that we have not been able to bring the Velim work to completion at a time when Hrala could have seen and approved the outcome.
Vávra transferred in 1994 to the newly formed Ústav archeologické památkové péče středních Čech, which still enables him to attend Velim from time to time when chance discoveries are made. Sedláček left the Kolín Museum in 1993 and has taken no further part in the work.

decided that work had to be speeded up, and invited the present author to bring a team of students from Durham University to take part in the work. A short season was conducted in 1992, but this consisted of little more than cleaning up trenches already opened by the Czech team, though this was useful in familiarising the team with the site, the pottery fabrics present, and the recording system to be adopted. Effectively the only new work conducted was the section across the supposed extension of the Red Ditch northwards in Sonda 24/27.[5] After this somewhat unpromising start, however, larger-scale work was conducted in 1993, 1994 and 1995, with a much freer hand being allowed, though given the size and complexity of the features encountered this never achieved the scale that had been originally intended by Neustupný. Quite simply, in order to excavate just one of the Velim pits scientifically and with due regard to stratigraphy, around four people would be needed to dig continuously for ten weeks or so; and there are dozens, probably scores, of pits on the site. In the meantime, in 1993 another new Director of the Archaeological Institute, Petr Sommer, was elected; in that year an official contract of collaboration was signed between the Institute and Durham University.

Also in 1993, Dr Radka Šumberová joined the team, initially as a research assistant paid by the Durham Department of Archaeology, later as a permanent employee of the Institute of Archaeology responsible for the Bylany research centre. Šumberová has had special responsibility for the finds from Velim, both from the earlier Czech excavations (Šumberová 2000) and from the British work (below, Chapter 45). This work she has conducted while at the same time carrying on the Institute's work in rescue archaeology in the Kutná Hora – Čáslav region, and running the Institute's bases in both Bylany and Kutná Hora.

Excavation work by the British team concluded in 1995, and the post-excavation work started. No detailed provision had been made originally for this, though a subsequent application to the British Academy for post-excavation assistance was successful, and enabled most of the site drawings to be completed in 2002-3. Although computer databases were used from the beginning in the recording of finds and contexts, various other modern aids were not readily available in the early 1990s; added to which help with various categories of work were always intended to be the responsibility of the Czech side. Thus no detailed site survey was undertaken, because one already existed; no provision was made for the examination of human and animal bones, given that these had already begun under the direction of Marta Dočkalová; and no conservation needed to be implemented since the Institute of Archaeology had sufficient resources for the small number of finds requiring it. In the event, things turned out rather differently. It proved difficult to tie in the British trenches with the original Czech survey, since several of the datum points were no longer visible. The trench plans are therefore illustrated on the basis of the site grids established at the time. Finds were processed as the excavation went along; all pot was washed, marked and bagged, and an initial listing of form made (see Šumberová, Chapter 400 below). Given the long lead-in time for the bone to be examined, alternative arrangements were put in place, greatly assisted by the fact that in 2002 an application to the Leverhulme Trust by Alan Outram, Christopher Knüsel and the author was successful: this project was to examine peri-mortem trauma on human and animal bone, with the purpose of creating a protocol for establishing how intentional butchering of human bodies might be recognised. This project involved cataloguing and examining all the recovered bone from the British trenches (all that was available; some was never rediscovered), so that bone reports were relatively simple to assemble.[6]

In 1993 a modified Siraf flotation tank was set up on site and used for screening soil samples from a variety of contexts in the 1993-95 seasons. The quantity of plant remains recovered was extremely small, and even from recognised pit or floor deposits no significant remains were found. A pot in Feature 64 contained a deposit of millet, the only such discovery (cf below, p. 00).

In 2000, the Czech team published some of the results of the excavation work that had been conducted up to 1995 (Hrala *et al*. 2000). This report is notable in that it includes the last words that the late Jiří Hrala had to say on the form and function of the site. It includes a long report on the pottery by Radka Šumberová, and a partial report on the archaeological features by M. Vávra, as well as appendices on the human and animal bone (from certain features only), the geophysical work conducted by Antonín Majer, and air photographic reconnaissance by Martin Gojda.

The present account is to be considered complementary to this 2000 report (and the earlier short account in *Památky Archeologické* 83, 1992). A few remarks are, however, necessary about what is and

5 Even this work, which took place under difficulties caused by the parched conditions and consequent lack of visibility of features, was compromised by the disappearance prior to the 1993 season of the trench plan, which had been left for safe-keeping with the other plans produced by the Czech team.

6 By agreement, and in the expectation that it would be studied in Brno, the bone from the British excavations was taken to the Anthropos Institute, Moravské Museum, Brno. Having been accessioned into its collections, access to the material then became more difficult. In order for the British team to study it subsequently, application had to be made in 2002 for it to be brought back to the Bylany research station. It was evident, however, that a number of bone groups, notably skulls, were not present and apparently could not be found, but neither were they present in the on-site store at Velim or the stores at Bylany. After study the bone was returned to Brno. We are grateful to Dr Martin Oliva for his help in this matter.

what is not included here. A full understanding of the Skalka site was always going to be unlikely at the end of the twentieth century, given that so much had been destroyed – by quarrying, sand extraction, and military activity – before serious excavations began in 1984. It was our original hope that the Czech and British excavations since 1992 could be included in one single report which might have shed light on at least some aspects of the site which were hitherto unclear. Unfortunately, in the event this goal was not possible. The complexity and quantity of the features made the task of writing up a daunting one, and the reorganisation of rescue archaeology in the Czech Republic in 1993/4, meant that resources were no longer available for the extensive task of post-excavation on the archives and finds emanating from the Czech trenches. Annual reports were written by the Czech excavators and are available for consultation, but it must be pointed out that these are concerned with the detail of individual features and not with the overall picture. They are illustrated with photographs but not with plans or section drawings, which might elucidate important details of feature function and history. While it might theoretically have been possible for the British team to engage with these reports, with a view to including them in this account, in practice such a task was far beyond our resources, and in any case only the excavator could realistically undertake it. Dr Miloš Vávra holds the key to much of the site's history, and only he can resolve some of the issues that are highlighted here. It is to be hoped that resources will eventually be made available to enable him to spend the necessary time on the production of a full and systematic account.

By comparison, the British trenches were more modest in extent and the task – although by no means easy – was at least manageable in size. The recording methods adopted (single context recording, combined with daily diaries giving an overview of each whole trench or area) also meant that the records were relatively easy to interrogate. An account of the excavation of each area worked on in the 1992-95 excavations is included here, with enough trench drawings to make the overall situation clear. The remainder are to be found in the archive report, lodged with the Institute of Archaeology. The site archive, along with the finds, is to be deposited in Kolín Museum, and the electronic records made available through the Archaeology Data Service.

It is a matter of regret that a single site report was not possible, and it has to be admitted that the results of the excavations reported here can only cast partial light on the complex practices that were adopted in Bronze Age Velim. On the other hand, the detailed analysis of human and animal bone, and the detailed recording of at least some of the site's features, will, it is hoped, contribute more than a little to an understanding of Skalka and ritual practice in central Europe at the close of the Middle Bronze Age.[7]

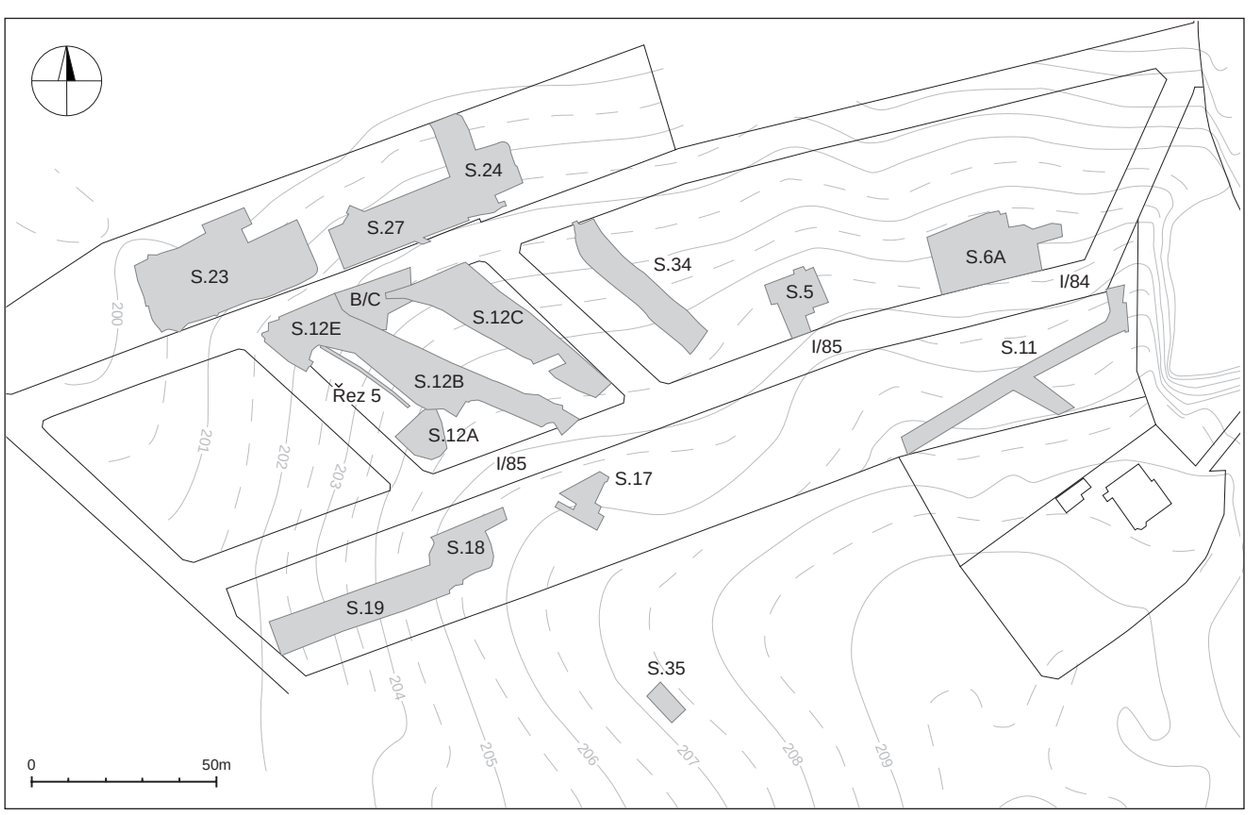
7 It is necessary to record here that the published interpretive plans, in Hrala *et al*. 1992, and Hrala *et al*. 2000, are based on a reconstruction of the site which supposes that ditch-like features ran continuously round the northern slope of the hill. Exposures in different trenches, dug at different times and by different methods (e.g. by bulldozer), have been assumed to tie up in a logical fashion, thus giving continuous ditch circuits. It is evident from the work reported in this volume that these assumptions are not necessarily justified, particularly as the ditches were for the most part collections of pits and – with the main exception of circuits G and H (the Red Ditch) – not true ditches at all. Caution should therefore be exercised in using the published reconstruction plans, and the published statements should always be checked against the actual trench plans and sections.

Chapter 2. The excavations of 1992-95

INTRODUCTION

The area of Skalka hill that is known to contain the archaeological features of interest covers a little over 3 ha, measuring around 270 m east-west by 120 m north-south.[1] This is the part of the hillside that is bounded on the south by an orchard (that terminates in the quarry), on the north by the barracks buildings and football pitch, on the east by a 1920s house, approach road and small quarry, and on the west by open fields (Fig. 1.3). This is the area that was designated for housing development, and during the work in preparation for this it was criss-crossed by concrete slab roads and divided into house plots,[2] with services being added as the work proceeded. The work between 1984 and 1992 concentrated on investigating each area in turn before destruction, starting with the lines of the roads, and moving on to particular plots that were scheduled for the earliest house-building. Thus Sonda 1/84 and 1/85, which produced many of the early surprises in the form of metal hoards and finds of human bone, was a long narrow trench following the line of the southern site road, and hit the inner ditch line with accompanying palisade (Fig. 2.1). Subsequent trenches were either placed on the site of particular plots, or were machine-cut slit trenches to pick up the lines of presumed ditches or other features, when time and money did not permit proper excavation.

Fig. 2.1. Position of trenches (Sondy) within the excavated area of Velim-Skalka



1 The orientation of the two main roads across the site is actually ENE-WSW rather than E-W. During the excavations, "trench north" was regarded for the sake of convenience as lying in the direction of the football pitch, but was in reality north-west. The correct orientation is reflected in the plans published here, but the site diaries, included in the archive, often refer to "north" meaning "trench north".
2 "Parcels", *parcely* [= German *Parzellen*].

By 1992, a large number of separate trenches (sondas, or correctly, *sondy*[3]) had been opened, and excavated to some extent. Relatively few had been dug fully or even extensively. Sonda 14, in east part of the site, produced the postholes of a presumed rectangular building, with the line of the palisade circuit running through it. Feature 27 in Sonda 17 was an enormously deep and complex multiple pit, from which the burial of the "Golden Lady" had come. Feature 30 in Sondas 18 and 21 contained a series of human skeletons lying in disorder. Features 45 and 45A (Ditch Circuits G and H, the Red Ditch) were exposed in a number of trenches, but particularly in Sonda 19, on the west side of the site. Sonda 23, on the north-western periphery of the site, produced multiple lines of post-holes. All these trenches can be located on the plans published in the preliminary reports by the Czech team.

It is necessary to record here that the published interpretative plans, in Hrala *et al*. 1992, Hrala *et al*. 2000, and elsewhere, are based on a reconstruction of the site which supposes that ditch-like features ran continuously round the northern slope of the hill. Exposures in different trenches, dug at different times and by different methods (e.g. by bulldozer), have been assumed to tie up in a more or less logical fashion, thus giving continuous ditch circuits. It is evident from the work reported in this volume that these assumptions are not necessarily justified, particularly as the ditches were for the most part collections of pits and – with the main exception of circuits G and H (the Red Ditch) – not true ditches at all. Caution should therefore be exercised in using the published reconstruction plans, and the published statements should always be checked against the actual trench plans and sections – where these are provided.[4]

At the time of the start of the British excavations in 1992, fairly extensive information was available about the southern and eastern parts of the site (Sondas 1/84 and 1/85, 8, 14, 17, 18, 19, and 21), with some knowledge of the north-western area (Sondas 23 and 24). The central part of the site had, however, mainly been investigated by small cuts, many of them machine-dug, and large parts had not been explored at all. It was to this area that our attention turned from 1993 to 1995. It was here that Sondas 12 and 34 were situated, and where the bulk of the British work took place. Much of this central area east of Sonda 34 was already inaccessible by the time our work began in 1992, and only small cuts carried out in advance of the plots being released for building had been made. These interventions were recorded faithfully by the local team and the results are accessible in the annual reports that were made each season. Because of the small scale of the work, however, little can be said about their overall contribution to the nature of the Velim site.

The location of the trenches (Fig. 2.1) was to a large extent determined by factors other than archaeological. Piles of concrete slabs for temporary roads, metal cylinders intended for septic tanks, and large mounds of topsoil, lay in many positions that would have been ideal for excavation, and in only a few cases was it possible to move them. This explains the gaps in the plan between Sonda 12B and 12C, for instance. It was thus to some extent inevitable that any investigation, particularly one carried out in a limited summer season, would answer some questions but leave many others unaddressed.

THE EXCAVATION BY SEASON

1992:

Sonda 19: the previously excavated section through the outer fortification circuit (Circuits G and H in the terminology used in Hrala *et al*. 2000), along with the smaller ditch features lying inside it, was examined. The section walls were cleaned up and drawn.

Sonda 24/27: an area north-west of the main site was opened up and a section dug through the presumed continuation of the outer fortification circuit (Ditches G and H). At the same time the area to the east of this section was cleaned off and various pits and the stone footings of post-pads noted. The trench plan of this latter area was apparently mislaid in the winter of 1992-93; the general situation is that published by Vávra (2000, Plan 1), which shows an abundance of post-holes but not the post-pads.

1993:

Work was concentrated in the western side of Sonda 12, later known as 12B. The available area of 12B was stripped, and excavation was concentrated on the complex groups of pits and ditches in the centre of the trench, the Red Ditch as exposed in this area, and the pits that lay outside it (to the north-west), later known as Sonda 12E. A start was made on excavating Objekt 64, towards the south-eastern end of the trench, where a machine-cut excavation had previously occurred.

3 English "trench" and Czech "sonda" are not exactly equivalent but can be regarded as being so in what follows. Similarly English "feature" and Czech "objekt" are essentially the same for present purposes, though "objekt" would typically be used for rather more obvious elements than would the neutral term "feature". "Context" and "kontext" are identical, though the notion of the "context" as used in British archaeology was not at the time familiar in Czech archaeology, where digging was either stratigraphic (by identified layers) or by means of artificial spits. The Czech excavations at Velim used a system of numbering that identified features (objekty) in a unique sequence, and within them, layers (vrstvy).

4 It is a matter of regret that the published accounts include very few plans and section drawings, though these exist and are of high quality.

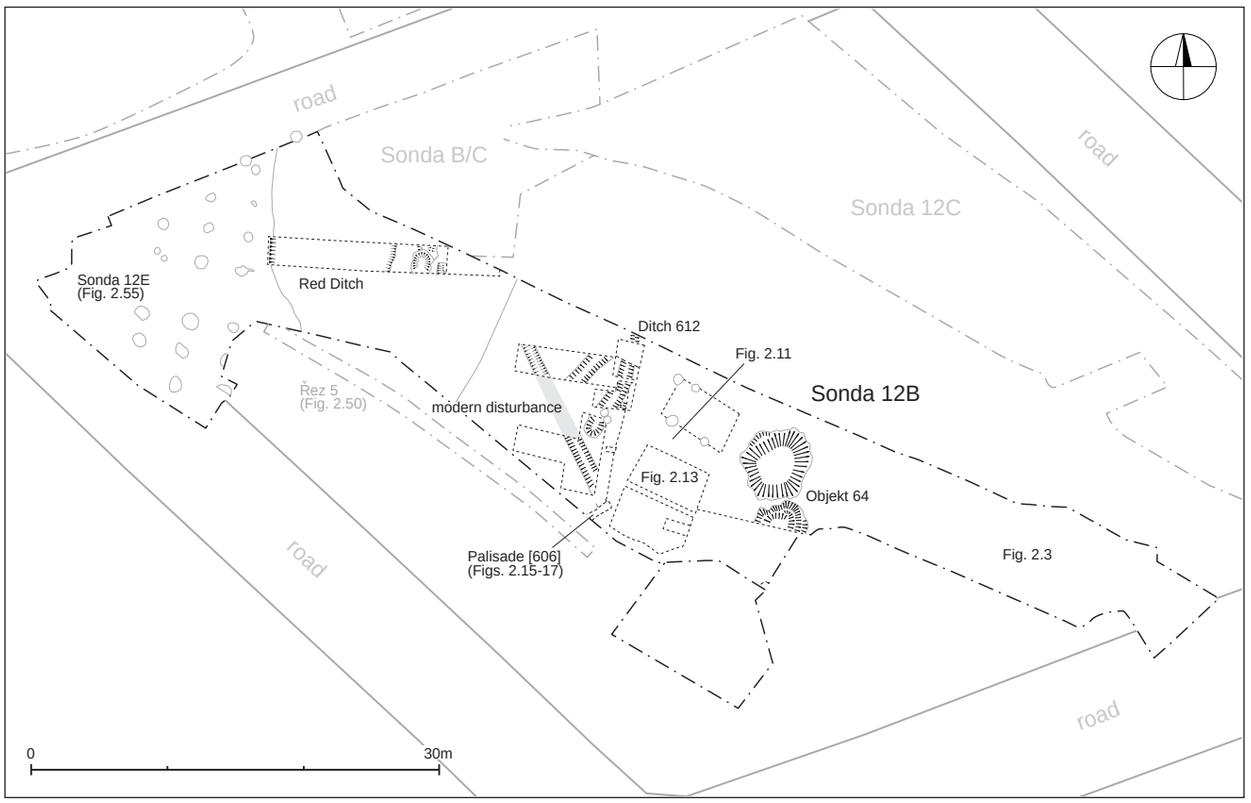


Fig. 2.2. Sonda 12B, general plan

1994:

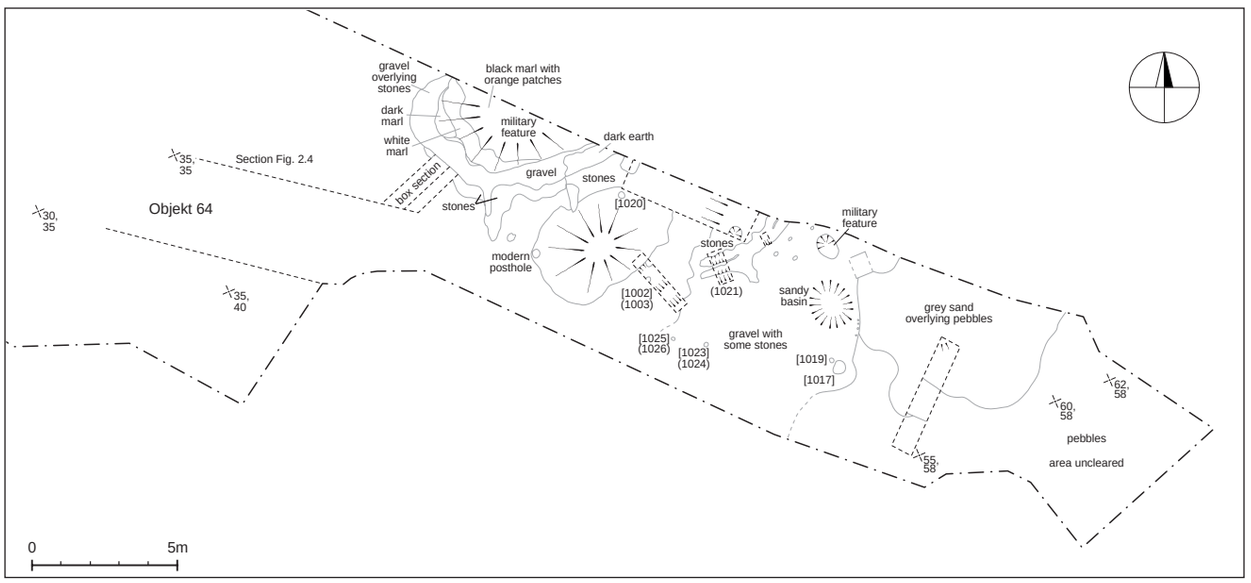
Work continued on Sonda 12, this time with a further trench east of 12B being opened (12C). A larger cut was made through the Red Ditch, and the larger pits in 12E were fully explored. Objekt 64 was further excavated, and the ditches north-west of it examined, notably Ditch 612.

1995:

In Sonda 12B, work concentrated entirely on completing the open parts of Objekt 64, the North pit of which was eventually bottomed. The South pit lay largely under the trench side, and could only be explored partially. Northern extensions to Sonda 12C, and an area which joined 12C with 12B, were explored, exposing further ditch segments and pits (only partially excavated).

Sonda 34 was opened, lying east of 12C and across the concrete road that had been built to enable house construction. At its south-eastern end a major ditch/pit feature was exposed but not excavated. A small ditch was located at the north-western end,

Fig. 2.3. Sonda 12B, south-western end



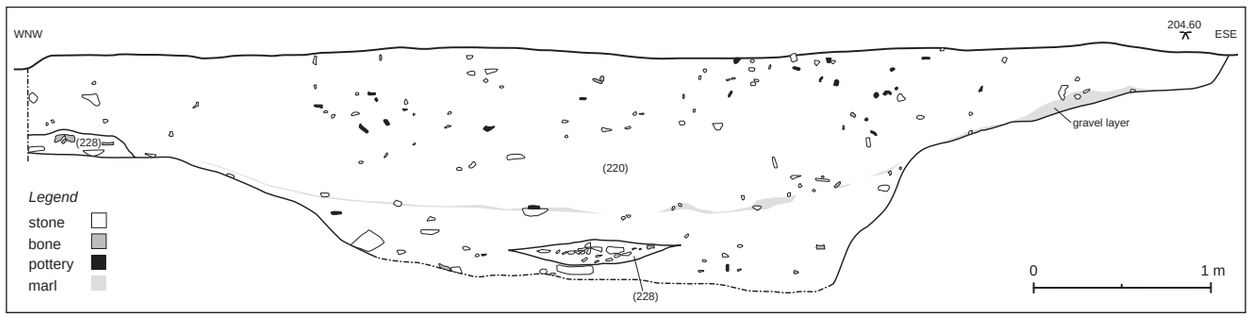


Fig. 2.4. Sonda 12B, Objekt 64, south-west facing section at upper excavation level

mostly lying under the road and therefore inaccessible.

Sonda 35 was excavated in the orchard, the highest surving part of the Skalka site. According to the geophysical survey it lay inside the innermost ditch circuit. It produced no recognisable archaeological features.

THE EXCAVATION BY TRENCH

The account that follows describes the features found during the British excavations, proceeding from south to north, and west to east, with the exception that all the exposures of the Red Ditch are discussed in a single section, again proceeding from south to north.

Because certain feature descriptions are used in the published report of 2000, they are usually repeated here to make clear how the Czech and British excavations coincide. This applies, for instance, to the labelling of the ditch circuits, and the term "Fortification Zone", which is used regular in the 2000 report. It does not imply that we accept that the features in question were indeed necessarily defensive in nature.

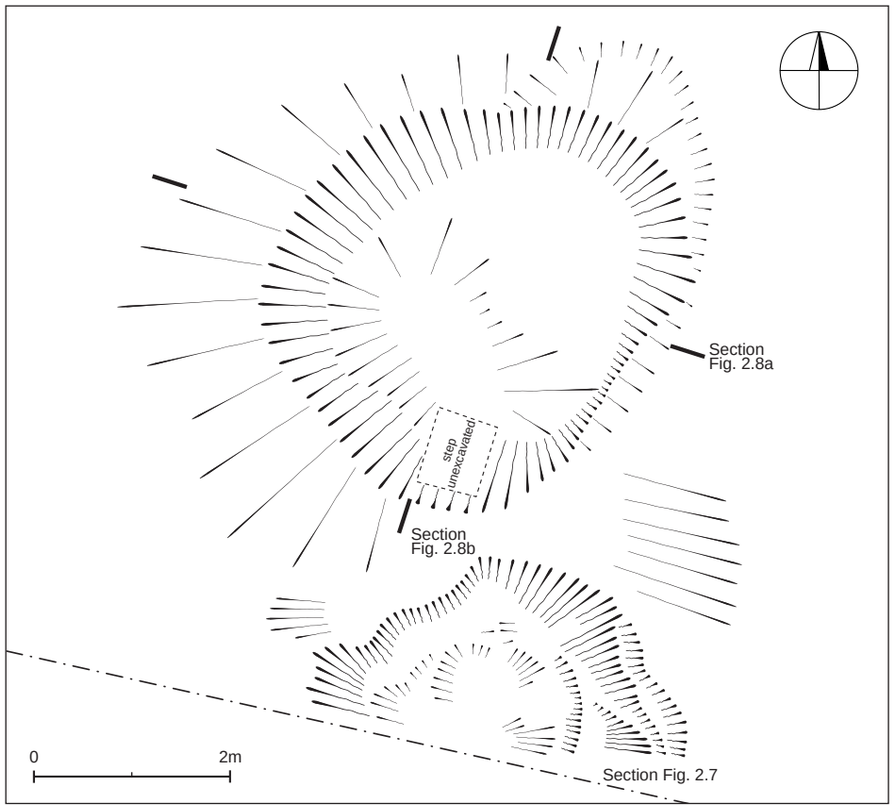
Sonda 12B

Sonda 12B lay in the central part of what had originally been designated Sonda 12, and consisted of a long and narrow strip of ground going from the Middle Fortification Zone (Ditch E, in this area labelled Objekt 64) northwards downslope to the northern perimeter road and adjoining Sonda 12E (Fig. 2.2). The British team excavated here in 1993-95. The principal features examined were two of the pits that made up Objekt 64 (dubbed the North and South pits, only the more northerly one being fully excavated); a series of small pits or post-holes immediately north-west of this Ditch; a fairly slight ditch, Context 612; the palisade trench, here known as Context 606, with a series of post-holes cut into it; and the major ditch features forming the Outer Fortification Zone, ditches G and H (Objekt 45/45A, known during the excavation as the "Red Ditch").

Area south-east of Objekt 64

This area, towards the inside of the site from Ditch E, produced little in the way of archaeological features. A few small post-holes and pits were found, but they produced no recognisable plan nor were did their sections suggest anything more than slight hollows in the subsoil (Fig. 2.3). A series of box sections were cut across various parts of the trench, but without revealing anything more significant.

Fig. 2.5. Sonda 12B, plan of Objekt 64 (north and south pits)



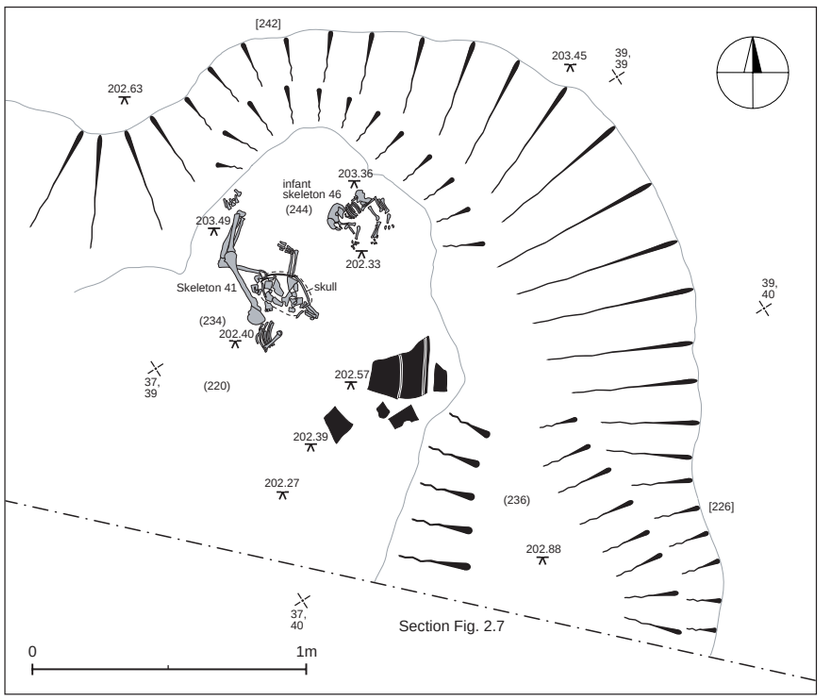


Fig. 2.6. Sonda 12B, Objekt 64, south pit showing child skeletons and pottery scatter

Instead, a series of undulations was present, partly natural and partly influenced by modern trench-digging activities.

Objekt 64 (Ditch E in the Hrala-Vávra nomenclature)

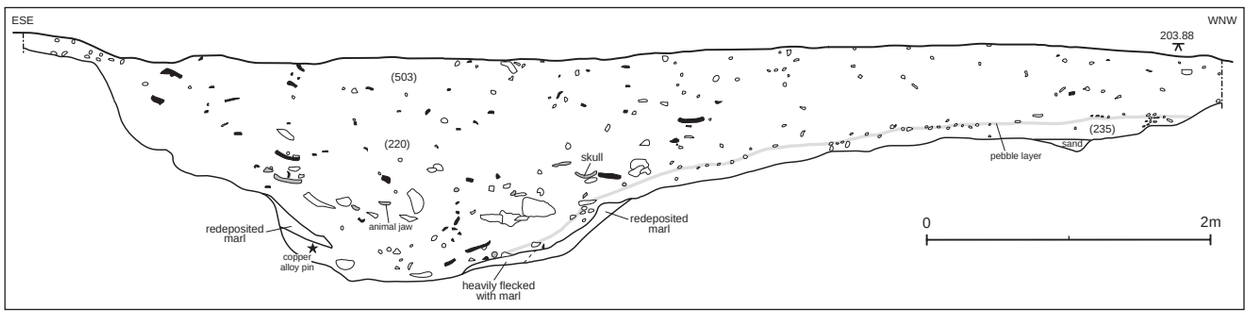
This feature (Fig. 2.5) forms part of the "Middle Fortification Zone" of Hrala *et al*. (2000, 22 ff.), as investigated mainly in Sondas 17 and 22 higher up the hill to the south-east. In Sonda 12, it was first excavated by means of a machine cut and a partial clearance to the south in 1988, was left partly dug at the end of the 1993 season. After cleaning back the eroded surfaces, a section trench 3.20 m wide was worked (Fig. 2.4). It soon became apparent that this trench came down over a segment end in the ditch; accordingly an extension was opened up to the north so that a fuller picture of the ditch could be obtained. In the event, this northern part turned out to include one complete pit, while to the south only a segment of another pit was revealed, both confirming the fact, suspected from the investigation higher up the hill, that Objekt 64 is a line of pits rather than a ditch proper. Because of the numerous deposits of bone and pottery, the excavation of this feature was time-consuming and extended over three seasons (1993-95).

The **South pit** produced a series of scattered bones, and at the end of the 1994 season had revealed part of a child's burial accompanied by a large storage vessel (Colour Plate 1C). In 1995, excavation showed that the rest of the skeleton was present, the child's body slumped forward, lying in a bent position with earth heaped up on top of it (Fig. 2.6; Colour Plate 1D). At a slightly lower level was the skeleton of a 3-6 month infant (context 244, Kostra/Skeleton 46; Fig. 2.6). Its skull had been crushed, and its limbs lay at strange angles. Elsewhere, considerable quantities of stone, bone and pot were encountered, but only one bone group appeared to be articulated, the ribs and scapula of a child. Below these deposits the pit bottom was reached, though as only the northernmost part of the pit was excavated, the base continued to slope down into the unexcavated area beneath the balk (Fig. 2.7). It is not known how large the pit was in total, but the excavated portion was certainly less than half. The excavated section reached to a depth of approximately 1.80 m.

The **North pit** revealed an extensive set of bone, pot and stone deposits at all levels. In 1993 a section across the pit showed that it extended further north than the trench opened, with the result that the trench was extended in 1994. Because of the depth of the pit, excavation of it continued throughout the 1994 and 1995 seasons (Colour Plate 2A-C).

As completely dug out it measured around 4 m in diameter and 2.40 m deep (Fig. 2.8 a-b), with steeply shelving sides and an irregular base, the southern half of which was cut deeper than the northern. Unlike other large pits excavated at Velim, there was no evidence for intentional or ordered bone deposition. Individual bones, human and animal, and including skulls, were scattered throughout the pit fill, but there

Fig. 2.7. Sonda 12B, Objekt 64, south pit, north-facing section



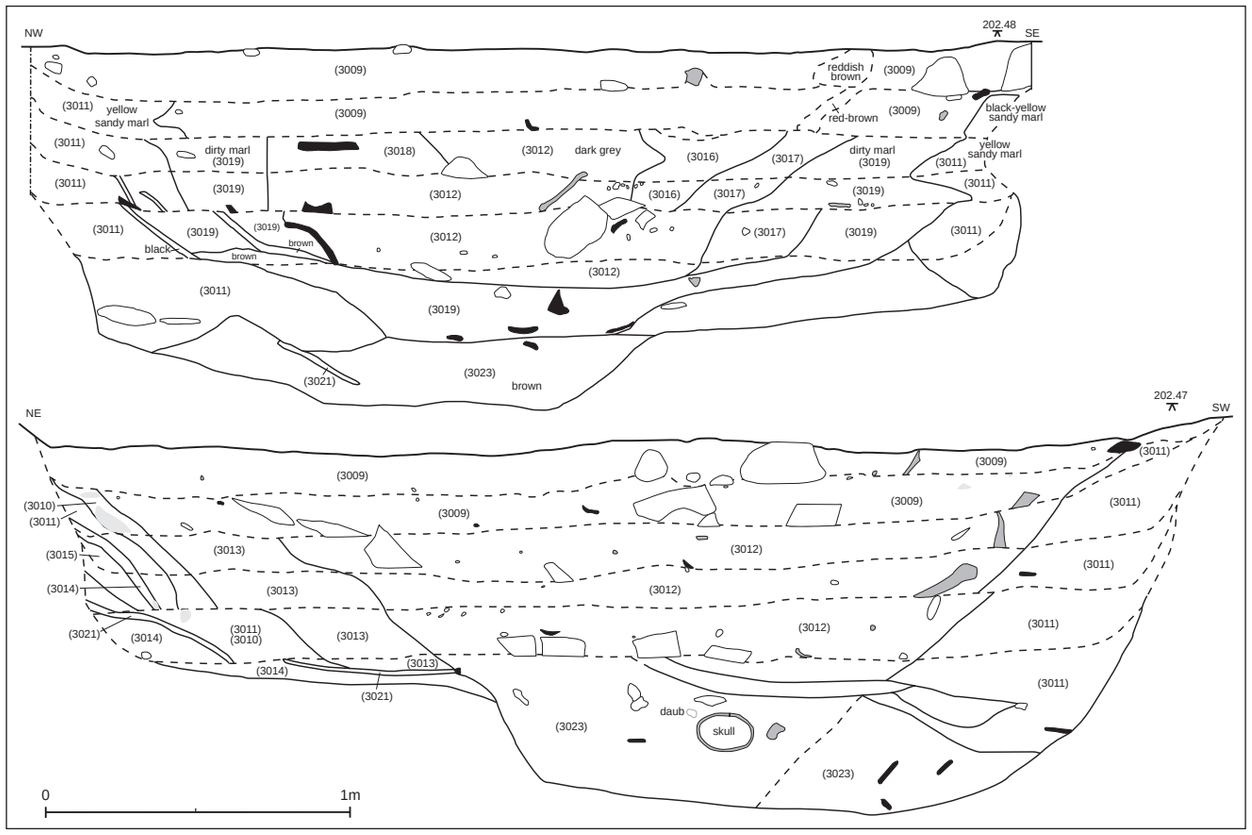
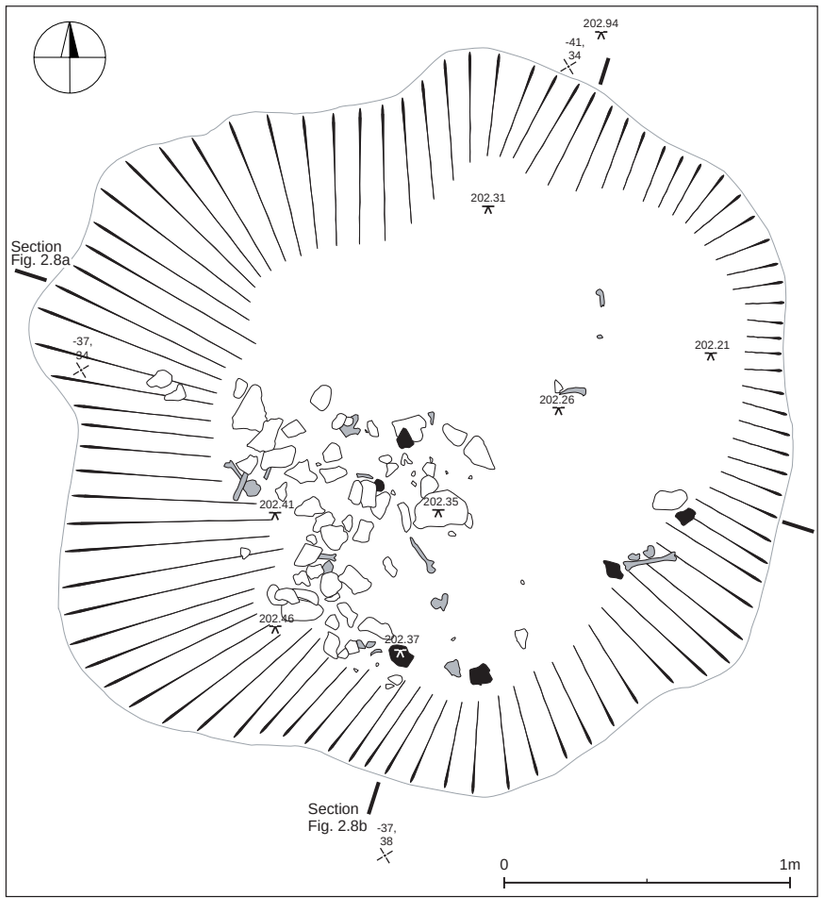


Fig. 2.8. Sonda 12B, Objekt 64, north pit, sections across pit: a) south-west facing; b) north-west facing

Fig. 2.9. Sonda 12B, Objekt 64, north pit, plan during excavation



were no articulated skeletons or even skeletal elements. The lower deposits contained a large numbers of sherds of large and coarse storage vessels (Figs. 2.9, 2.10, showing the recovered plan at different depths). A thin carbonised layer covered the bottommost deposits, and this contained carbonised seeds, including millet. While it is impossible to say that Objekt 64 (north) had a domestic function, it is certainly the case that the material found in its bottom layers has domestic rather than ritual associations, and is strikingly different from what is found in other large pits at Velim, the deposits being essentially disordered rather than structured.

There are a number of notable features about the deposits in Objekt 64. Among the finds was the simple clay figurine, 95/1937, from context 3000, representing upper levels of the feature (Plate 12C), the foot of another miniature figurine also comes from this layer (95/1665). The ceramic

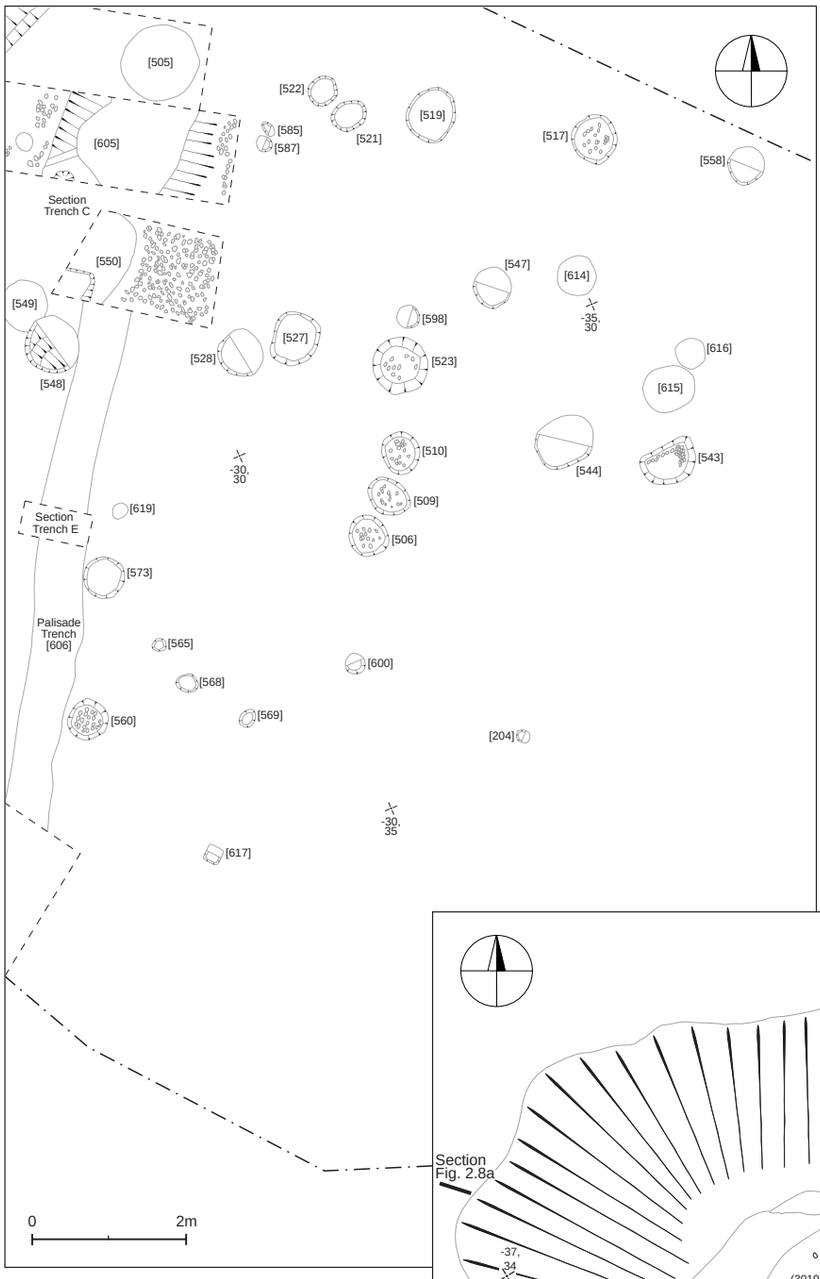


Fig. 2.11. Sonda 12B, central area, plan showing pits and post-holes between Objekt 64 and Ditch 612

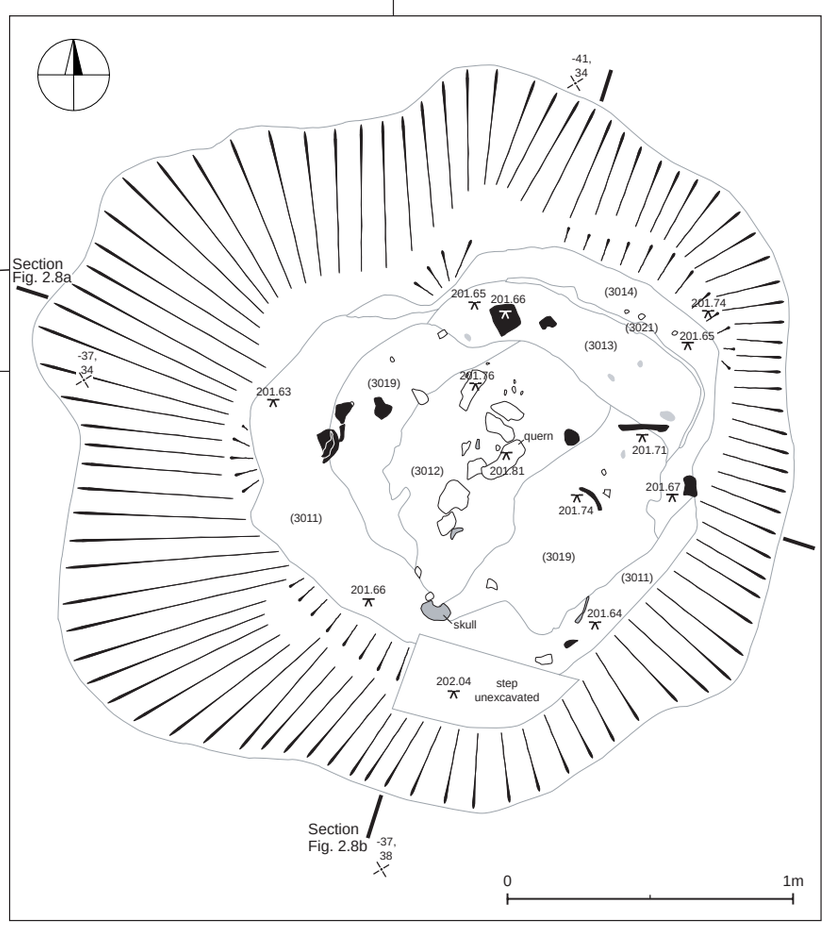


Fig. 2.10. Sonda 12B, Objekt 64, north pit, plan at a later stage of excavation

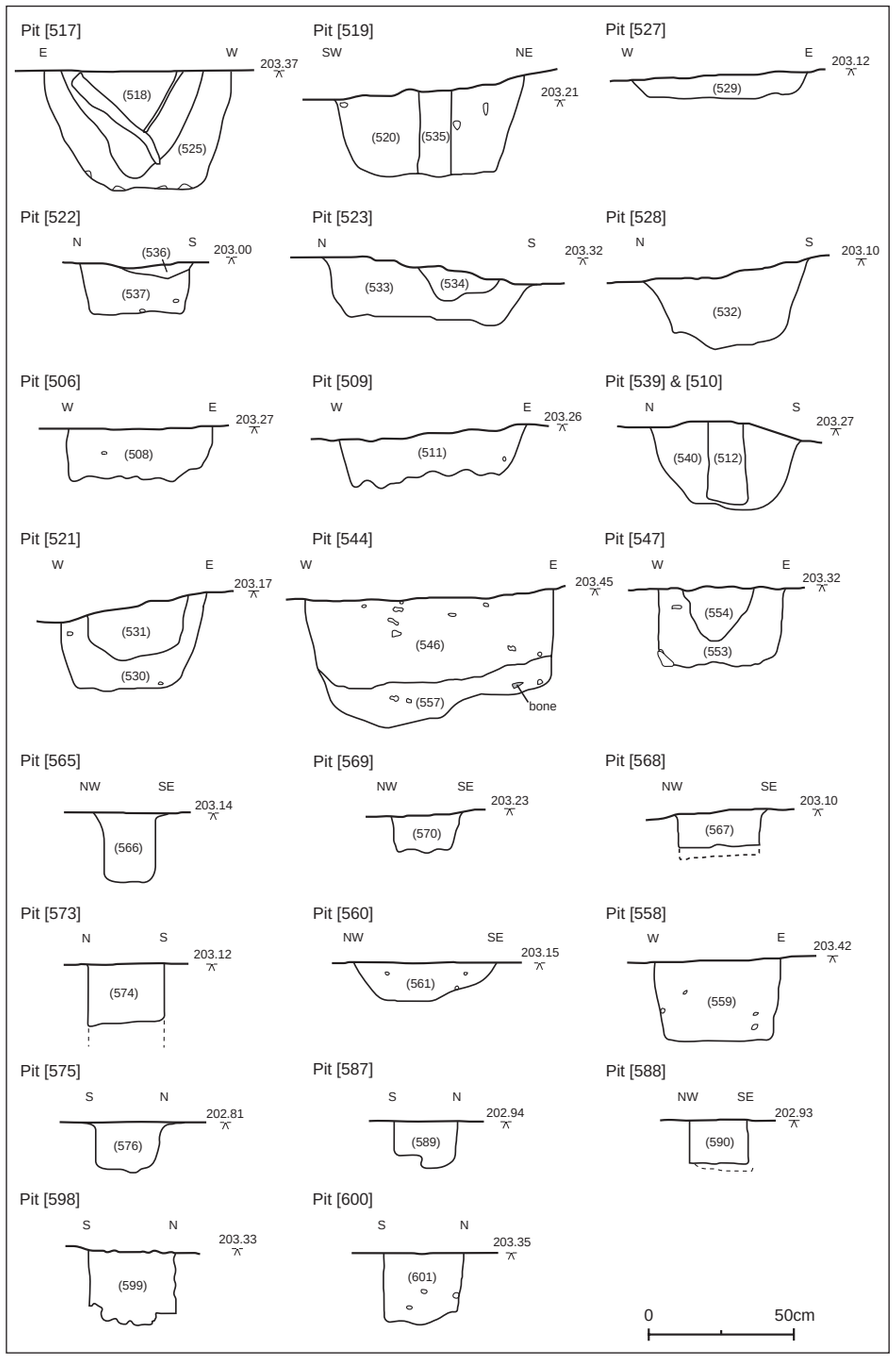


Fig. 2.12. Sections of pits and post-holes shown in Fig. 2.11

assemblage is discussed below; the deeper levels of the pit produced what appears to be a representative collection of late Tumulus forms (below, p. 000). This was the only deep feature fully excavated by the British team and the stratigraphic separation of the material is therefore accorded some attention in the discussion.

Four C14 dates were obtained from deposits in Context 3021 (Appendix 2). Of these, one (GrN-27619) at 2990 ± 80 BP was a little later than the others and had a larger error term, giving a calibrated date range of 1420-1000 BC at 95% probability (1320-1110 BC at 59% probability). The other three dates were close together and had small error terms, giving a date range of 1430-1404 cal BC at 68% probability (1440-1380 at 88.6% probability), in other words in the last decades of the fifteenth century cal BC.

The other notable feature of Objekt 64 is the treatment of the bone, which is considered in the reports by Knüsel and Outram (below). Briefly, the bone is very fragmented and shows a much higher proportion of dry and mineralized fractures than elsewhere on site, and relatively few helical fractures, probably indicating post-depositional disturbance – in contrast to that from Ditch 612 (below). The bones include animal bone with features indicative of food remains, but also many human bones. The prevalence of dry fractures, and the relatively high level of fragmentation, suggests that bone has been redeposited in the pit, and specifically that the human bone had originally been deposited elsewhere (perhaps articulated) and later disturbed, removed, and incorporated into the rubbish thrown into Objekt 64.

Postholes between Objekt 64 and Palisade trench 606

The area between these two major features is occupied by a large number of post-holes (Fig. 2.11). Some of them are close together and set in a line (e.g. 510-509-506; 614-547-598-527-528; 558-517-519-521); with the eye of faith it might be possible to see some kind of grid construction here, possibly even parallel rows of posts, but these lines are too irregular for any presumption of a post-built building on this spot.

Sections of these post-holes are shown in Fig. 2.12. Of them, some show definite signs of having held posts (517; 519; 510; 547) while others are ambiguous in this regard. It is certainly possible that some kind of post structure stood on this spot, outside Ditch Circuit

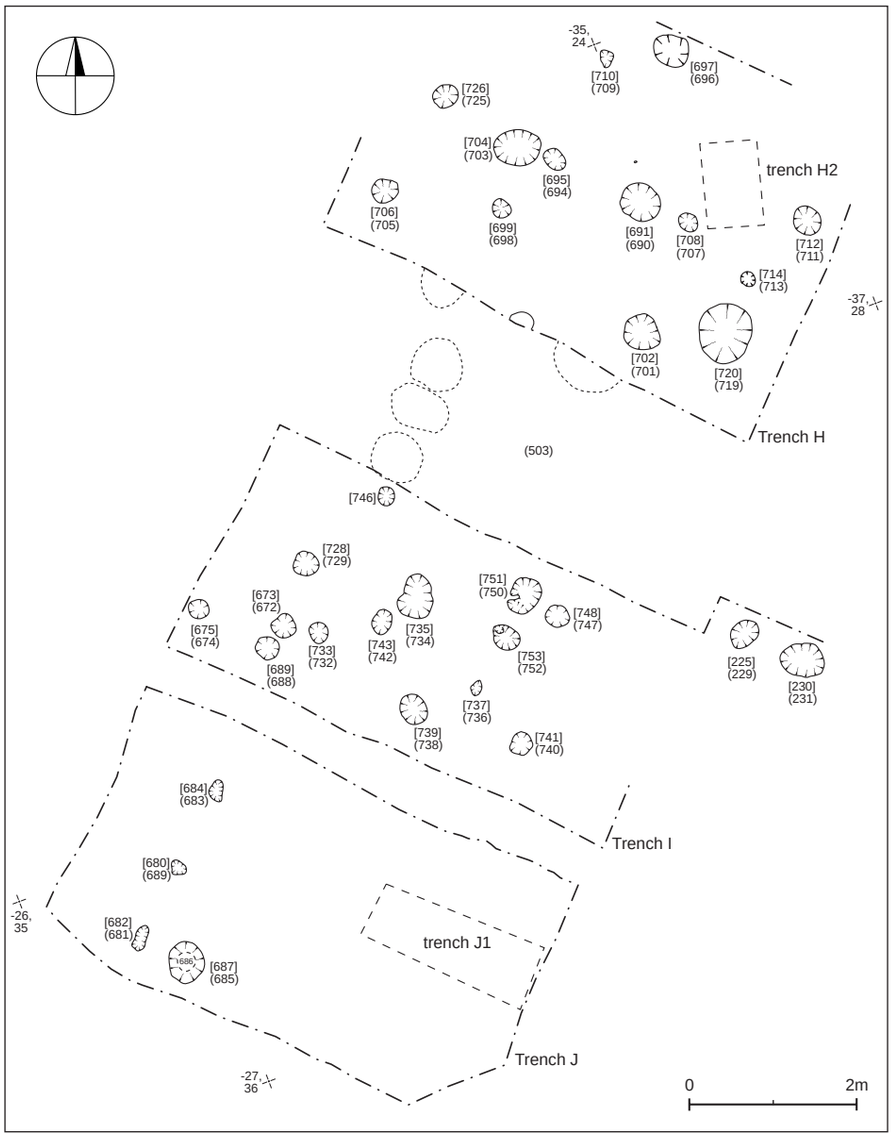


Fig. 2.13. Sonda 12B, central area, plan at a lower level than Fig. 2.11, showing pits and post-holes

E (Objekt 64) and inside Ditch 612 and the palisade, though it is impossible to specify what sort of construction this might have been.

Deeper excavation in this zone, in three discrete areas (Trenches H, I and J) (Fig. 2.13) revealed more potential postholes, but again there was little sign of anything structural. Sections of some of these are shown in Fig. 2.14.

The palisade trench and adjacent features

Feature 606 is a palisade trench, as known from various parts of the site, notably in the adjacent trench 12C and elsewhere (cf Hrala *et al*. 2000, 34 Fig. III.19). The trench was investigated by a series of cuts and sections, some transverse, others longitudinal (Fig. 2.15, 2.16, 2.17). It contains a series of post-holes (from north to south: 661, 666, 668, 700, 677, 676, 731, 729, 749, 678). The posts are placed around 20-30 cm apart, and as the section drawings show (Fig. 2.18) they are 50 cm or more in diameter, placed in the trench matrix (664). From the alignment it is clear that the trench would join up with Feature 2502 in Sonda 12C. It is also evident that it runs concentrically with the Red Ditch, and lies about 12 m inside it (Hrala *et al*. give the figure of 14 m in the areas they investigated).

This palisade trench (606) is cut by the modern military trench 584 and cuts other pit and ditch-like features, and specifically Feature 612, which is a ditch that must therefore precede both it and presumably also the Red Ditch. Figs. 2.19 and 2.20 clearly show this relationship. In the course of excavation it also became clear that the two features follow different alignments, since the palisade is concentric with the Red Ditch, while ditch 612 is more likely to be concentric with Objekt 64.

Ditch 612

Ditch 612 (Fig. 2.2) runs discontinuously north-south through Sonda 12B, its upper levels being cut by the palisade trench 606. It was disturbed both by that feature and by military trenches at both ends that were investigated in 1993-4. Sections were cut across it in specially dug box section trenches, G, C, B and D, where the sections (Figs. 2.21 and 2.22, relating to Trench G, and Fig. 2.23, relating to Trench B) show the characteristic profile (other sections were drawn in 1993 but are not shown here). The ditch is around 80 cm deep and one metre wide at its base, broadening to around 2 m wide at the subsoil surface. Fig. 2.24 shows the cutting through 612 in Trenches A and G, while Fig. 2.25 shows a terminal in the ditch recovered in Trench D at two excavation depths, along with the bone deposits that were found there (Colour Plate 4A). The fact that the ditch terminated at this point probably indicates that it, like so many other of the Velim features, was not continuous but rather like a string of sausages laid out end to end.

What characterises it above all, however, is the nature of its deposits, which looked black and greasy, and included much organic material, especially bone.

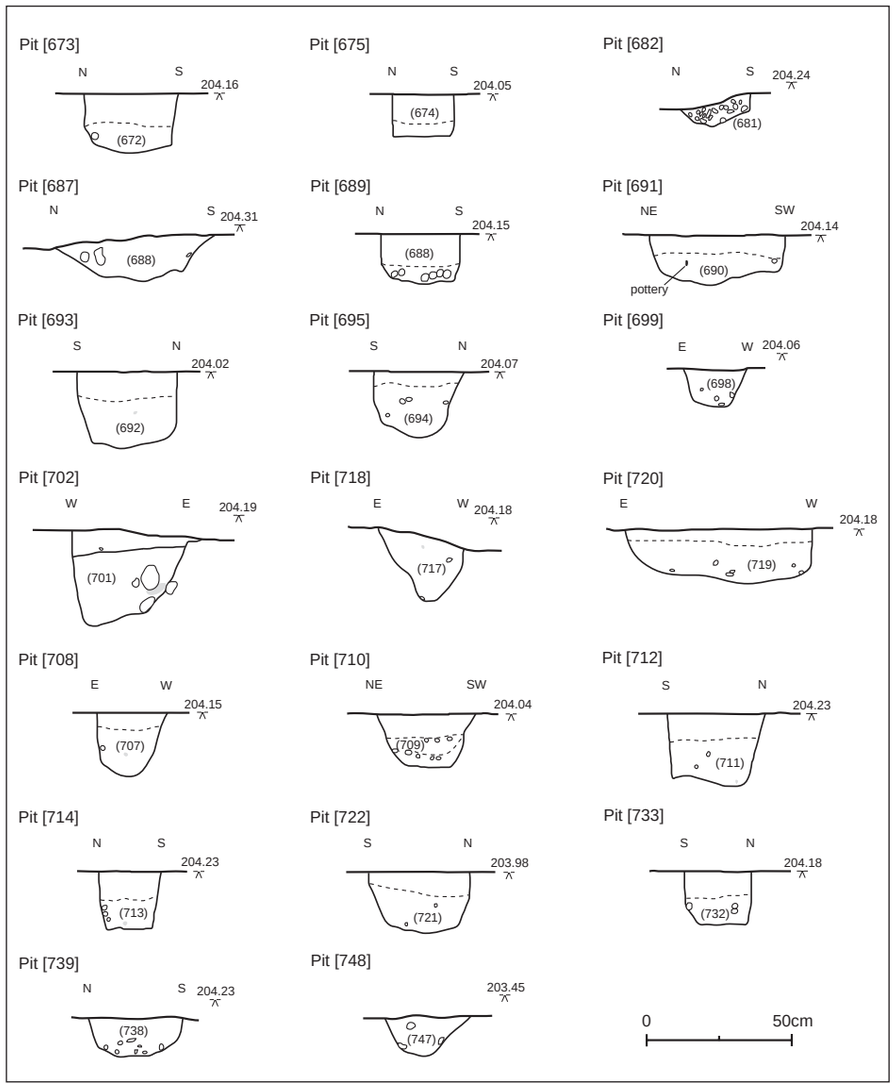


Fig. 2.14. Sections of pits and post-holes shown in Fig. 2.13

In Trench B, beneath the upper layer (504, a hard mixed whitish marl deposit), 541 was a dark brown-black fine silty loam, with flecks of daub and marl, having a "burnt" appearance; beneath that was 661, a dark brown clay loam with pebble inclusions. In Trench C, the lower levels were firm loam deposits containing much bone; in Trench D, the middle fill 631 was a soft red sandy clay loam with marl inclusions and much burnt material including bone; beneath it was 626, a firm dark brown fine clay loam with marl flecks and bone.

Ditch 612 contains a large proportion of the animal bone assemblage but very little human material, and much of the bone is burnt. It is also highly fragmented, with radial fractures commonly associated with butchering.

The deposits in Ditch 612 were therefore different in nature from anything recovered from elsewhere in the British trenches. It remains to be seen whether comparable deposits were recovered in the Czech trenches when they are fully published. The nature of the animal bone suggests that these deposits emanated from feasting activities, including butchering and cooking; this sheds important light on the function of at least this part of the site.

Sonda 12C

Sonda 12C lay to the north-east of 12B (Fig. 2.1), from which it was separated by a large spoil-heap. An area c. 56 x 10 m was stripped by machine in 1994 and trowelled down (Fig. 2.26). Several large modern disturbances were immediately apparent, mainly from the digging of military trenches in the 1950s and 1960s. In 1994 attention concentrated on the eastern, upslope, part of the trench, where relatively few archaeological features were apparent, while the line of certain features (notably the palisade trench) was delineated (but not excavated) in the western half. In 1995, attention was turned to this western part, west of a large area of military disturbance and south of the concrete perimeter road.

In the **south-eastern area** (Fig. 2.27) there were few features that could definitely be associated with the prehistoric occupation of the site, or were structural in any obvious way. There was extensive disturbance from military activities, especially from a large trench that cut right across the Sonda, but also from a number of smaller features in the south-eastern end of the trench. It cannot be ruled out that some of the small pits and post or stake-holes were also military in origin. A number of features were regarded as natural in origin after excavation, though it is possible that some represent the bottoms of prehistoric pits. Even where an L-shaped cutting was dug (2446), in order to investigate a large stone, nothing further was visible other than the natural gravel on which the stone lay.

A scatter of small pits, post and stake-holes may be seen in the central part of the trench, but these do not form any recognisable pattern. Sections of a number of them may be seen in Fig. 2.28. Some are more convincing as post-holes than others. Cut 2422, for instance, contains a genuine post-pipe that reaches down some 43 cm, and a flattish stone packing it on the eastern side. Cut 2039 is pointed in shape, about 35 cm deep, angled somewhat

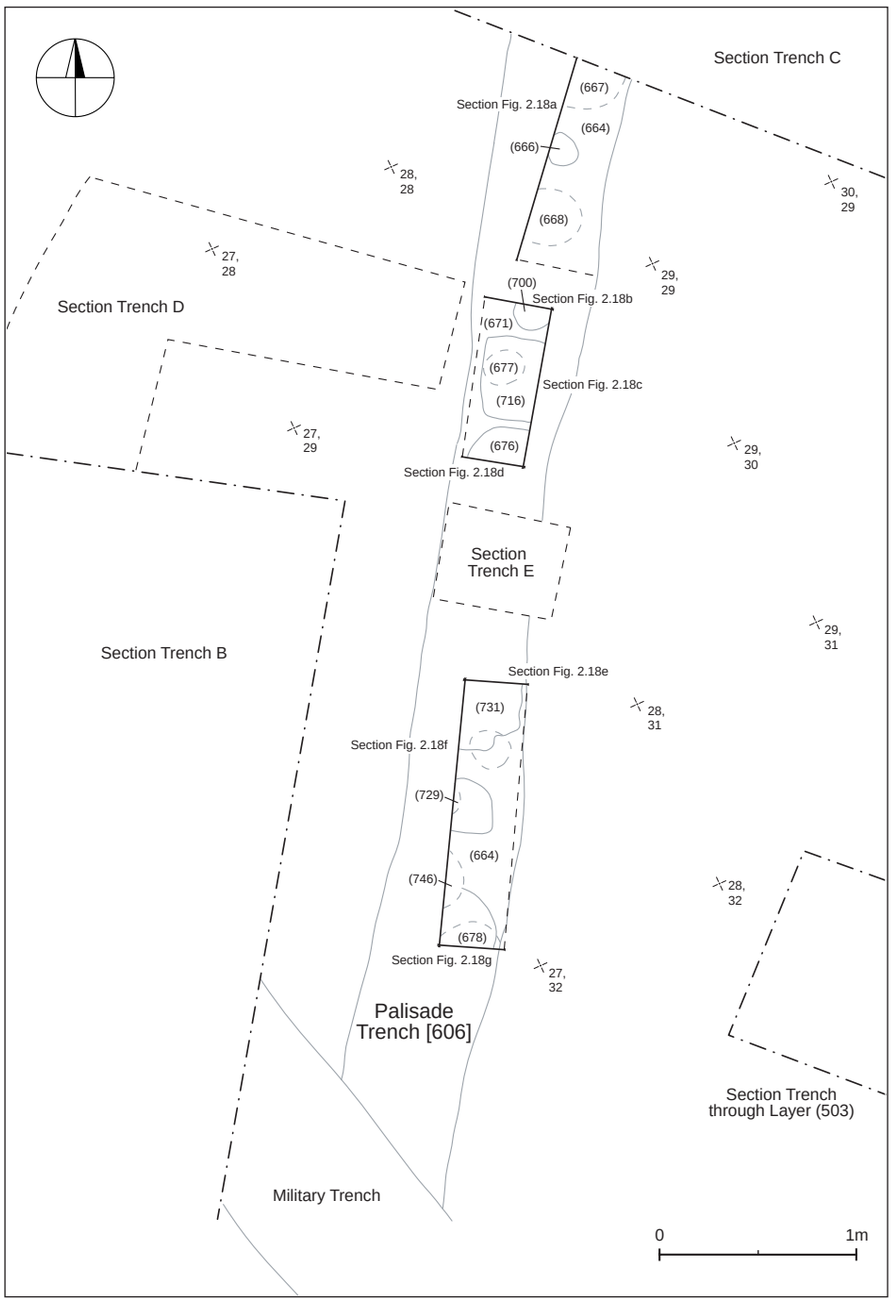


Fig. 2.15. Sonda 12B, central area, plan of palisade trench 606 showing location of section trenches

and with charcoal concentrations in the fill (2038). Cut 2440 (fill 2441) is about 53 cm deep and truncated conical in shape. All other pits or post-holes were slight and not more than 20 cm deep.

At the end of the south-eastern sector of Sonda 12C, right beside the military trench that separates the east and west sectors, was a small part of a larger ditch-like feature (2028/2067), which however was almost entirely destroyed by the military trench. It is not clear if and how this links with the lines of small ditches in Sonda 12B.

The only other feature that deserves particular mention is 2024, filled by a black silty material (2023) and containing human bones (2022) and a number of finds including an amber bead, a stone quern and a copper alloy pin. The plan and profile of this pit is shown in Fig. 2.29. A human mandible lay in the centre of this ovoid pit, some large sherds at the sides, and the copper alloy object towards the southern edge. Initially it was thought that this feature represented a grave, but since the total amount of human bone was in the end very small, this is unlikely; instead it must represent scattered material, human and animal, from the many corpses that were present on the site.

In consequence, little can be said about this part of Sonda 12C, and while the one-time presence of structural features cannot be ruled out, it also cannot be conclusively demonstrated. It may be that, as with Sonda 34, this was an open area between major ditches and pits to north-west and south-east.

The **north-western part** of the trench (Fig. 2.30, 2.31) evidently contains the northward continuation of some – but not all – of the features visible in 12B. In particular the palisade trench was clearly visible on the stripped surface (Colour Plate 4B). Numerous other features, apparently post and stake-holes, lay in the immediate vicinity. On the other hand, there were no clear indications that ditches 210 and 612 continue into this area, though some of the ground was clearly disturbed by archaeological activity. A machine-cut trench at the northernmost corner had no clear indication of either ditch in it.

Numbers were assigned to these features in 1994 (contexts 2074 to 2413), but they were not excavated in that season and consequently no details of their nature or dimensions were recorded at that time, although a plan of the exposed surface was made. In 1995 the area was still available for study, and the palisade trench was explored, as were a number of postholes in the same general area. Upon further cleaning the features of the trench were defined more

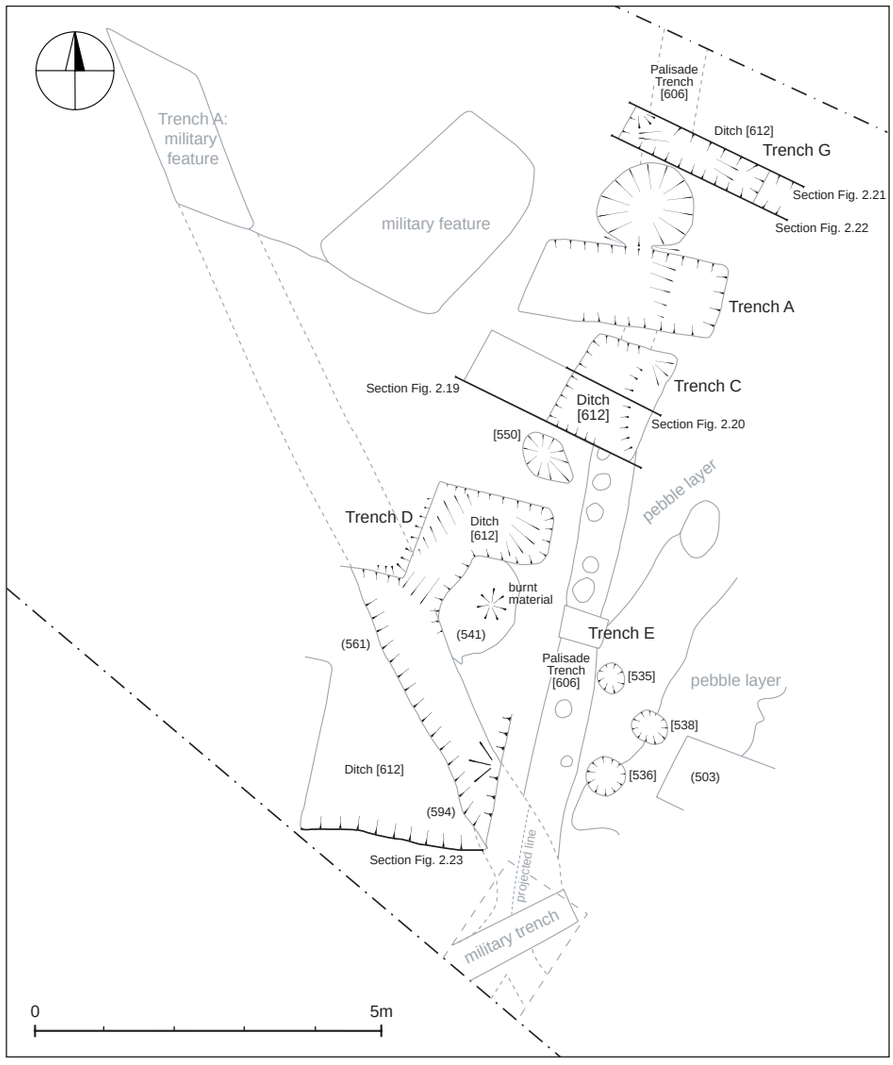


Fig. 2.16. Sonda 12B, central area, plan of palisade trench 606 showing location of section trenches

closely than had been possible in 1994, and a series of post-holes were evident. Some, though not all, of these could be correlated with the plan drawn in 1994. Even in 1995, not all the apparent post-holes visible on the surface actually turned out to be "real" features when sections were cut through them; thus not all that are shown on Fig. 2.30 have section drawings.

The palisade (2502) was of the same general character as in Sonda 12B (Figs. 2.32, 2.33). Four box sections were cut into the fill (2503), intended to produce longitudinal and cross-sections of a number of post-holes. Those that do can be seen in Fig. 2.34. Thirteen of the post-holes were excavated and drawn (2594/5, 2603, 2609, 2559, 2582, 2608, 2610, 2531, 2532, 2533, 2534, 2571, 2516). The profile of the trench can be seen, with roughly vertical sides, around 40-50 cm deep, with the post-pipes clearly visible. Fig. 2.34 shows the longitudinal profiles cross-sections of the trench. Individual post-holes and/or post-pipes are about 30-40 cm deep, the holes being about 25 cm across and the pipes about 15 cm.

Area north-east of the palisade trench

East of the palisade, the sides of a large ditch or pit became visible on the subsoil surface. Three section trenches were dug through this, and a fourth later joined up two of these (Fig. 2.35). The first to be dug, section trench A, was positioned so as to cut straight across the ditch in the middle of the trench; section trench B was placed 2 m to the north-east, where the ditch appeared to change in width; section trench C was placed to the south of A and at an angle, reflecting the fact that the ditch appeared to merge with a large pit-like feature at this point. Finally, trench D joined up A and C in order to understand the relationship between the ditch and the potential pit.

The line of the broad, shallow ditch thus exposed measured around 4 m wide and 0.80 m deep. **In the southerly trench (A),** the ditch (cut 2560) produced a series of disturbed deposits – 2562, with large post-holes 2537 and 2539 on the northern ditch lip (Fig. 2.36); tumbled stone with admixed bone and pot (2513) (Fig. 2.37); a further considerable quantity of tumbled stone and bone (2576, the bone being 2615) (Fig. 2.38); and the bottom being a series of irregular scoops in which all this material had accumulated or been deposited (Fig. 2.39) This can be seen in section in Fig. 2.40 a-b.

In the northerly trench (B) cutting the ditch (2616, filled by 2617, 2620 and 2636) (Figs 2.41, 2.42; sections in 2.43), deposits of human bone were found, including one (2636) that consisted of the bones of three individuals (Fig. 2.44; Colour Plate 4C). The specialist report by C. Knüsel indicates that there was a very incomplete child aged 5-6 (Kostra 47B), and a second child aged 6-8 (Kostra 47A) consisting of two groups of bone, the pelvis and lower limbs and an articulated torso, the two groups of bone displaced laterally from each other. In addition to these two children were the articulated lower limbs of an adult (Kostra 48). The sequence recovered indicates that Kostra 48 arrived in the earth first, and Kostra 47A followed, the two parts becoming displaced from each

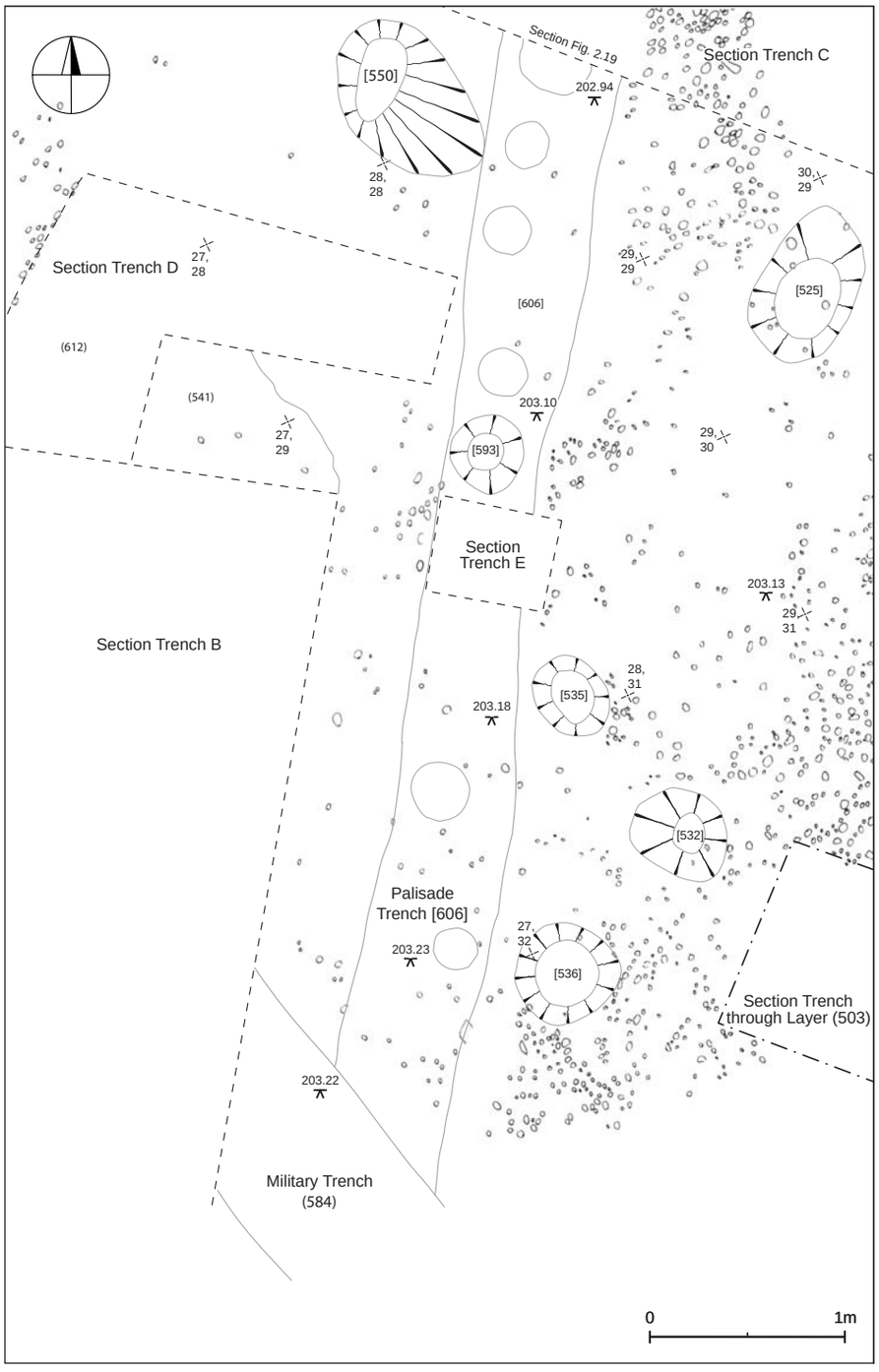


Fig. 2.17. Sonda 12B, palisade trench 606 and adjacent features

other. The gruesome implications of this are that bodies, or parts of them, were placed in the ditches and subsequently shifted when disintegration of the tissue was sufficiently far advanced that parts of the corpse would detach, creating smaller but still partially articulated body parts.

To the south, there was a large pit (2624), only part of which was in the trench as excavated (the remainder was cut by the military disturbance or under the spoil heap). It probably represents a continuation of the line of Objekt 64. This pit was investigated by section trench C. Only some 50 cm depth of this pit was dug for reasons of time; at the level reached, a scatter of stone, bone and pot was visible (2632). The curving side of the pit could be seen on the west side (Fig. 2.45), though at this level the complete pit edge could not be defined. The excavation exposed successively fills 2625, 2626 and 2632 (Fig 2.46). Even when section trenches A and C were joined up by a further trench D, it remained the case that the pit edge was not visible. In all probability, the contents of pit 2624 would have resembled one of the large pits dug elsewhere in this middle ditch circuit, such as Objekt 64, but this remains speculation.

Sonda 12C as a whole thus contains a mixture of features, some representative of what the site produces in other areas but only visible in small exposures, others of little obvious interest. The whole trench was much disturbed by modem military activity. The eastern end of the trench produced only a scatter of small pits and postholes, and an irregular pit containing human bone, an amber bead, a stone quern, and a bronze pin. No large pits were visible in this area, which must have been relatively featureless. The western part, by contrast, produced part of the palisade also visible in Sonda 12B (with which it must be continuous, though the presence of the spoil-heap prevented this from being established with certainty), with a series of small fugitive features on the subsoil surface, and a number of deeper pit or ditch features, one of which is almost certainly the continuation of Objekt 64. The others, which continue the same line though they do not actually join up with the first pit, contain bone deposits.

12C thus represents parts of both the "Middle Fortification Zone" and the "Outer Fortification Zone" as presented by Hrala *et al*. (2000), though their precise nature could not be more elucidated in greater detail in this area.

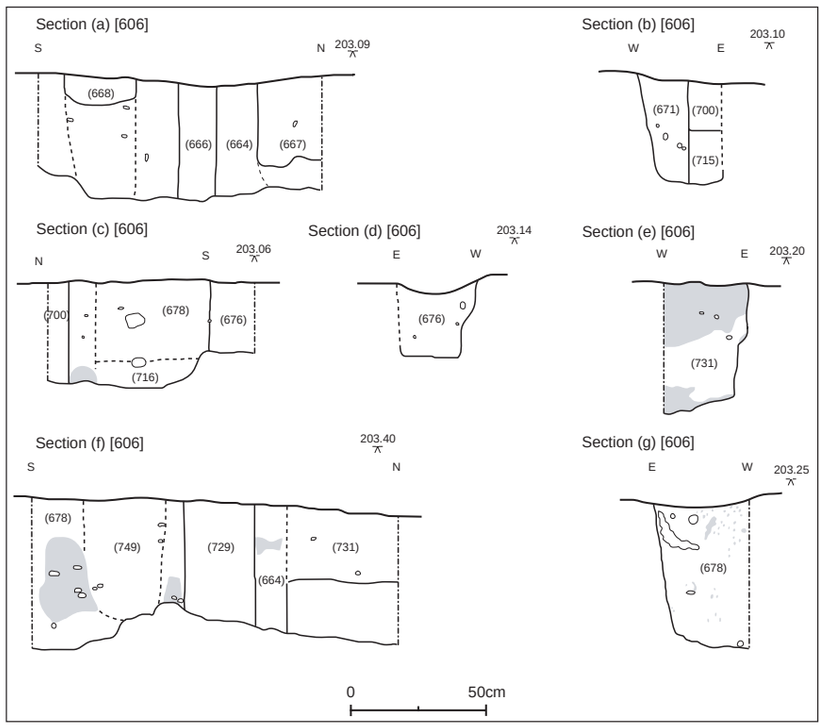


Fig. 2.18. Sections through palisade trench 606

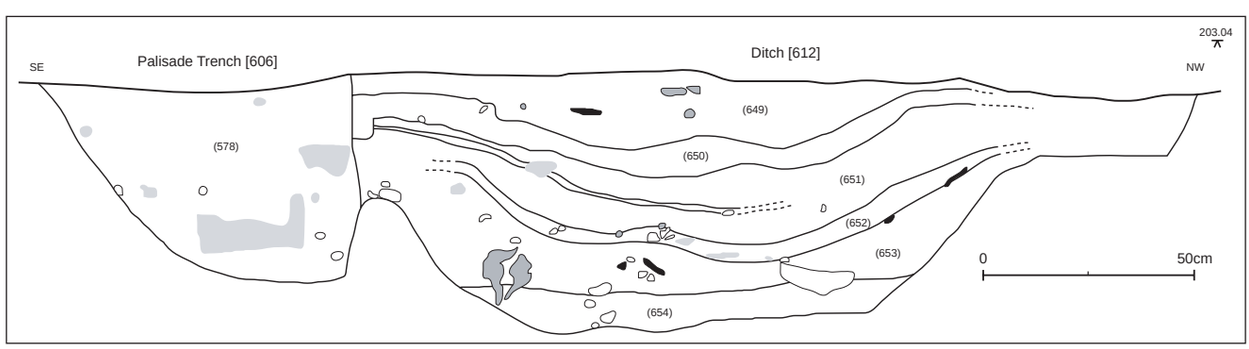
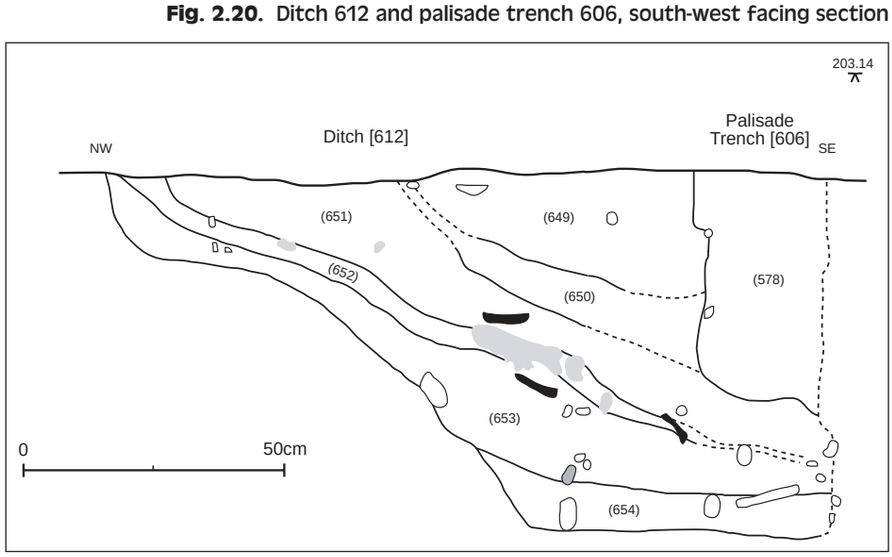


Fig. 2.19. Ditch 612 and palisade trench 606, north-east facing section

Fig. 2.20. Ditch 612 and palisade trench 606, south-west facing section



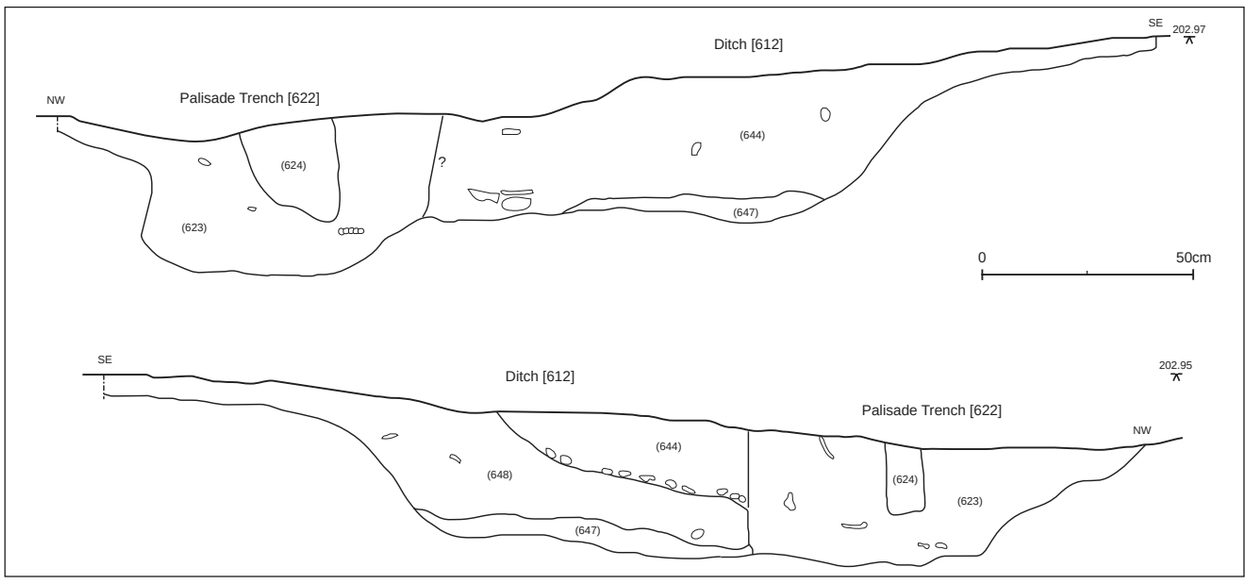


Fig. 2.21. Ditch 612 and palisade trench 606, south-west facing section
Fig. 2.22. Ditch 612 and palisade trench 606, north-east facing section

Fig. 2.23. Ditch 612, north-facing section

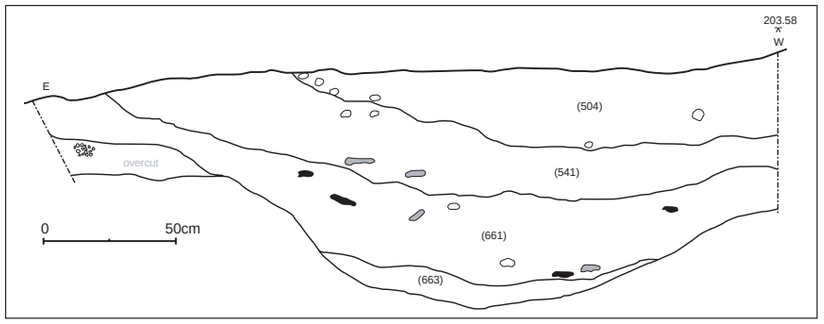
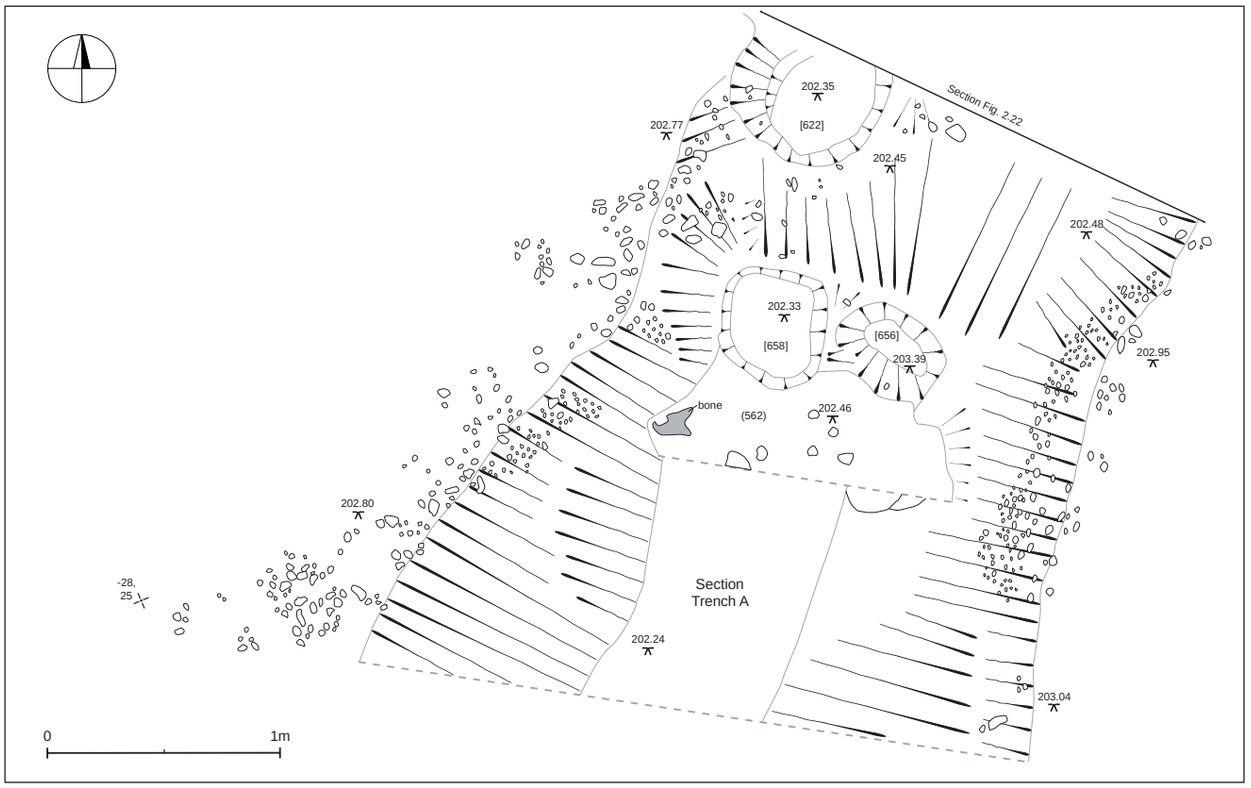


Fig. 2.24. Ditch 612, plan in trenches A and G



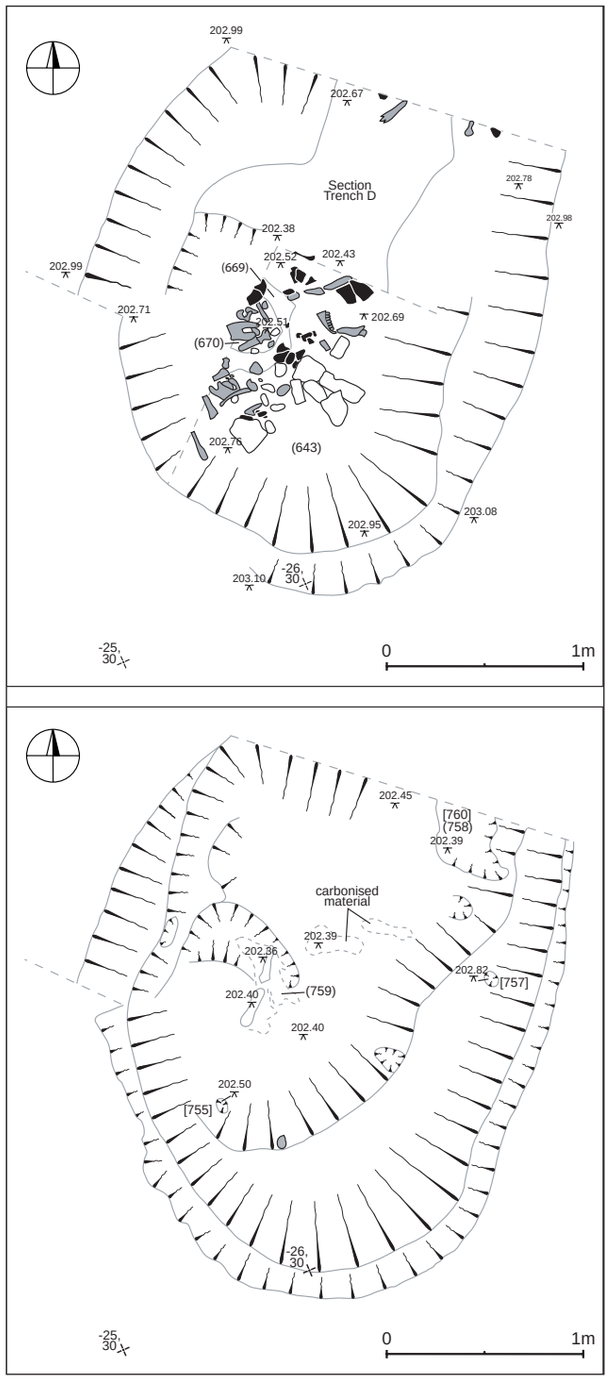


Fig. 2.25, a-b. Ditch 612, terminal in trench D at two stages of excavation

Ditch circuits G and H (Objekt 45/45A, the "Red Ditch")

Ditch circuits G and H formed the "Outer Fortification Zone" of the Czech team (Vávra 2000, 28ff.). Although it was investigated in a number of areas, including several machine-cut slit trenches, the only substantial areas of excavation were in Sonda 19, Sonda 12 (mainly 12B), and Sonda 27. The British team worked in all these areas, though work in Sonda 19 in 1992 was restricted to little more than cleaning up and recording features already excavated by the Czech team. Nevertheless, in the absence of a full report on the Czech excavations, our observations in this trench bring elements to our understanding of the sequence that were not evident elsewhere. In what follows, the excavation of the Red Ditch is considered in each trench in turn, following which an attempt at an overall reconstruction is made.

Sonda 19

Sonda 19 lay at the south-western extremity of the site, adjoining Sonda 18, next to the lower part of the orchard on the hill summit, and running downslope south-westwards towards the fields on the west side of the site. Large-scale work was carried out here by the Czech team from 1988 to 1991, during which the major features were uncovered. These were a massive double ditch system (Objekt 45 and 45A), a smaller ditch inside them (Objekt 100), and a palisade trench inside that (Objekt 102). No plan or section of the ditches in S.19 was published by the Czech excavators; a version of them is presented here, resulting from the British work in 1992 (Figs 2.47; 2.48). The ditches in S.19 were wide and shallow, especially the Outer ditch (Obj. 45A), which contained large quantities of tumbled stone, and in places had post-holes in its bottom. In this respect it is rather different from what was encountered in S.12B (below). In the Outer ditch (45A), the uppermost layer, 19/26, consisted of a dark brown sandy loam with white inclusions and rounded pebbles. Below this was 19/28, a light brown material containing marl, with yellow and orange inclusions; this context was considered to form the bulk of the primary silting in Ditch H. In places, it overlay 19/27, of similar colour and texture. At one point a deposit of animal bone was encountered (19/56), spreading across the ditch bottom in an elongated hollow (Fig. 2.49). This recalls the bone deposit discovered at the bottom of the Outer ditch in S.12B (below).

In the Inner ditch (45), a greater depth of deposit was present. The largest amount of material in the upper part belonged to 19/1, a compacted dark sand and marl mixture with burnt daub inclusions. The lower fill was mainly 19/5, a compacted grey/light brown clay-like material, with bone finds in it. A number of other units were observed tipping down from the inner side, notably 19/7, a yellowy-buff marly material containing gravel, and 19/52, a compact brown clay loam with yellow flecks and marl inclusions. Both of these layers probably represent parts of a bank that had eroded into the ditch (there was no clear indication that it had been intentionally pushed in but it may indicate an episode of abandonment).

Inside the Inner ditch in S.19 ran a further ditch (Objekt 100, Ditch circuit F), and inside that a palisade gully (Objekt 102). Ditch F was up to 3.50 m wide and between 0.50 and 1.20 m deep, and was filled with pottery and animal bone.

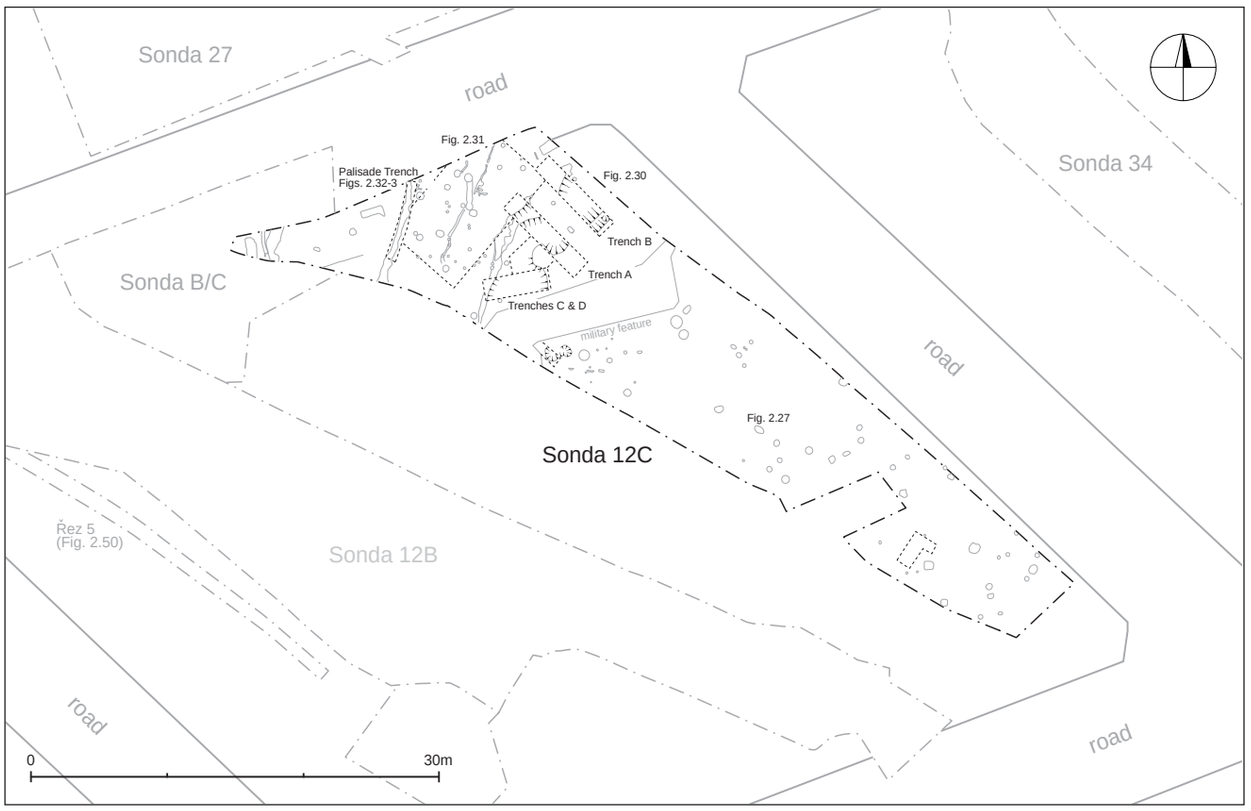


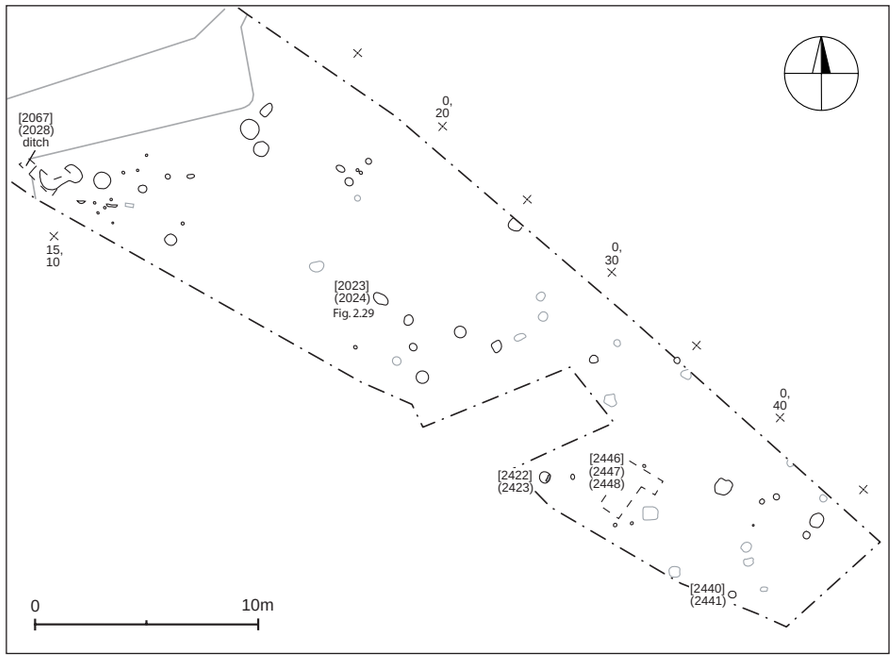
Fig. 2.26. Sonda 12C, overall plan

Sonda 12B

Stripping of the topsoil in Sonda 12 had revealed that Objekt 45/45A progressed northwards through this area. A machine-cut trench running alongside the excavated area (Řez/Cut 5), dug in 1990-91 (Fig. 2.1, 2.2), had revealed something of the nature of this feature; this was studied and recorded in 1992 by the British team (though not excavated further) and observations made within it served to illuminate details of the excavated section described below (Fig. 2.50 shows the NE-facing section; the SW-facing section is shown in Hrala *et al*. 2000, Fig. III.20). In general, this section was very similar to that excavated a few metres to the north and described below. The added advantage was that the entire ditch system was cut through, including the area inside the inner ditch where pits were present, and further towards the interior another, smaller, ditch (Objekt 55, not visible on the side of the trench illustrated in Fig. 2.50).

In Řez 5 the width of the ditch was around 9.50 m and the depth 1.50 m below the subsoil surface (2.30 m below the topsoil surface). The central buttress was not well defined, being only a little higher than the ditch bottom; it was cut by shallow pits and had large stones lying on it. The fill of the Inner ditch was especially complex and showed at least one recut at a late stage of the infilling process. It was around 6 m wide and the

Fig. 2.27. Sonda 12C, south-eastern part



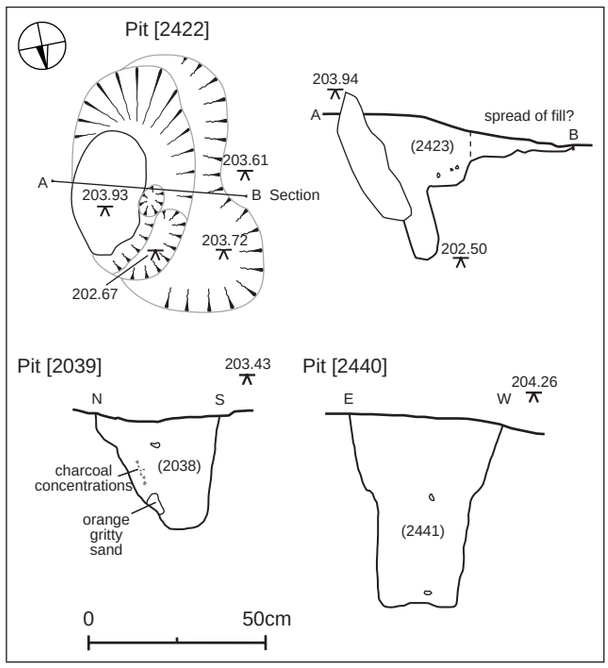


Fig. 2.28. Sonda 12C, plan and sections of features in south-eastern part of trench

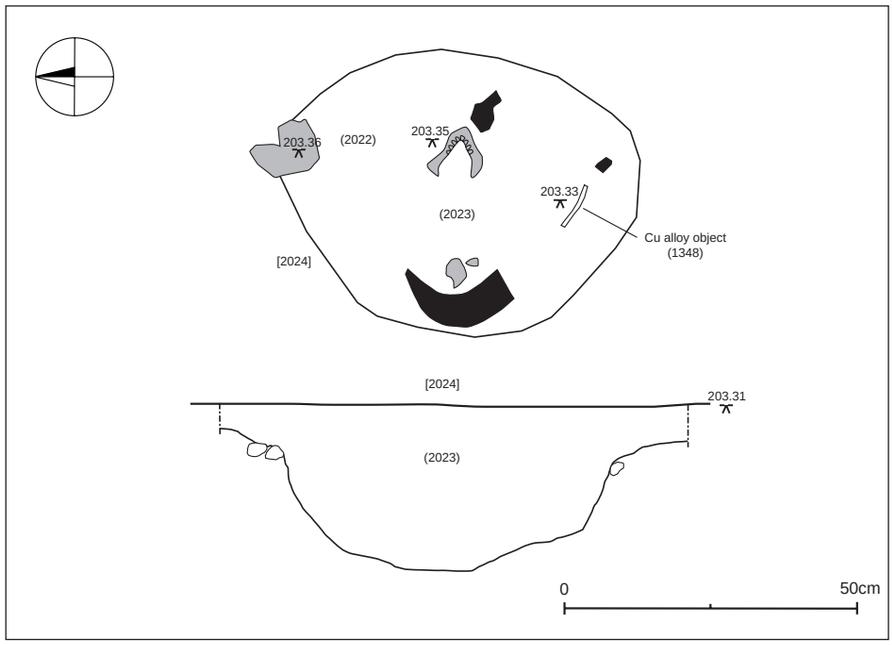
same depth as the Outer ditch, but the fills were mainly clayey loams, grey and brown, with frequent marl inclusions. On the inner (south) side of this was a marked gravel layer which is interpreted as the lowest remains of a rampart. The interface between this and the Inner ditch is complex, but tip lines were visible coming from the inner edge into the Inner ditch, including redeposited dirty white marl that must have formed part of the rampart, having originally been dug out of what became the ditch. The gravel layer appears to have been cut by the palisade gully, which indicates that the palisade must post-date the first-phase rampart and actually belong with the second-phase, Outer, ditch. In other respects, however, the chronological relationship between Inner and Outer ditches was not very clear; but it looked as if the Inner Ditch had filled up to half its depth when the Outer ditch was in use. These various lines of argument show that the Inner preceded the Outer ditch. It must be stressed, however, that this section through the Red Ditch in S.12 was not excavated archaeologically but merely dug out mechanically by machine, so that observations on its stratigraphical relationships are only made on the basis of the profiles.

In 1993, a section of the Red Ditch was opened by the British team in a trench 2 m wide and over 13 m long, somewhat to the north-east of Řez 5. This trench was designed to cut across the ditch at right-angles, but in the event it turned out to be somewhat skewed in a clockwise direction to this ideal positioning. In 1993, a depth of around 50 cm was reached in the southern end of the trench, and around 1 m in the central part. Further excavation was left until 1994, when a determined effort was made to reach the bottom of the ditch across its entire length (Colour Plate 3A, 3C). This was largely achieved, with two exceptions: the southern end of the Inner ditch (Obj. 45) lay underneath a spoil heap so its inner lip (and possible rampart) could not be reached; and boring in the bottom of the Outer ditch (Obj. 45A) after the end of the excavation at least had the merit of revealing that in the central part the true bottom of the ditch had not been reached. A deposit of bone was found here but only partially excavated (see below). In 1995, removal of the spoil heap enabled an extension of the section south-eastwards, and the discovery of what was assumed to be the inner lip of the Inner ditch, with possible indications of rampart material on its inner side. The area between S.12B and S.12C where the ditches ran down towards S.27 (investigated in 1992) was also explored, although time did not allow a full investigation. The account that follows is thus a composite of several seasons of excavation.

The sequence recovered in S.12B was highly complex. Fig. 2.51 shows the section trench in plan, and Fig. 2.52 in section. The "Red Ditch" can be divided into three parts: Outer ditch; buttress; and Inner ditch.

The Outer ditch (Feature 45A, Ditch H): This feature was broad and relatively shallow (approx. 9.20 m wide and 1.45 m deep below the subsoil surface at the

Fig. 2.29. Sonda 12C, plan and section of context 2024



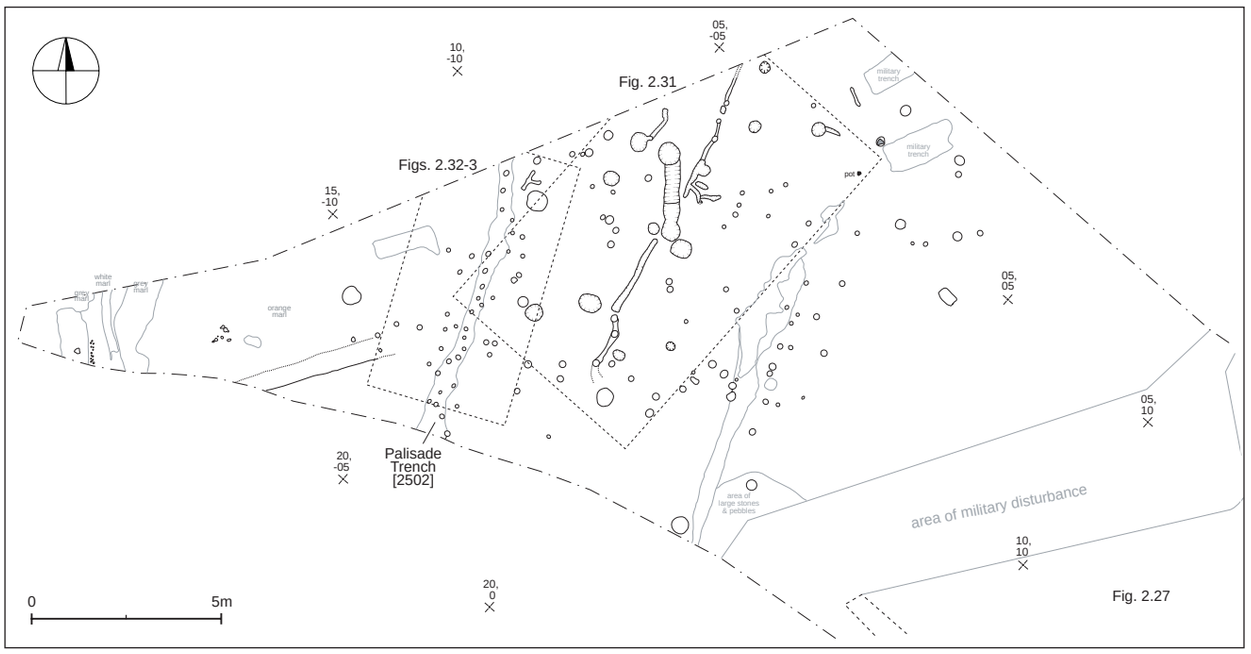


Fig. 2.30. Sonda 12C, north-western area

deepest point). It is filled with layers of material that tip in from each side. While the uppermost layer (77) consists of loose black silt, layer 104 beneath it is yellowish-brown, but surrounding this is layer 86, subdivided into many complex divisions. These were expertly dissected by Ken Murphy.

86A: a dark grey-brown silt with red, yellow and orange-brown mottling

86B: very mixed, comprising irregularly shaped blocks of red, yellow and yellow-brown concreted fine sand and silty sand set into a matrix of red, yellow and pale brown silt

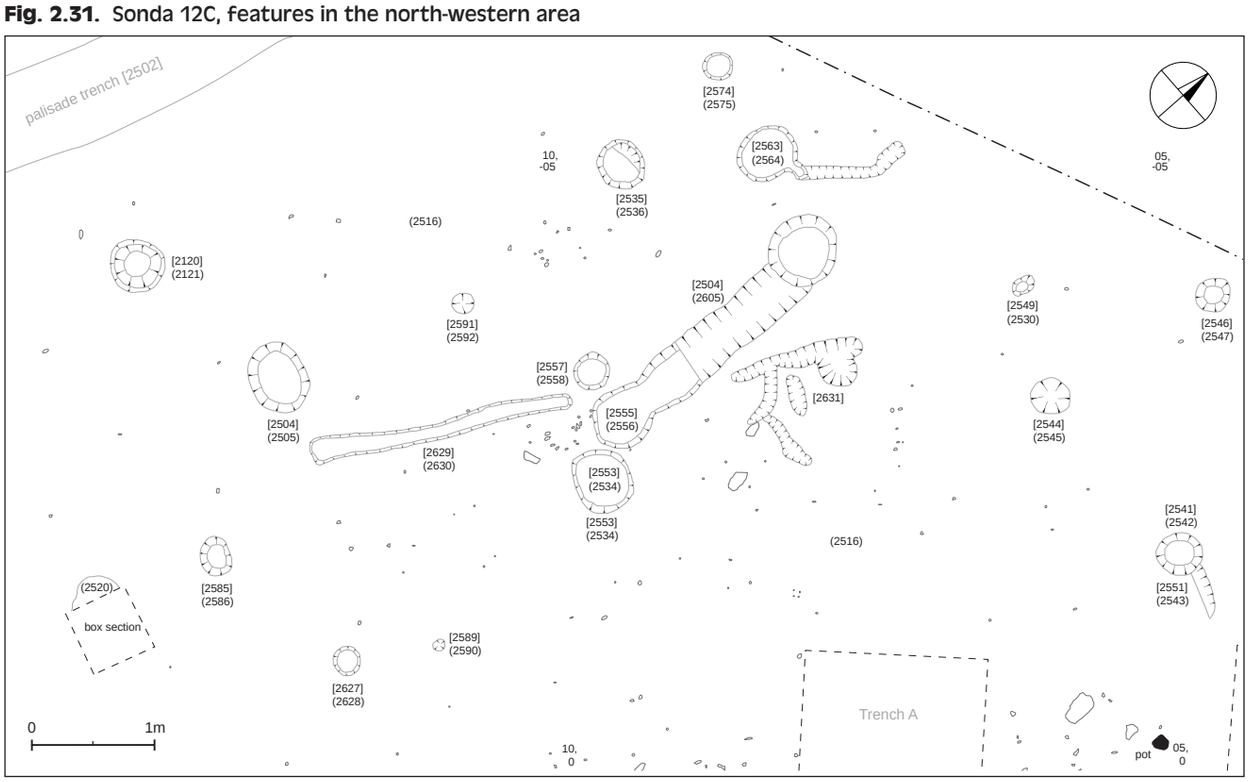
86C: Loess-like material with occasional irregular blocks of yellow-brown concreted fine sand or silt

86D: Loess-like material with orange-red mottled patches

86E: Very mixed, mostly bright red irregular blocks of fine sand or silt interleaved with bands of white silt

86F: A patch of dark brown silt

Fig. 2.31. Sonda 12C, features in the north-western area



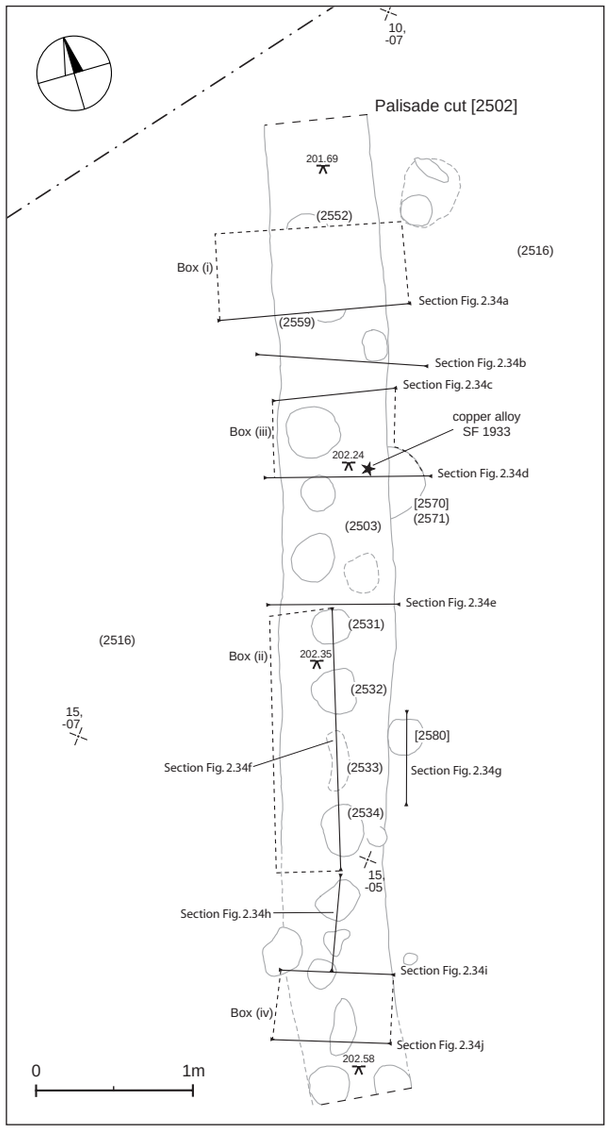


Fig. 2.32. Sonda 12C, palisade trench 2502 before excavation, showing location of sections

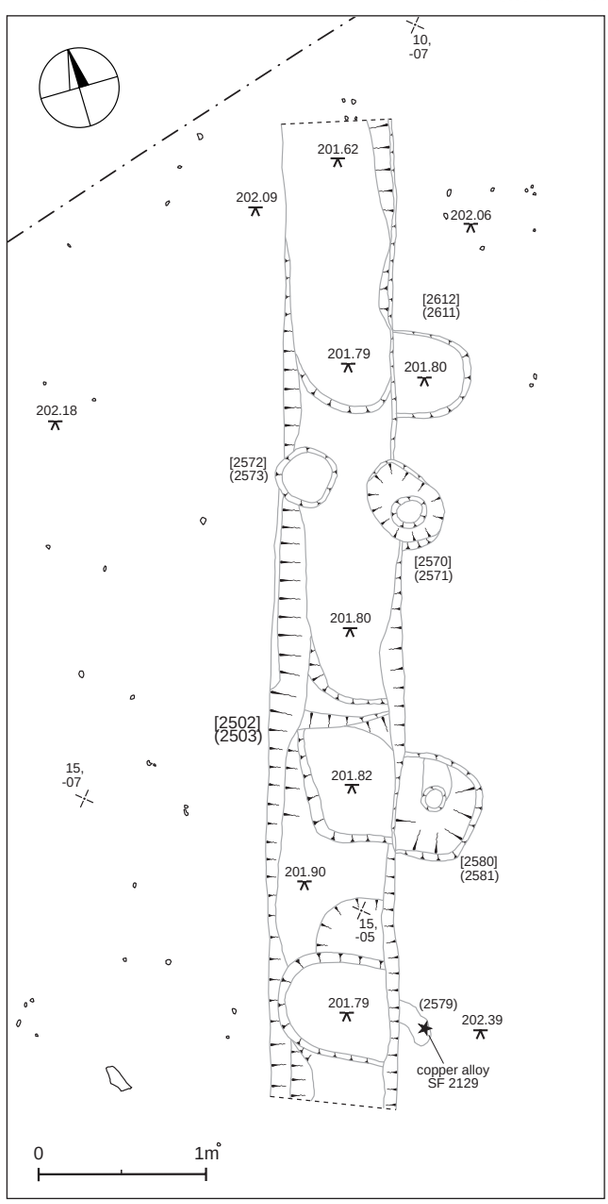
86G: Several lenses of white silt separating other components of the layer

Beneath the various parts of 86 was 87, a homogeneous loess-like material, pale yellowish-brown in colour, derived from the east side of the ditch. Finally, in the lowest layers of the ditch, were 106, a scatter of angular stones set in a black silty loam; 112, a pale yellowish-brown coarse loessic silt; and, at the very bottom, 117, a highly compacted pink/buff/light grey fine silt with some medium-sized stones (Colour Plate 3D). This, the layer discovered by M. Vávra and not fully excavated by the British team in 1994, is interpreted as redeposited burnt marl probably emanating from the beginning of the destruction sequence. Unlike much of the main fill of the ditch, this layer contained pot and bone (see below).

The nature of this ditch fill is particularly important. Layers 86 and 87 were especially striking, consisting as they did of brightly coloured deposits of sandy silt – red, yellow, white and various shades of grey and brown. Particularly in Layer 86 discrete chunks of highly coloured material could be seen (Colour Plate 3B), which looked as if they had originally formed separate pieces of marl, perhaps brick-like chunks or spadefuls, which had been exposed to fire differentially. The possibility of sun-dried bricks was considered, but cannot be demonstrated conclusively, and is perhaps unlikely in all the circumstances. Separate spadefuls of material are perhaps more likely, but this in itself is interesting since it suggests that these chunks of earth remained in distinguishable form at the time when they were exposed to fire (cf below).

It is presumed that firing was responsible for the bright colours involved, though the excavator, Ken Murphy, was sceptical about this possibility. Samples were submitted to Dr R Shiel, University of Newcastle

Fig. 2.33. Sonda 12C, palisade trench 2502 after excavation



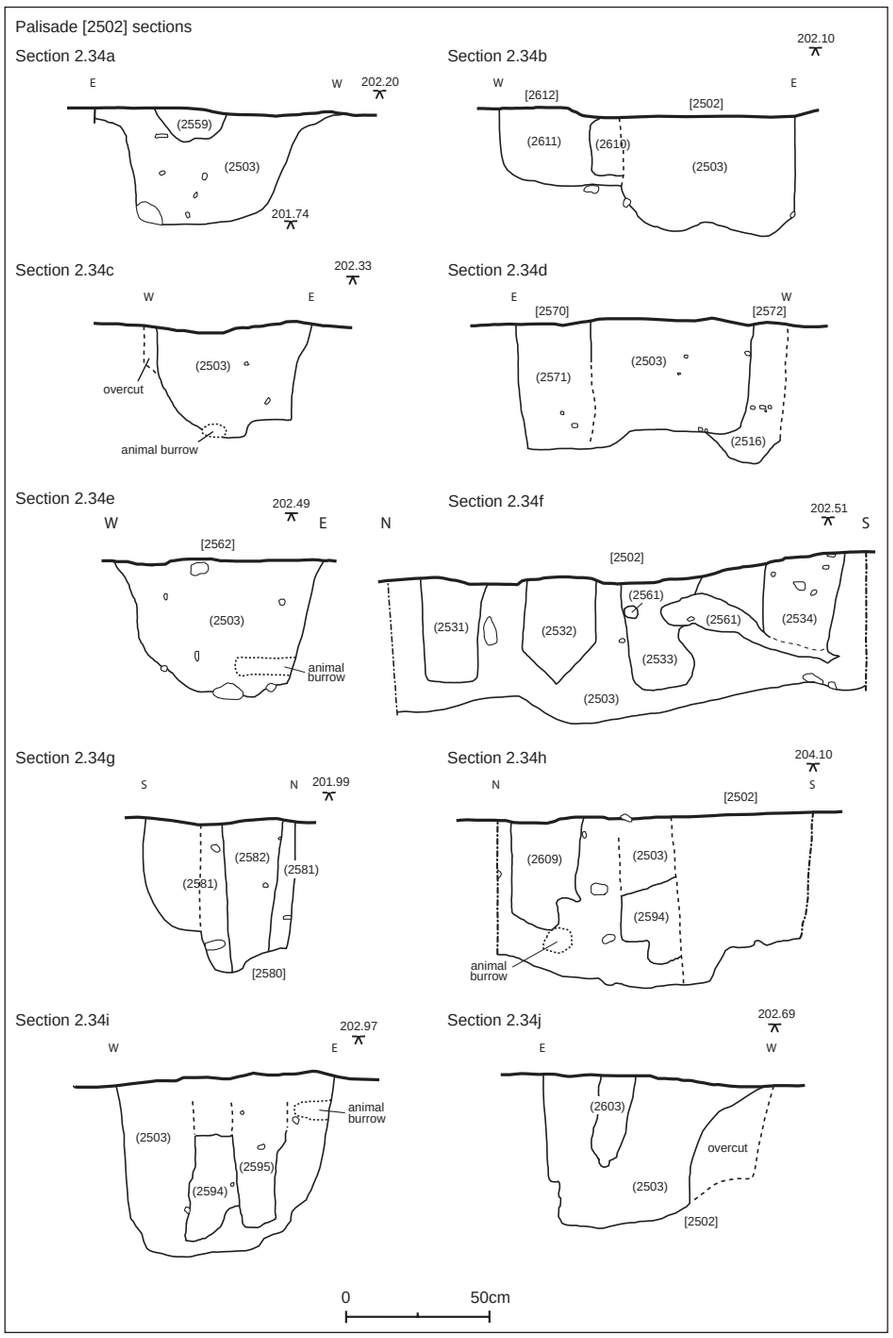


Fig. 2.34, a-j. Sections through post-holes in palisade trench 2502

upon Tyne, for particle size analysis (Appendix 1) in the hope that this might indicate the nature of the material of which the chunks of highly coloured material were composed. As his report indicates, the red material (samples 2 and 8, context 86) consisted principally of sand (85-90%), 57% of it coarse sand with 26-33% fine sand, and smaller proportions of clay and silt. The yellow material (sample 1, context 87) contained 65% sand, 31% of it coarse and 34% fine, with 30% clay. By contrast, material from the primary fill (sample 4, context 107 – which also produced charcoal for the radiocarbon date, see below) only contained 20% sand and nearly 80% clay and silt. This made it very similar to the sample of topsoil that was submitted (sample 7) and to the fill of a posthole (sample 3, context 2722, the postpipe 2710). All these were quite different from background samples taken from 15 and 30 cm below the subsoil level (samples 5 and 6), which consisted overwhelmingly of clay and silt.

One can conclude from this that material was brought to construct the rampart (the material from which this ditch fill presumably consists of) from a variety of subsoil locations, being deposited in the rampart as homogeneous chunks of soil just as it had been dug out of the ground. While it is unlikely that it had undergone the effects of fire directly, it had probably been in a situation where burning was occurring in the vicinity, so that it baked in the heat. This conclusion seems justified since from our observations digging in the natural soil can produce white marl but not bright red sand. On the other hand, hard pockets of agglomerated sand do occur, and in all likelihood it was blocks or chunks of this sand that were collected and placed first in the rampart fill, and then, on its destruction, tumbled into the ditch.

The central buttress: This feature formed a rather slight division between the Outer and Inner ditches. At this point the deposits were only 50 cm deep below the subsoil surface. Context 89 formed the upper part (a firm black sandy silt), and 113 the lower (a yellow-grey silty clay). In part of the trench a pit (context 110) goes down below this level (visible on the north-east-facing section, Fig. 2.52, but not on the south-facing section (not illustrated here)). This pit was not cut through context 113, however, and must have been an original feature. It slopes up again towards the east, where it adjoins the Inner ditch.

The Inner ditch (Feature 45, Ditch G): This feature was only fully explored in 1995. Although the upper deposits were initially investigated in 1993 and more

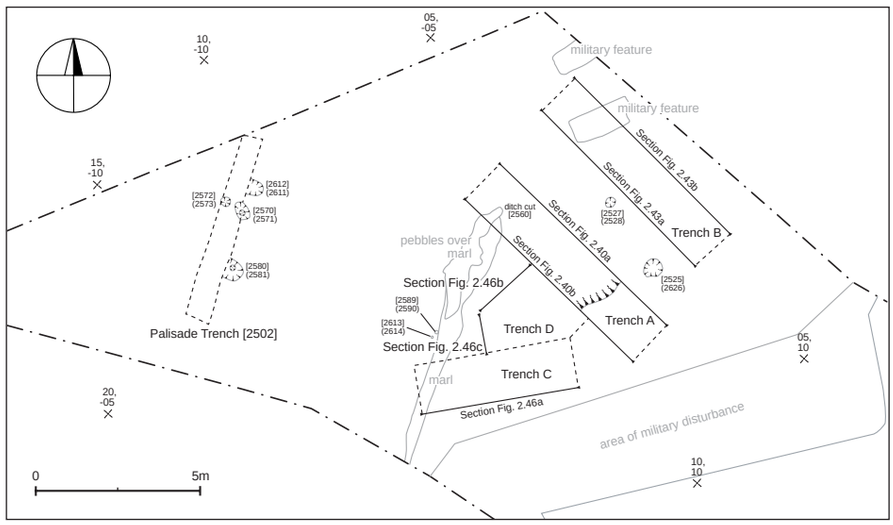
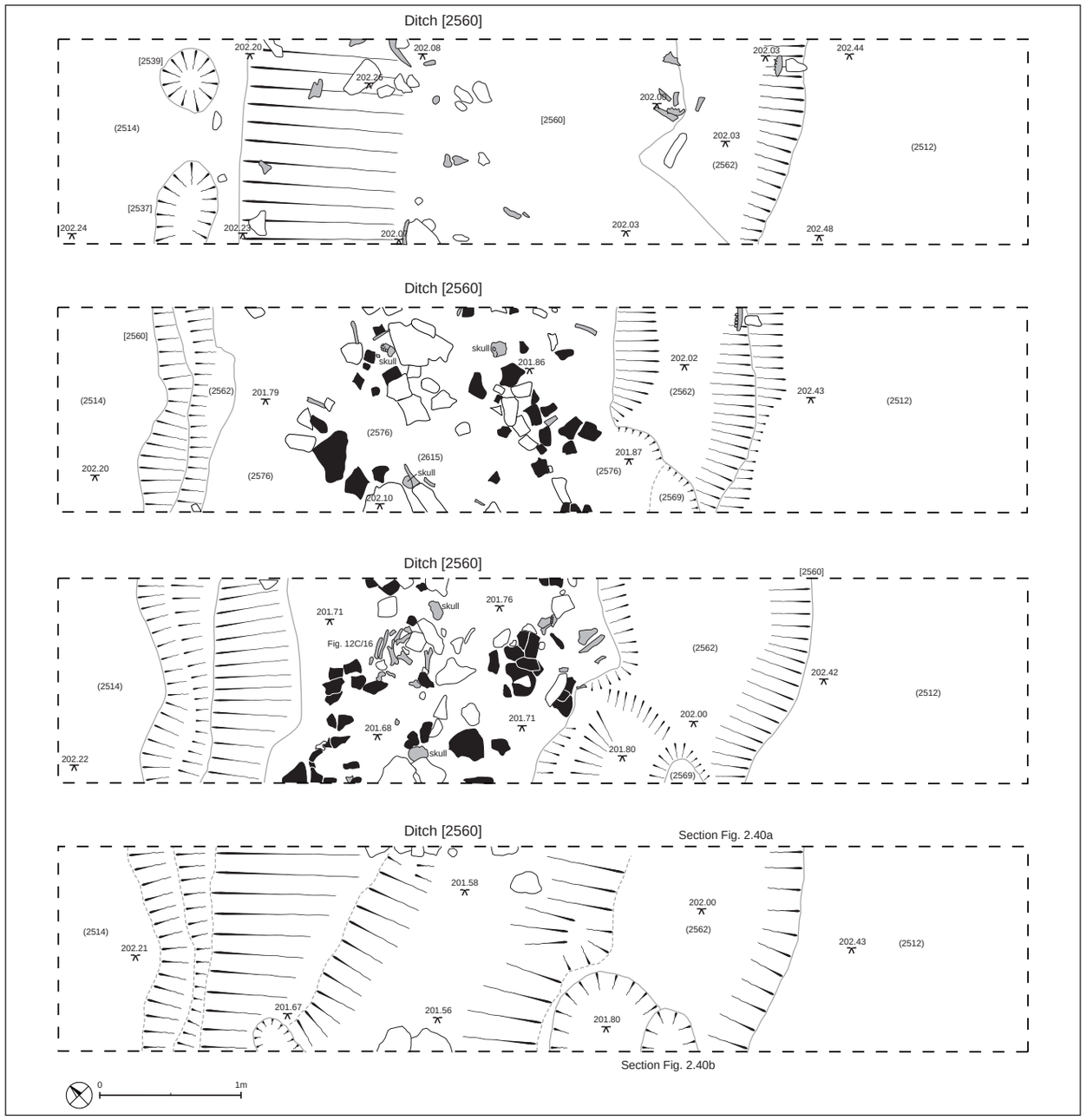


Fig. 2.35. Sonda 12C, north-western area showing location of section trenches

Figs. 2.36 – 2.39 Sonda 12C, north-western area, trench A, plans at successive stages of excavation



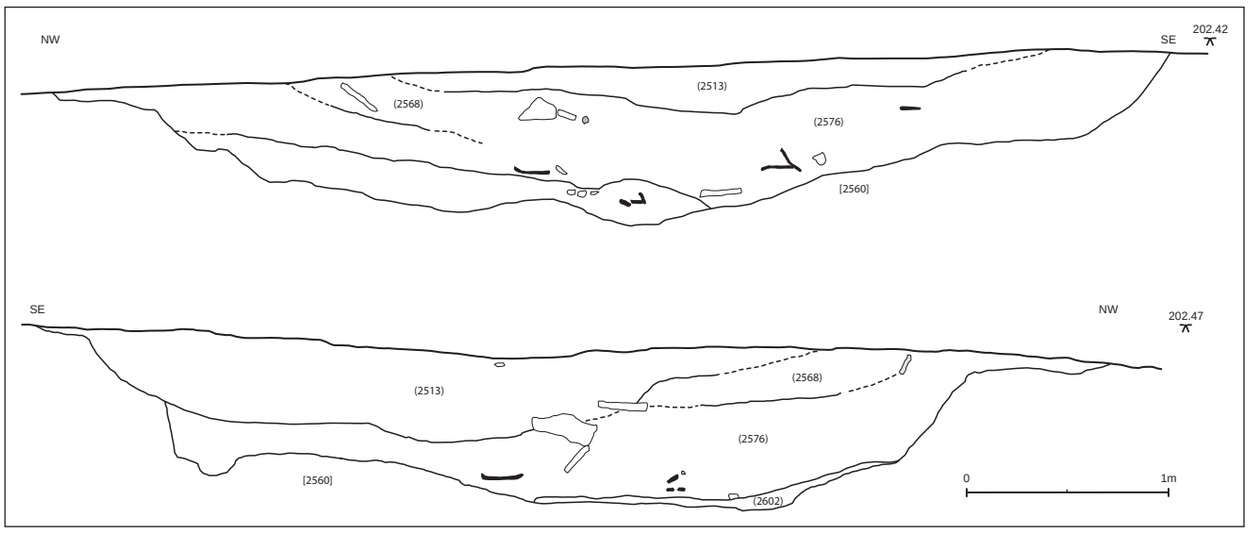
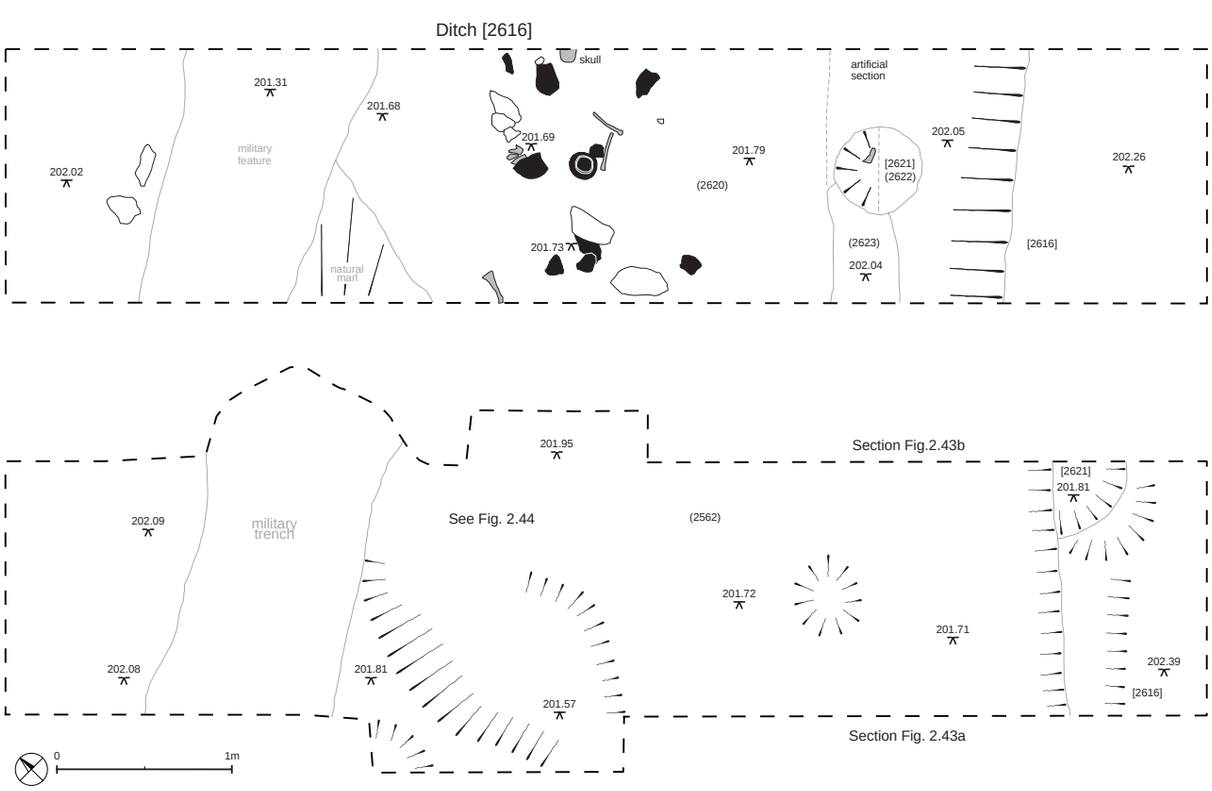


Fig. 2.40, a-b. Sonda 12C, trench A, sections through ditch 2560. A: south-west facing; B: north-east facing

fully in 1994, only in 1995 was it possible to extend the section trench eastwards under the spoil heap and find the inner ditch lip. The ditch here was 5 m wide and 1.40 m deep towards the east, deeper (1.80 m) towards the central buttress; the bottom is flat except where the deeper pit-like feature (5009) goes down. These pits are irregular and evidently did not feature in the Inner ditch at every point on its circuit.

The deposits were quite different from those in the Outer ditch. Although the uppermost layer (5000) consisted of soft red sandy material, the rest were not like this. 5001 (below 5000) was a soft black greasy silty sand, with charcoal inclusions; 5003 a hard white marl; 5004 a hard grey marl and loam mix; 5005 a firm dark grey/brown clay loam; 5010 a mixture of white marl and dark grey clay loam; and 5009 a cream/grey mixture of marl and clay loam. It is clear from these layer descriptions that the Inner ditch had a quite different history, at least in its final stages, from the Outer, with its extensive marl inclusions probably indicating the one-time presence of a rampart which has then collapsed or been pushed into the ditch.

Fig. 2.41 – 2.42. Sonda 12C, north-western area, trench B, plans at successive stages of excavation



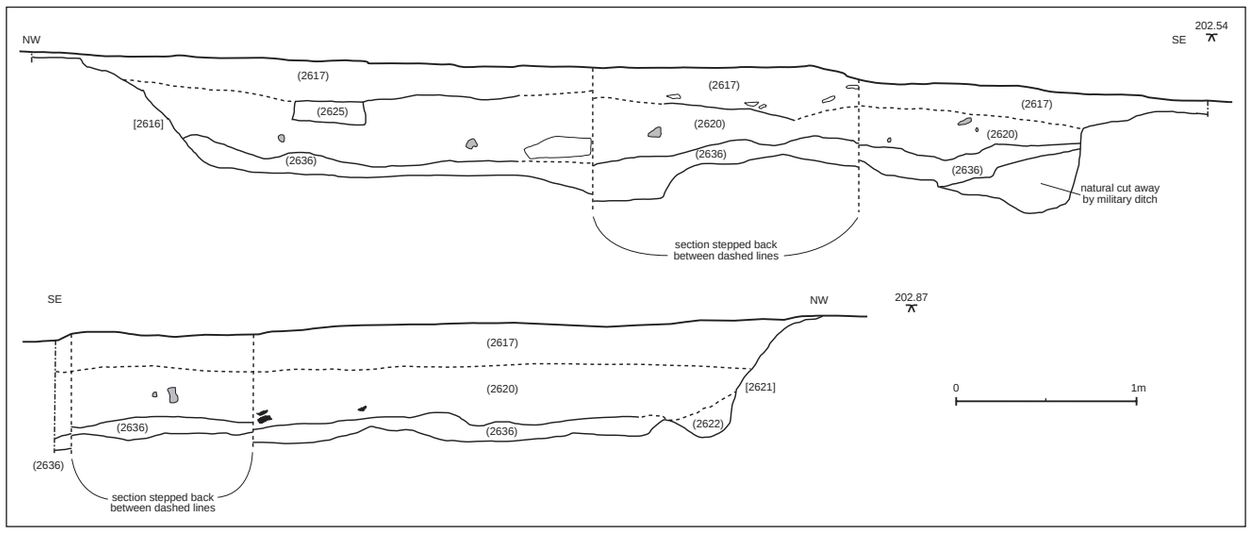
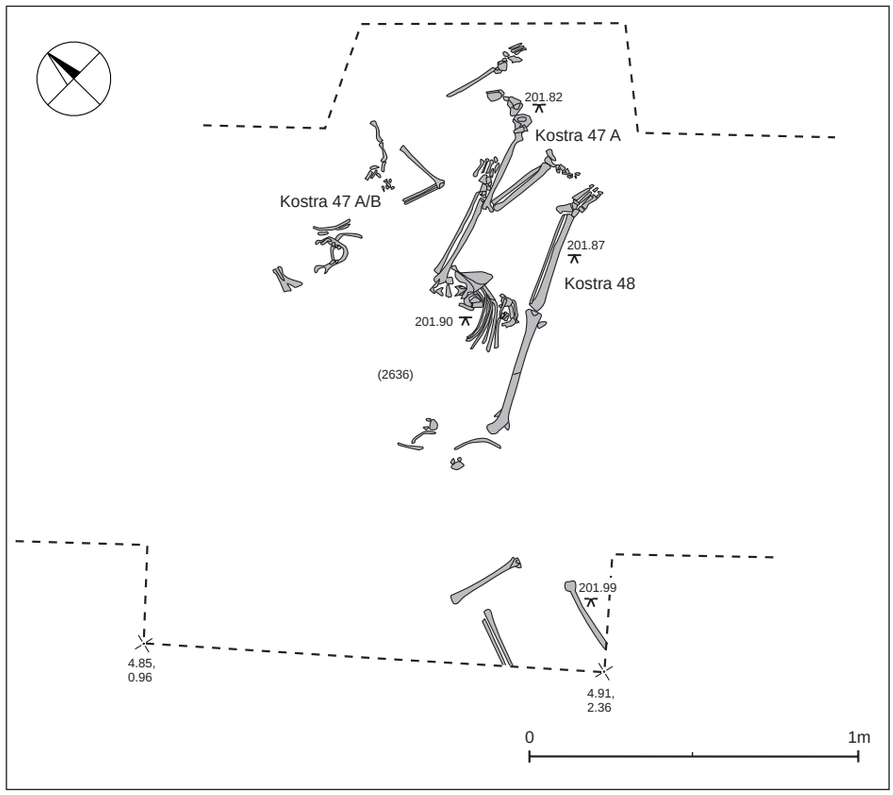


Fig. 2.43. Sonda 12C, trench B, sections through ditch 2616. Upper: north-east facing; lower: south-west facing

There is little sign of burning except in the uppermost levels (5000), which are probably redeposited.

Fig. 2.51 shows that the small extension eastwards of this section trench came upon the gravel edge of the ditch at the extreme eastern end. This gravelly material is believed to represent at least in part the remains of the rampart that stood on the inside of the ditch. Unfortunately this could not be investigated further as spoil still prevented any further extension to the east.

Fig. 2.44. Sonda 12C, trench B, bone deposit in trench B



Sonda 27

In 1992 a section (Řez/Cut 1) was cut across the presumed extension of the Red Ditch (here numbered Objekt 76B in the Czech sequence) northwards into the area at the lowest part of the site, where development plots were situated north of the circuit road and immediately beside the playing field on the edge of Velim village (Fig. 2.53; for the location of this trench see Hrala *at al*. 2000, Plan 1). Curiously, it was barely discernible in the iron-hard grey loessic silt in this part of the site and, except at its south-east end, was uniformly shallow and featureless. A trial section was cut in the bottom of the excavated deposits but this concluded only that natural had been reached; there was no sign of the "red" material that was present in huge quantities a mere ten metres upslope.

Thanks to the efforts of M. Vávra with R. Šumberová in October 1992, Řez 1 was extended some 2.4 m towards the south-east and the bottom of the ditch was reached, some 80 cm below the level achieved by the British team in late July. Fig. 2.53 therefore includes the profile of the south-eastern end of Řez 1 as drawn by Vávra and Šumberová. From this it can be seen that at this south-eastern end there were two pits cut into the subsoil below the infill layers of the ditch, and above them a series of tipping lines representing inwash into the broad shallow ditch.

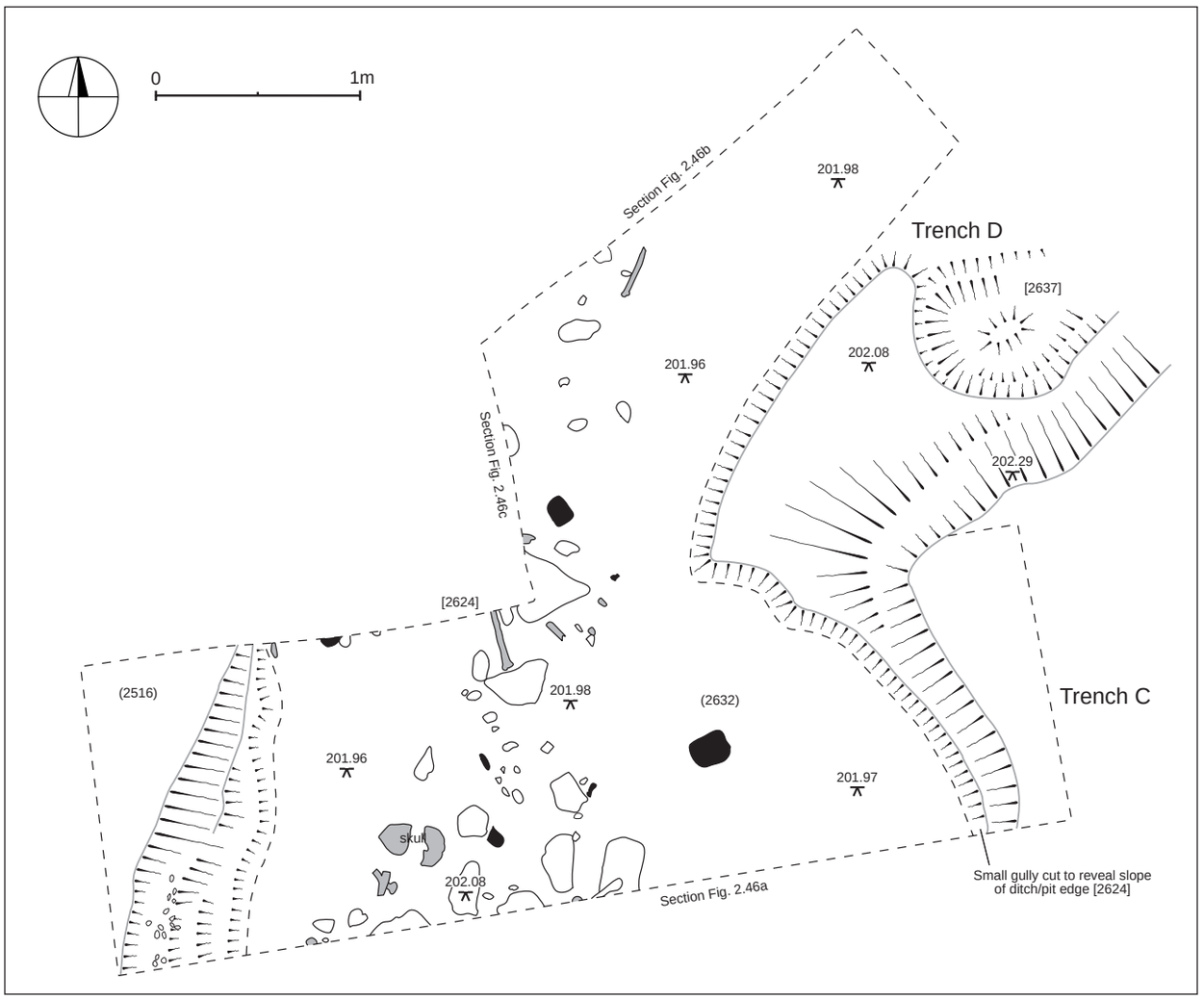
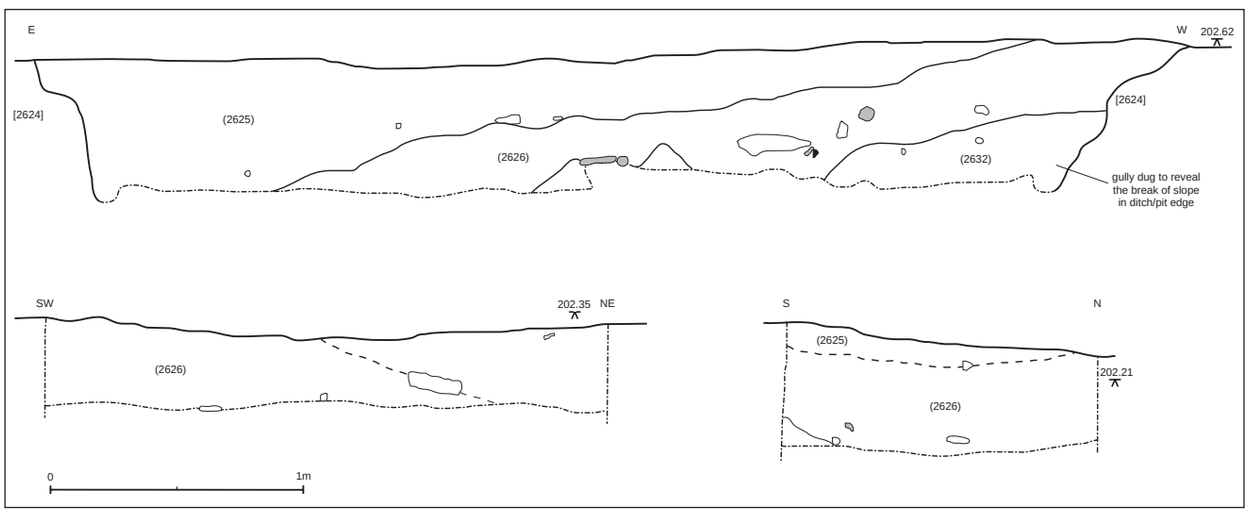


Fig. 2.45. Sonda 12C, north-western area, trenches C and D

Fig. 2.46. Sonda 12C, trenches C and D, sections of partially excavated ditch



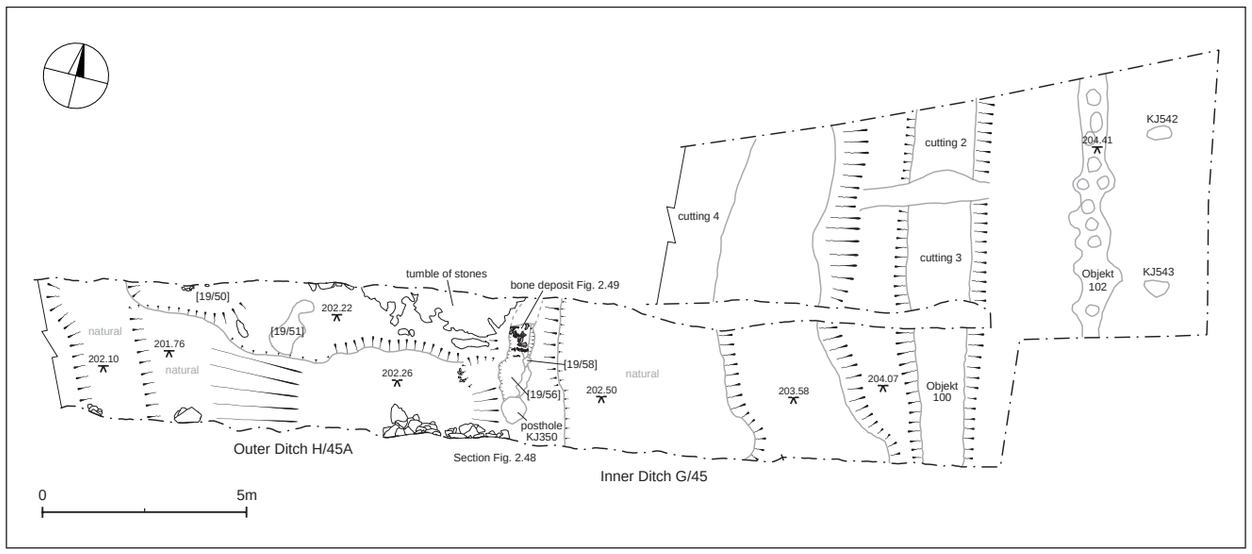


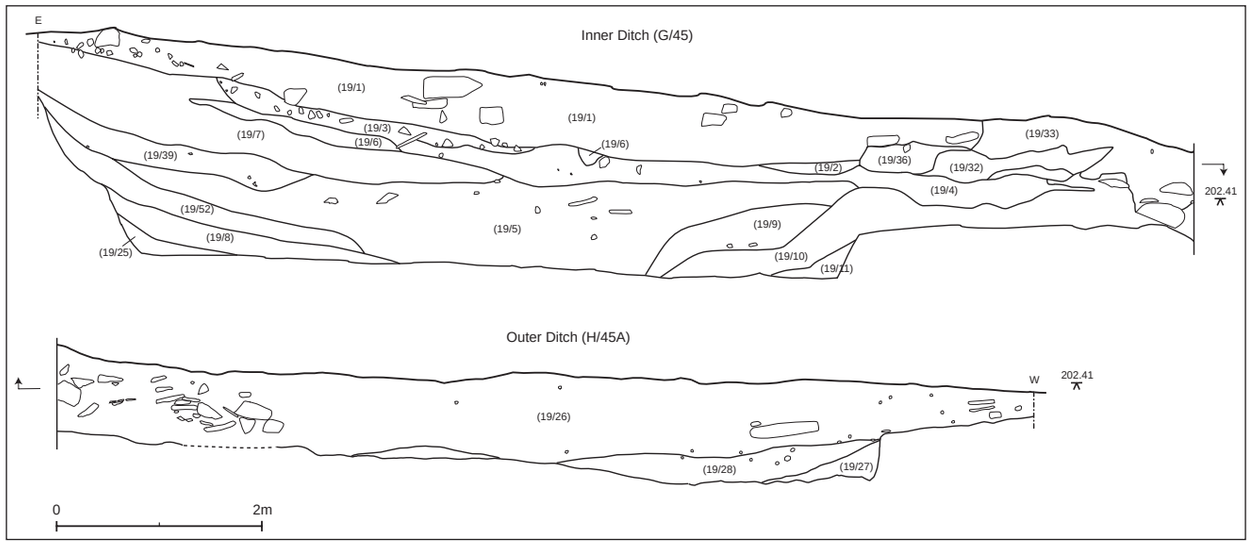
Fig. 2.47. Sonda 19, plan showing Ditch circuits G (45) and H (45A) (the "Red Ditch")

From this it is clear that between S.12B and S.27 the Red Ditch dwindled in depth and definition until it is barely a ditch at all. Some support for this came from an investigation late in the 1995 season, when the area between S.12B and S.12C, immediately beside the concrete road, was explored (Fig. 2.54). Although the surface exposed by the digger was varied in colour, rapid sectioning of some of the major colour changes produced nothing in the way of a definite ditch edge which enabled the ditch course to be followed. One is forced to conclude that at this point the history of the ditch was different from that higher up the hill, partly because it was never dug to the same depth, partly because its post-depositional history has been different, but also, significantly, because its infill history has been quite different from that on the hillslope. Thus there is no red, orange and white material indicating intense burning, no tumbled stone, indeed no sign of a two phase ditch construction (unless the pits at the bottom of the south-east end represent the first phase, Inner ditch). It may be that this area of the site was on or near an entrance, and the presence of massive post-holes in S.12E lend some support to this hypothesis (see below). What is necessary for greater certainty, however, is further exploration of the ditch circuit in areas outside the "site" proper, for instance within Velim village, or in the fields to the north-east and west of the site. This could tell us whether the "Red Ditch" was typically "red" or only coincidentally so in the area of the complex set of pits and ditches that make up the central Velim-Skalka site.

Interpretation of the "Red Ditch" excavations

The elucidation of these sequences is complex, and depends on results obtained from various sectors of the site, including those excavated by the Czech team in the years preceding the campaigns described here. The accounts given in Hrala *et al*. 1992 and 2000 are generalised, drawing on information from the S.19

Fig. 2.48. Sonda 19, north-facing section



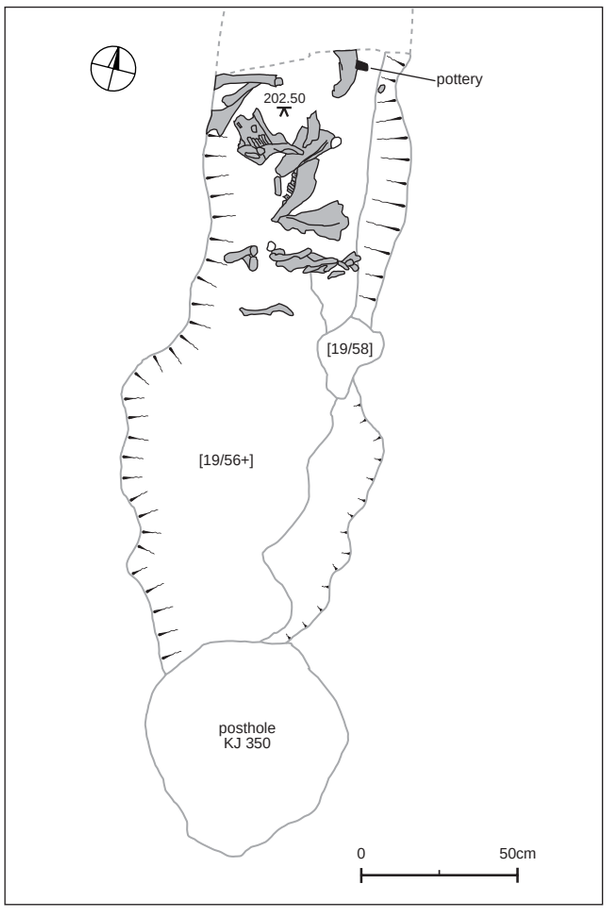


Fig. 2.49. Sonda 19, bone deposit on bottom of outer ditch (H / 45A)

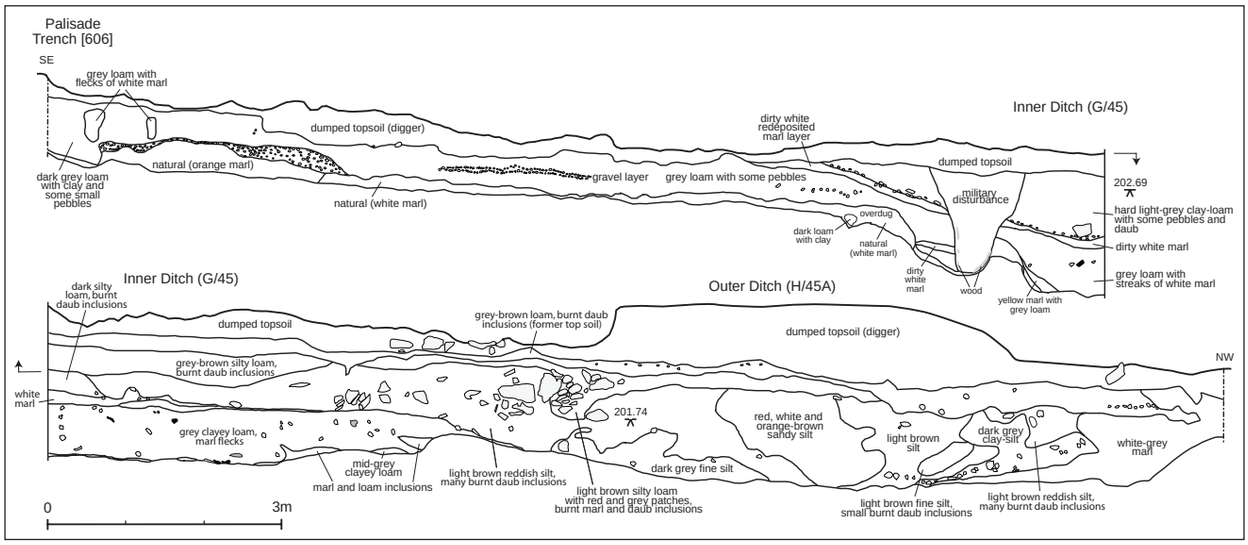
excavation, as well as from machine-cut slit trenches further to the north (1/85, and S.12 Řez 5). Although there are differences between the ditches in S.19 and in S.12B, the sequence is broadly the same.

The account of Ditches G and H (Objekt 45/45A) by Vávra is thus a composite. Ditch G is described as about 5 m wide (4.80 m in S.19) and 1.70 m deep, with sloping sides and flat bottom. Its fill was overlain by a marly layer which was "covered by the destruction layers of the later fortification H, burnt in places"; it was only apparent on the western side of the site. The published sections (*ibid*. Figs III.20 and III.21) indicate that it was similar there to what was recovered in S.12B. Ditch H is described as 10 m wide and 1.5-1.7 m deep. In the central part, "charred posts… were resting on an ash layer. Fallen stones lay above them and further towards the inner ditch side. Underneath, the ditch bottom was covered by a thin charcoal layer resting on the burnt subsoil marl" (Vávra 2000, 33). Above this, "a silty fill occurred, up to 1 m thick, fine and ochre to red in colour. It contained larger lumps of daub and quarry stone… The destruction lay on a charcoal layer together with reddish gravel… The layer, with traces of burning in its body and surface, was mainly composed of light-coloured marly material max. 60 cm thick" (*ibid*. 34).

The tumbled stone emanated from a fortification wall, erected along the inner ditch lip according to Vávra, and composed of stone interlaced with horizontal and vertical timbers (*ibid*. Fig. III.23). Unfortunately no plans are published in support of this interpretation, and the published sections (notably Fig. III.21) are far from clear on the point. It certainly appears, however, that the tumbled stone must have come from a rampart that lay immediately inside the Outer ditch (H / 45A), and constructed over the infilled Inner ditch.

There was no ditch in S.12B corresponding to Objekt 100 in S.19 (inside Ditch G / 45), but from the description of Objekt 100 given by Vávra it sounds similar to Ditch 612 (see above/below). Since Ditch 612 is cut by the palisade in S.12B, it is evident that it comes from a phase preceding the construction of the entire Outer ditch circuit. The palisade, on the other hand, corresponds to that recovered in S.12B and S.12C (see above), and was also recovered in S.24 (Obj. 75). It was thus a regular accompaniment of the Red

Fig. 2.50. Sonda 12B, Řez 5, north-east facing section



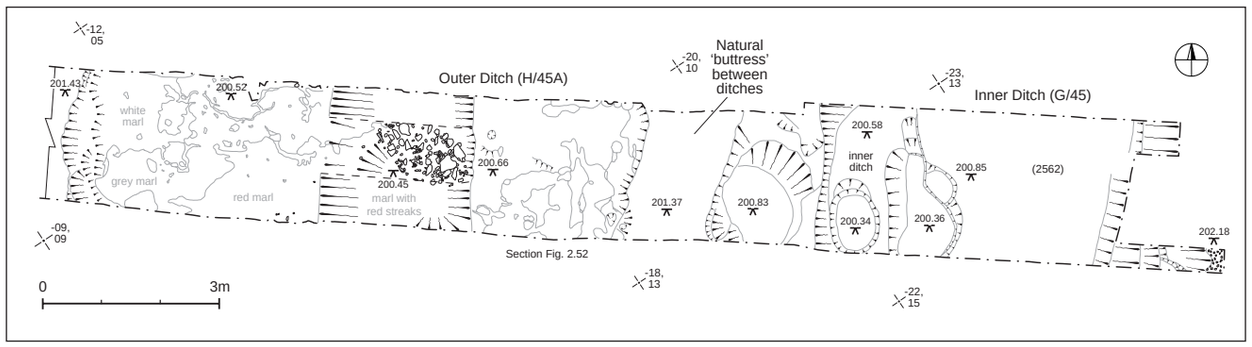


Fig. 2.51. Sonda 12B, Red Ditch section, plan

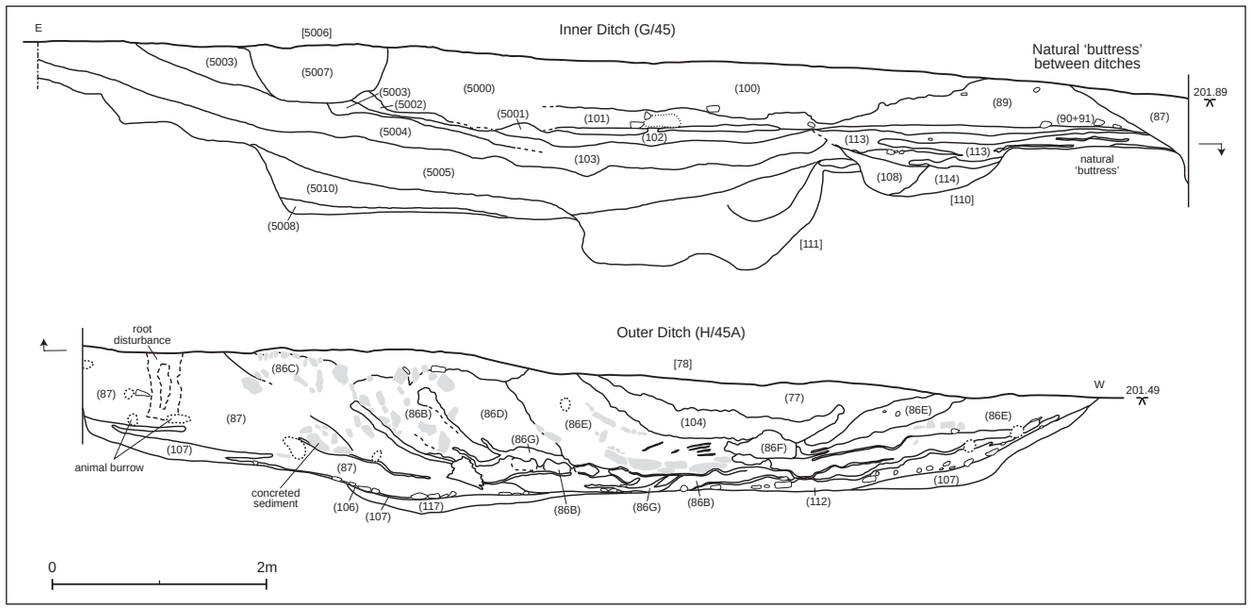
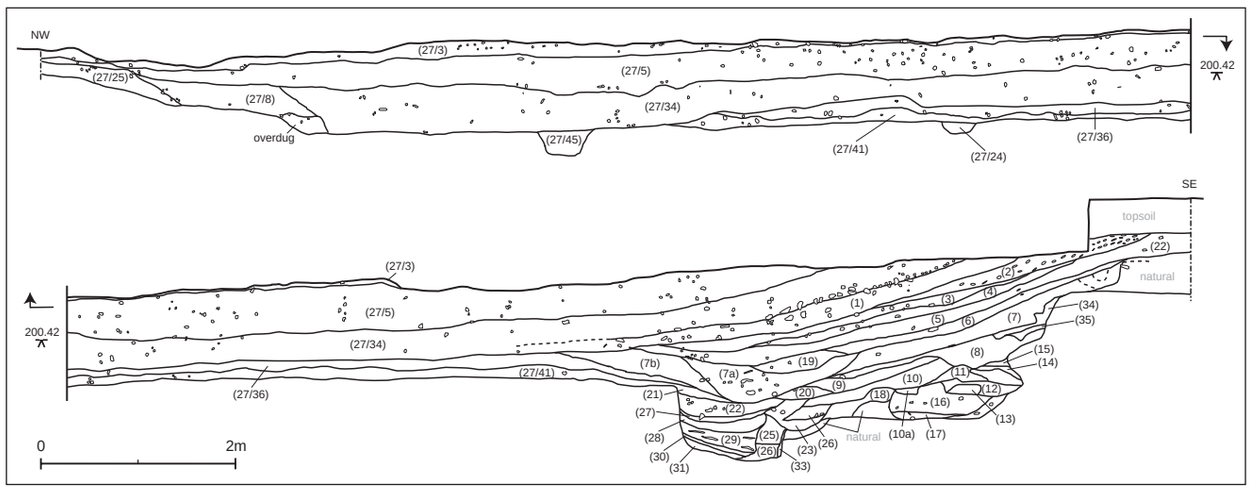


Fig. 2.52. Sonda 12B, Red Ditch section, north-facing section

Fig. 2.53. Sonda 27, Řez 1, south-facing section



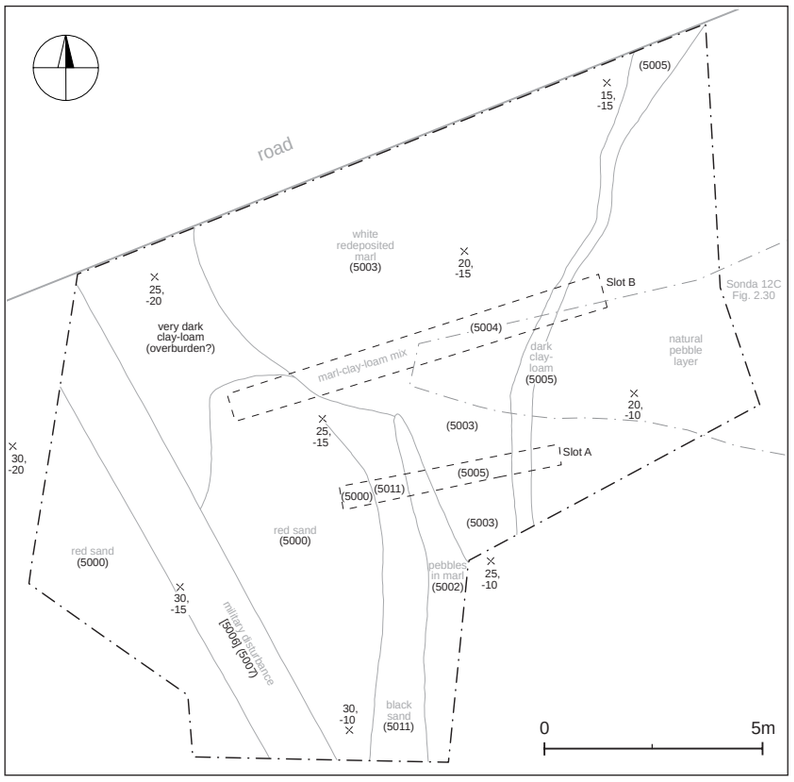


Fig. 2.54. Sonda 12B/C, plan

Ditch, runs concentrically to and respects it, and seems to represent a structural feature connected with the potential rampart that lay inside the Inner ditch.

Since the palisade cuts Ditch 612 it is also clear that at least the Outer ditch must have been a late, possibly the latest, feature on the site, and its destruction probably the final act of the Bronze Age occupation. Since, further, it appears that the Outer ditch runs completely concentrically with the Inner ditch, and seems to have been constructed after the Inner ditch had gone out of use, it is plausible too that the construction, use and infilling of the Inner ditch immediately preceded the construction of the Outer, though there are no certain stratigraphical indications that prove this.

What is extremely striking in the context of the Velim site is the unusual nature of the deposits in the Red Ditch. This can be seen particularly clearly from an analysis of the finds. Unlike most of the features in S.12B and indeed in other parts of the site, especially those in the southern part of S.12B, finds in the Red Ditch were relatively few. The total number of sherds recovered from this entire cutting was 392, weighing 7199g; of this, 132 sherds were from contexts 107 and 117, at the bottom of the ditch and 128 from 5005, the lower fill (not the lowest) of the Inner ditch. Extraordinarily, no pottery at all was recorded from contexts 86 or 104 in the upper layers or 105-6 in the lower, and only 44 sherds from 77 and 87. With bone the contrast is even more marked: context 107 produced 276 pieces, and all the other contexts together 232 pieces. Quantities in most other parts of the site are much higher.

The clear implication of this is that the Red Ditch had a quite different history from other ditches and pits at Velim, in so far as we are able to reconstruct this from the partial information at our disposal.

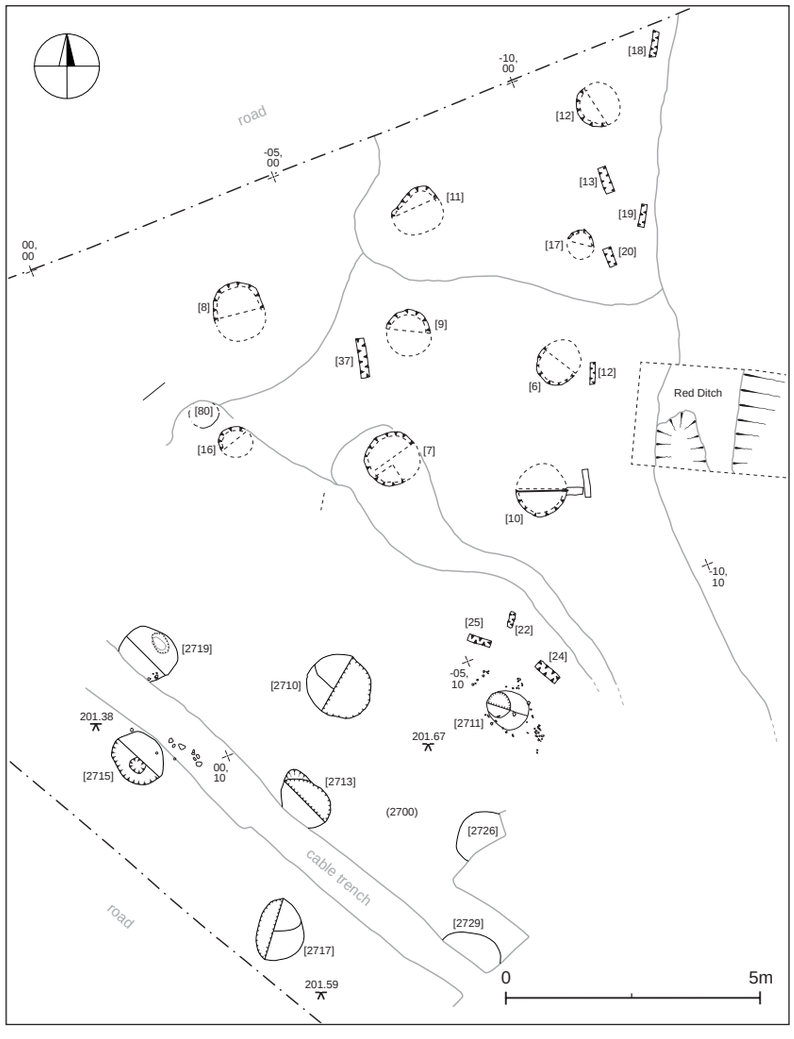
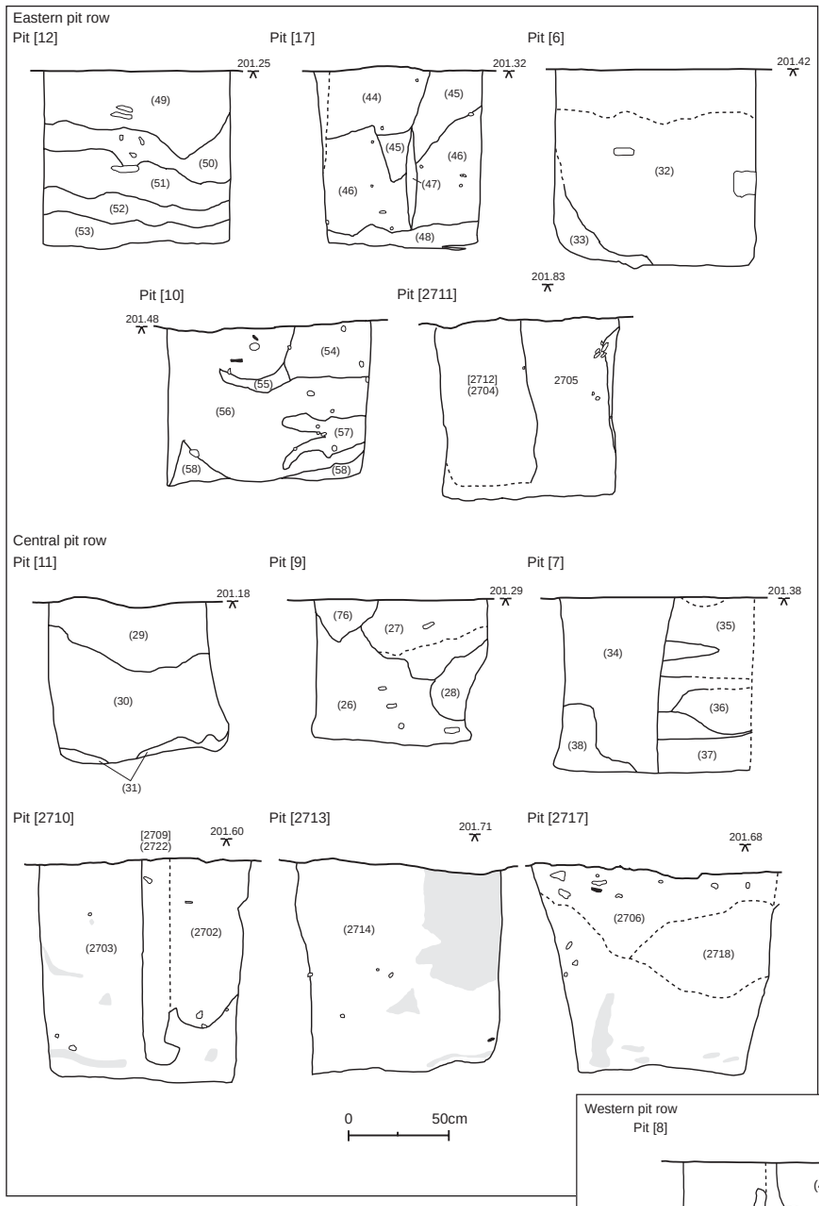
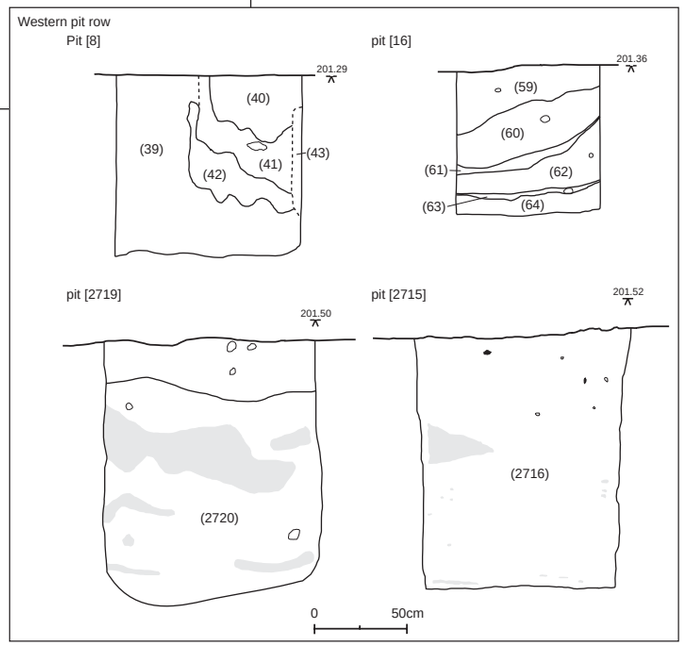


Fig. 2.55. Sonda 12E, plan





Figs 2.56 – 2.57. Sonda 12E, pit sections

precisely dated they indicate that the Red Ditch belongs to a phase of occupation that is equivalent to Br C2-D.

From the Czech excavations one C14 date is available for the Ditch (3319 ± 138 BP, CU-869), but its broad error term allows no possibility of more precise dating of the feature; at the 1 sigma level the date range is 1750-1430 cal BC, which does no more than confirm a dating in the Middle Bronze Age.[5] From the British excavations one sample was available for dating, charcoal from context 94/107, close to the bottom of the Outer ditch. The date is 3080 ± 20 BP (GrN-27615), which gives the date range 1420-1290 cal BC at 95% probability. This is some what later than but not statistically different from the dates obtained for Pit 64, and suggests a date in the 13th century cal BC for the filling of the Outer ditch and therefore for the destruction of the rampart – and arguably for the abandonment of the site. This dating corresponds well with the pottery dating, insofar as that can be tied to particular features and events on the site (see below, Chapter 5). It does leave open the question of

Admittedly the discovery of bone deep in the Outer ditch in S.12B shows that the differences may be more apparent than real, but the extraordinary paucity of material elsewhere is extremely striking. The catalogue of finds given by Hrala *et al*. (2000, 220 ff) indicates that a number of bronzes and other objects were found in Obj. 45A, though no precise information on findspot is provided. Three pins were found in close proximity and in stratigraphically successive layers, belonging to the Vel'ká Lehota, Henfenfeld-Weitgendorf and seal-headed (*Petschaftnadel*) types; these are found in Late Tumulus and early Urnfield contexts and though they cannot be more

5 The precise position of the sample, horizontal and vertical, is not stated, so that it is impossible to know quite what is being dated. In any case the broad error term inhibits more precise definition.

the relationship between the Red Ditch and the internal ditches and pits, and of course the quarrying of material to construct the rampart.

The Re Ditch, properly called Ditch Circuits G and H, can thus plausibly be associated with a complex fortification history, probably in two main phases. As such, it is the only ditch circuit which appears to be genuinely intended to have served as a real barrier, and not to have been used for the disposal of dead bodies. I return to the wider significance of this matter below (Chapter 10).

Sonda 12 outside the Red Ditch (S.12B/E)

North-west of the Red Ditch, but within the area bounded by the concrete circuit road, lay an area divided between S.12B and S.12E (the latter a name assigned in 1995, when S.12B could be extended up to the diagonal concrete road). The area is continuous but was excavated in two separate seasons (1993 and 1995); as it happens, there was a break in the features found that corresponded to the areas dug in the two seasons. Thus it was only at the end of the 1995 season that the overall pattern could be discerned. In fact the Czech team had excavated in this area before the circuit road was built (a machine slit trench was dug alone its projected line), and in Sonda 23 (north-west of the circuit road) a sizeable area excavation took place in 1990 in parcels 1106 to 1111, adjacent to the future Sonda 27. Some of the features found in S.23 clearly relate to those recovered by us in S.12B and E, but unfortunately by 1993 these were no longer available for study, and it is only from examination of the plans made in 1990 that the picture can be reconstructed. In this context it is worth noting that the published plans in Hrala *et al*. 2000 (Plans 1 and 2, between pp. 40 and 41) only shows the 1990 and 1993 features, not the additional ones recorded in 1995; and from these plans it is impossible to obtain a clear idea of the real situation on the ground.

S.12B/E was occupied by a series of massive post-holes, lying in lines with a marked break between them at one point (Colour Plate 4D). Fig. 2.55 shows these features, as recorded in 1993 and 1995 (i.e. south of the concrete circuit road). From Hrala *et al*. 2000 Plan 1, it is evident that more such features were found in and north of the road in 1990, though it is not known how closely they corresponded in form to the southerly group. It would appear that they became slighter as one proceeded north-westwards, though they still ran in rows that are concentric to the Red Ditch.

Description

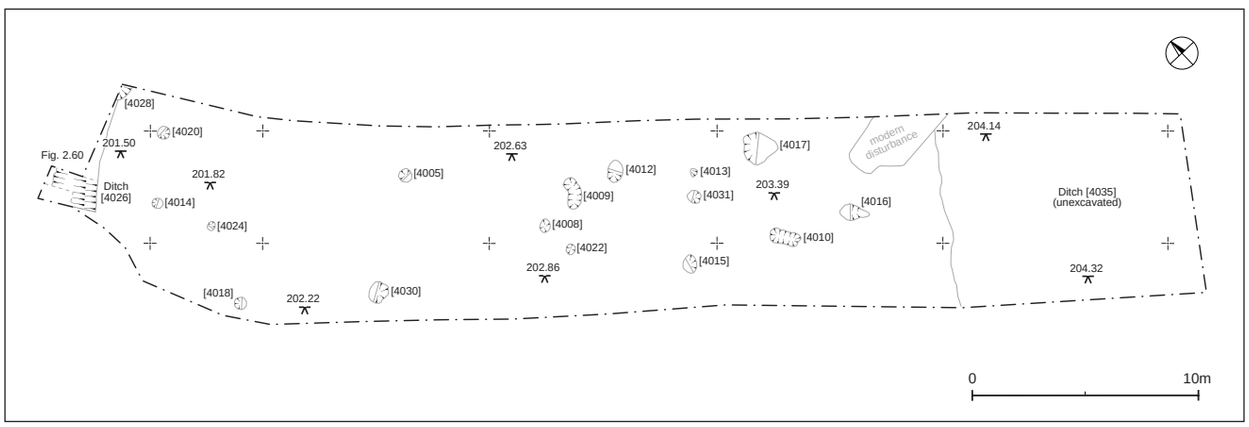
Northern group (1993):
First row: 12, 17, 6, 10
Second row: 11, 9, 7
Third row: 8, 16

Southern group (1995):
First row: 2711, 2726, 2729
Second row: 2710, 2713, 2717
Third row: 2719, 2715

Drawings of these post-holes appear in profile in Figs. 2.56 and 2.57. They are between 0.80 and 1.20 m in diameter, and between 0.70 and 1.15 m deep. 2710 contained a visible post-pipe (2709), while in other cases there was a vertical division which suggested a differential fill caused by the one-time presence of a post.

Details of two pits (Features 133 and 134) were published by Vávra (2000, 40): Feature 133 was "a circular pit 81 x 75 cm in extent, with almost vertical sides and a flat bottom 32 cm below the subsoil level"; 134 was a "circular pit 90 cm in diameter… with flat bottom 133 cm below the present surface". From this it appears that the pits corresponded closely to those recovered in 1993 and 1995. In addition, Feature 140 appears on Vávra's Plan 1, though it is not described. All three lie north of the line of the pits dug in 1993, but 140 would fall into the second row, 134 into the third row, and 133 into a hypothetical fourth row (traces of which were recovered in the corner of S.12E).

Fig. 2.58. Sonda 34, plan



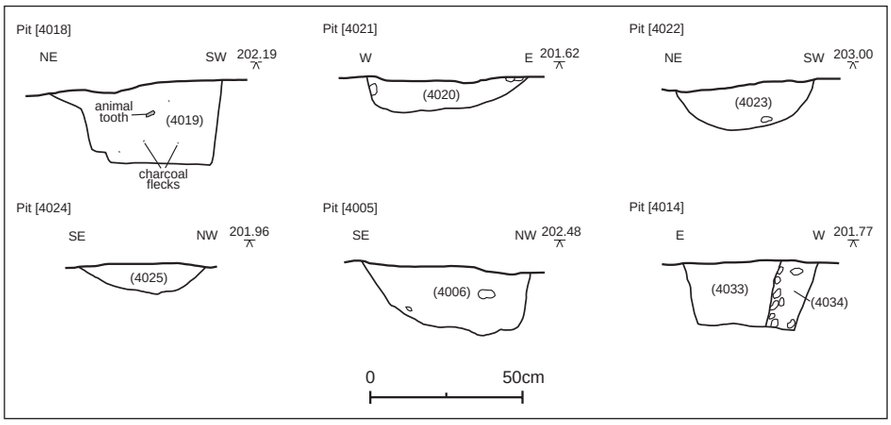


Fig. 2.59. Sonda 34, pit sections

The spacing of the posts is around 2.5 m north-south and a little over 3 m east-west. The gap between the northern and southern groups is around 3.5 m (3.4 – 3.8 m). From plans provided by M. Vávra it appears that these figures are a little smaller than those for the pits/post-holes in S.23 (1990) but not greatly so.

Interpretation

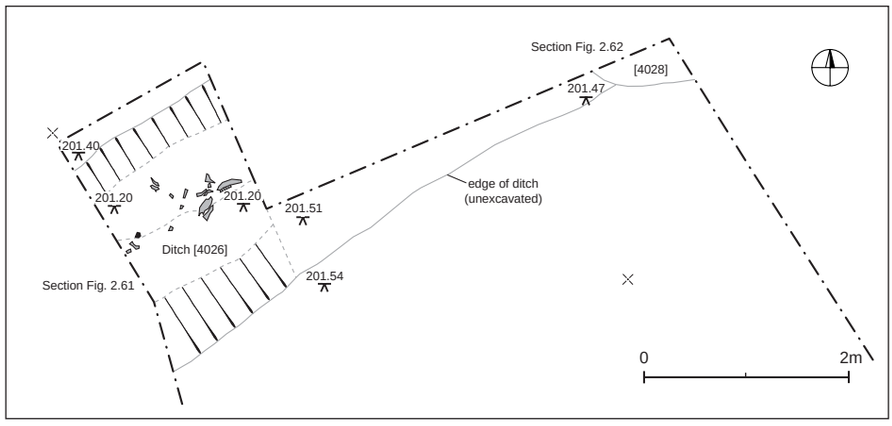
Although the information available is partial and ambiguous (for instance, post-pipes are not certainly present in more than a few of the pits), certain statements can be made about this array of pits. They were considerably more massive than any other pits found by the British team at Velim, and if post-holes they must have held sizeable posts, which were sunk around 1.30-1.40 m into the ground. They could thus have been structural, which raises the question of what sort of structure they represent. It is tempting to think of some kind of gateway, though the gap between northern and southern groups does not seem to be echoed by a corresponding causeway in the Red Ditch. Alternatively this gap may itself have been a structural feature, and the entrance may have lain further to the north, where the Red Ditch peters out in S.27. Yet other possibilities present themselves. The pits may have supported a platform, perhaps not unlike the floors of houses in Alpine lakeside villages. They could conceivably represent the foundations of a massive building, though there is no supporting evidence to confirm this, and the quantities and types of finds in this part of the site do not suggest any domestic activity here. There was apparently no sign of such features in S.32, some 40 m to the south, so it would seem that they were not a universal accompaniment of the Red Ditch. In the absence of crucial information on areas to the north and south, it seems most likely that they do indeed represent some kind of structure at a major entrance into the site, but its nature remains uncertain.

Sonda 34

Sonda 34 (Fig. 2.58) was a strip of sloping ground some 50 m long and 9 m wide, lying to the north of the concrete road that separates it from Sonda 12C. It became available for excavation in 1995, following the partial removal of concrete road slabs from the northern part of the trench. Even then, these slabs hindered the complete investigation of this part of the trench, near the northern perimeter road.

Following stripping of topsoil (4001) by machine, the area was trowelled down to the gravel subsoil (4002). With the exception of a clearly visible major ditch in the southern part of the trench, this revealed relatively few other features, though variegated areas indicated clay and sand patches (4003). The dark soil (4036) that indicated the presence of a major ditch to the south (4035) was obviously part of the "inner ditch circuit" (Ditch D in the Vávra terminology), and was not excavated by the British team in 1995 for reasons of time, though some excavation has been conducted by Vávra subsequently. It was presumed that the contents would resemble those recovered by the Czech teams in other parts of circuit D, notably the exceptionally deep and complex Feature 27 (Hrala *et al*. 2000, 16 ff.) – hence our reluctance to

Fig. 2.60. Sonda 34, north-western area, plan



6 Feature 27 was at least 3 m deep over an irregular area 15 m across, and consisted of numerous cuts and recuts, deposits and redeposits, burials and bone groups; it was excavated, on and off, for over 10 years, though the published account gives little idea of its extraordinary complexity.

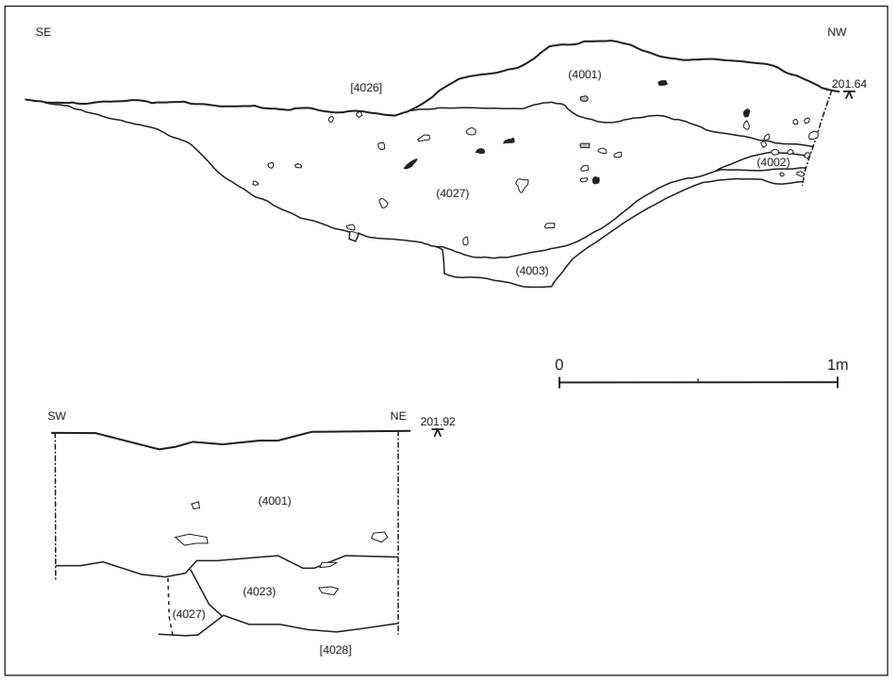


Fig. 2.61. Sonda 34, ditch 4026, east-facing section
Fig. 2.62. Sonda 34, pit 4028, south-facing section

embark on the excavation of 4035 in 1995, which it was known would be the last season of work by the British team.[6]

As Fig. 2.58 shows, Sonda 34 contained a scatter of small features, some of which were post-holes, and touched on a larger ditch feature (4026) at its extreme north-western end. All of these features were investigated. Some were natural in origin, such as tree-roots or animal disturbance, or truncated features about which nothing more could be said (4030, 4031, 4008, 4009, 4010, 4012, 4013, 4015, 4016, 4017). Around six were plausibly interpreted as post-holes (4005, 4014, 4018, 4020, 4022 and 4024); these can be seen in section in Fig. 2.59. They lie towards the north-west end of the trench, but cannot be said to form any noticeable pattern.

Ditch 4026 (Figs. 2.60; 2.61), filled by a compact dark brown loam (4027), and cut by shallow pit 4028, was some 0.55 m deep (as preserved in the subsoil) and 3 m wide. A scatter of bone and pot lay in its lower fill. Pit 4028 was some 25 cm deep, cutting the ditch at the north-east corner of the trench (Fig. 2.62). Its overall dimensions could not be established since it disappeared into the baulk.

From its location, it would appear that Ditch 4026 represents a continuation of the ditch system in Sonda 12C, though the unexcavated area between the two trenches is of such an extent that certainty on this point is impossible.

Sonda 35

This trench, measuring 5 x 2 m, was placed in the orchard on the south side of the site where the ground rises towards the quarry, by permission of the owners of the orchard.7 It was situated at a spot reckoned to be within the interior of the innermost ditch circuit, and was intended to investigate the extent to which archaeological remains were still present on the highest surviving part of the site. Unfortunately, as Fig. 3.1 shows, according to the measured survey conducted by the Czech team it was located over an area which geophysical prospection shows was disturbed, and turned out to be disappointing in terms of both finds and features. After removal of the topsoil a layer of pebbles was found, extending over most of the trench. A few pebble-less areas were present, but on further investigation these all turned out to be natural features, and most were probably the result of root disturbance. An area of disturbance filled with redeposited topsoil (4040) in the south-east corner, irregular in plan and only 11 cm deep, produced a small amount of undiagnostic pottery.

One must conclude that whatever features were once present in this area have been completely destroyed by cultivation. Since the geophysical survey also gave no indication of archaeological activity in this area, it is possible (though unlikely) that none was ever present. The original nature of the central part of the site thus remains uncertain.

7 It is unfortunate that more work could not be done in this area prior to the restitution proceedings following the 1989 political changes. Although the owners of the orchard, upon regaining their property in 1993/4, allowed work to take place in 1995, its extent was strictly limited and compensation had to be paid. The area has now (2001-2) been fenced off and access is no longer possible from the north slope of Skalka hill, except by arrangement with the owners (who do not live locally).

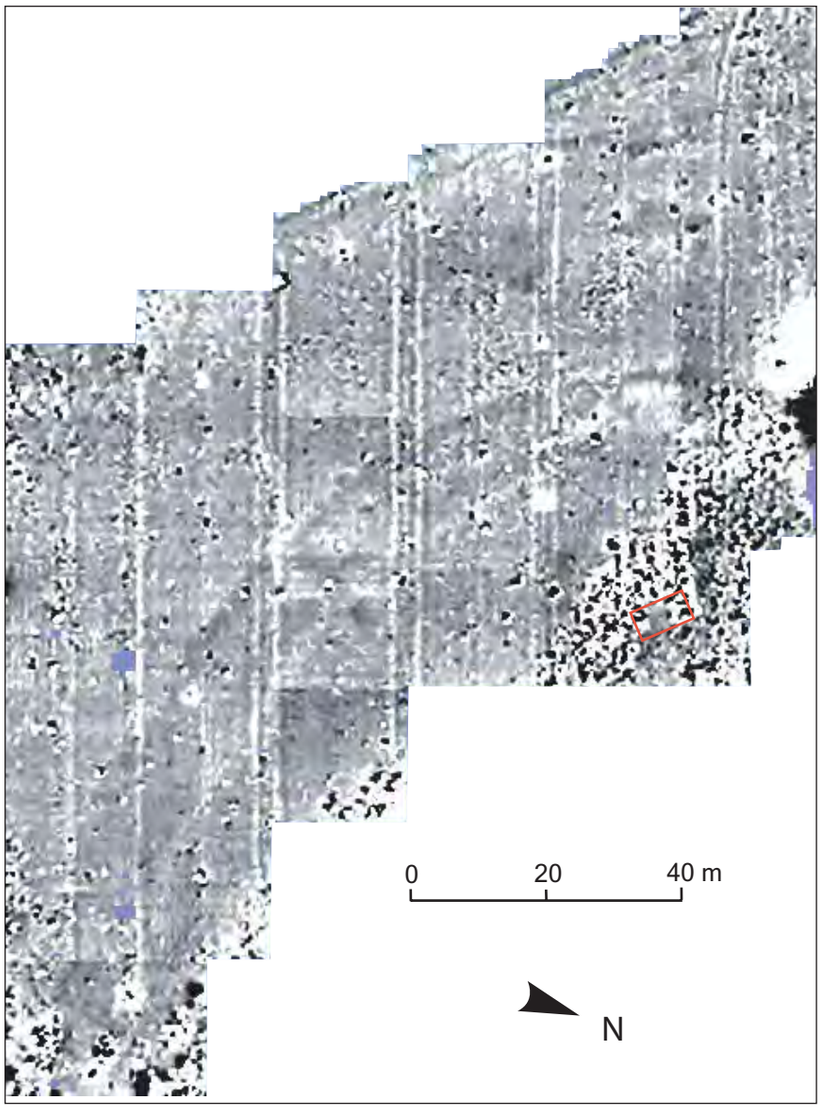
Chapter 3. Geophysical prospection

Given what was known about the extent and history of the site, it was felt desirable from the beginning to include geophysical survey work as an integral part of the programme of research by the British team. Thus in 1992, survey by gradiometer was carried out in the orchard at the top of Skalka hill, between the area where excavations were taking place and the quarry (Fig. 1.3). From the available plans at that time, it seemed clear that the area occupied by the orchard represented the true interior of the site, that part which lay within the innermost ditch circuit. It was evident that if the ditches proceeded at all regularly, the quarry had destroyed a large part of the interior, so that investigation of what remained was a priority. In addition, it was known that sand had been extracted from an area lying between the orchard and the 1920s house, further restricting the possibly intact interior.

Following the discovery by Martin Gojda that what appeared to be circuit ditches pursued a curvilinear course in the fields to the east of Skalka, further geophysical survey was carried out in 1993 in these areas (the fields between the site and the railway line; Fig. 1.3, upper right).

Survey work was conducted by Phil Howard using a Geoscan FM36 gradiometer belonging to the University of Durham, and processed using the proprietary software Geoplot.[1] Simultaneously, and subsequently, Ing. Antonín Majer conducted surveys not only in the orchard but also in a wide arc of land to the west of Skalka. His results are published in the 2000 report (Majer 2000), though the legibility of the material presented there is not ideal. In the orchard, the results of the two teams and two sets of instruments were fully in agreement, though some difficulties were experienced by us as a result of the drift of the instrument in the high temperatures experienced in summer 1992.[2]

Fig. 3.1. Velim-Skalka, geophysical survey area in orchard



1 This report is based on the magnetic grid-point measurements as provided by P.Howard, reprocessed by the author. The surveyed areas were tied in to reference points only by tape. Due allowance should therefore be made for slight errors in fixing the survey area to the map.

2 The differences and difficulties are explained in detail in Ing. Majer's account (Majer 2000, 341 f.). It is well known that fluxgate magnetometers can experience problems in certain conditions, and measure change relative to the magnetic field rather than absolute values, but in general these differences do not inhibit the production of useful results at high speed (cf Gaffney & Gater 2003).

Orchard survey

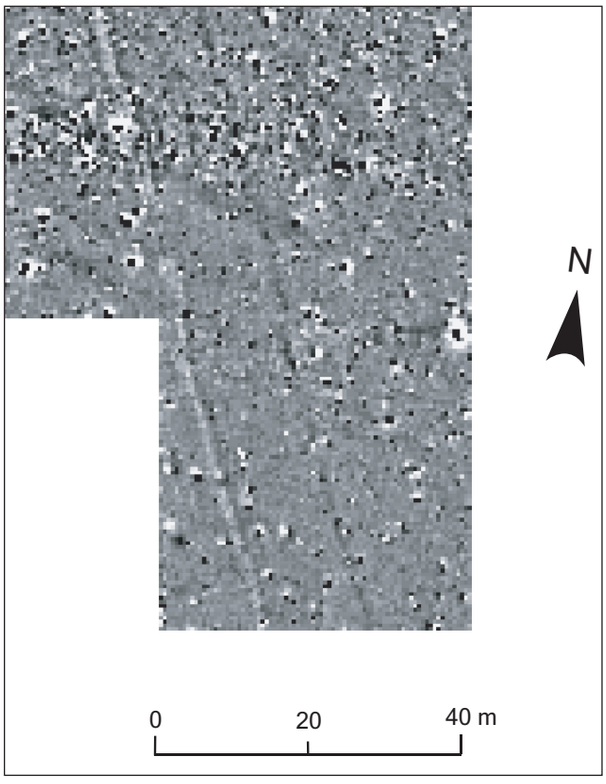
In the orchard that lies above and to the south of the excavation area prospection was carried out over an irregular area (determined by the field boundaries and areas of known disturbance) measuring 120 m from north-west to south-east and 150 m south-west to north-east; the resulting survey is actually nearer to 80 m north-south by 200 m east-west. The plan (Fig. 3.1) shows clearly that the inner ditch line continues round in a subcircular plan through the orchard, probably as a twin ditch circuit. The gradiometer plan is not capable of distinguishing individual pits within these ditches. At the south-eastern limit, the ditches disappear into a disturbed area, beyond which lies the quarry. At the north-west, an extensively disturbed area shows where sand-digging took place earlier in the twentieth century. Parallel light strips running east-west represent the lines where fruit trees stand and where the accompanying ridges and furrows arising from cultivation between the trees produce variations in height above the subsoil. A scatter of dark anomalies across the area outside the ditch circuit could represent pits, and in some cases there is a suggestion that they lie in lines, but the detail is too ambiguous for this notion to be pressed further. It was noteworthy that the trench dug in this area in 1995 (Sonda 35) found no certain archaeological features of any sort, probably because it was not placed far enough out into the orchard and therefore hit a disturbed area.

Survey north-east of Skalka hill (Dolní Nouzov)

In the field to the north-east of the excavation area, between the Velim-Nová Ves road and the railway, an area 300 by 40 m was surveyed, initially at intervals of 1 m. As well as the marked route of a service line crossing the field near the road, this succeeded in picking up the double ditches but showed little else (the plan is therefore not included here). A more detailed survey, at half-metre intervals, was conducted in the area of the double ditches, over an area 80 m north-south and 40/60 m east-west (Fig. 3.2). This shows the ditches running straight across the zone in a north-west to south-easterly direction. The interpretation of this ditch line is difficult in the absence of knowledge of the full extent of its course; since it disappears under the built-up area of the village this matter is unlikely to be resolved.

Majer's surveys, however, conducted using a proton magnetometer, have succeeded in charting the course of the outer double ditch circuit with considerable success (Majer 2000). Although it is unclear what happens to the ditches at certain crucial points, for instance at the north-eastern extremity of the surveyed area, the overall impression is that the outer ditches enclose an area over 1 km in extent NE-SW and over 700 m SE-NW. This is a crucial matter to which we return in later sections (Chapters 10-11).

Fig. 3.2. Velim- Dolní Nouzov, geophysical survey area



Chapter 4. The finds

RADKA ŠUMBEROVÁ AND ANTHONY HARDING

Velim-Skalka is rich in finds of many kinds. The previously published material (Hrala *et al*. 2000) indicated the types of material encountered; and though the quantities described there are much larger than those encountered in the 1992-95 excavations, the range is very similar. A major difference in this report from anything that has gone before, however, lies in the possibility of relating individual finds or find groups to very specific locations on the site ('contexts', cf Chapter 2), with the consequent possibility of carrying out detailed analysis for the purpose of chronological or contextual ordering. A second difference is that the bone, human and animal, has been the subject of intensive and detailed study in a way that has not previously been attempted (Chapters 6 to 8).

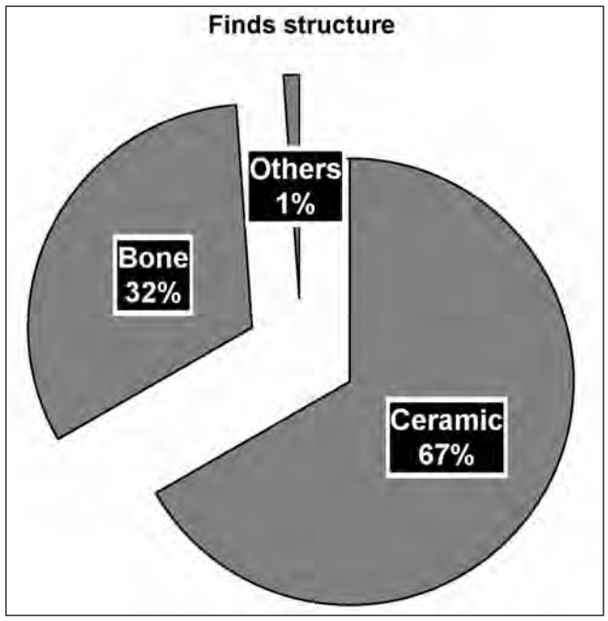
Procedures

When the British team joined the long-term rescue excavation at Velim-Skalka in 1992, new methods and procedures started being applied both in the excavation trenches and in the handling of the material from the excavations. These methods enabled a very detailed description of the assemblage and other types of analysis to take place, which could then be used in the assessment of the pottery and other finds.

The method of excavation used at Velim is discussed in Chapter 2; here we consider the treatment and analysis of the finds that Šumberová conducted from 1993 to 1995.[1] A processing area was set up on site where all work connected with the conservation, handling and sorting of the finds took place, up to the stage of making a sketch record of individual objects. The material from individual natural layers (contexts) was immediately washed in the processing area and sorted according to basic material categories (pottery, bone, stone, daub etc). From the individual categories only isolated finds were separated out – for instance whole vessels, tools, and similar. Finds of each category from each context were put into their own bag which was marked with the number of the find (object). This find number was the basic handling unit; every find was provided with an individual sheet on which basic information about the position of the find, the degree of preservation, the number of pieces, dimensions, weight, and verbal description were recorded. Individual fragments were marked with the year of excavation, the context number and the finds number. Simultaneously with the recording onto individual sheets, a general register was created – a list of all finds, and concordances by find category, so that a very good overview of the quantity and structure of the finds was immediately available during the dig even before the creation of a computer database. The assessment was incorporated into the list of finds from the Czech excavation by means of bag numbers that followed the Czech listing.

The structure of the finds catalogue from the four seasons of excavation by the British team can be seen from the table (Table 4.1; Fig. 4.1). Pottery predominates, in all 38,016 pieces weighing in total 635.73 kg. Given the character of the site, the large quantity of bone is not surprising: 18,424 pieces weighing in total 171.92 kg were catalogued [2] (all bone was taken together and not identifed as human or animal at that stage; the indications were that animal bone was much more common – cf Chapters 6 to 8). Stone implements and bronze objects are represented less commonly, and of other materials there is a single appearance of amber. A small piece of graphite was the first such find on the site; this appears otherwise on south Bohemian sites.

Fig. 4.1. Finds categories in percent



1 The method of recording the finds was set up in 1992 by Christine Howard-Davis, on the basis of the methods used by the (then) Lancaster University Archaeological Unit.

2 The total given in Chapter 8 (approx. 18,600) is slightly different. This follows detailed assessment of the material by the relevant specialists. It is also likely that some breakage occurred during storage and transport between Brno and Bylany.

Class	No. of bags	%	No. of pieces	%
Pottery	2064	68.69	38016	66.64
Bronze	24	0.80	25	0.04
Bone	658	21.90	18424	32.3
Daub	158	5.26	441	0.77
Charcoal	12	0.40		0
Stone	42	1.40	47	0.08
Shell	24	0.80	36	0.06
Amber	1	0.03	1	0.002
Slag	6	0.20		0
Iron	10	0.33	35	0.06
Glass	4	0.13	20	0.04
Graphite	1	0.03	1	0.002
Pigment	1	0.03		
Total	3005		57046	

Table 4.1. Breakdown of finds by material

The complete finds register is lodged with the archive and on the electronic database. This has been used to compute the statistics in the discussion that follows.

POTTERY

Pottery is abundant at Velim, with over 38,000 sherds weighing more than 635 kg being recovered from the relatively limited trenches dug by the British team in 1992-95 (the quantities recovered by the Czech team are much larger: Šumberová (2000) analysed over 220,000 sherds weighing nearly three tonnes from the excavations up to 1992!). The pottery is of intrinsic interest because the 'Velim type', as identified by Dvořák and Böhm, has long been recognised to occupy a place transitional between the Tumulus and the Lausitz cultures of central Bohemia, though the amount available for detailed study was, until the re-opening of the Velim excavations in 1984, very limited, both in absolute quantity and in terms of closed find context. The study of the pottery from the British excavations has, therefore, been regarded as an important element in the overall assessment of the site.

The pottery from the British excavations was studied on site in 1992 and 1993 by Christine Howard-Davis, and in 1994-1995 and subsequently by Šumberová. The method adopted was to make an initial division of the material into distinct fabric types, and to sketch noteworthy sherds immediately after the sorting process. Since the volume of material was large, and could not be studied *in toto* at the time, all pottery was later re-examined and a selection of sherds suitable for illustration was made. At this stage, joins (within or between bags) were also noted.

Basic characterisation

Thirteen fabric classes were identified and described, most by C. Howard-Davis, having particular regard to the type of clay, the size and form of inclusions and the method of surface treatment.

Pottery Fabric Series

Fabric 1. Medium hard fabric with slightly powdery feel. Mixed, generally fine (1mm) inclusions include fine quartz sand calcite (white opaque sometimes 2mm) iron one small red flecks showing on surface small mica plates (c.0.5mm) both incorporated in fabric and showing in surface – generally burnished. Generally reduced to dark grey.
Surface treatments: burnishing, shallow incised/burnished lines, deeply incised roughly parallel lines.
Motifs: vertical lines, horizontal lines with pendent triangles.

Fabric 2. Medium hard fabric with smooth, talc-like feel. Mixed inclusions, fine quartz (1mm) a small amount of white calcite. Inclusion dominated by mica (c.1-2mm) which leads to a somewhat laminated fabric. Generally reduced on inner surface to dark grey, the other surface oxidised, the colour ranging widely from yellowish beige to dark purple.
Surface treatments: burnishing, mica (mica gives a twinkly surface), rough-cast rustication.
Motifs: vertical finger-dragged rustication, applied stabbed cordon.

Fabric 3. Medium to hard fabric. Mixed medium to coarse inclusions, including fine quartz, calcite up to 4mm, small fragments of mica, occasional red fragments (iron ore?). Internal surfaces generally reduced to dark grey, external to dark brown / beige with occasional orange.
Surface treatments: burnishing, rough-casting, rustication.
Motifs: vertical finger-dragged rustication.

Fabric 4. Fabric variable but generally quite hard. Mixed angular grits, mainly quartz or opaque white mineral, some are quite large (5 x 5mm), some mica, showing mainly on burnished / smoothed surface. Internal surfaces reduced to dark grey, smoothed but not necessarily burnished. External surfaces oxidised / reduced, smoothing shows mica.
Surface treatment: smoothing.
Motifs: applied stabbed cordon.

Fabric 5. Medium-hard very sandy fabric. Inclusions generally quite fine and mixed, quartz, mica, opaque white and opaque pink. Only some of the opaque inclusions are larger than 1mm. This small group runs up to 4 x 3mm. Interior surfaces reduced to dark grey, exterior oxidised to browns and cream.
Surface treatments: smoothing, rough-casting, rustication.

Fabric 6. Soft very light fabric with few inclusions. Inclusions not easily visible to naked eye or at 1x10 magnification. May include quartz. Uniform light grey, reduced.
Surface treatment: smoothing.

Fabric 7. Medium to hard fabric. Fine white plate-like inclusions, mixed evenly thoughout, giving a speckled appearance, some very small mica fragments, some organic inclusions, very finely chopped. Internal and external surfaces red to even dark grey-brown.
Surface treatments: burnishing.

Fabric 8. Hard light fabric. Frequent large rounded opaque white inclusions, 2-5 mm, sparse very fine mica, a suggestion of finely chopped organic temper. Reduced, external surface (only) oxidised to beige.
Surface treatments: vertical dragged rustication.

Fabric 9. Soft fabric, very sandy, fairly fine,with mica and red amorphous speckles – possibly iron ore. Completely oxidised, fine angular quartz.

Fabric 10. Sherds in all fabrics showing extreme secondary firing.

Fabric 11. Soft sandy fabric with small white angular inclusions and small fragments of plate mica.
Surface treatments: smoothing.

Fabric 12. Hard, very sandy fabric with very numerous angular small fragments – opaque white minerals.

Fabric 13. Hard, very light fabric with very numerous white angular inclusions, coarse inclusions, abundant mica, generally 1-2mm.

The representation of individual fabric classes in the assemblage is seen in Table 4.2, and these figures are shown graphically in Figs 4.2-4.4.

Fabric	No.of sherds	Weight(g)	Average sherd weight (g)
0	2810	43142	15,35
1	13015	275231	21,15
2	1281	25956	20,26
3	2111	106342	50,38
4	2513	26749	10,64
5	1654	15119	9,14
6	10979	110836	10,09
7	1831	12973	7,09
8	178	2352	13,21
9	584	5589	9,57
10	170	2302	13,54
11	477	3222	6,75
12	379	5168	13,64
13	34	752	22,12
Total	38016	635733	

Table 4.2. Numbers of sherds, weight and average sherd weight by fabric

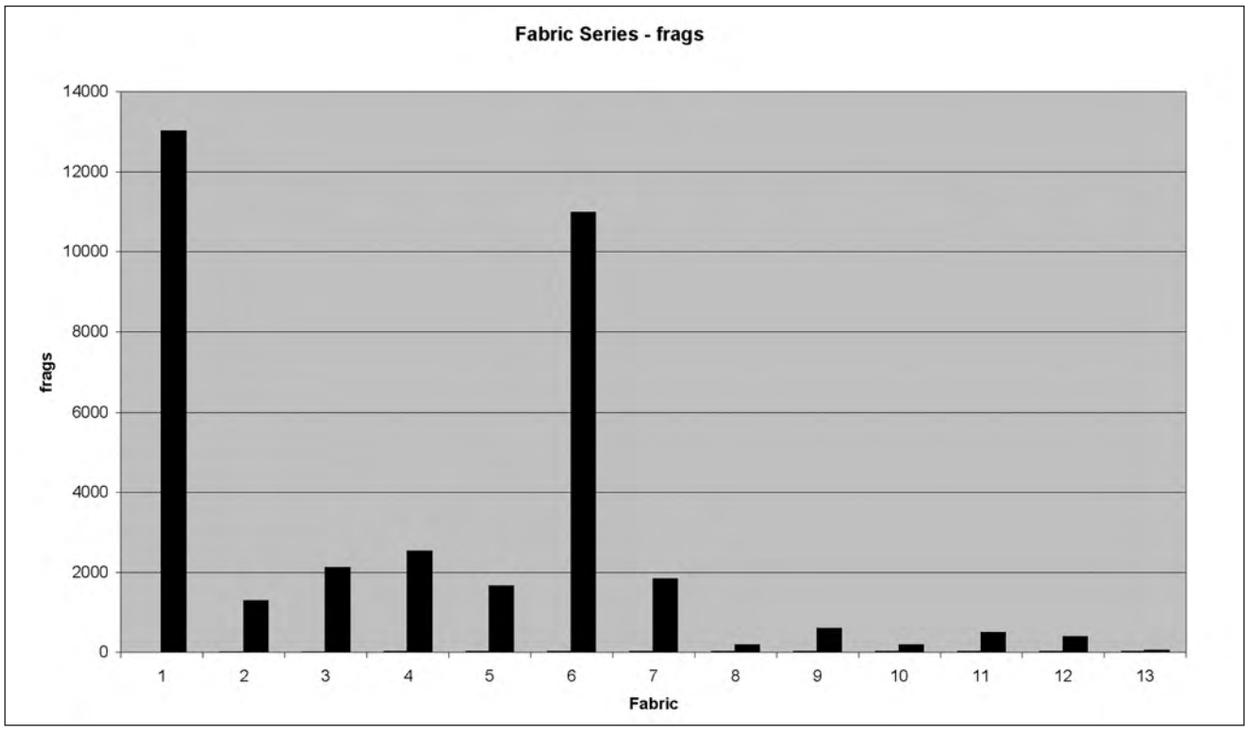
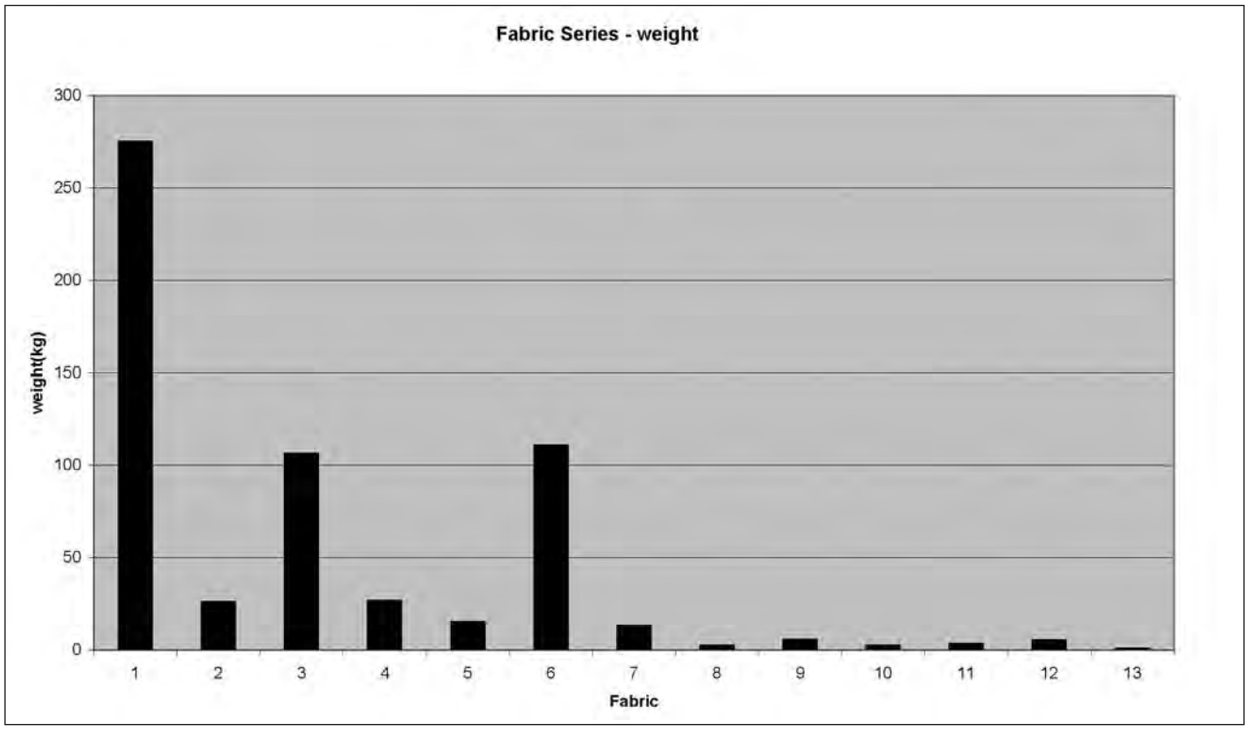


Fig. 4.2. Sherd numbers by fabric

Fig. 4.3. Sherd weight by fabric



Of the total of 38,016 sherds, 35,206 could be assigned to fabrics. The classification of material was subject to the conditions of work in the field and the division was carried out on the basis of appearance and feel, so that a certain amount of subjectivity in the decisions made must be allowed for. In every case this sorting was the basic step towards the further study of production processes and the relationship between pottery material and morphology. In the sorting process the weight and thickness of sherds was recorded, and the size of sherds described (by means of detailing the percentage representation of particular size groups – x% bigger than y mm).

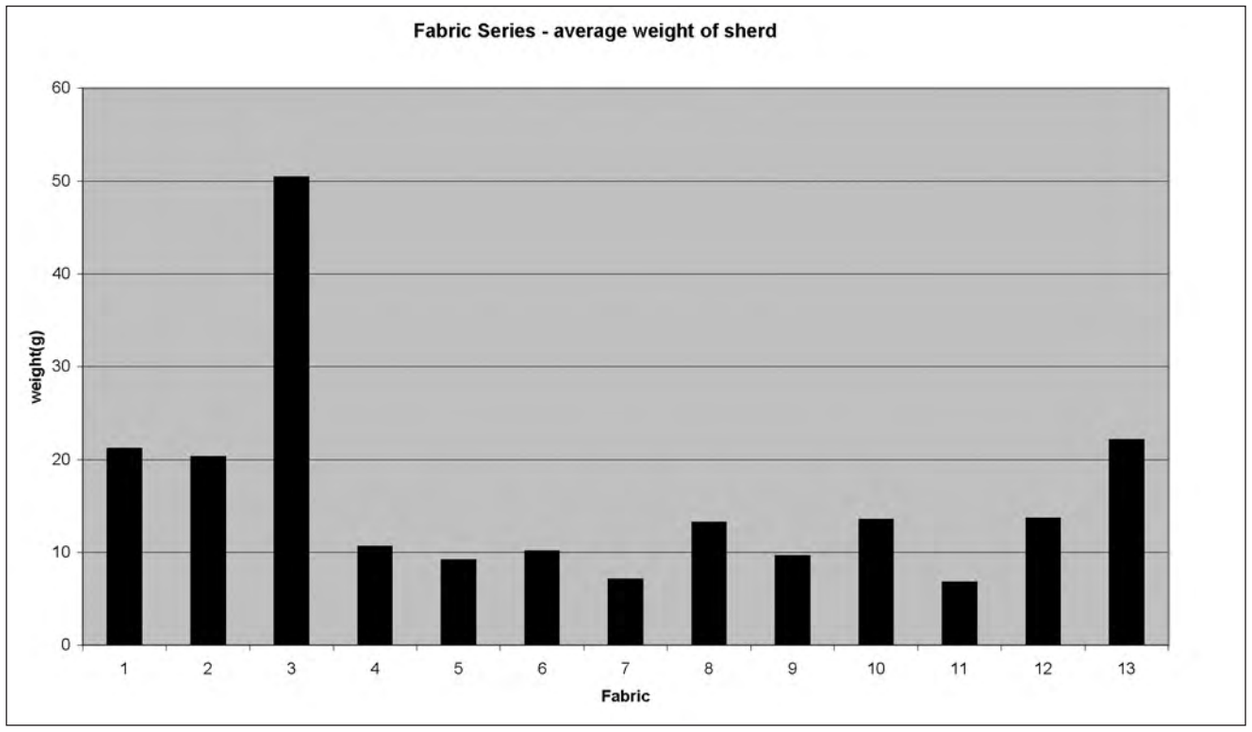
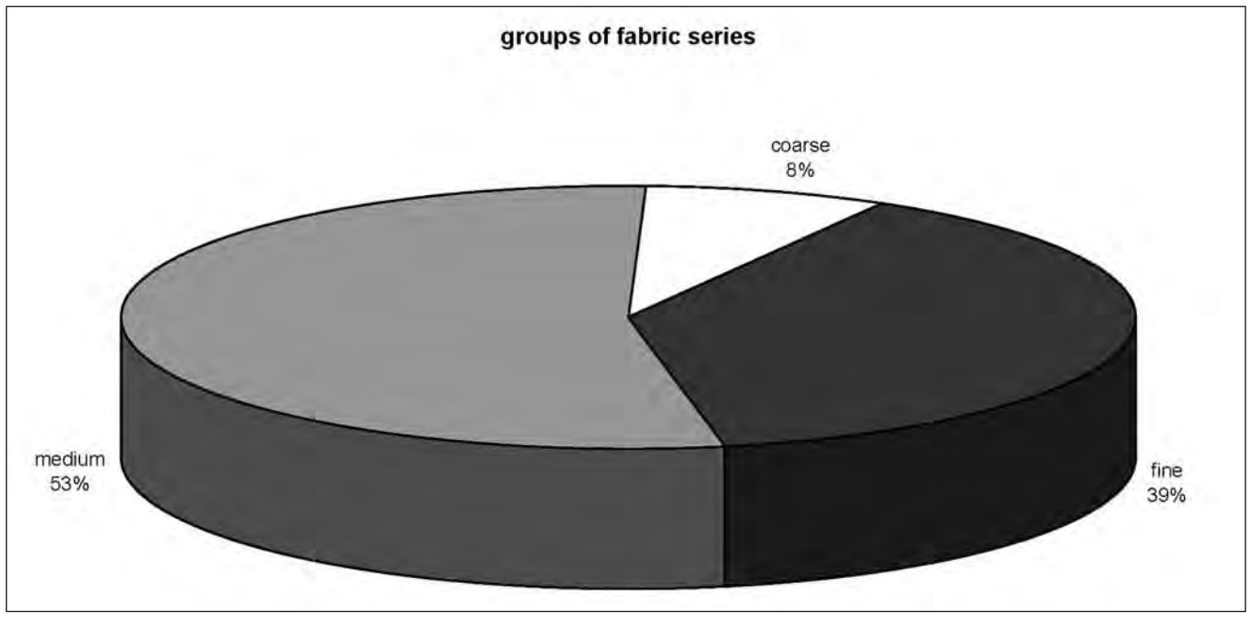


Fig. 4.4. Average sherd weight by fabric

Morphologically important elements were defined separately – rim fragments, bases, profiled body-sherds (including handles), and decorated sherds. Because no code for the description of pottery existed at the time, such as we now have (Šumberová 2000; Chvojka & Michálek 2003), a simple code consisting of a combination of letters and numbers was created for the purpose, and gradually extended as new finds were made. All data were then imported into a Paradox database and subsequently analysed using Excel and Access.

Since we needed to know the proportions of fine and coarse pottery, which are usually recorded in the description of pottery assemblages, we divided the fabric classes into three groups – fine, medium, and coarse (Fig. 4.5).

Fig. 4.5. Fabric group percentage representation



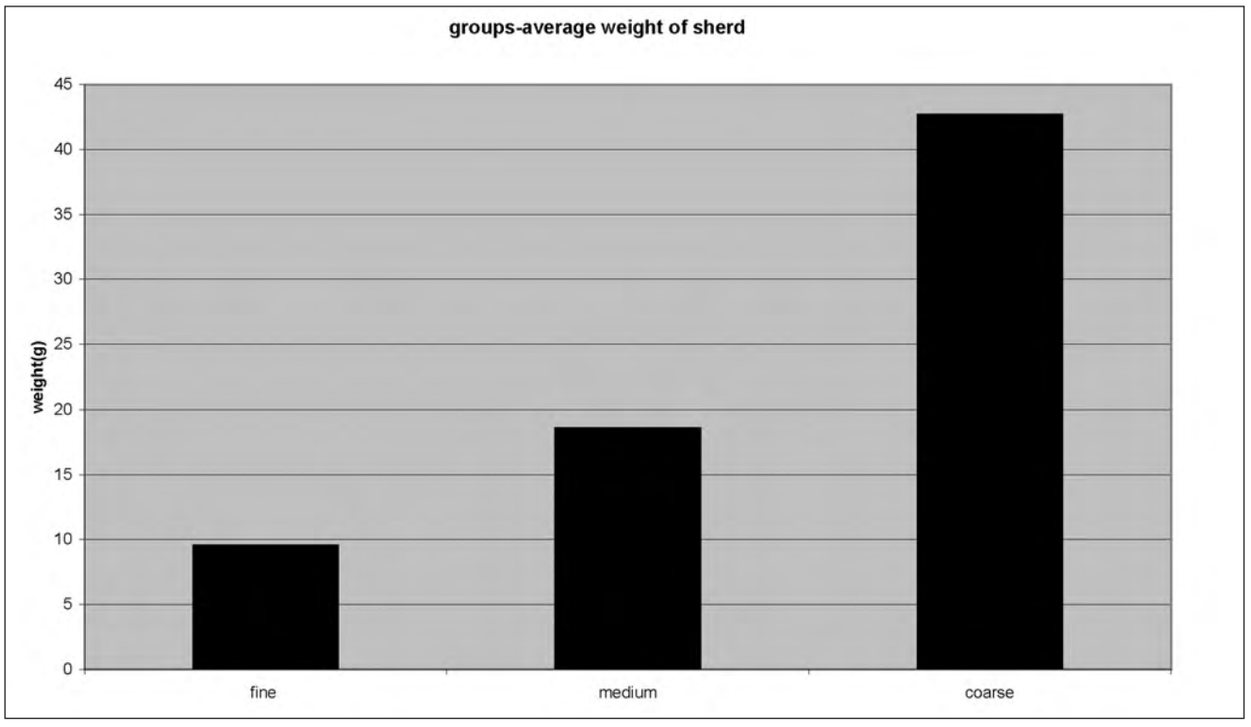
Fine fabrics: 6, 7, 11
Medium: 1, 2, 4, 5
Coarse: 3, 8, 12

These material classes are, however, distinguished mainly on the basis of the clay materials (fabrics), with particular attention being paid to the thickness of the sherds, which in some other analyses is taken as the primary means of division. In spite of this, in the comparison of average weight of sherds of fine and coarse fabrics the result speaks for itself (Fig. 4.6).

Aside from this division into groups there remain the sandy fabrics that are hard to classify, and Fabric 10, in which all the different fabric types that are damaged by intense heat are lumped together. Given the deformation and sintering of the individual components in the fabric, defining these as separate types has little meaning.

The assemblage is in large part made up of medium wares. Thirty-nine percent of the assemblage is of fine wares and only 8% coarse. By contrast, although the method of classification is different, on

Fig. 4.6. Average sherd weight by fabric group



the Middle Bronze Age settlement of Radčice coarse sherds dominated (Chvojka & Michálek 2003, 119). In order to identify the causes of this difference we would need to have available analyses from other sites of the same age and use comparable methods of classification; but for the time being we can merely note these differences, and state that for Velim, on the basis of this method of division, fine fabrics appear in considerable quantities. By contrast, in the description of the assemblage from the Czech trenches, where no account was taken of fabrics, only sherd thickness and weight, thick-walled sherds predominated (Šumberová 2000, 73).

It is interesting that the fabric groups differ also in the proportions of preserved vessel parts and the appearance of ornament (Figs 4.7-4.10). In general in the assemblage, the representation of rim fragments and decorated sherds is comparable, while base and handle fragments appear less often. This trend is evident only on medium wares. In fine wares rim sherds dominate markedly; decorated sherds are not numerically so important, but are very varied in terms of types. Handles are frequently preserved, sometimes even exceeding the numbers of base sherds. The coarse pottery, on the other hand, exhibits a remarkable quantity of decorated elements but in a less varied spectrum; rims, handles and bases are relatively little represented. The difference in the representation of decoration is markedly influenced by the use of finger-tip surface treatment as a decorative technique. Finger-tip decoration and applied cordons are in general the most frequent types of decoration, and because they are associated above all with large coarser vessels, this tendency is easily explained. Fine pottery appears to be decorated far less, but practically every type of decoration found at Velim is attested on it, and almost all types of handle and knob occur on it. Less clear are the various

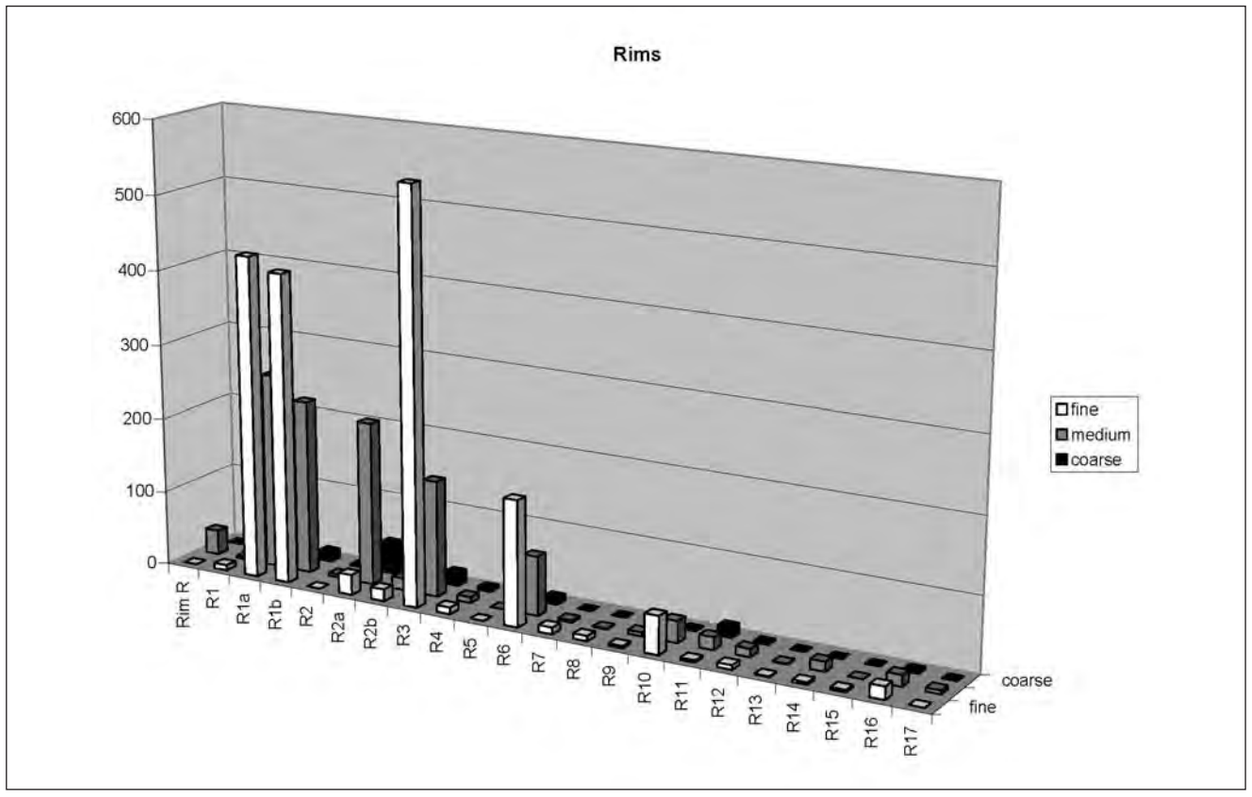
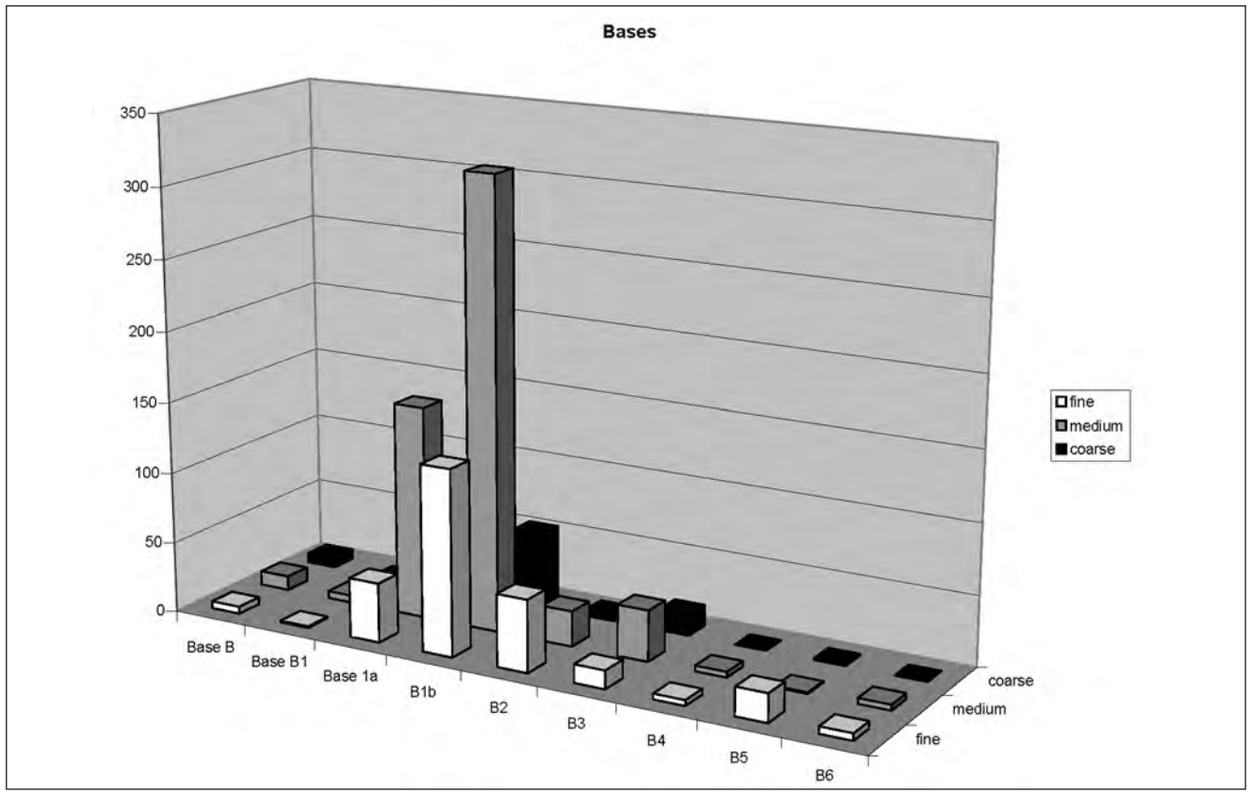


Fig. 4.7. Numbers of rim types by fabric group

Fig. 4.8. Numbers of base types by fabric group



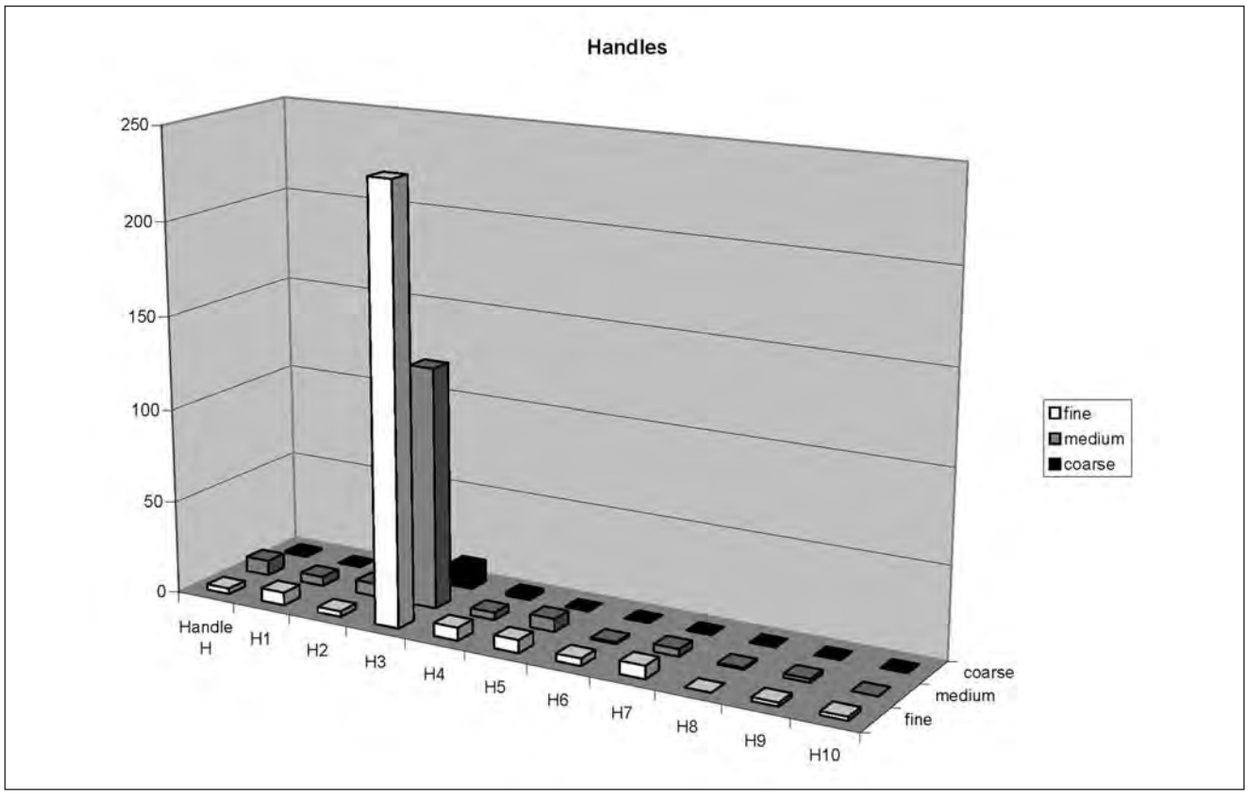
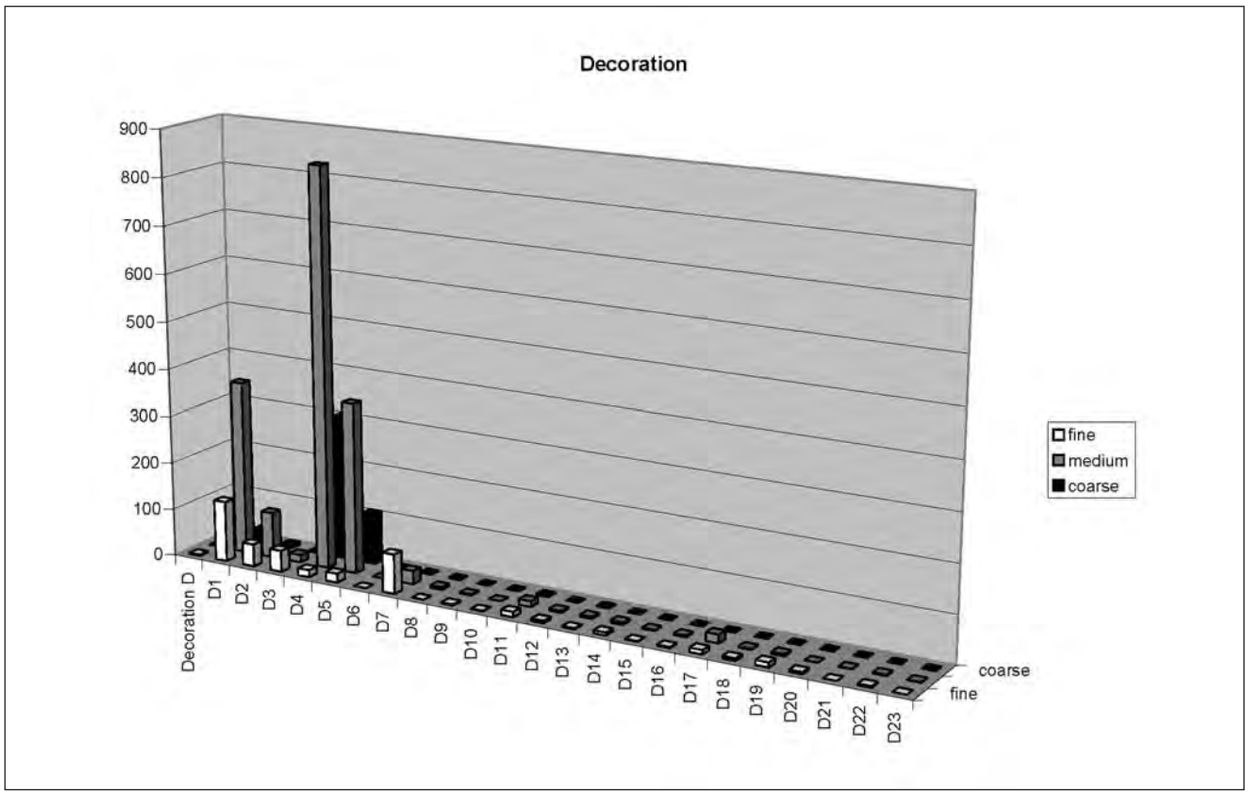


Fig. 4.9. Numbers of handle and knob types by fabric group

Fig. 4.10. Numbers of decorative elements by fabric group



tendencies in the frequency of rim and base types, where there is significantly more variability on medium and especially on fine ware than on coarse wares. Subjective factors in the initial sorting of the material may have played a part in this, when sherds of thicker bases may have been intuitively assigned to the coarser fabric classes. A technological explanation is also available, connected with the degree of fragmentation of the material, when thin-walled sherds from rims are broken into a far greater number of pieces, while the tendency of massive bases to fragment is not so much influenced by the quality of the material. Again, as with decoration, the different types of rim and base are far more varied on fine wares, while medium and coarse wares occur mainly in simple forms.

Dimensions

The metrical characteristics of the assemblage derive from the analysis of the fabric structure of the assemblage. On each 'find' (i.e. find/context group, or finds bag, not individual sherds) the maximum and minimum values for size and thickness were recorded. The figures show the preponderance of sherds of medium thickness, when the average thickness values vary between 6 and 9 mm, and illustrates the relatively marked fragility of the pottery – the average sherd size varies between 27 and 67 mm (Table 4.3). The tendency of sherds to fragment was commented on during the analysis of other parts of the Velim excavation and is attributed to the fact that the majority of finds occur in ditches, where one is dealing with tertiary settlement refuse (Šumberová 2000, 59).

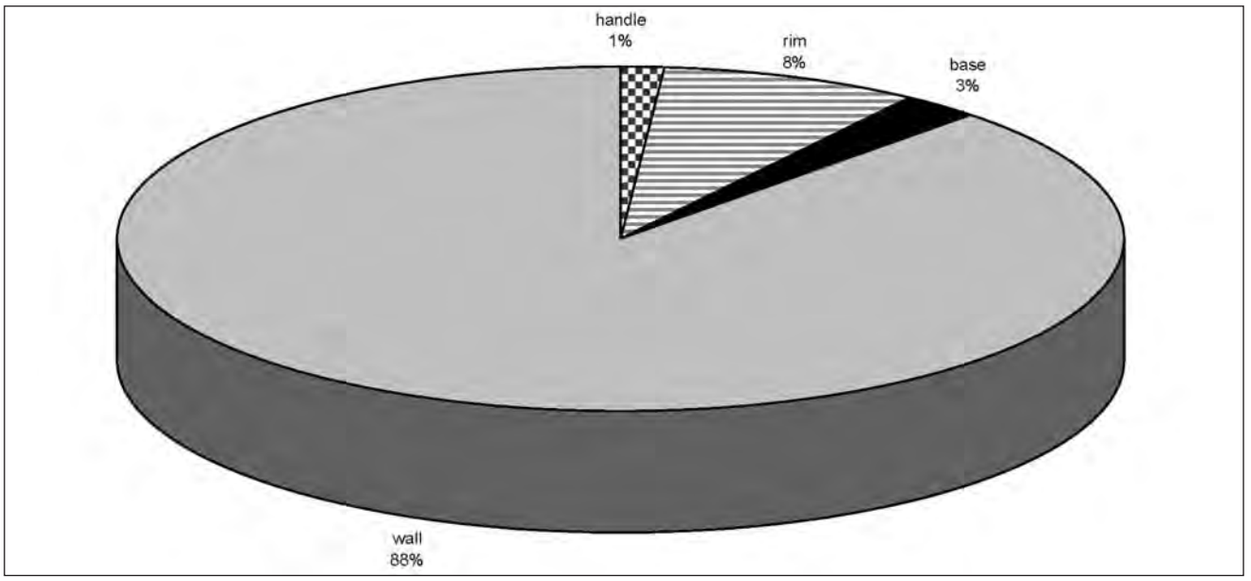
	Fragsize min (mm)	Fragsize max (mm)	Thickness min (mm)	Thickness max (mm)
Average	27,35	67,02	6,08	9,4
Min	5	9	1	1
Max	400	400	95	95
Median	22	55	5	9

Table 4.3. Pottery groups (as recorded by finds number, i.e. bag), illustrating recorded minimum and maximum values for dimension and thickness (x axis), compared with overall values for sherd size and thickness for the whole assemblage (y axis)

Vessel form

A total of 37,663 sherds were attributed to vessels, ignoring sherds not identifiable because they were too fragmentary. Because the fragmentary nature of the sherds did not allow whole vessel forms to be recognised at the initial stages of description, special attention was devoted to the description of individual vessel elements (Figs. 4.11-4.12). Subsequent reference to the form of vessels corresponds to the typology used in publication of previous excavation (Šumberová 2000, fig. V.10A-B). Rims, bases, handles and knobs were described separately. The presence of these elements and the correlations between them lead to these graphs; sherds that are not described are treated as body-sherds. Only 12% of the pottery assemblage is listed by form.

Fig. 4.11. Percentage representation of vessel parts



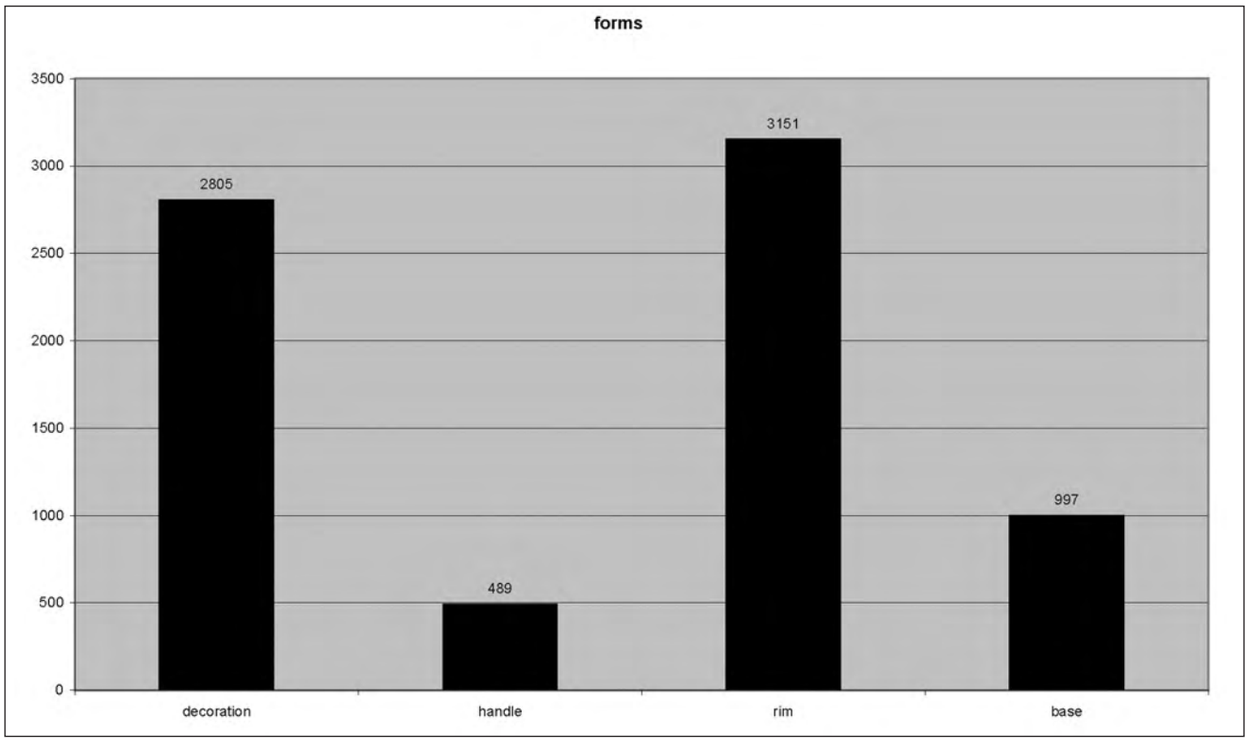
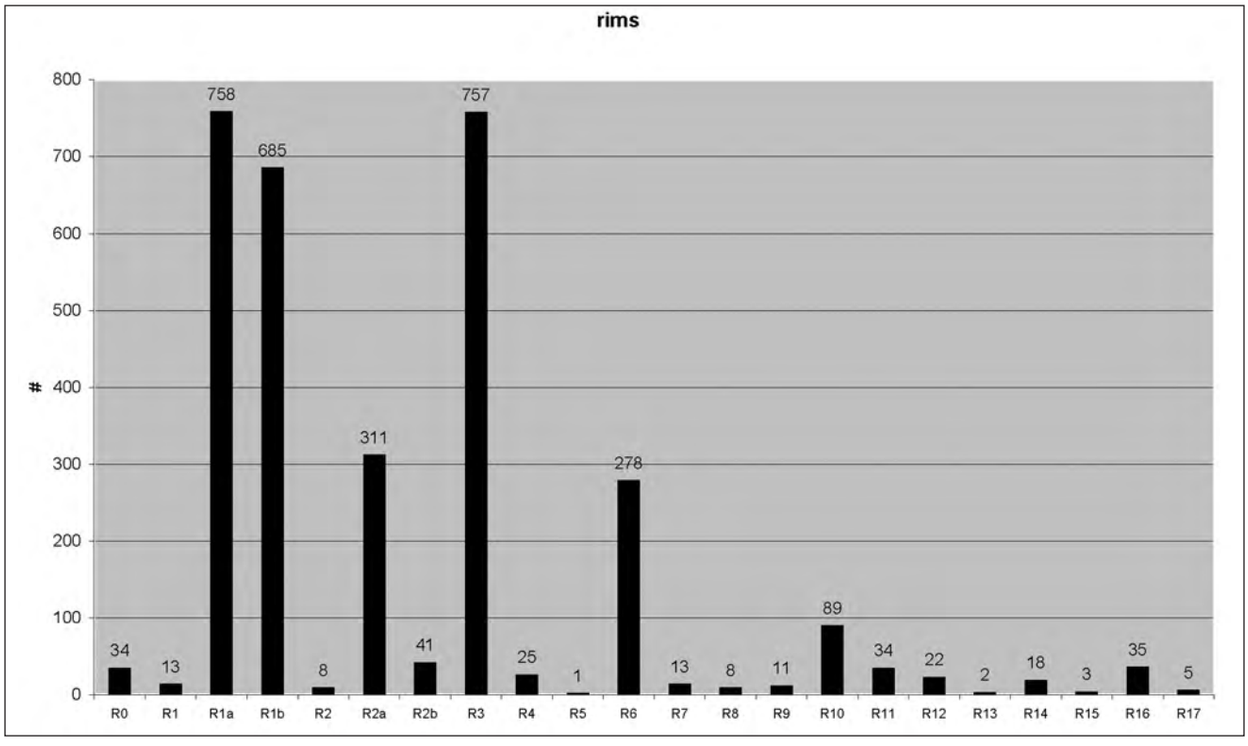


Fig. 4.12. Numbers of vessel parts

Fig. 4.13. Rim numbers by type



Rims

In all, 3151 rim sherds were identified. The code that was developed distinguishes seventeen types of rim, while two further variants of the two basic types are distinguished (Fig. 4.13-4.14). Simple straight rims with even proportions of round and bevelled variants (R1a, R1b) predominate. The appearance of these rim types indicates the marked representation of biconical and amphora-shaped vessels in the assemblage. Another very common type is the moderately curving rim with very varied lip form (round, pointed, bevelled inside or out), obviously representing jugs and cups. Out-turned (R2) and s-profiled rims (R6) are also statistically important, again found principally on jugs and cups; also worthy of mention are the widely spreading rims (R10) of bowls and the facetted

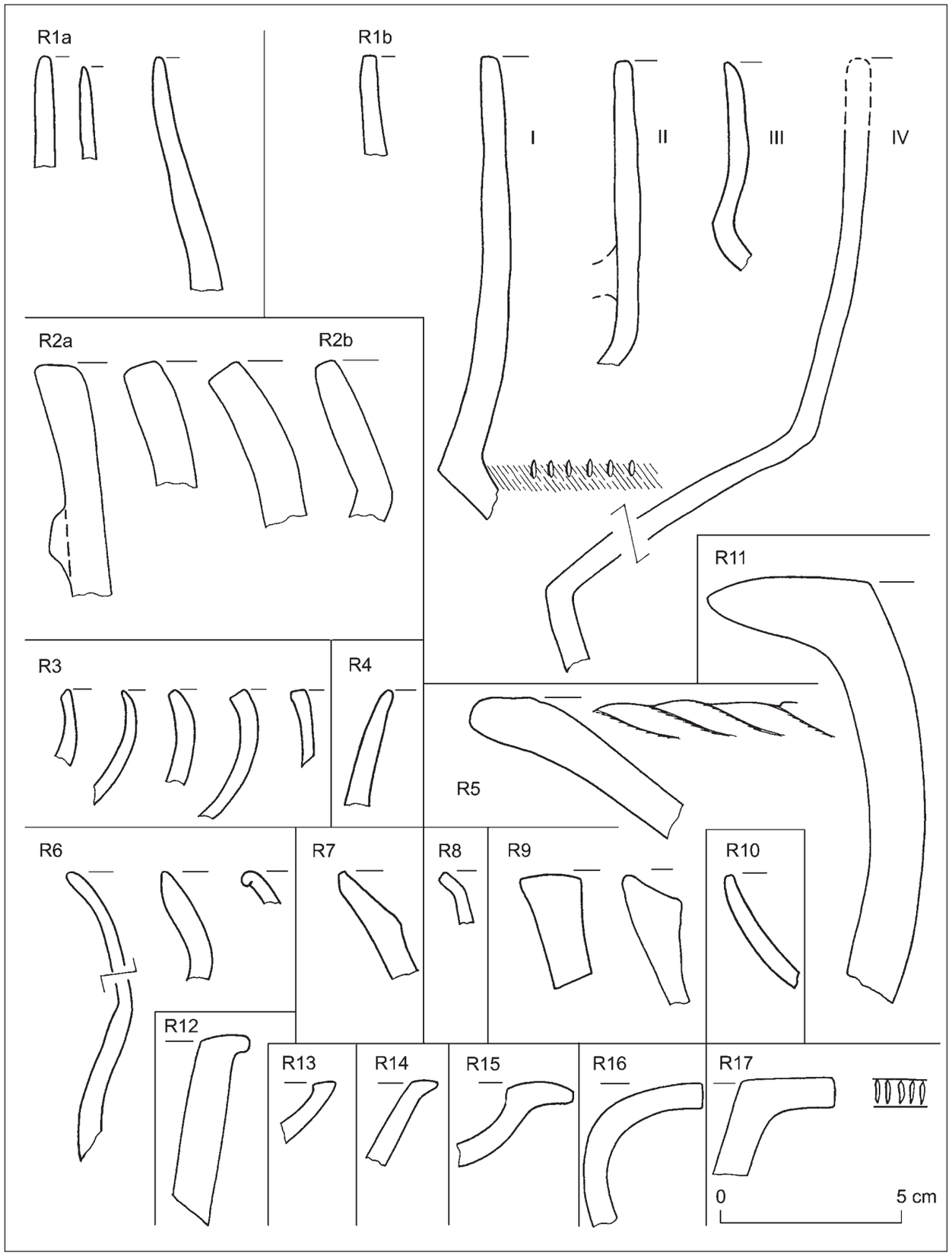


Fig. 4.14. Rim types

horizontaly outturned rims of storage vessels (R11, R16 and R17). From the chronological point of view, oblique internally bevelled outturned rims of type R7 are important, appearing at the close of the Tumulus period (cf Čujanová-Jílková 1970, tab. 14, 22; Strof 1995, obr. 1, 6, 10), and occasionally already in phase Br B2 (Chvojka & Michálek 2003, fig. 13). Some of the rims, above all those of horizontally outturned or strongly everted form, are decorated with nail impressions or cuts; a widely spreading rim with decoration that recalls torsion is unique, being more common in the later Knovíz milieu.

Handles and knobs

489 handle and knob sherds were sorted into ten types (Fig. 4.15-4.16). The commonest type is the simple strap handle (H3), while other types are represented by less than twenty examples. This corresponds with the earlier analyses of the Velim material (Šumberová 2000), and with analyses from other sites (Chvojka & Michálek 2003, 111). The appearance of various knobs on the rims or concavities of vessels is statistically unimportant but rather interesting, as are various small handles, both vertical and horizontal, that are more like perforated knobs. The double-fluted handle with ribs (Pl. 2:9,10; Pl. 6:9; Pl. 7:4,6,7,8) has analogies in the Middle Danubian area. Lobes on the rims of vessels, typical of the Tumulus Culture, appear only exceptionally, but little knobs ('pimples') below the rim are also represented (Pl. 7:23; an exact analogy comes from Přáslavice (Šabatová in print, obr. 1: 2-3). The so-called 'blind handle', which appears in two variants, is also unusual. A vertical blind handle has been published from Radčice in the Tumulus milieu (Chvojka & Michálek 2003, obr. 28, 9). The placing of the handle on the body of the vessel is variable; on amphorae, where one can assume chronological significance in the placing, handles placed at the junction of neck and belly predominate. Only fluted handles with ribs occur beneath the junction.

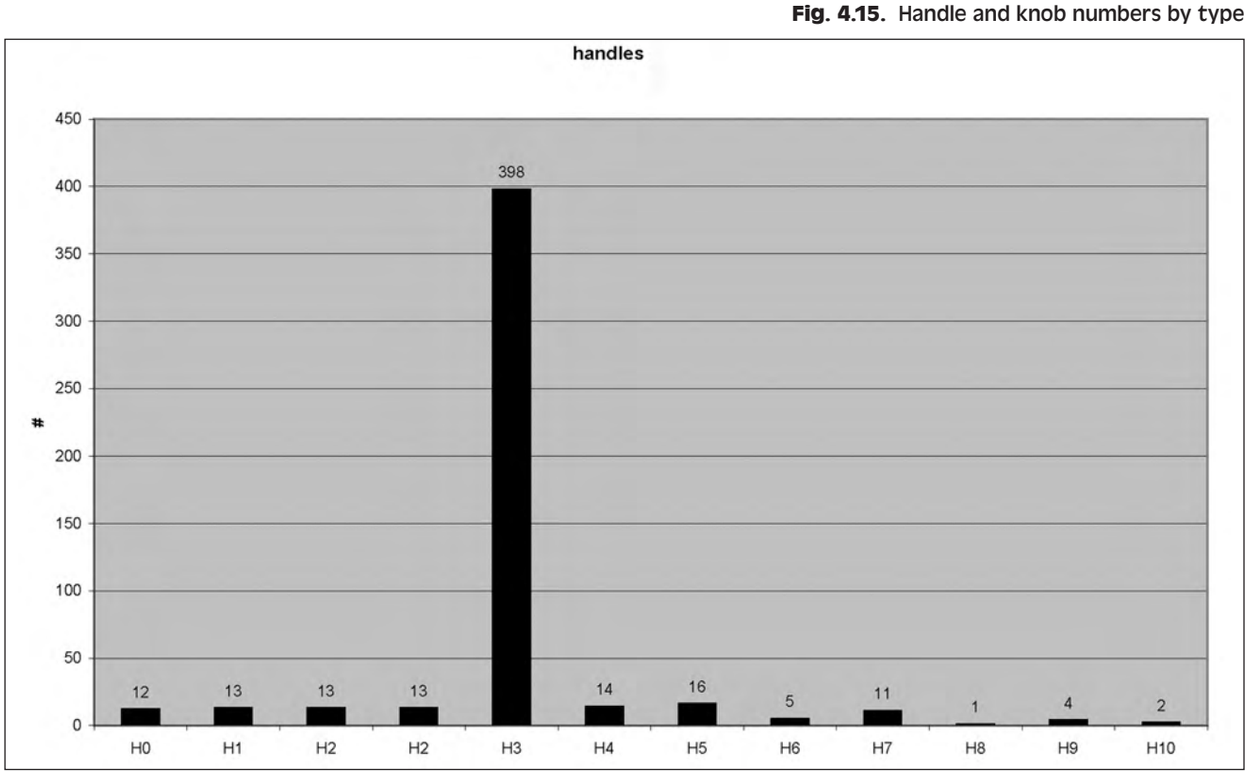
Bases

Only six types were distinguished among the bases (Fig. 4.17), among which the basic flat form predominates, with variants with moderately rounded (B1b) or angular (B1a) transition to the wall. The representation of concave bases (B2) and those with a foot or stand (B3) is quite striking. The classic footed and omphalos base appears only in isolated instances. By comparison with the analysis of other parts of the excavation the footed base appears to be rather more marked; it is typical of Br C2-D, when these bases replaced the classic hollow foot (Čujanová-Jílková 1995). On five examples decoration appears, or a sign in the form of two crossing lines or several parallel incisons (Pl. 10:14). The cross on the base appears also on typical 'Velim' cups from the Křechoř hoard, while from Velim itself it is known only on the Vacíkov–type bowls from Feature 20, there on the inner side of the base (Šumberová 2000, Pl. 10).

Decoration

2805 decorated sherds were identified in the assemblage, that is 7.5% of the total (Fig. 4.18-4.20). Incision and finger-tip decoration of the whole vessel

Fig. 4.15. Handle and knob numbers by type



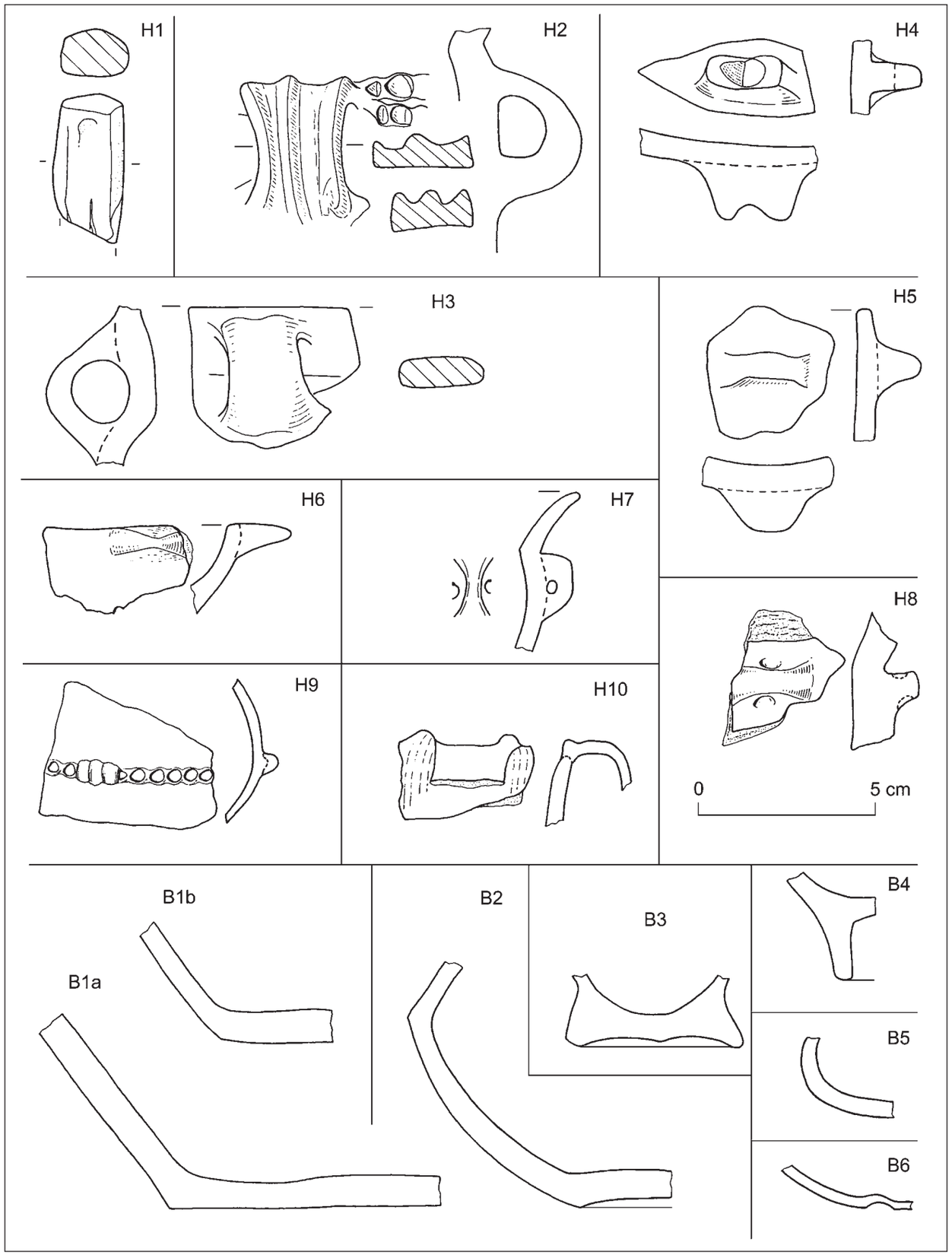


Fig. 4.16. Handle and ledge types

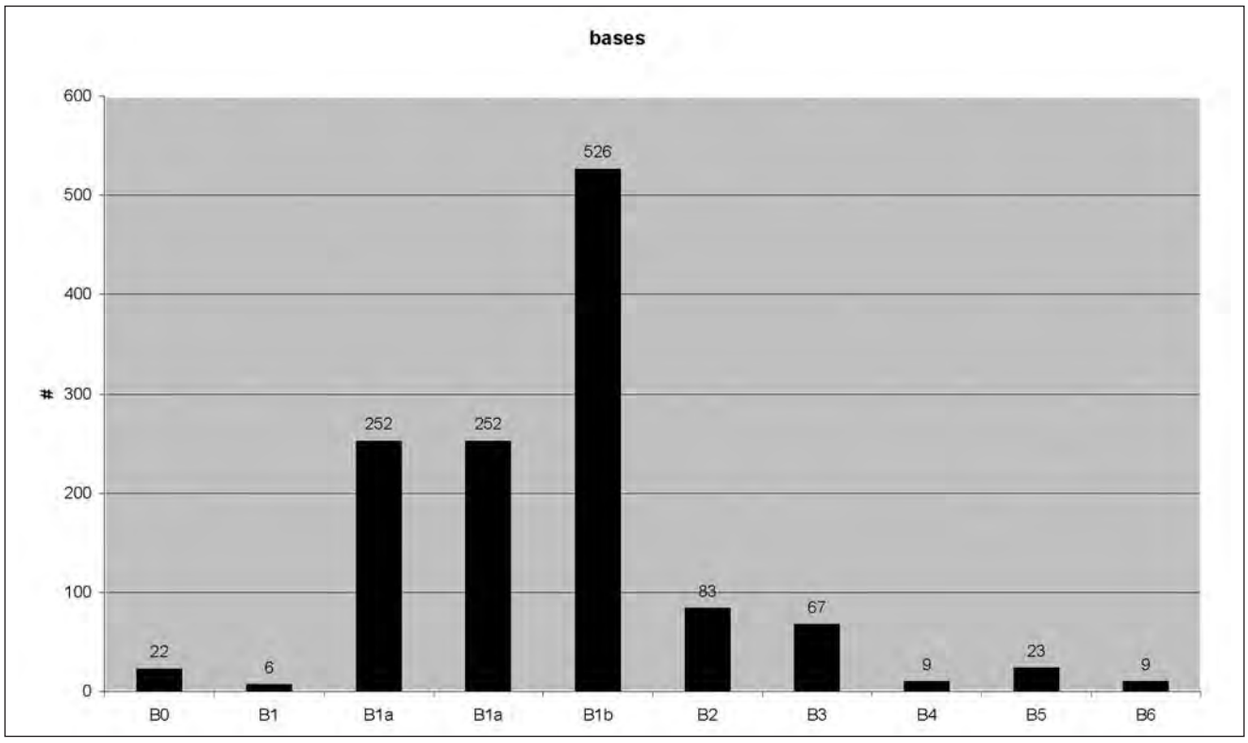
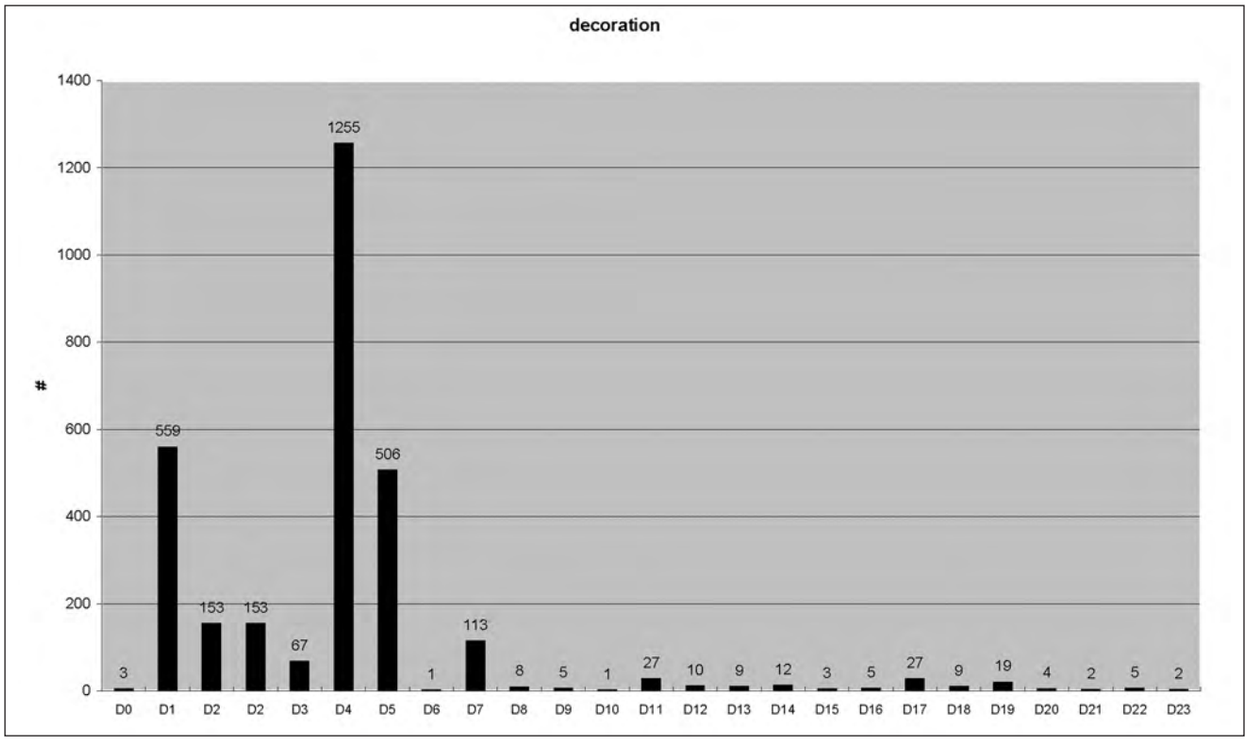


Fig. 4.17. Base numbers by type

Fig. 4.18. Decorative element numbers by type



surface are included, although they are sometimes considered simply a method of treating the surface and in reality might have had a practical rather than an aesthetic function. In spite of this, the representation of decorated sherds is relatively low if we ignore finger decoration; it accounts for only 4% of the assemblage, which agrees with the findings of the earlier analysis (Šumberová 2000, 61).

In using the coding system, it is finger-tip decoration that is actually the commonest. In isolated instances it occurs in horizontal form; then incision on the whole or part of the surface of the vessel; and applied cordons. Cordons are represented in several variants, with dimples or pits, cuts or slashes, and fingernail impressions, but unfortunately this type of decoration is common almost throughout the Bronze Age and

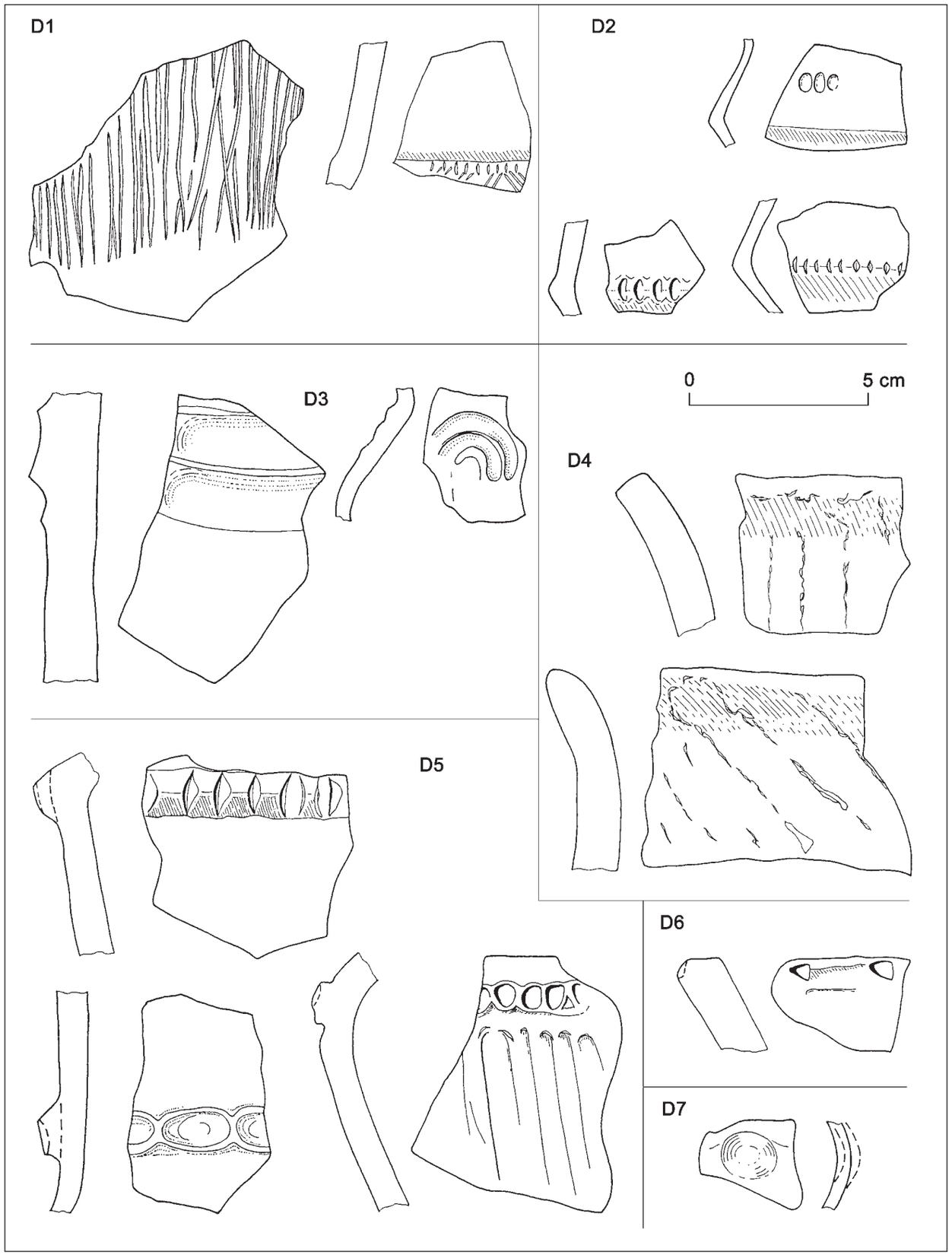


Fig. 4.19. Decorative element types 1-7

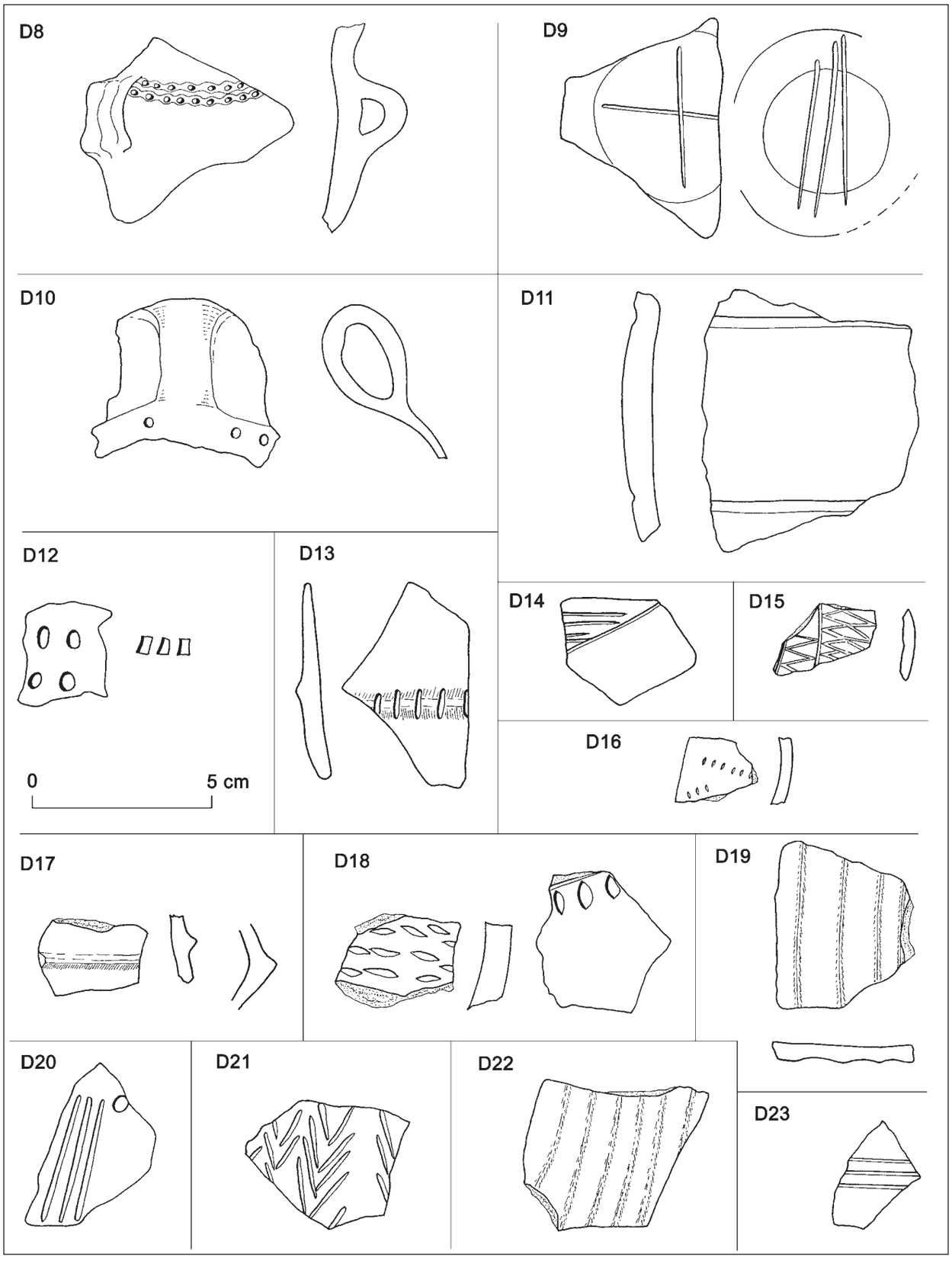


Fig. 4.20. Decorative element types 8-23

provides no chronological indications. Stamped and stroked cordons are absent. Given that cordons were used mainly on jar-like vessels and storage jars, identifying them is important in order to obtain an accurate schedule of pot types. Smoothed cordons and double cordons also appear. Only two other decorative types exceed 100 occurrences: the cutting of the carination in a hollow (D2), typical for biconical vessels and amphorae, and protrusions (D7), appearing mainly on jugs and amphorae. Protrusions are placed on body vessels both individually and combined with flutings or grooves. Flutings, ribs, channelling, various types of dimple, stroke and stamp are also represented – motifs which only serve as a faint memory of the classic incised decoration of the earlier phases of the Tumulus Culture. Geometric decoration hardly appears, and applied decoration noticeably exceeds excised decoration. This tendency is again typical for the later Tumulus culture and the transitional phase to the Late Bronze Age. Combinations of motifs are very little used, with the exception of a combination of finger-tip decoration of the surface with applied cordons and protrusions with horseshoe-shaped fluting. On one piece a combination of horizontal and vertical channelling is found, a motif that recalls forms from the later Knovíz milieu.

Vessel form

From this analysis one might describe a typical Velim vessel as a vessel of medium-coarse fabric with straight rim, flat base, finger-tip decoration, perhaps with a strap handles. The vessel parts fortunately allow at least a basic typological classification, and some categories of vessel are represented by whole or reconstructable forms. In the spectrum of forms all basic shapes appear in a large number of variants (Figs. 4.21-4.22).

Cups

The typical representative of fine pottery occurs in all four basic variants – with simple s-shaped profile, with neck separated from body, with carination beneath a neck with smooth contour, and with neck separated from body with carination (Pl. 1). In contrast to the early phase of the excavation, conical cup variants were identified here; these occur on other sites fairly frequently (cf Chvojka & Michálek 2003, 106 with further instances). The handle as a rule extends to the shoulder; exceptionally knobs appear on the rim. Cups are usually undecorated, with the exception of crosses on the base.

Jugs

Small vessels that are higher than they are wide, with high neck and one strap handle, are represented only on a few pieces in the form with curving or carinated wall, boss decoration (protrusions), sometimes in combination with horseshoe-shaped incisions or grooves (Pl. 2:7, Pl. 3:12, Pl. 9:17).

Biconical vessels

These are very sparsely represented among the complete profiles (Pl. 5:1,2, Pl. 6:1), but the high proportion of straight and moderately inverted rims shows they were commoner than they seem. They occur most frequently with transversally cut carination and incisions on the lower part.

Amphorae

Amphora-shaped vessels are represented in several forms and variants, differing mainly in the shape of the neck, which is either tall and cylindrical, tall and conical, or low and incurved. Further variants are distinguished by the separation of the neck and the shape of the wall. The typical representative is the amphora with high conical neck separated from the body, with slashed carination and incised lower part (Pl. 10:1). This form usually has no handle. Undecorated amphorae often have a strap handle at the junction of the neck (Pl. 5:4-5; Pl. 11:23, 26-28). Amphorae with incurving neck usually have a high shoulder and the belly appears spherical. There is also a variant with horizontally outturned rim. These amphorae often have a finger-decorated surface and a cordon below the neck (Pl. 2:2,13). There are a few instances of a small amphora with foot (Pl. 11:29).

Jars

The unaccentuated form of jars only allows an general division by shape and neck/body separation. They appear as simple s-shaped, profiled and handleless (Pl. 2:5), or with handles beneath the neck (Pl. 2:3), and the so-called flowerpots with separated neck and handle from rim to shoulder (Pl. 2:8). A poorly made jar with handles on the body is unique (Pl. 2:1). Handles on the body appear more commonly on bowls, and at the Radčice settlement were noted also on amphorae (Chvojka & Michálek 2003, 104 with more parallels). There are also large open jars clearly used for storage, sometimes heavily decorated (Pl. 4:1-2).

Bowls

Bowls were initially divided into three types – simple conical, curving, and amphora-like. Small conical bowls appear more frequently, sometimes with incisions (Pl. 11:12-13) or fingertip decorated surface, on occasion with handle on the rim (Pl. 11:1) or wall (Pl. 11:2). Two further types can only be distinguished with difficulty in the fragmentary sherd material, but the the wall sherd with handle on Pl. 11:5 perhaps represents a rounded bowl, and the fragments of massive vessels with applied cordon and double-fluted handles, with ribs or overhanging cordons on the carination, may belong to amphoroid bowls (Pl. 2:9-10,12; Pl. 6:9). On some examples footed bowls are present, in the classic concave form ~~a~~ typical for Tumulus culture feature (Pl. 10:13), often however only with the suggestion of an outturning foot (Pl. 10:11-12), which could be either a bowl or a small amphora.

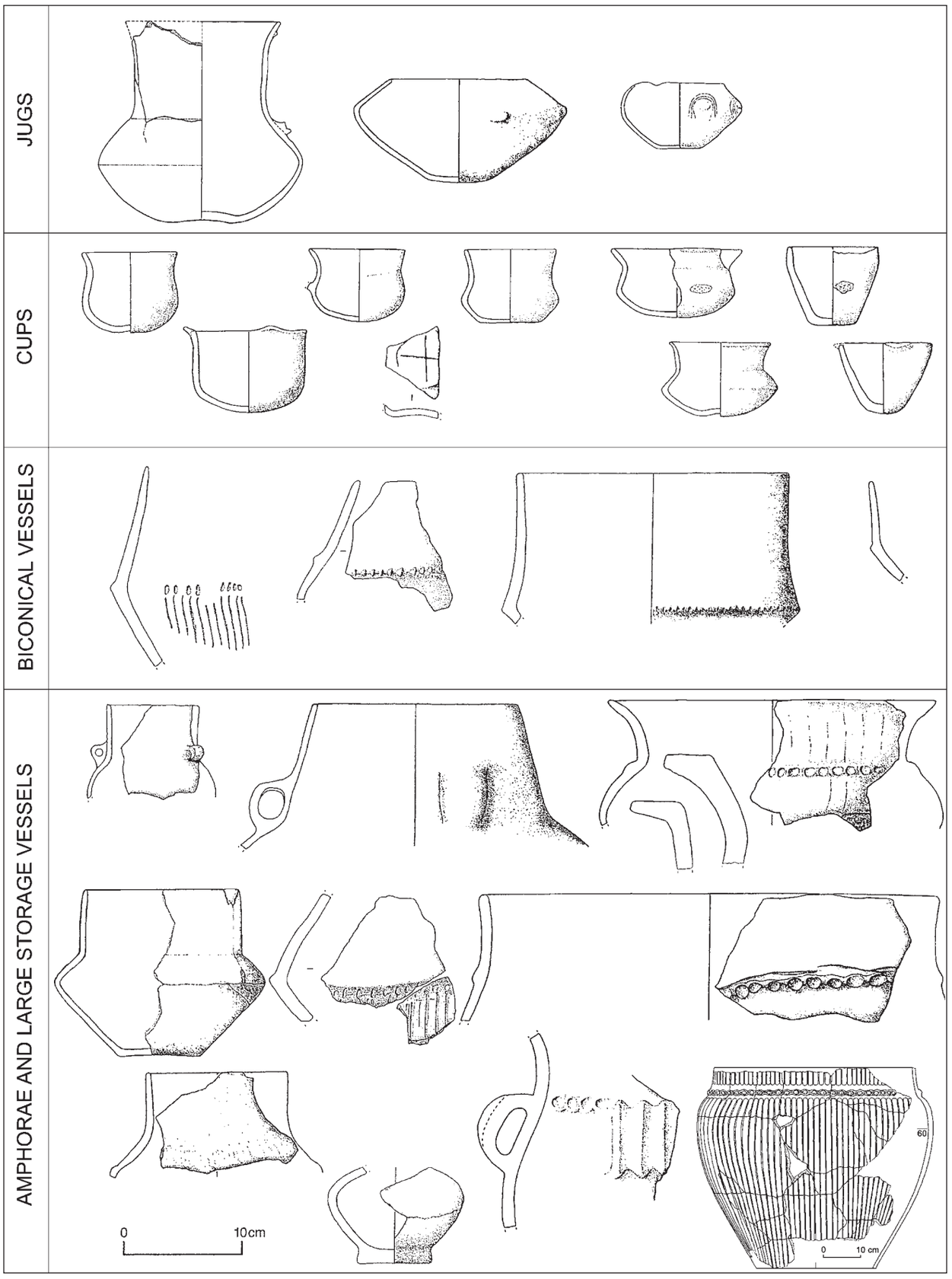


Fig. 4.21. Vessel forms: jugs, cups, biconical vessels and amphorae

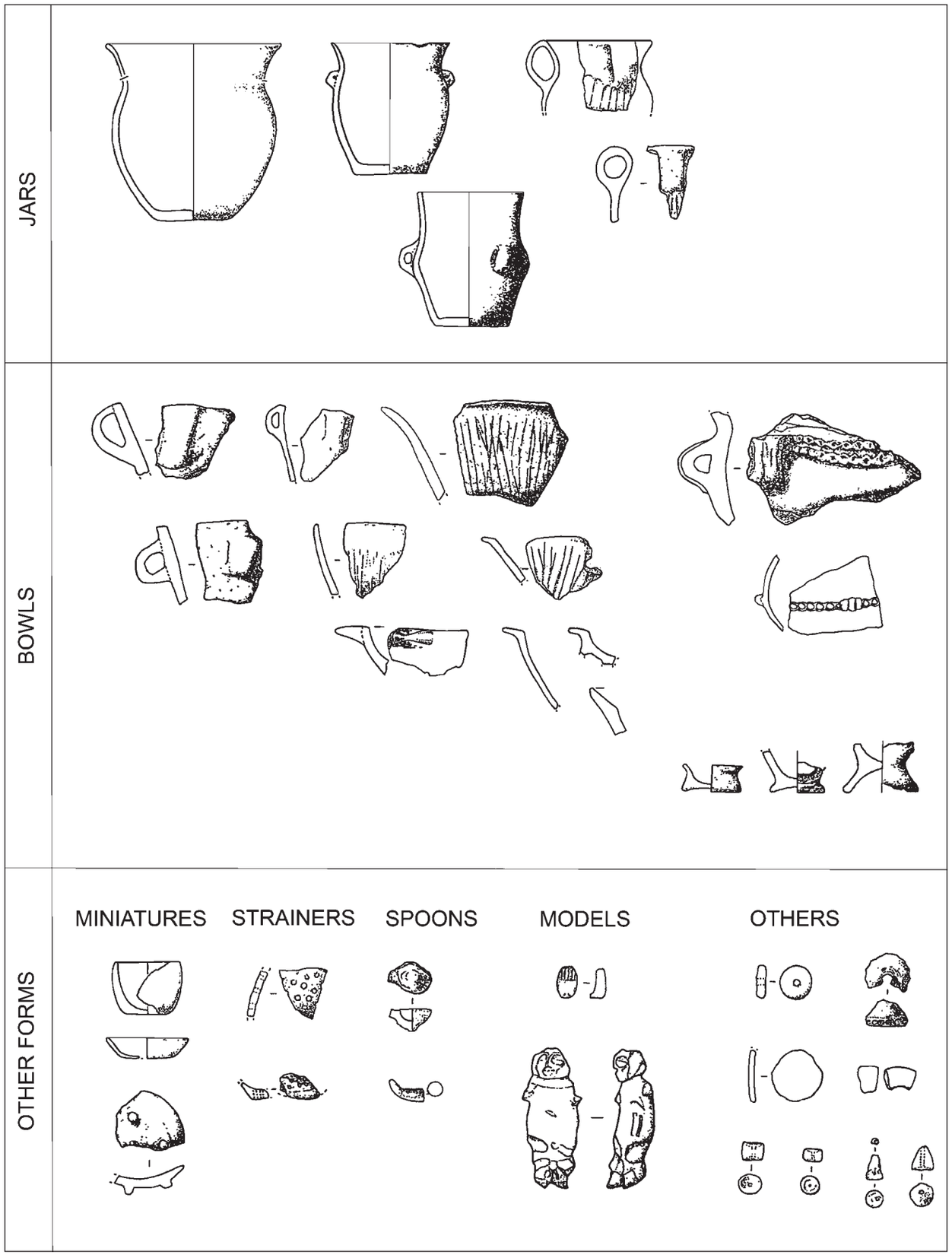


Fig. 4.22. Vessel forms: jars, bowls and other forms

CHARACTERISTICS OF INDIVIDUAL PHASES

Although the fills of the ditches, and pits within ditches, cannot be considered true closed assemblages, by comparing the pot forms in features representative of individual phases (Objekt 64, Ditch 612, Red Ditch) one can trace specific variation in the ceramic repertoire (Figs 4.23-4.24). In terms of preservation the structure of the assemblages is very similar; one can simply say that in the very meagre assemblage in the Red Ditch rims and bases are in percentage terms less well represented, and handles and knobs appear rarely. Simple strap handles of type H3 predominate in these contexts; in Ditch 612 the small round-sectioned handle of type H7 is well represented. Objekt 64, which was very rich in material, contains more handle variants, and the blind handles H8 and H9 are also represented there. As for bases, Objekt 64 again contains almost the entire spectrum of types, with hollow feet and omphaloi being common; in Ditch 612 flat bases with moderate projection are markedly less common than in Objekt 64. For rims the features differ rather more, although simple straight rims with rounded or flat top predominate (in Ditch 612 there are more rounded, in Objekt 64 more bevelled). Moderately everted rims of type R3 are more frequent in Ditch 612, and rim type R8 appears only here. In Objekt 64 the repertoire is again more varied; almost all types are represented, including for the first time horizontally outturned rims of type R11 and R17. In percentage terms, the representation of horizontally outturned rims of type R11 is still more marked in the Red Ditch.

The large number of decorative types brings with it greater variation in the repertoire present in each of these three features. Treatment of the surface by finger-rustication and applied cordons is particularly common; in this only the relative proportions differ. While in Ditch 612 applied cordons predominate over finger-decoration, in Objekt 64 and the Red Ditch the reverse is true. While in Ditch 612 the third most common after ribbing and finger-decoration is applied decoration with protrusions, in Objekt 64 its percentage representation is distinctly lower, and in the Red Ditch it was not recorded at all. In these Features the third most common type of decoration was line decoration on the vessel surface, which in Objekt 612 was only represented in relatively minor proportions.

We can say, then, that for the early phase on the site applied cordons typically predominate, with finger decoration slightly less common, and grooving of the surface very infrequent. By contrast, applied protrusions are relatively common. The shape of the wall above the spreading of the base is rather rounded, and round-sectioned handles appear commonly. The middle phase is very varied in terms of shape and decoration (thanks to the rich assemblage in Objekt 64), with finger decoration dominant. Surface incisions are still very marked, applied cordons apparently on the recess. Pricked decoration is used frequently – dots, fingernail impressions, cuts, dimples, and horseshoe-shaped ribs accompanying protrusions. Plain cordons and other less common types of decoration appear for the first time, while geometric decoration is also represented. The range of rim forms is very varied, with bevelled forms appearing in greater numbers, and horizontally outturned rims appearing for the first time. Among the bases hollow feet appear, but a swelling on the foot is commoner. It is rather difficult to characterise the fill of the Red Ditch horizon given the poor repertoire (similarly with the Czech excavation), but we can point to a marked representation of finger decoration and surface incision, and applied cordons again; horizontal channelling appears for the first time. Among the rims the high percentage of horizontally outturned rims should be emphasised.

In conclusion it is possible to say that the formal and decorative scheme of the pottery from the British excavations at Velim-Skalka is comparable to that known from the close of the Tumulus Culture in Bohemia. Some pieces could probably be assigned to phase Br C1 and C2, but the majority of the material belongs to the transitional horizon Br C2/D1, which can also be designated the early phase of the Lausitz Culture (Ia, in part Ib, of the Vokolek classification). Elements typical of the classic Lausitz Culture were noted only in small quantities; in isolated instances, that were evidently intrusive, certain decorative elements typical for the Knovíz Culture were identified (torsion on the rim, horizontal finger impressions on the neck of amphorae). The smooth development of the late Tumulus to the early Lausitz culture is here very well recognisable, especially on the amphora-like and biconical vessels.

A similar development has been very well documented recently in central Moravia. Newly published settlement excavations, especially at Přáslavice (Šabatová & Vitula 2002), exhibits a remarkable similarity to the pottery from Velim in the Moravian area, and on the Přáslavice settlement a comparable development from late Tumulus to Lausitz is also seen. Since finds of this period are now known also from the eastern part of central Bohemia, one can suppose that a smooth transition from the Middle Danubian Tumulus culture to the Lausitz culture occurred in this area too, without the need for imagining an 'expansion into empty space', as used to be thought.

The boundary between individual phases at Velim can only be assessed with difficulty given the lack of closed find assemblages, but the detailed analysis of individual contexts from the ditch fills allows a basic division into three phases. The earliest corresponds to the Late Tumulus, to which we can assign Ditch 612 (in the Czech sequence phase A), the latest to the Tumulus-Lausitz transition phase, to which the Red Ditch belongs (45A, in the Czech sequence C). Between

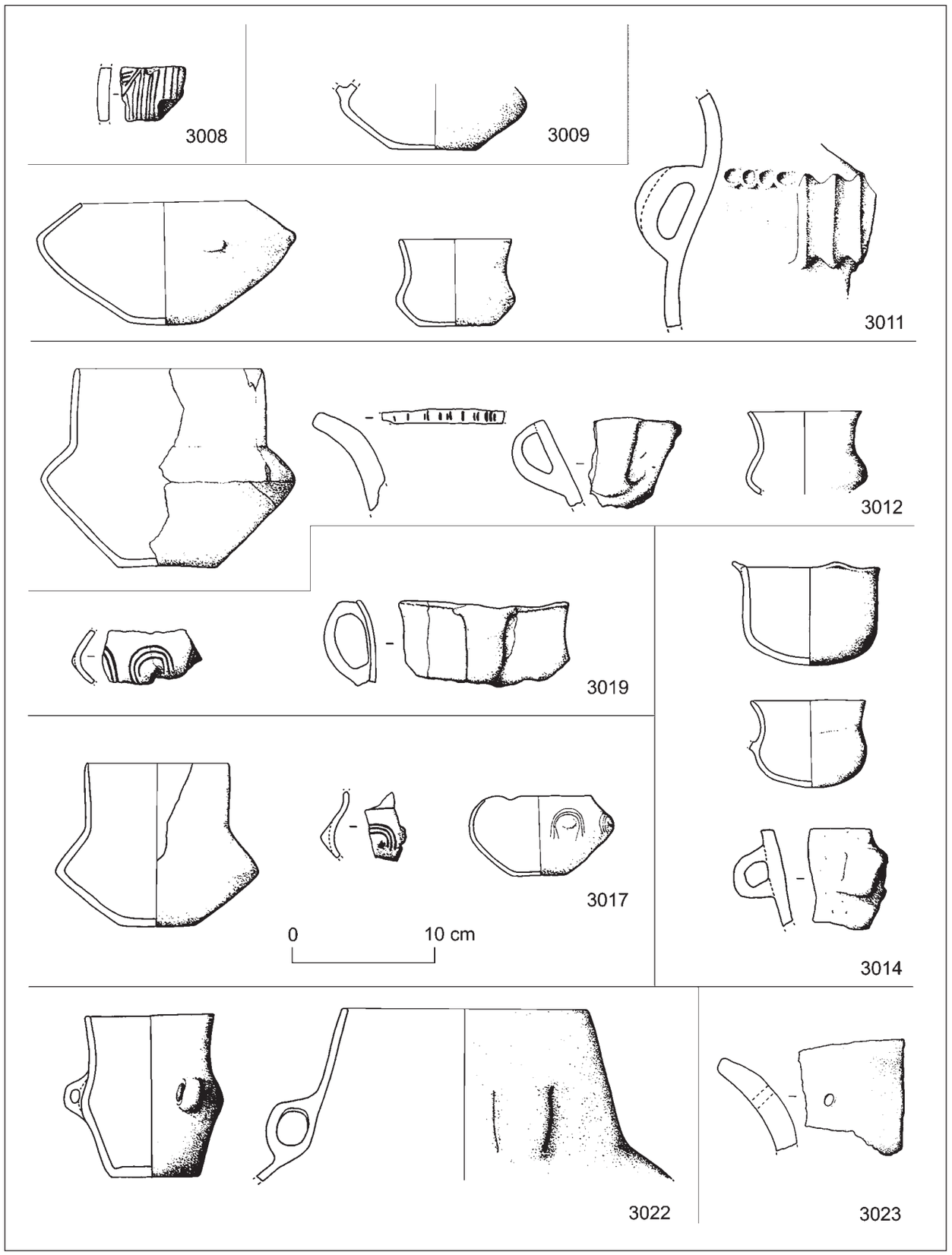


Fig. 4.23. Pot forms from Objekt 64 North pit, in stratigraphical order

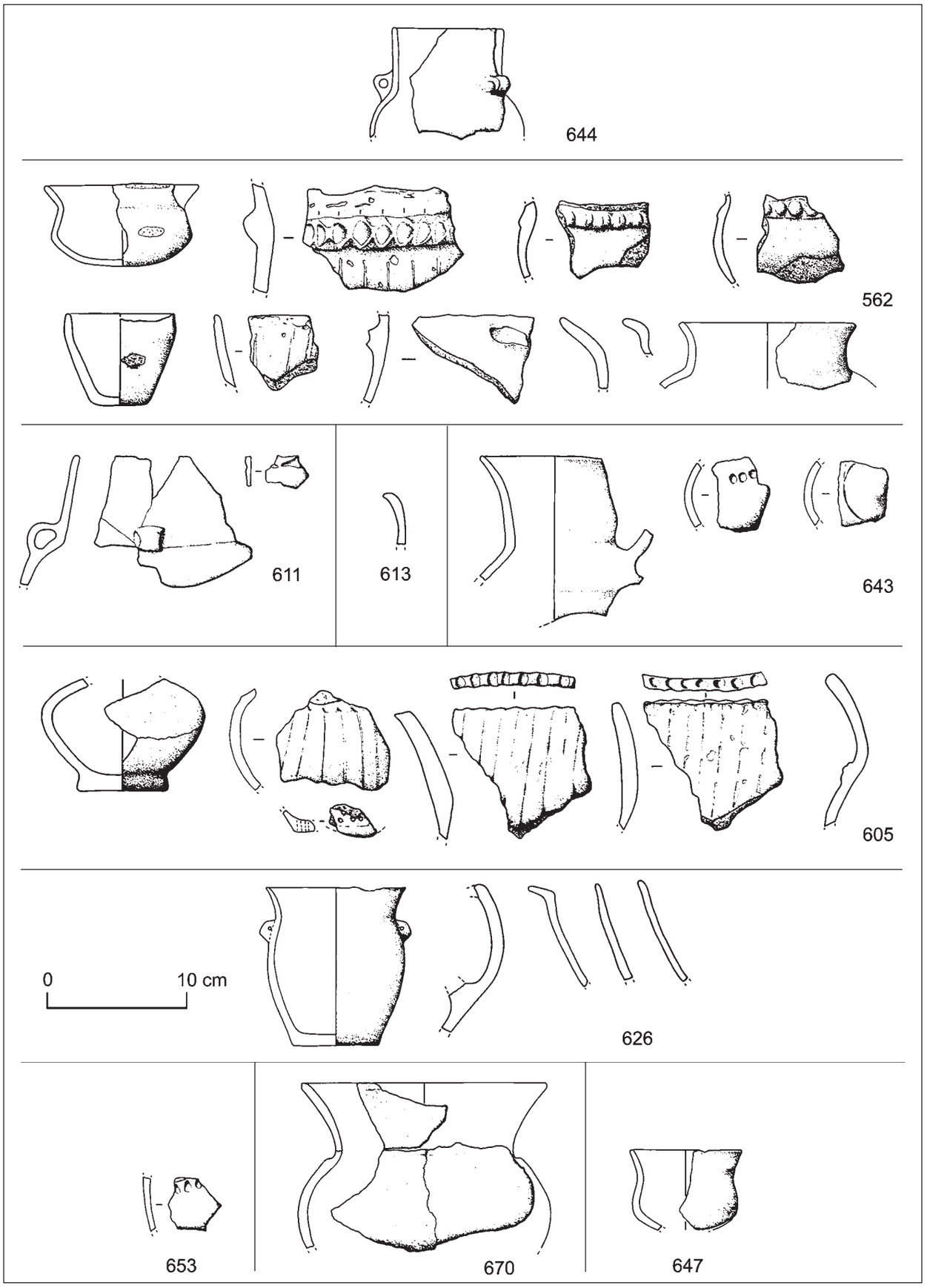


Fig. 4.24. Pot forms from Ditch 612, in stratigraphical order

them it is possible to distinguish another phase which on the Moravian model we would call latest Tumulus; but it has to be distinguished statistically, because it contains elements of the succeeding phases (Objekt 64, in the Czech sequence B). In the analysis of material from the Czech excavations a fourth phase, D, was also distinguished, corresponding to Lausitz culture developments; but this horizon was not found in the British excavation trenches.

The smoothness of the transition limits the possibilities of precisely defining the border between the Tumulus and Lausitz phases of settlement at Velim, unless a great deal more of the site is excavated and individual closed contexts isolated; meanwhile, we can continue to use the term 'transitional phase' for the bulk of the Velim pottery.

CERAMIC OBJECTS OTHER THAN POTTERY

The Czech literature refers to many of these objects as 'technical ceramics', that is, items of fired clay with particular utilitarian functions. The assemblage at Velim was not exceptional in any way, including a standard range of small ceramic objects.

Miniature vases

Miniature vases lie formally outside the normal range of pottery production. Most are tiny cups with straight or slightly funnel-shaped walls (Pl. 11:16-17), or simple conical bowls; there is also a shallow bowl with small feet (Pl. 7:18) and part of a miniature cup (Pl. 14:35).

Discs (roundels)

The most numerous items in this category (58) were discs, fashioned from pared-down potsherds (Pl. 16:1-9,11). Most are circular, or nearly so; a few are elliptical and several were recorded as being unfinished – though presumably only in the sense that they could have been made more regular. Some are properly smoothed; they occur on decorated sherds as well (Pl. 16:12). In similar vein there is one example of a sherd cut down to make a smoother (Pl. 8:21). The dimensions of the discs vary from 22 to 80 mm, with a concentration around 40 mm; the thickness is most commonly 7 mm and the average weight 25.5 g (Table 4.4).

Size	mm	Thickness	mm
Max	80	Max	16
Min	22	Min	4
Median	38,5	Median	7

Table 4. 4. Dimensions of clay discs

Discs or roundels were also present in some numbers in the Czech trenches (Šumberová 2000, 90), where they are said to be absent in some features and common in others; they are said there to be characteristic of the later features of the site, as found for instance in the lower layers of ditch 45A, while absent from ditch 44, stratigraphically the earliest feature.

The function of clay discs has been discussed in the literature many times; Velim offers no further clues about this aspect. Their interpretation varies from a purely practical function as sling shots, through gaming pieces or pottery smoothers, to a cultic significance. Study of their dimensions, or their distribution, gives no firm support to any of these interpretations.

At Velim too, earlier analyses noted greater concentrations from the later phases of the site (Šumberová 2000, 90). They come from all parts of the site, including eleven from Objekt 64, others from the ditches in Sonda 12C, and a couple from Ditch 612. None was found in any situation which might shed light on their purpose. The usual explanations are that they are gaming counters, which remains a possibility, or that they were symbolically associated in some way. At least one had smoothed edges, which suggests it might have been used for burnishing pot surfaces.

Discs of this sort are very common on later prehistoric sites of all periods. Analogies from the Tumulus milieu include the site of Radčice I (Chvojka & Michálek 2003, 127 Obr. 18:16). They occur sporadically on Middle Bronze Age sites, but more turn up in the Late Bronze Age (Chvojka 2001, 37-8) and the Early Iron Age, for instance in Poland (Harding 2004, 60).

Spindlewhorls and perforated discs or beads

A small number of items may be spindle-whorls or they may be beads (Pl. 14:26; 16:10,14,15); a couple of other fragmentary examples were recorded. Only one looks like a classic spindle-whorl (Pl. 14:34), being of conical shape with impressed dots round the basal rim. The other pieces are equally likely to be large beads. Four such perforated discs came from context 562, part of the fill of Ditch 612. Comparanda include examples from Radčice I (Chvojka & Michálek 2003, 127 Obr. 18:15).

Genuine beads, suitable for stringing on a necklace, include two cylindrical pieces (Pl. 14:29-30) and two conical (Pl. 14:32-33). These compare with those from the Czech trenches (Hrala 2000, 211, there called "skittles" or ninepins) and from Radčice I (Chvojka & Michálek 2003, 127 Obr. 18: 13-14).

Weights

Three clay objects appeared to broken weights, probably loom-weights. One appears to be roughly spherical, the other of classic pyramidal form (Pl. 17:3-4); the third is too fragmentary for its shape to be identified. Clay rings were also identified among the sherds, most likely added on to weights.

Other ceramic objects

Other individual items are a perforated object of unknown form or function (Pl. 14:28), a sphere (Pl. 14:27), a sherd with longitudinal perforations (Pl. 14:24, and the fragment of a figurine foot with finger-drawn grooves (Pl. 14:25). This compares well with comparable pieces from the Uherský Brod "sanctuary" (Hrubý 1958, 48 Obr. 7: 1-3). The decoration of these figurines distantly recalls that of the so-called 'loaf-of-bread idols', as found at Radčice (Chvojka & Michálek 2003, fig. 16, 1-2).

An object that looks like a potsherd but is actually some kind of tube or cylinder is shown in Pl. 14:31; it was one of two such pieces. Its function is unknown.

There are six fragments of strainers, mainly of simply profiled bowl-like or hemispherical vessels with perforated walls (Pl. 9: 39-50), or bases (Pl. 9: 51).

Figurine

The most remarkable object falling in this category is undoubtedly the crude figurine, 95/1937, emanating from context 3000, the upper levels of Objekt 64 (Pl. 15). The figurine is 114 mm long, 49.5 mm wide and the widest point, and 31 mm thick; it weighs 129 g. The condition is generally good (it appears to be complete), but the surface of the clay is somewhat crackled.

The crude modelling clearly represents the human form, with head, neck, torso and legs. The nose, ears and shoulders are pinched out; there is a clear separation of torso from head and legs from torso. There is a broad stump-like penis and a depressed area at the rear where the buttocks should be, perhaps because a flake of clay is missing. Seen in profile the head bends forward slightly, as if nodding.

No close analogies to this piece could be found in the area and period to which Velim belongs. A simple anthropomorphic figurine of the Tumulus period, though with barely modelled features, came from Vochov (Čtrnáct 1954, 340 Obr. 3: 12). Apparently close parallels to the Velim object come from somewhat later contexts in Poland and France. A clay figurine from a Lausitz cemetery at Gliniany (Wrocław), attributed to Ha A-B (Gediga 1996, 337 ff. Abb. 1,1) has a crudely modelled torso, clearly defined legs and feet, a bird-like head with protruding beak/nose, and a prominent penis. The figure is a little over 20 cm long, which makes it somewhat larger than the Velim piece. A female clay figurine comes from a site within Wrocław and is similarly crudely modelled, but is too fragmentary for any conclusions about its precise form or its relationship (if any) to the Gliniany and Velim figures (Gediga 1996, Abb. 1,3). Crude figurines are present on the Bronze final IIIb sites of Chalucet (Haute-Vienne), Lac du Bourget, and other sites in southern and eastern France (Chevillot and Gomez 1979). The crude modelling of some of these pieces recalls the Velim piece quite strongly, though as with other analogies, the features and overall syntax are too vaguely defined for any detailed conclusions to be drawn.

Early Bronze Age modelled clay figurines from Bohemia were studied by Pleinerová (1961). The crudeness of the Velim figure is certainly repeated in the animals she illustrated, but the only anthropomorphic figure, that from Velké Číčovice, was much more carefully modelled, appearing almost fiddle-shaped and having close analogies with material from Otomani contexts in Slovakia and Hungary. There are no *Brotlaibidole* from Velim, as there are from Radčice I (Chvojka & Michálek 2003, 123-6, Obr. 16-17).

In view of the exceptional simplicity, indeed crudeness, of the Velim figurine, close parallels are unlikely to be found or to be very helpful. It is also arguable whether it gives much insight into the nature and function of the deposits in Objekt 64 (cf below, p. 000).

Worked bone

Five pieces of worked bone were noted. One, a perforated tooth (Pl.14:4), comes from a fox or large dog; similar pieces came from the Czech excavations (Hrala *et al*. 2000, 237-8 Fig. VII.16). The curious perforated piece (Pl.14:5) is of unknown form and function. There is one small bone pin or needle (Pl. 14:6).

Copper alloy

Twenty-four bronze or other copper alloy objects were found, eight of them fragmentary or unidentifable. At least one, the brooch fragment, is later and probably part of a La Tčne piece (Pl. 14:11). Five finger-rings are made of coiled bronze wire (Pl.14:19-22), similar to those found in the Czech excavations (Hrala *et al*. 2000, 234 Fig. VII.11, 64) or that from Bezměrov pit 33 (Spurný 1972, Obr. 25: 8). Of the pins (Pl.14:16-18), two have rolled heads (*Rollenkopfnadeln*), unfortunately found over a long time-span (Říhovský 1979, 136 ff., 143-5, occurring through the entire Bronze Age; cf Hrala 2000, 248f.; Fröhlich 1983, 65 Taf. 55: 12-13); the other has no head preserved. A twisted bar may also be part of a pin (Pl.14:13), or conceivably a fragment of a *Rollenkopfnadel* with twisted shaft (Říhovský 1979, 143 nos. 1057-1060).

A very small dished disc is presumably an appliqué for clothing or application to the body (Pl.14:23); similar pieces can be seen in Hrala *et al*. 2000, 235 Fig. VII.12, 85.

The remaining bronze objects include small bars that may be pin shanks (Pl. 14:7-9), a possible chisel

fragment (Pl. 14:10), a triangular-sectioned blade-like object (Pl. 14:15), and other small indeterminate pieces.

Stone and flint

Thirty-six stone and six flint objects were catalogued, though some are undoubtedly natural and not worked at all. The flints (Pl.14:1-3) are flakes, two being blades, one serrated (Pl.14:2). They are not chronologically diagnostic except for one possible Mesolithic piece and all came from unstratified or topsoil contexts. They are presumably part of the background spread of earlier material that could be found anywhere. A small assemblage of chipped stone also came from the Czech excavations (Hrala *et al*. 2000, 239-40, Fig. VII.18), and from Radčice I (Chvojka & Michálek 2003, 142-3 with further refs).

The worked stone objects include five small querns and one larger one, mostly broken or fragmentary, and showing dished surfaces. The two illustrated pieces (Pl.17:1-2) all came from Pit 64, which also produced a deposit of millet, suggesting that food processing activities took place in or near the pit. The significance of this is considered in Chapter 9. Querns occur frequently on Bronze Age settlement sites, for instance at Radčice I (Chvojka & Michálek 2003, 142).

A curious worked stone, unfortunately unstratified, is that shown in Pl.16:16, multiply worked on all faces. These workings consist of grooves, some parallel and some placed at angles, presumably indicating that the stone (which has not been identified as to type) served as a whetstone. The curious piece shown in Pl.16:17 has a broad groove on one side and two converging grooves on the other, but its purpose is unknown; it may be a mould fragment, similar to that illustrated in Hrala *et al*. 2000, 238 Fig. VII.17 no.5.

Four pieces relate to axes or axe production. The battered and broken shaft-hole axe (Pl.16:18) is presumably a Neolithic stray, as is the flat axe fragment (Pl.16:21). Two cores from shaft-hole boring were also found (Pl.16:19-20), both of them in Pit 64. An almost identical shaft-hole axe came from the Czech excavations (Hrala *et al*. 2000, 238), while stone axes occur in the Plzeň region at Vochov (Čtrnáct 1954, 338 Obr. 3: 5) and Nová Hospoda (id. 350, Obr. 9: 19-20).

It has been observed in other contexts (e.g. Kostrzewska 1950-53; Harding 2004, 64) that stone axes turn up quite frequently on Bronze and Iron Age sites, and while it is always assumed they are Neolithic in origin there remains a possibility that some were used, or at least collected and preserved, in later periods.

Industrial residues

Several pieces of slag, a piece of metal residue, and a crucible fragment belong to this category. These finds suggest that metallurgy was taking place on or near the site; a possible stone mould fragment from a topsoil context suggests the same, as do the lumps of molten metal and stone mould fragments found in the Czech excavations (Hrala *et al*. 2000, 237, 240, Fig.VII.3-6; cf Radčice I: Chvojka & Michálek 2003, 130 Obr. 18: 21).

Crucible

From Context 235 in the upper levels of Feature 64 (Sonda 12B) came several fragments of a vitrified ceramic that appeared to be crucible. It was submitted to David Dungworth, then of the Department of Archaeology, University of Durham, for conservation and analysis.

Crucible fragments from Velim
by David Dungworth

Nine crucible fragments were submitted for analysis. The fragments were conserved, where possible fragments were rejoined,[3] and the fragments were analysed using EDXRF.

Conservation and repair

Eight of the nine crucible fragments submitted for analysis were heavily vitrified and green in colour. These fragments were fragile and so were conserved with B72 in acetone/toluene solution. It was then possible to rejoin all eight of these fragments.

The last fragment is not as highly vitrified as the others and may belong to a second crucible.

Analysis

The crucible fragments were analysed using EDXRF analysis. This method can identify different metals which have diffused into the crucible fabric during the melting of the metal. Analysis of crucibles cannot, however, give a quantitative assay of the composition of the metal melted as metals behave differently. Some metals are extremely volatile when the alloy is molten (e.g. zinc and arsenic) and some metals diffuse more easily into crucible fabrics than others (e.g. zinc). In the Roman period, for example, almost all crucible fragments contain some zinc even though the alloy melted may have contained very low levels of zinc (Bayley 1989; Barnes n.d.).

Analysis of fragments of both crucibles from Velim showed high levels of copper, tin and lead. Other metals possibly present include nickel, arsenic and antimony. These results suggest the melting of a

3 When found and recorded in the finds database in 1994, there were only six fragments. Damage occurred in transit to the laboratory (AFH).

leaded bronze, which probably contained the levels of impurities common in Bronze Age objects (Brown & Blin-Stoyle 1959).

Comment (Harding): The presence of crucible fragments at Velim is important corroborative evidence for on-site metalworking, already attested from the finds of stone moulds and waste metal from the earlier excavations (Hrala *et al*. 2000, 237, 240 Fig. VII.17). It is very likely that some of the tools from the bronze hoards on the site are metalworking tools (Hrala *et al*. 2000, 230-1). On-site metal-working has important implications for the interpretation of the site (below, Chapter 9).

Spoon-shaped objects occur quite commonly on Middle Bronze Age sites, as at Radčice I (Chvojka & Michálek 2003, 126-7, Obr. 18: 17-18), Vochov (Čtrnáct 1954, 340 Obr. 3:8), or Uherský Brod (Hrubý 1958, 55 Obr. 9:7), but there is no indication from the residues, as stated in these reports, that they might be crucibles.

Amber

A single small shapeless amber bead was found in context 2023, a pit feature in Sonda 12C. Several amber beads were found in the Czech excavations up to 1992 (Hrala *et al*. 2000, 237, 255). Amber is known from central Europe in a number of Early and Middle Bronze Age contexts, usually graves (e.g. Hachmann 1957); the quantities declined in the Urnfield period (Hrala & Plesl 1990). Klára Marková has listed the amber from Slovakia, showing that it was commonest in the Early Bronze Age but by no means absent in the Middle and Late Bronze Age (Marková 1993; 1999). There is thus no surprise to find amber in Middle Bronze Age Bohemia, though it usually occurs in graves.

Daub

Considerable quantities of daub were noted and some was collected. The Finds register includes 143 entries for this category, with a total weight of 4.655 kg, but this figure is only indicative since no attempt was made to collect all that was encountered. Significant amounts of daub were found at Radčice I and some is illustrated (Chvojka & Michálek 2003, 127-8 Obr. 19); it also occurred in quantity in a pit at Praha 3-Miškovice (Ernée & Smejtek 2004, 263-4 Obr. 4; 11). On smaller sites it is undoubtedly present though in quantities that have not attracted attention. The Czech excavators of Velim also found plentiful daub but the published accounts say little about it. At present it does not appear that elaborately moulded daub has been found at Velim, as was the case at Kutná Hora (Beneš 1981; cf Paulík 1962).

Chapter 5. Dating, phasing and stratigraphy

In general terms, the date of the Velim site is reasonably well known: it belongs mainly to the late Tumulus period, and spans the transition to the Late Bronze Age. There are indications, however, that the material from the site belongs to more than one period; and the absolute date of the site depends on a number of considerations, including absolute dating derived from radiocarbon samples.

THE AFFINITIES OF THE VELIM FINDS

Since the earliest days of exploration at Velim, it has been known that the bulk of the material belongs to the late Tumulus and/or the early Urnfield cultures. At the same time, there were indications early on that there was an element which belonged rather earlier, to the early Tumulus or Veteřov culture. Before considering the affinities of the 1992-5 material in detail, a short resumé of the history of research on Middle to early Late Bronze Age pottery in central and east Bohemia is necessary.

Dvořák's excavations produced pottery which he recognised as containing Únetice elements. "The vessel types, still recalling late Únetician material, are found here together with Lausitz pottery, and not only with skeletons buried in ritual fashion but also in the abandoned huts", he wrote (Dvořák 1936, 49-50), illustrating two cups that do indeed resemble late Únetice forms, a jug that looks more Tumulus in nature, and a biconical vessel that looks to be Lausitz in character; he referred to the material from Velim as "Kultura velimská". Filip (1936-7, 8-9, Obr. 4) illustrated three of the same vessels and a further five, discussing them in the section of his book devoted to the Lausitz culture; the types of the Lausitz pots, he commented, were "by no means the earliest". These pots, which are still on display in the Kolín museum, consisted mainly of cups or small jugs, sometimes with sharp profiling and with handle stretching from rim to carination, frequently polished or burnished, recalling Únetice material but with elements close to Knovíz pottery such as cups with rounded belly rather than carinated. Tumulus elements were also visible, especially on the bronzes, but he saw the grave rite as found in the Dvořák graves (about which we actually know next to nothing), the positioning and orientation of the bones, and the numbers and positioning of the pots, as indicative of a "continuing presence of Únetician population at a time when the Lausitz culture was already present in the land" (Filip 1936-7, 8). At this time too Böhm recognised the importance of the Velim finds (1937, 91-2). He perceptively pointed out that the cups carried a "reminiscence" of Únetice material but also of pure Lausitz, and that on none of them was the handle in the correct place for typical Únetice cups.

Spurný's excavations in 1948-9 recovered a comparable range of material, and it is from this time that a presumed occupation at the time of the transition Early to Middle Bronze Age emanates . Very little of Spurný's material has ever been published; a discussion article of 1972 illustrated some nine vessels and a pin with twisted neck; two of the pots were said to be Middle Bronze Age (an ovoid jar and a carinated jar with tall cylindrical neck). A recent further contribution has illustrated a further pin and a complete jug found in a pit beneath a skeleton grave. This jug has a carinated belly and an everted neck with handle from rim to carination and is a typical Tumulus culture vessel.

It is hard to know how to take the alleged survival of Únetice elements in the Velim pottery. The fact is, as Hrala pointed out in his full discussion of the Velim pottery , that small cups such as are found at Velim occur over a wide chronological span and are not diagnostic by themselves. The group of such cups from nearby Křečhoř is of just this type; it was initially dated to the proto-Únetice period but has since been realised to belong to a considerably later period, probably contemporary with Velim.[1] The cups from the Křečhoř find are just like those from Skalka, and very probably emanated from the same workshop; we shall return to consider the potential significance of the find in a later section (below, Chapter 9).

In fact, there is little to recommend an early date for any significant element of the Velim site; the earliest that is likely is a date in the early to middle Tumulus period, as Bouzek (2001) has also recognised.

Here we must bring into the discussion the basic discussions of pottery of the relevant cultures affecting central Bohemia: the Tumulus cultures;

1 This find is of considerable interest for the Velim situation. Thirty-nine complete pots and one fragment were discovered in a small pit, around 1 m in diameter and 0,60 m deep; they lay in layers and had thus been carefully placed in the ground. All of them are handled cups, with the exception of two vessels of similar shape that had no handles; three had crosses incised on the base (cf below). Surface treatment consisted of polishing and burnishing. The one fragmentary pot was part of a larger handled vessel, perhaps an amphora.

Lausitz; and Knovíz. The fundamental work on these was carried out in the 1950s and 1960s by Beneš, Vokolek and Bouzek , and later by Hrala . Although further finds have been made since then, and the absolute chronology can be refined, the basis of the cultural sequence remains essentially unchanged.

Tumulus cultures: Classically, Tumulus material comes from barrows, as in many parts of Germany and in west Bohemia, and these are of course not necessarily relevant to the situation at Velim – which, although it may not be a normal settlement site, is not a normal burial site either. Furthermore, the Tumulus culture is not widely represented in central Bohemia, unlike the situation in west and south Bohemia. Thus the studies of Beneš have had to work with a relatively small amount of material. His basic study of 1959 covered the small number of sketchy settlement sites that characterise the period and are found throughout the region, some ten hoards and/or groups of bronzes (some of which may in fact emanate from graves), and tumuli from some twelve localities, of which only one (Velká Dobrá, okr. Kladno) was large (more than 60 mounds, but only nine certainly of the Middle Bronze Age). Almost all the tumuli occur west of Prague; only two sites (Houštka, okr. Brandýs nad Labem and Choboty, okr. Mladá Boleslav) lying east of the Elbe-Vltava line. In addition, Beneš had available material from flat graves from 26 localities. When one inspects his list for finds from east-central Bohemia, that is the Český Brod-Kolín-Podebrady-Nymburk area, it is striking how little material is present (some 24 findspots, several with merely a single pot) and even though there are new finds to add since 1959, they do not include tumuli. Compared with the situation in west Bohemia, around Plzeň for instance, this is remarkable; it is hard to believe that it results from a comparable level of cultural exploitation. The map (Fig. 10.3) illustrates Tumulus culture settlement in east-central Bohemia (Šumberová, below p. 000), from which it is clear that some finds are known, though not a dense distribution.

Böhm devoted the first section of his 1937 book to a consideration of the Tumulus culture in Bohemia, and at sites such as Pchery (Slaný), Hostouň (Kladno) and Stodůlky (Praha-Venkov) had a significant amount of settlement material to deal with. In the present context the settlement material from a site at Podebrady is also of interest (Beneš 1959, 42, Obr. 19-21), though little is known in detail about it. As Beneš later pointed out, for Böhm the line where Tumulus material stopped ran from the Kolín area to Mladá Boleslav and thence to Melník and along the Elbe to the Ohře (Beneš 1961). That said, Beneš included in his discussion settlement sites, or traces thereof, throughout central Bohemia, and in 1961 published a significant quantity of settlement material from a pit at Louny – Starý cukrovar. From these we have a reasonable idea of what Tumulus settlement material looks like in central Bohemia. This has now been expanded by material from recent excavations, for instance at Radčice-Vodňany, okr. Strakonice (Chvojka & Michálek 2003) or Praha 9-Miškovice (Ernée & Smejtek 2004).

While this is not the place to enter into a full discussion of Tumulus culture chronology across the whole of its distribution area, we may recall the current situation regarding chronology in the German and Austrian areas of distribution. This work goes back to Willvonseder and Holste, and more recently Torbrügge and Ziegert; all of them building on the foundations laid by Reinecke and others . In the 1970s, as a logical result of the Prähistorische Bronzefunde project, Müller-Karpe and colleagues developed a system of period names based on assemblages that were considered to characterise the time in question . The sites chosen were those well known since the time of Reinecke, Lochham for B (ältere Hügelgräberkultur), Göggenhofen for C1 (mittlere Hügelgräberkultur), Asenkofen for C2 (jüngere Hügelgräberkultur), and Riegsee (more recently Riegsee/Henfenfeld) for the transition HGK-UFK or Bz D; since all these sites are in south Germany it was always likely that other sites would be useful for areas elsewhere.

For Bohemia, a somewhat different approach was taken, the periods being known to scholars from characteristic finds but not usually systematised in quite this way. Beneš provided a fourfold chronology for the material from central Bohemia, which was repeated by Bouzek and others later on (starší, střední, mladší, pozdní, i.e. “older”, “middle”, “younger”, “late”, or in Reinecke/Willvonseder/Torbrügge terms Bz B/B1, B2/C1, C/C2, and D). While the Houštka material belongs to the third phase (late Tumulus), the final phase is typified by the material from Prague-Modřany, which as Böhm recognised, and Bouzek and others have repeated, seems to represent a mixture of Tumulus and Lausitz elements. Čujanová-Jílková’s publication of the west Bohemian tumuli was based on a similar division; the larger part of the material published by her belongs to the early and middle part of the period and relatively little is late.

By contrast, the work of Říhovský and Podborský for Moravia, which put the whole study on a very clear footing, used phase labels very distinctly (e.g. Podborský 1970; Říhovský 1979, 1993, drawing too on the phases identified for Austria by Pittioni 1954). The Moravian Tumulus phases which would correspond to the time period of the Velim site are the Middle Tumulus or Pitten-Sieding and Late Tumulus or Maisbirbaum-Zohor. In north Moravia, where the Tumulus cultures are not present, there seems to have been a gradual transition from late Únetice to early Lausitz; the earliest Lausitz horizon is named after the site of Záhoří, while in south Moravia contemporary material comes from Blučina and Kopčany. Both these material groups belong to a transitional phase that is often called Bz C2/D, and it can be distinguished with

some certainty from the full early Urnfields of Bz D that are named in Moravia after Lednice (Baierdorf in Austria), contemporary with the site of Mostkovice in north Moravia. The succeeding Urnfield phases, including the full Velatice culture, are of limited interest here. Furmánek's study of the bronzes of the Tumulus culture in Moravia worked along similar lines . He identified especially the material from Velké Hosterádky as characteristic of the late phase, while that from Bošovice-'u dvou závor' and Popůvky is characteristic of the last, transitional, phase.

Recent discussions of the division of the Middle Bronze Age into periods include those by Innerhofer, primarily based on his study of pins but including a range of other metal types also . Since there are relatively few metal finds from Velim, and those that there are have been studied in print by Hrala, there is relatively little to add from Innerhofer's work, which says little about pottery and nothing about Velim. Innerhofer (2000, 261 ff) devotes some considerable space to the definition of each Tumulus phase, including the possible existence of an independent transition phase between Br C and D, concluding that such a phase cannot be demonstrated to have existed in central Europe – at least in burial sites and metalwork.

These various studies have, between them, defined the phases of the Middle Bronze Age as closely as seems possible at present, and form a basis for the assessment of the date of the Velim material. Since, as Innerhofer points out (2000, 272), the Tumulus period seems not to have lasted more than about 150 years in total (in contrast to an apparent 300 years for Br A2 alone), finer subdivisions will be difficult to substantiate, especially when the repertoire of material deposited in graves seems to have differed substantially from that found on settlement sites.

Lausitz culture: It is again the work of Böhm and Filip which laid the basis for the study of the Lausitz culture in Bohemia, subsequently developed and modified by Vokolek, Bouzek, Kytlicová and others. Fundamental studies of the Lausitz culture in different parts of the Czech Lands are those by Plesl (1961), Bouzek and Koutecký (2000; both dealing with north-west Bohemia), and Vokolek (1962, on the cemetery at Pouchov, Hradec Králové; 1992, on settlements; 2003 on cemeteries). In Moravia we have above all the work of Dohnal to thank for our knowledge (Dohnal 1974, 1977), while the excavation of the cemetery of Moravičany by Nekvasil has provided a rich source of material for study (Nekvasil 1982). The more recent work of Štrof has provided detailed comparison and discussion of the phases of the late Middle and early Late Bronze Age, especially the genesis of Lausitz material (Štrof 1990, 1994, 1995). The Lausitz culture in Slovakia has been covered above all by Veliačik (1983), with earlier discussions of the start date by, among others, Točík and Vladár (1969). Given the situation of Velim, those parts of Poland which lie little more than 100 km distant (parts of Middle and Lower Silesia, at its nearest the area from Jelenia Góra and Klodzko to Wrocław) are also relevant to a study of the Lausitz culture in central and eastern Bohemia. Gediga's work (1967) represents the basic study of this area; it is, however, striking that his map of Lausitz sites in Middle Silesia shows that settlement material is quite rare. Indeed, taking the whole of the Lausitz period, only 40 sites out of 1130 studied were certain settlements (Gediga 1967, 192 and unnumbered maps), and for Period III only five sites were charted. A certain number of cemeteries span the transition from Period II to Period III, for instance a few graves at Jordanów Śląski (district Dzierżoniów) (*ibid*. 184), but these do not assist the analysis of the Velim material in any significant way. The extensive investigations of Gedl at Kietrz on the Głubczyce Plateau have also identified Lausitz material that lies very early in the development, though also without specific relationships to Velim (Gedl 1974, 1975, 1977, 1991 etc). For the Silesian/Great Polish border zone, the work of Lasak is of importance (1996, 2001), but analogies are too general to assist with the analysis of the Velim material. Further north, in Kujavia and other parts of Great Poland, the material becomes more distant in morphology and the relationships to the early Lausitz culture more problematical (Wiklak 1963; Bukowski 1974; Ignaczak 2002). The areas of Saxony where the Lausitz culture has been intensively studied and chronologies developed lie rather further away (e.g. Grünberg 1943; Coblenz 1952, 1977), though the work of Coblenz is fundamental in establishing a chronology for the transition to the full Lausitz culture, in particular the definition of a "transitional phase" ("Übergangsstufe").

In fact most manifestations of the Lausitz culture fall later in time than Velim; the culture was widely distributed and long-lived, continuing into Ha C / Period V or beyond. A typical cemetery in north-east Bohemia, only 50 km north of Velim, is that of Malá Belá (Hralová 1962), where 181 graves have been excavated; the two phases identified both fall in the mainstream of the Lausitz culture and show the typical ceramic and bronze repertoire.

It is above all the much-discussed question of the beginning of the Lausitz culture that is of interest here. From a relatively early period, certainly corresponding to Br C in German terms, vessels that bear a strong resemblance to classic Lausitz vessels of the full Urnfield period occur, leading to an assumption that there was a "Proto-Lausitz" or "Pre-Lausitz" culture. Typical of this phase was the material, or some of it, from Level B of the fortified site of Hradisko near Kroměříž (Spurný 1954, 1961a, 1972a), which was considered to show many characteristics indicating an ancestry in the Veteřov culture, but already many features of the Lausitz material that characterises Level C. Typical are jugs with cylindrical neck, flaring rim, and bosses on the

belly, carinated bowls, or two-handled amphorae with incurving neck. Similar manifestations are visible in Slovakia. Benkovská-Pivovarová (1972) was able to demonstrate this for the cemetery at Martín I, for instance, where Phase II – with material already foreshadowing the Lausitz – was characterised by bronzes typical of the later Tumulus period, and Phase III – designated Early Lausitz – could be dated to the Br C-D transition. Characteristic forms of this phase included biconical vessels, pedestal bowls, and conical bowls with carination or incurved neck, as well as a range of less specific types such as jars. All these types can be seen in one form or another in the Velim material. Discussions of the earliest phases of Lausitz by Štrof (1990, 1995) were concerned with the detail of pottery forms, as was that by Wiegandová (1974), the problem for us being that much of this material comes from cemeteries with closed find groups, whereas the Velim material is mixed and of uncertain function.

Knovíz culture: Although the majority of Knovíz culture finds lie further west than the Kolín area, there are a considerable number of finds attributable to Knovíz along the Middle Elbe. Hrala's account (1973) provides the basis for study, while Bouzek (1963, 1967-68) has listed sites in the eastern part of central Bohemia that represent the eastern border of the culture distribution. Most sites in our area are merely sherd finds that probably emanate from settlements, but there are a few graves as well.

One sherd of those illustrated here seems to belong to the storeyed vase typical of Knovíz (Pl. 11:27), while another has a torsioned rim that might also belong in a late stage of Knovíz (Pl. 11:14). There was thus a Knovíz presence of some sort at this site.

ANALOGOUS SITES

One of the ongoing problems in the analysis of the Velim assemblage is the relatively poor range of sites with which to compare it. If it were a matter simply of looking at pottery and bronzes from burial sites, notably tumuli, the matter might be straightforward; but as we argue in Chapters 8 and 10 below, Velim was not any ordinary funerary site, if indeed it was one at all. The material recovered seems more likely to relate to that found on settlements or ritual sites, which brings a different set of problems, since few Middle Bronze Age settlements have been extensively excavated: a collection of undistinguished pits and post-holes has been the norm. Nevertheless, in recent years a number of more extensive excavations have taken place, both within Bohemia and outside it, so that comparanda may be more readily sought than was the case twenty or thirty years ago.

In Bohemia, chief among these may be mentioned the sites of Radčice I near Vodňany in southern Bohemia (Chvojka & Michálek 2003) and Praha 9-Miškovice (Ernée & Smejtek 2004). Smaller assemblages of material are available from Vochov and Nová Hospoda near Plzeň (Čtrnáct 1954), Meclov-Březí near Domažlice (Čujanová-Jílková 1964), Zdice and Hořovice-"Háj" near Hořovice (Jílková & Maličky 1954), and Tuchlovice near Kladno (Moucha & Trnka 1959), to say nothing of older finds such as Praha-Modřany, first discussed in detail by Böhm (see above).

In Moravia, in addition to the older finds from Hradisko level B (Spurný 1954, 1961a, 1972a), and from Bezměrov near Kroměříž , smaller finds of settlement material have come from Smržice near Prostějov , the area between Dobrčice and Horní Moštěnice near Přerov , Bořitov and Býkovice near Blansko , and an extensive settlement site at Slavonín near Olomouc (Šmid 1997)). Settlement material of the Tumulus Bronze Age occurs sporadically in Slovakia, as at Veselé – Hradisko Podzámske, Piešťany district (Bartík 1996), or Bratislava-Rusovce (Bartík 2003).

Cemetery material that appears to span the Tumulus-Lausitz transition includes a pit grave at Kostelec na Hané, near Prostějov (Fojtík 2002), and the large and well-studied cemetery at Přáslavice . It is likely too that some of the material from the huge cemetery at Moravičany dates from this period (Nekvasil 1960, 1982). It remains uncertain how such cemetery material relates to that found on settlements; and of course it is unclear whether Velim was a settlement, a cemetery, a mixture of both, or something else (see below, chapter 10).

Outside the Czech Lands we may mention the material from Herzogenburg and Maisbirbaum , as well as the hoard of pottery from Schrattenberg (Eibner 1969), while part of the material from the enormous cemetery at Pitten belongs to a late stage in the Tumulus period as a study of the pin types present shows (Benkovský-Pivovarová 1982-85, 1987, 1991; the latter publication unfortunately contains no chronological discussion). Detailed studies of Tumulus culture pottery in both settlements and cemeteries in Germany have shed light on the situation west of our area (Hochstetter 1980; Pinsker 1993). In few of these cases, however, is it possible to discern a temporal progression that relates to settlement, as opposed to funerary, material.

Of the material from these various sites, it is the recent Moravian finds (Bořitov, Býkovice, Přáslavice) that offer the most striking analogies to the Velim assemblage as recovered in the British excavations. The range illustrated by Štrof from Býkovice, for example, or that from the graves identified as transitional by Šabatová, will, when fully studied, offer an unrivalled opportunity to help set the Velim material in context (Šabatová forthcoming). For this, more contextual information from Skalka itself will be indispensable.

STRATIGRAPHIC INDICATIONS

Although Velim-Skalka abounds in large and deep pits, the information on chronology derived from stratigraphic succession is disappointingly poor, at least in the features excavated in 1992-95. Šumberová's account analyses three features (Objekt 64, 612 and the Red Ditch) in which material from clearly separable layers were analysed, but concludes that although no clear difference in types is discernible between top and bottom, there are differences between the separate features. The sections cut through the Red Ditch were not helpful; the large section in S.12B was extraordinarily poor in pottery, presumably because the destruction material filled it up too quickly for the normal processes of rubbish dispersal to take effect.

On the other hand, the Czech excavations in S.17, which was extraordinarily deep and complex, might be able to show a progression of pottery and other types, but this remains a task for the final publication of these areas of the site.

ABSOLUTE CHRONOLOGY

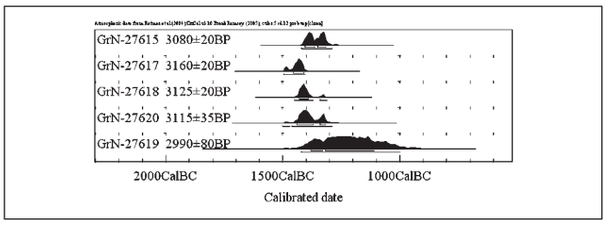
Six radiocarbon dates are currently available for Velim-Skalka (Table 5.1, Fig. 5.1; Appendix 2). One was obtained by the Czech team and published by Hrala and Šumberová (2000, 265); the sample came from "fortification H" (45A, the Outer Ditch of the Red Ditch) though it is not stated where exactly; its error term is large and at 2 sigma the date spans the period 2000-1300 cal BC. A second date for the Red Ditch came from material from the British excavations, charcoal from close to the bottom of the Outer ditch. The date is 3080 ± 20 BP (GrN-27615), which gives the date range 1420-1290 cal BC at 95% probability. While it was unfortunate that no more datable material could be recovered from this feature, the date seems acceptable and is compatible with those from Pit 64. It suggests a date in the thirteenth century BC for the filling of the Outer ditch and therefore for the destruction of the rampart – and arguably for the abandonment of the site.

The four dates obtained for the lowest levels of Feature 64 (north pit) are more helpful. Of these, one (GrN-27619) at 2990 ± 80 BP was a little later than the others and had a larger error term, giving a calibrated date range of 1420-1000 BC at 95% probability (1320-1110 BC at 59% probability). The other three dates were close together and had small error terms, giving a date range of 1430-1404 cal BC at 68% probability (1440-1380 at 88.6% probability), in other words in the last decades of the fifteenth century cal BC. The number of dates is not large enough for certainty but the indication of a date around 1400 BC for the bulk of the material recovered in 1992-95 is clear; and it corresponds well with the pottery dating, insofar as that can be tied to particular features and events on the site.

The relationship between the Red Ditch and the internal ditches and pits cannot be certainly established by this means, but the indications are that there is no big chronological difference. In other words, the destruction of the site seems to have followed on from use and filling of the pits fairly quickly, probably within a generation.

In spite of some advances made in recent years, the radiocarbon chronology of the central European Bronze Age, particularly its more advanced stages, is still relatively undeveloped. Some attention has been paid to the early stages of the Bronze Age , but a few studies look at the implications of particular sites (e.g. Smejtek 2004 on Kněževes near Prague). Other studies have looked at the situation in particular countries, notably Slovakia . In this case, stratified sequences such as that at Včelince provide some assistance. According to Görsdorf *et al.*, layer II at Včelince belongs to the Piliny culture, which runs parallel to

Fig. 5.1. Probability distributions for radiocarbon dates from Velim-Skalka



Lab. No.	Feature	Context	Material	BP	Cal. BC range	
					1σ	2σ
CU-869	Fortif. H (Red Ditch)		?Charcoal	3319 ± 138	1760-1430	1950-1250
GrN-27615	Red Ditch	94/107	Charcoal	3080 ± 20	1405-1315	1420-1290
GrN-27617	Obj. 64, North pit	3021 N quadrant	Dark earth with grain	3160 ± 20	1455-1410	1495-1405
GrN-27618	Obj. 64, North pit	3021 NE	Dark earth with grain	3125 ± 20	1430-1390	1450-1370 (88.3%)
GrN-27619	Obj. 64, North pit	3021 SW	Charcoal	2990 ± 80	1320-1110 (59%)	1420-1000
GrN-27620	Obj. 64, North pit	3021 SW	Charcoal	3115 ± 35	1440-1370 (55%)	1460-1290

Table 5.1. Radiocarbon dates from Velim-Skalka

the Tumulus Bronze Age; two radiocarbon dates from pits belonging to this layer gave closely similar results that indicate a date in the fifteenth century cal BC for Piliny (early stages). At present the data from Slovakia do not provide indications of when Piliny ended and the Late Bronze Age began; but these dates are in good accord with those from Velim.

A recent discussion of the radiocarbon dates for the Lausitz culture in central Poland provides strong supporting evidence for the notion that it started rather earlier than believed hitherto (Ignaczak 2002, 137 ff.). Although the picture is not consistent, in that apparently late phase contexts produce dates indistinguishable from early ones, early Lausitz contexts (equivalent to Nordic Period II) give dates between 1600 and 1200 cal BC, centring on 3000 BP; in fact the range is remarkably similar to that from Velim, and while the spread of dates does not allow proper internal periodisation, it does seem that these sites are in radiocarbon terms contemporaneous with Velim.

For Müller-Karpe (1959), the start of period D of the Bronze Age (Bz D, *sensu* Reinecke) took place around 1300 BC. Among the subsequent attempts at dating the beginning of the Urnfield period, the works by Sperber (1987) and Della Casa & Fischer (1997) are worthy of particular mention. The former, by using available dendro dates and estimates of period lengths, placed the start of Bz D at 1365 BC. The latter scholars used radiocarbon, dendrochronology and cross-dating from various sites to suggest that Bz D belongs in the fourteenth century BC, compared with the traditional assignation to the thirteenth. Radiocarbon dates from Neftenbach (Switzerland) and Velika Gruda (Montenegro) have wide error terms, and the material from them can be correlated with Bz D only in rather general terms, but the general trend is clear. Furthermore, Della Casa and Fischer drew attention to the dendro-dated oak coffins in the Nordic area (mainly Denmark), where the sites belonging to Period II fall between ca 1420 and 1340 BC, and those of Period III fall close to 1300 BC. It is clear that some coffins associated with material of Period II came from trees that were felled in the middle of the fourteenth century, and not as early as 1400 BC. The relative position of Bz C-D and Periods II-III is not a simple matter; but in general it is clear that the II-III transition falls close to the C2-D transition.

More recently Andreas Mäder has undertaken an extensive analysis of radiocarbon and dendro dates from the north-east of Switzerland, starting from the excavation of cremation burials and fireplaces on a site at Elgg (Kanton Zürich) (Mäder 2002). The material from the site is assigned to various parts of Bz D, though rather little comes from the earliest part of it. A felling date of 1290 BC is used, along with many radiocarbon dates in the thirteenth century, to argue that Bz D spans that century – as Müller-Karpe suggested nearly 50 years ago. On the other hand, the chronology depends on the parallelism of pottery between different parts of central Europe, and what goes for Switzerland may not apply equally to Germany or the Czech Republic.

For the chronological position of Velim this is somewhat problematical, given that the dates published here are at least 50 and more likely 100 years earlier than this. Against this must be set the argument that the synchronisation is not exact; the Velim material cannot be compared directly either with that from Danish coffin graves or with material from Switzerland; and the error terms on the Velim dates would allow for a somewhat later date for the site.

Nevertheless, the date of ca 1400 BC for the Bz C2-D transition falls much earlier than would be expected from other sources, and suggests that local effects are to be expected. Given the lack of radiocarbon dates for the latest phases of the Velim site, we cannot rule out the possibility that Objekt 64 North pit dates some decades earlier than the Red Ditch, the destruction of which marks the final episode of activity on the site.

CONCLUSION

Consideration of the history of research on the Velim material, along with the characteristics of the finds assemblage, indicates clearly that while some material from the site belongs to the main part of the Tumulus period, the bulk of it falls at the very end of the period and at the transition to the Lausitz Urnfield period (Bz C2-D in terms of the German chronology). The absolute date of that transition would have been put by Müller-Karpe in 1959 in the decades shortly before 1300 BC, but with increasing availability of radiocarbon dates, including those from Velim itself, it is likely that a date around half a century earlier, possibly more, is more appropriate.

It is not entirely clear how long the main occupation phases of the Skalka site lasted. The amount of material earlier than the Tumulus-Lausitz transition is not large, and radiocarbon dates do not suggest any big chronological divide between the use of the pits and the destruction of the site as seen in the Red Ditch. Clearly there was occupation on the site considerably earlier than 1400 BC, but it shows no sign of having been long-lived or extensive. The evidence available for the pit-digging phases seems to indicate that these major activities took place in quite rapid succession, over decades at the most rather than centuries. This conclusion has important implications for our understanding of how Velim-Skalka operated.

Chapter 6. The Human Remains

CHRISTOPHER KNÜSEL

This chapter covers the demographics of the human remains assemblage. Because of the disarticulated and fragmented nature of the grand majority of the assemblage, this section concentrates on the more complete individuals and creating 'completeness' from paired elements.

Minimum Number of Individuals (MNI) based on Zonation MNEs

The most commonly occurring element in the analysed assemblage from the site is the femur, of which there were 95 fragments, among which there were 48 right and 45 left-side fragments.[1] Of the right-side fragments 23 were from unfused elements and 17 from fused elements, with eight for which fusion could not be determined due to incompleteness. Of the left-side fragments, 20 elements derived from unfused elements, whereas 19 were from fused elements, with six for which fusion could not be determined due to incompleteness. The most commonly occurring zones for the left femora are zones 5 (N=24) and 8 (N=25), from which the minimum number of elements was calculated. These frequency counts for the left femora, then, indicate that a minimum of 10 sub-adults and 13 adults, in addition to one infant, contributed to the formation of the analysed assemblage for a minimum total of 24 individuals, including a three to six month-old infant (Kostra 46). Inspection of the fusion data for the claviculae, a late fusing element, reveals that of the left elements (N=11), eight come from sub-adults (e.g. the sternal end is unfused). For the right side, of the 10 diaphyses (zone 3), two are fused and seven unfused. This pattern confirms that a high proportion of sub-adults contributed to the skeletal assemblage at Velim Skalka.

Age-at-Death

Age determinations were made on the mandibulae due to their capacity to determine age-at-death from tooth eruption observations. Of these, two mandibulae come from infants (including the nearly complete individual Kostra 46), three come from individuals aged from five to nine years, four from individuals aged between 10 and 15 years and two from individuals over 15 years of age but without M3 yet fully erupted at the time of death. Twelve other fragmentary mandibulae, including the one bearing a peri-mortem decapitation-type injury (12/2636), come from adults. Again, it is clear from this distribution that roughly half of the individuals that contributed to the Velim Skalka human remains assemblage are from infant, juvenile, and sub-adult individuals.

Palaeopathological Observations

Although the human remains from the site were disarticulated and fragmented, several conditions were identified in them, both human and animal. For the most part, these include traumatic injuries, mainly of a peri-mortem nature (see Chapter 8), but also age-related degenerative conditions that commonly occur in ageing humans, especially in the vertebral column, producing spicules of bone at ligamentous attachments. There was little evidence of osteoarthritis in the human remains, although eburnation reflective of osteoarthritis was identified in a human right lateral femoral condyle (12/2620) (Fig. 6.1) in Sonda 12c of Trench B of Objekt 64.

Fig. 6.1. Distal condylar surface of a human femur bearing evidence of osteoarthritic change

1 Although the cranium produced 25 fragments from zone 4, the left parietal, the extent of cranial fragmentation meant that the cranium was not viewed to be particularly representative for the purposes of creating Minimum Numbers of Element (MNE) or Minimum Number of Individual (MNI) counts. Some indication that this is a recommended approach to the data comes from the observation that the left and right zygomae, bones that are much more resilient to fragmentation, represent only eight elements each.

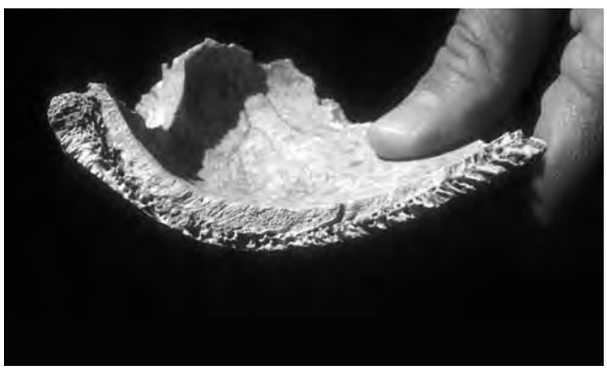
Fig. 6.2. Cattle femoral caput with eburnation indicative of osteoarthritis

Animals also experienced similar degenerative conditions. Eburnation affected a cattle left femoral caput (12/30), anteriorly (Fig. 6.2). Since osteoarthropathies are generally age-related phenomena, as well as related to joint injuries, the occurrence of them suggests that at least some humans and animals may have been of an advanced age at death, or had suffered damage to joints, or both.

The most unusual condition occurred in a disarticulated frontal from a child found amidst the disarticulated remains of the North Pit of Sonda 12b. The thickened diploë and inner table of the cranial vault (12/3009) bears the characteristics signs of a 'hair-on-end' appearance of iron deficiency anaemia (Fig. 6.3). This condition derives from the hyperplasia of the blood-producing diploë layer of the cranial vault and develops from inadequate dietary intake or an infestation with gut parasites that cause bleeding in the gut and subsequent loss of haemoglobin (Ortner 2003).

Evidence for a benign neoplasm occurred on the frontal of an adult (12/3009) from Sonda 12c of Trench B of Objekt 64 (Fig. 6.4). This frontal displays two

Fig. 6.3. Frontal bone from a child exhibiting a thickened diploë layer indicative of iron deficiency anaemia



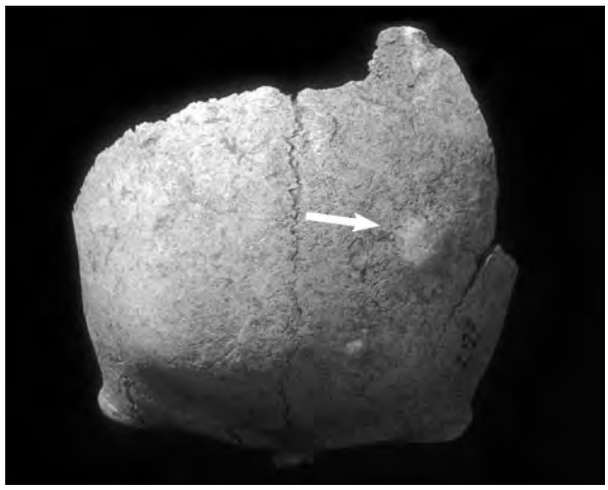


Fig. 6.4. Human frontal with osteomata (benign tumours)

localised areas of hypertrophic bone with a well-mineralised cortical bone surface. A larger example occurs near the frontal boss of this individual with a smaller one located more inferiorly above the left supra-orbital margin. These are button osteomata, the frequency of which increases with the age of the deceased. They are non-life-threatening (Eshed et al. 2002). These cranial bones appear to have come from an adult male based on their morphology.

Among the animal remains were two cases of new bone deposits on the visceral surface of two ribs, one from a pig (12/2617) (Fig. 6.5) and another similar lesion on a cattle rib (12/3001) (Fig. 6.6). These lesions have been associated with pulmonary infections in humans (Roberts et al. 1994, Roberts 1999), although the aetiology of them in animals is uncertain. No similar lesions were noted in any of the human ribs.

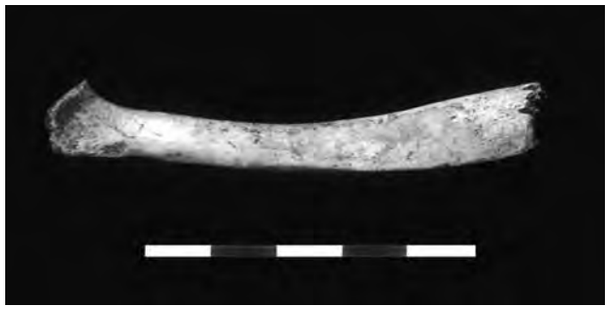


Fig. 6.5. New bone formation on the visceral surface of a pig rib

Fig. 6.6. New bone formation on the visceral surface of a cattle rib

Sex Determination

Because of the disarticulated nature of the assemblage, sex determinations were performed based on sexually dimorphic metric features of the remains, mainly using femoral and humeral head diameters (following Bass 1987: 150-151, Krogman and Iscan 1986: 236). Based on these data, some of the long bones could be assigned a sex based on the relative size of their femoral or humeral head diameters. Using this method, it is clear that both adult males, including a large male who contributed a femur with a dry fracture to Context 2636 (see Fig. 8.56), and females contributed to the assemblage, with roughly equal numbers of male and female bones: two females, four probable females, two probable males, six males, and five elements of indeterminate sex (i.e. those that fell between definite male and female assignations) contributed to the assemblage based on this method. Since these elements could reasonably be expected to come from the same individual, dividing them by two, renders a total of one female, two probable females, three males, and one probable male, as well as three additional adults of indeterminate sex assignment.

Metrical Assessment for Stature Reconstruction

The heavy fragmentation of the assemblage provided for few limb bones complete enough to permit stature reconstructions. In the absence of sexually dimorphic features for isolated but complete limb bones, stature reconstructions were performed using the equations for both males and females. As noted above, femoral and humeral head diameters could be used to determine sex in some cases, and the same bones could thus be used to determine sex-specific stature reconstructions. In some cases, these individuals fell between the values indicative of males and females, and these are thus considered 'indeterminate' with regard to sex. Some individuals produced figures that would indicate the probability that they derived from either males and females, and these are considered 'probable males' or 'probable females'.

The lower limb long bones representing Kostra 48 would suggest that this individual was probably male based on the size of the right humeral and femoral head diameters. The limb bones of this individual produce stature estimates in the range from 161 cm (right femur) to 166 cm (left ulna). All are roughly consistent with the stature obtained for the combined right femur and tibia of 161 +/- 3.74 cm using the 'white male' equation of Trotter and Gleser (1958). Including the indeterminate individuals and calculating both male and female stature values from them and adding these values to those obtained for the definite and probable males and females, respectively, produces an average female stature of 158.8 cm (N= 4, with a range from 147 to 167 cm), while the male stature is 166.5 (N= 6, with a range from 161 to 173 cm). Inclusion of only the two definite males and Kostra 48 produce a mean stature of 170 cm. Unfortunately, due to heavy fragmentation a stature estimate could not be obtained for the morphologically robust and scattered elements thought to represent remains of a larger male. These male stature estimates are no different from the mean statures of populations sampled over the last 2,000 years. These attained adult statures are about eight to ten centimetres below the British average male stature today (Schweich and Knüsel 2004). It appears, then, that growth stunting was as common at Bronze Age Velim Skalka as elsewhere in the past.

L'Anthropologie de Terrain

Following the precepts of *l'anthropologie de terrain* or *archéothanatologie* (Duday 2006; Duday *et al*. 1990), *in situ* photographs of the human remains were examined in order to address their state of articulation and positioning with respect to the state of the body at burial and during decomposition.

A six-year-old child (Kostra 41) in the South Pit of Sonda 12b of the pit circuit (Objekt 64) was found in an upright, seated position (Fig. 6.7). The rib cage of

Fig. 6.7. Kostra 41, a 5 to 6-year-old child *in situ*

this individual was still in correct and fully articulated anatomical order upon excavation, which would indicate that it was held in place by tightly packed surrounding soil. The position of the remains of this body indicates a 'wall effect' in that this individual would have had to been supported along its back in order to maintain a seated position after decomposition. This indicates burial without a container that would have precipitated the disarticulation and inferior movement of the elements of the thorax once supporting ligaments and muscles had deteriorated. Given the articulated nature of this individual, burial occurred quickly after death.

The position of the extremities of this child (Kostra 41) are contorted but articulated with the right forearm in an extended position and the right hand visible in the photograph and placed in an extended and pronated position. The right lower limb is internally rotated and flexed at the knee and the left lower limb

Fig. 6.8. Kostra 46, a three to six-month old infant *in situ*

Fig. 6.9. Kostra 48, the articulated remains of an adult and individual 47a, a 6 to 8 year-old child *in situ*

is also internally rotated with the two crossing one another at the knees, left over right. Thus, although the pelvis of this individual is positioned in a seated manner, the position of the legs (tibiae and fibulae) is more suggestive of an individual buried on their side. This represents an unusual burial position that suggests little preparation and ordered placement of the body before burial.

Kostra 46, a three to six-month old infant, was found in a flexed position beneath Kostra 41, the 5 to 6-year-old child described above. Although the *in situ* photograph of the infant, Kostra 46, demonstrates that the elements of the hands and feet were disturbed during excavation, the disposition of the remainder of this nearly complete individual reveal it to have been originally deposited on its right side within a secure packing of earth that maintained the thorax in a fully articulated state (Fig. 6.8). The left upper limb appears to have been uppermost in the deposit with this limb flexed at the elbow and extended at the shoulder, placing it in front of the thorax. The articulated right upper limb appears out of anatomical order in the vicinity of the remains of the *ossa coxae*, and both lower limbs, although articulated, occur at a remove from the *ossa coxae* and are flexed at the knee. These relative positions suggest disturbance of this individual's lower limbs such that the remains of the right foot were found in front of the remains of the thorax, in an anatomically unusual position. This evidence suggests that this individual was placed in a very unnatural position and may have been disturbed in the past when the bones of the lower limbs were still held in articulation by soft tissues. A more recent disturbance may be responsible for the absence of this individual's left pectoral elements. The relative positioning of this infant's remains suggests, again, that this individual was deposited in an unusual position, and its remains were disturbed prior to full decomposition.

The lower extremities of Kostra 48, a probable male, can be seen in Fig. 6.9 with those of Kostra 47a, remains of a 6 to 8 year-old child. The lower limbs of Kostra 47a overlie the articulated remains of the left lower limb of Kostra 48 in the vicinity of the left ankle, as indeed do the remains of the thorax of this child, which overlies the knees of Kostra 48. Due to their close approximation to one another, it appears that these individuals were deposited in quick succession, first Kostra 48 and then Kostra 47a. Curiously, though, the thorax of this child (47a) is not in articulation with the lower limbs, but is located some distance away, though still in an articulated state. It would seem that the remains of this child, perhaps once in upright position with the thorax erect (given its position in the photograph), were disturbed prior to full

Fig. 6.10. Close-up of Fig. 6.9 showing the flexed lower limbs of Kostra 47a in a squatting position

decomposition and disarticulation. The left lower limb is flexed at both the hip and knee in a position that would suggest a squatting attitude (Fig. 6.10), while those of the adult, Kostra 48, suggest a supine and extended position. The position of these individuals is contorted and, again, appears to have been disturbed in the past before full decomposition of soft tissue support structures.

Chapter 7. The animal bones from Velim Skalka (British excavations 1992-95): a palaeoeconomic report

ALAN K. OUTRAM AND STEPHANIE KNIGHT

INTRODUCTION AND METHODS

The faunal remains from the British excavations at Velim 1992-5 were examined as part of an integrated study of human and animal bone deposition and taphonomy. The results of that study appear elsewhere in this volume, where the taphonomic history (butchery, trauma, fracture, fragmentation, deposition and post-depositional attrition) of the assemblage is considered in detail. This report focuses upon economic exploitation of animals, dealing principally with species representation and evidence relating to animal husbandry.

For the purposes of this study, appendicular and girdular elements and jaws were identified and quantified. Axial elements were included in the taphonomic studies, but are excluded here as such elements are hard to identify accurately, break into many pieces and exist in great abundance in the skeleton, making useful quantification problematic. The total number of bone fragments examined at Velim was 18,600. Of these 4,431 were identified to species and of those 1,730 were human and 2,701 from other animals. Of the unidentified bones, 9,944 were from axial elements and 4,225 from appendicular or girdular elements.

Fragments were recorded with reference to diagnostic bone zones defined by Dobney and Rielly (1988). Quantifications are presented as NISPs and MAUs. Number of Identifiable Specimens (NISP) (Klein and Cruz-Uribe 1984) is a raw fragment count, but with loose teeth excluded, as they can skew patterns. NISPs can over-represent elements and species that tend to become more fragmented, hence the use of Minimum Animal Units (after Binford 1984), calculated here in a slightly modified version. Initially a Minimum Number of Elements (MNE) is calculated for each anatomical part by excluding fragments that could derive from the same bone. This is achieved through the use of the bone zones recorded and reference to left and right sides. The MNE is then adjusted to take account of the differing number of elements there are in the skeletons of different species to create parity (e.g. with *Sus*, metatarsals and metacarpals are halved and abaxials omitted, to create parity with *Bos*, *Equus* and Ovicaprids which only have two of these elements each). The result is the MAU.

The frameworks for understanding animal husbandry patterns and herd structures follow the general approaches of Payne (1973) for ovicaprids and Legge (1981) for cattle. Fusion ages are from Silver (1969). Recognition of fracture types follows Outram (2002). Bone measurements follow von den Driesch (1976). There are insufficient measurements to warrant analysis here, but the data are listed in Appendix A (sheep are given only when positively identified).

SPECIES REPRESENTATION

The species present are listed in Table 7.1 along with quantifications in the form of NISP and MAU. Species proportions are also graphically displayed in Figure 7.1. It is clear that cattle dominates, representing almost half the assemblage. The proportional of cattle is slightly reduced if one applies the MAU method. This is most likely because the larger cattle bones had broken into a larger number of fragments, slightly over-representing them in the NISP count. However, there is little difference in the general pattern displayed by the two quantification methods. Ovicaprids and pigs are about equally represented and make up the bulk of the rest of the assemblage. Of the ovicaprids, none were positively identified as being goats, but several were clearly sheep. Horses have a really quite significant representation within the assemblage and the other species present were domestic dog, wolf, roe deer, red deer, hare, beaver and hamster. Only one bird bone was present and it was a goose.

Species		NISP	MAU
Cattle	*Bos taurus*	965	218
Pig	*Sus scrofa*	426	108
Sheep/Goat	Caprinae	376	114
Horse	*Equus caballus*	165	57
Dog	*Canis familiaris*	55	18
Hare	*Lepus europaeus*	7	7
European Beaver	*Castor fiber*	4	4
Wolf	*Canis lupus*	2	2
Red Deer	*Cervus elaphus*	2	2
Roe Deer	*Capreolus capreolus*	1	1
Common Hamster	*Cricetus cricetus*	1	1
Goose	*Anser* sp.	1	1

Table 1 – Species list and quantification (NISP and MAU) for all contexts.

Within the assemblage there are three major ditch/segmented ditch features (Objekts 45, 64, 612) that have sample sizes worthy of comparison. Figure 7.2 displays the proportions of the four main species in these features (by NISP count; the MAU count is very similar but with slightly depressed cattle

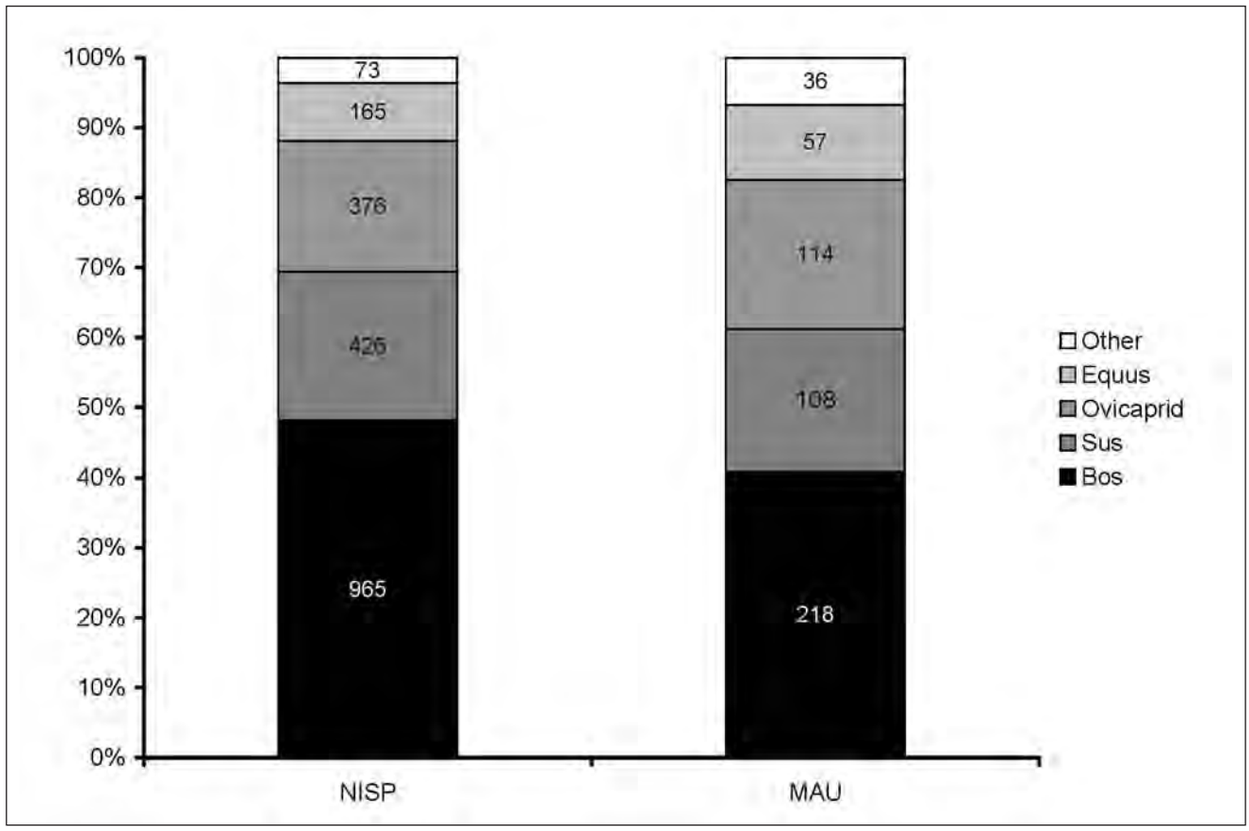
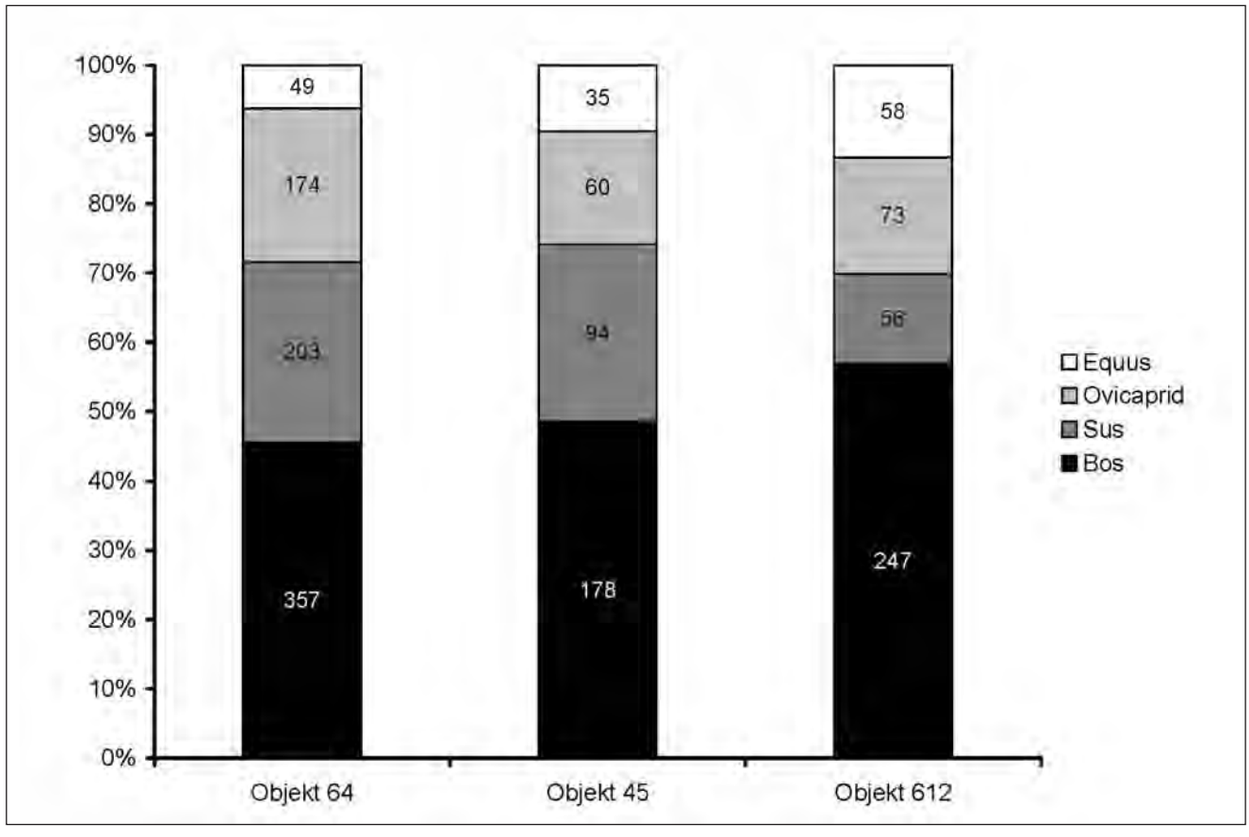


Fig. 7.1. Proportions of species, as quantified by NISP and MAU, for all contexts.

Fig. 7.2. A comparison of proportions of the four main species, as quantified by NISP, between objekts 64, 45, 612.



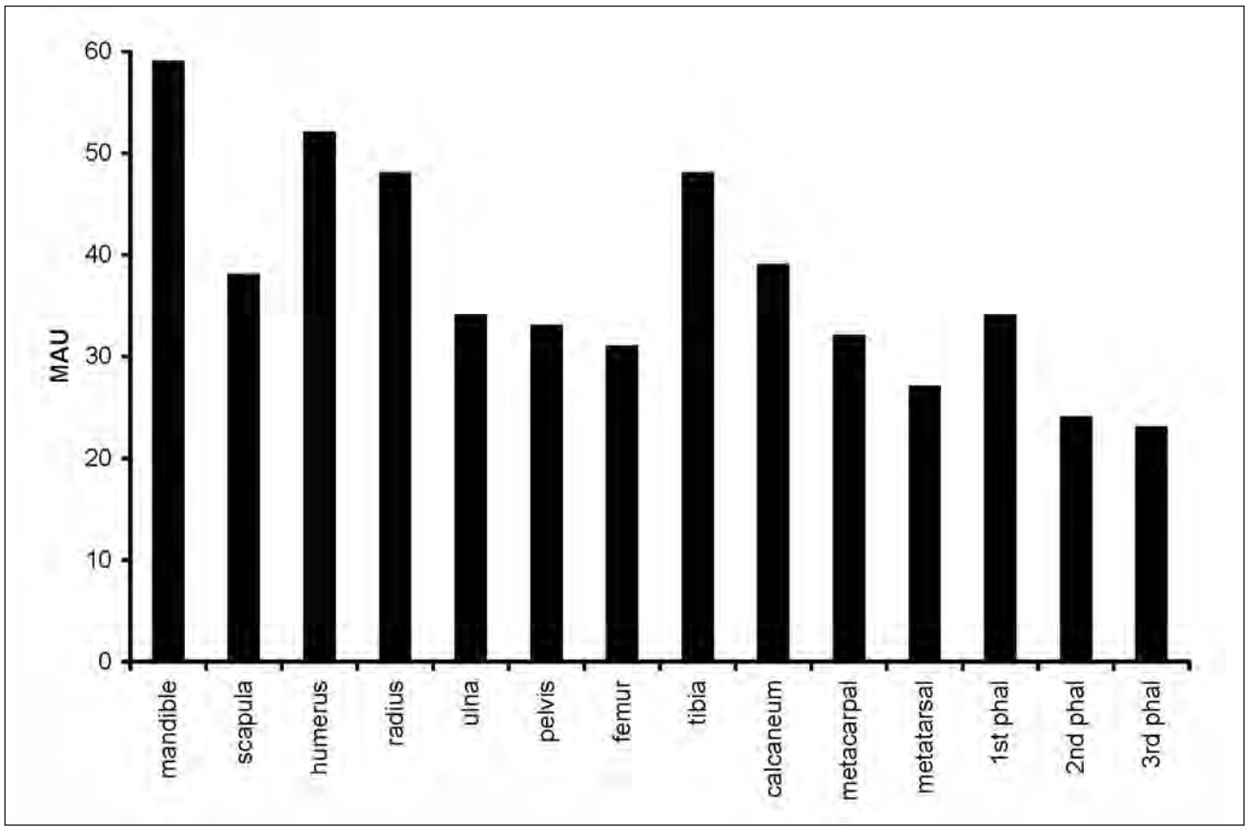


Fig. 7.3. Element abundance, as quantified by MAU, for all contexts and species.

proportions). There is little difference between the features, though, in Objekt 612, horse and cattle have better representation at the expense of pig. A previous study of a different ditch feauture, Objekt 23 (Dočkalová and Roblíčková 2000), displayed proportions very similar to Objekts 45 and 64 and the overall pattern. This study identified small numbers of some of the same wild species and did positively identify a small number of goats.

ELEMENT ABUNDANCE

Figure 7.3 displays element abundances (mandible, girdular and appendicular elements) for all species and contexts, quantified by MAU. This is a very even pattern of representation that does not suggest any particular selection or taphonomic bias relating any particular element. This same pattern is reflected in all species for which the sample size was valid. Animals were either killed on site or transported to the site whole.

AGE STRUCTURES AND HUSBANDRY

Sample sizes of mandibles were too small to allow analysis of age structures via that method. There are also insufficient data to reliably establish sex ratios. However, fusion data can provide us with insight into herd age structures up to the point of adulthood when all bones have fused. To do this, bones are grouped into fusion stages to create statistically valid samples and the proportions of bone fused in these stages are graphically displayed. That represents the approximate proportion of animals that survived at least as far as that fusion stage.

Figure 7.4 shows the fusion stage survival pattern for cattle. Over two-thirds of the cattle in this assemblage survived to maturity. This is a very high proportion. This pattern is most consistent with the exploitation of cattle for secondary products (milk and traction). In a classic milk model many males are killed very young, and these are clearly not represented at this site. The pattern most likely represents adult cows (and perhaps some adult males kept for traction) that were surplus to requirements. The absence of evidence for the culling of very young males is most likely because this activity did not take place on site. The assemblage is totally inconsistent with the optimized production of meat or the supply of 'prime' beef to this site. Optimized beef herds see very high levels of culling between about 18 and 36 months, when animals have reached full size and further foddering becomes an inefficient use of resources.

Figure 7.5 shows the pattern for ovicaprids. Over half the animals survived until adulthood, which suggests that secondary products such as milk and wool were being exploited. However, there is

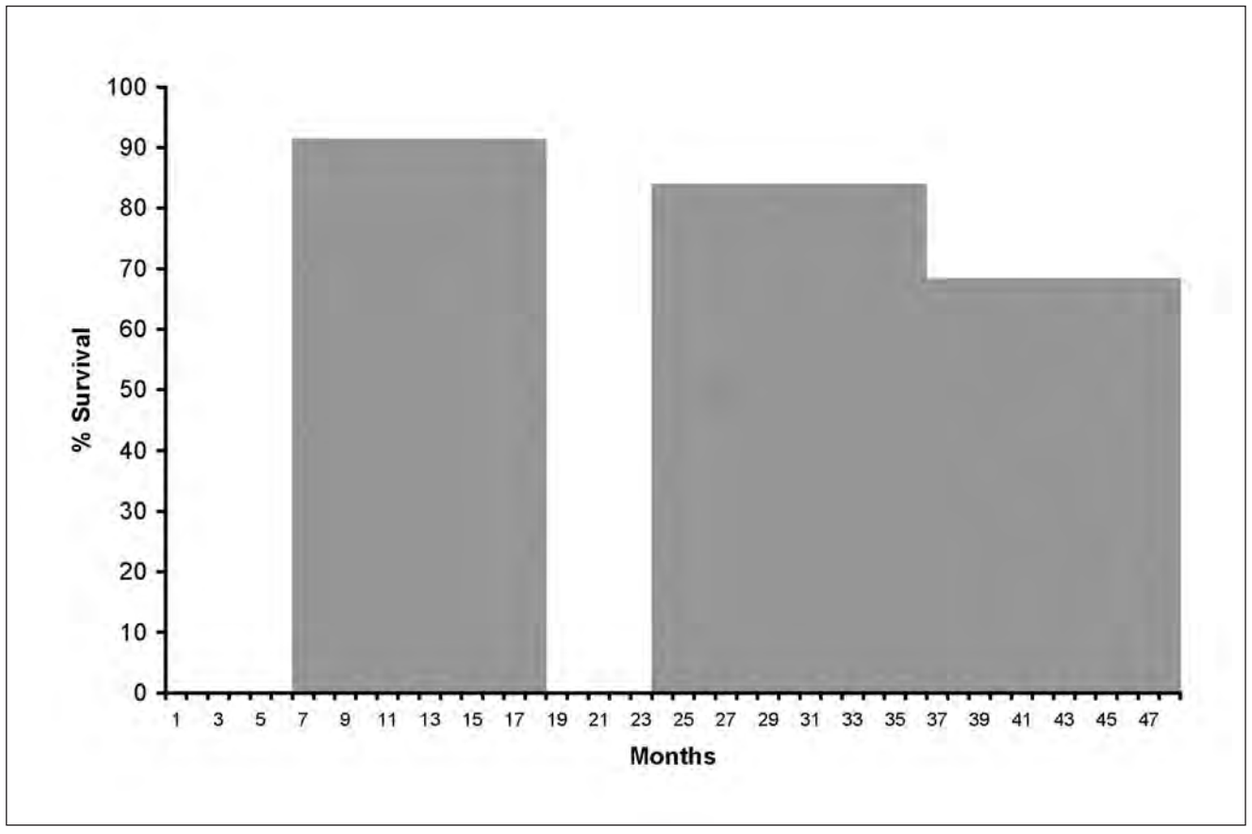
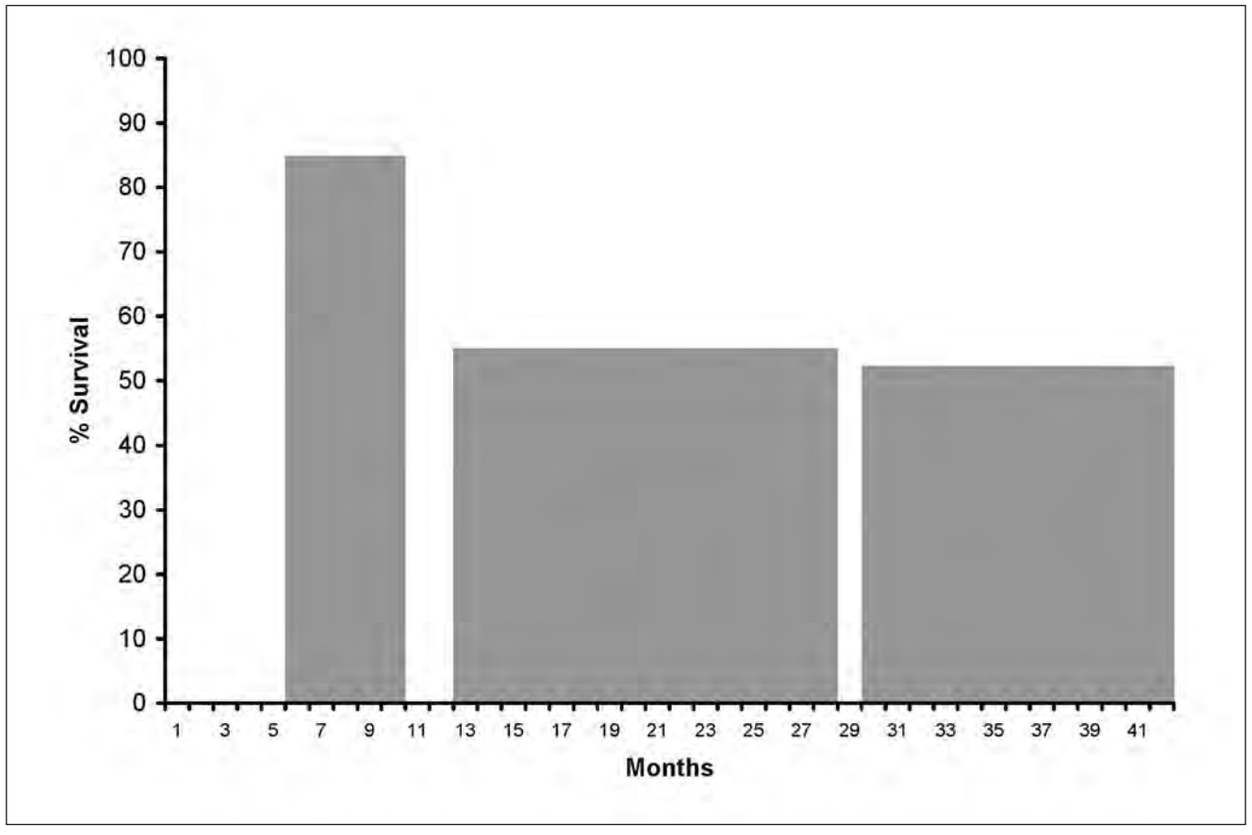


Fig. 7.4. % survival of cattle by fusion stage (N=404)

Fig. 7.5. % survival of ovicaprids by fusion stage (N=157)



evidence of culling some animals in the first three years of their life. As with the cattle, if there was any substantial culling of neonates, it did not occur on this site. The pattern displayed is most consistent with a mixed husbandry strategy of milking, exploiting wool, and, most likely, carrying out a seasonal cull (perhaps before over-wintering) of some young animals for meat in the first and second years.

Figure 7.6 displays the pattern for pigs. This is very straightforward. Very few animals make it to adulthood. After some neonatal deaths (not uncommon in pigs), there are heavy culls of animals in the second and third years when they are approaching full size. This is exactly what one would expect in a strategy of optimized meat production.

The sample size for horses was insufficient to examine the age structure by fusion stages, but it is big enough to consider the overall proportion of fused elements. 98.6%, of the 70 bones displaying fusion information, were fused. This suggests that almost all horses were kept to adulthood, most likely primarily for riding and traction.

BUTCHERY

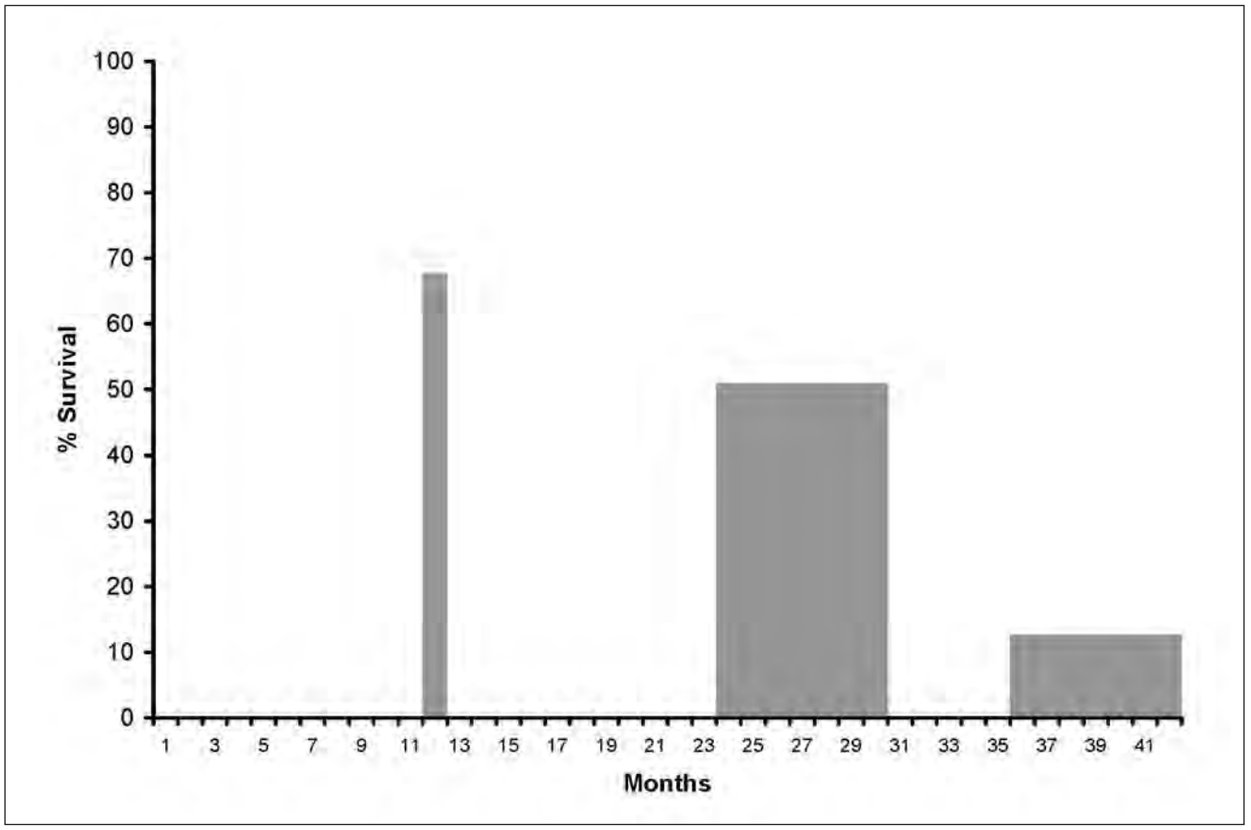
Butchery is covered in great detail in comparative study of human and animal remains. Here is a brief summary. Of the four main species, cattle displayed the highest proportion of fragments displaying butchery evidence (14%). Pigs had 7% and ovicaprids 6%. In is clear that, whilst almost certainly kept for riding, horses were butchered, though there is a lower frequency of evidence at 4%. There was also a small amount of evidence of dog butchery. On example was a dog's pelvis with chop marks, that had later been fed to a dog (it had been gnawed).

Approximately 30% of animal bones displayed fractures consistent with deliberate fracture near the time of death. This is suggestive of the exploitation of bone marrow. Furthermore, high marrow-bearing bones displayed an elevated proportion of peri-mortem fractures in comparison with bones containing less marrow.

CONCLUSIONS

Cattle were the most economically significant species at this site and it is likely that they were kept primarily with their secondary products in mind. None-the-less, given their larger size and quantity, cattle meat would have dominated at the site, albeit most likely derived from older, surplus, dairy cows. Sheep and goats were most likely managed for a compromise mixture of meat, milk and wool, whereas pigs, not surprisingly, were kept for meat. Horses are surprisingly abundant. Their strong presence is perhaps an indicator of status. Wild species do not form a large portion of the assemblage, yet may have played a part in the diet and/or sport of the users of the site.

Fig. 7.6. % survival of pigs by fusion stage (N=175)



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APPENDIX A – MEASUREMENTS (IN MM):

Cattle				
Horn core	46=52.60			
Horn core	46=43.94			
Horn core	46=42.00			
Horn core	46=46.18			
Horn core	46=40.10			
Tibia	Bd=54.92			
Tibia	Bd=59.10			
Tibia	Bd=53.56			
Astragalus	Bd=38.38	GLl=60.34	GLm=50.10	
Astragalus		GLl=62.66	GLm=56.08	
Calcaneum	GL=132.40			
Metacarpal		Bd=55.78	Dd=29.38	
Metacarpal	Bp=60.48			
Metacarpal	Bp=50.42			
Metacarpal		Bd=48.26	Dd=27.52	
Metacarpal		Bd=52.70	Dd=29.10	
Metatarsal	GL=204.0	Bp=45.40	Bd=52.03	Dd=28.64
Metatarsal		Bp=39.48		
Metatarsal		Bp=44.10		
Metatarsal			Bd=55.60	Dd=29.30
Metatarsal			Bd=49.40	Dd=26.70
Metatarsal			Bd=46.78	Dd=27.44
Metatarsal			Bd=54.14	Dd=28.80
Metatarsal		Bp=47.42		
1st phalange	Bp=26.94	GLpe=55.00	Bd=25.04	
1st phalange	Bp=29.22	GLpe=52.12	Bd=24.02	
1st phalange	Bp=30.20	GLpe=49.20		
1st phalange	Bp=34.26	GLpe=52.56		
1st phalange	Bp=24.52	GLpe=51.10		
1st phalange	Bp=29.68	GLpe=49.74		
1st phalange	Bp=29.70	GLpe=50.80		
2nd phalange	Bp=27.30	GL=35.30		
2nd phalange	Bp=29.50			
2nd phalange	Bp=29.60			
2nd phalange	Bp=26.50			
2nd phalange	Bp=30.74			
2nd phalange	Bp=25.60			
3rd phalange	DLS=67.46	Ld=49.64	MBS=19.84	
3rd phalange	DLS=61.38	Ld=46.64	MBS=18.74	
3rd phalange			MBS=19.32	
3rd phalange	DLS=82.9			
3rd phalange	DLS=63.10	Ld=48.00		
Sheep				
Metatarsal	Bd=25.60	Dd=18.90		
Pig				
Humerus	Bd=34.92	BT=26.34		
Humerus	Bd=37.60			
Tibia		Bd=35.50		

Tibia	Bd=29.20		
Tibia	Bd=30.16		
Astragalus	GLl=39.32	GLm=35.77	
1st phalange	GLpe=40.50	Bp=16.24	Bd=15.52
2nd phalange	Bp=11.10		
3rd phalange	DLS=29.54		
Horse			
1st phalange	Bp=44.10	Bd=38.90	GL=74.20
1st phalange	Bp=44.00		
2nd phalange	Bp=52.88	GL=48.22	
Dog			
Pelvis	LA=23.10		
Calcaneum	GL=43.60		
Metatarsal III	GL=66.88		
Metatarsal III	GL=66.60		
Red Deer			
2nd phalange	Bp=20.70	GL=38.90	

Chapter 8. A comparison of human and animal deposition at Velim-Skalka through an integrated approach

CHRISTOPHER J. KNÜSEL AND ALAN K. OUTRAM

INTRODUCTION

Complex, commingled deposits of human and animal remains are not uncommonly encountered in the archaeological record. The interpretations leveled to explain these occurrences have varied enormously – from ascribing such assemblages to unintentional disturbance of inhumations, to intentional disturbance connected to excarnation by exposure and/or secondary funerary rites, or cannibalism, sacrifice, execution and mass killing, mutilation and trophy-taking, relic collecting, and denigration of the deceased by intentional disturbance of burials. In many instances, these ascriptions are influenced more by impressionistic appearances and period-specific explanatory fashion than they are based on a thorough contextual analysis of the remains and their patterning (Duday 1998, 2006; Knüsel & Outram 2006). Furthermore, researchers have tended to view human remains from the perspective of regional funerary traditions, rather than as a result of the particular circumstances of their deposition. This practice has acted to conflate normative and non-normative burials within presumed regional 'traditions' of burial.

It comes as no surprise, then, that the mixed human and animal remains from Velim-Skalka have occasioned a number of interpretations over the years since excavations began at the site. Hrala (2000, 266) argues that "the whole site was suitable for ritual activities and ceremonies including human sacrifice, cannibalistic practices, skull cults, and votive deposits". In his view, the ritual nature of Velim-Skalka rests principally not only on its being a bounded space in the landscape, but especially on the occurrence of gold hoards and human cranial deposits in pits created to accommodate ritually-imbued deposits (Hrala 2000, 257-266). More recently, Peter-Röcher (2005) has argued that the site was primarily a burial site, after starting life as a defined sacred area. This interpretation also emphasizes the burial of human remains in pits and the furnished burials near the centre of the site with their hoard inclusions. These perspectives recall Whittle's (1996) 'bounded social space' when discussing causewayed enclosures of the Neolithic, where activities are defined based on whether they occurred inside the space or outside of it. In the case of Velim-Skalka, though, much of the deposition is not inside or outside but in the negative features, pits and ditches that form boundaries at the site.

Vávra and Šťastný (2004) have recently departed from the notion that the site represents a long-term ritual and cult centre and returned to the earliest suggestion levelled by the first excavator of the site, Dvořák (see Chapter 1), who interpreted it as a fortified craft centre that had been attacked and the population slaughtered. To support their interpretation, Vávra and Šťastný argue that the human remains at the site were not intentionally buried, and some may not have been buried at all. The material objects found at the site, rather than representing intentional ritual deposits, are remnants of looting, hidden from view and overlooked or lost during the site's destruction. The pits they ascribe to being the remnants of quarrying to build ramparts at the site, thus denying their origin as purposefully created places of intentional burial. While both these authors and Hrala (2000) see the site as having been host to manufacturing activities, including work in metals, bone, and stone, they differ in the extent to which they would describe the site as a ritual or cult centre. Much of Hrala's (2000) argument in support of this interpretation comes from his interpretation of the accumulations of gold objects as hoards, an interpretation that Vavra and Šťastný deny, as noted above. They also differ on the extent to which each would ascribe the apparent destruction of the site to attack. While Hrala (2000, 263) does not rule this possibility out, Vávra and Šťastný (2004, 259) see conflict as a result of Lausitz culture expansion, with the destruction of the fortified site warranted by its prominent role in local economic and power (i.e. political) relations.

In the absence of a complete consideration of the entire assemblage of human and animal remains from the site, the published reports tend to emphasise specific groups of material and provide interpretations supported by their spatial relationships to features and preliminary and, therefore, cursory appraisal of their element composition. In 1990, Dočkalová suggested that similarities in the deposition and bone breakage patterns between human and animal remains suggested that both were eaten at the site. This interpretation seems to draw its inspiration from Jelínek's (1957) early association of scattered and fragmented human remains with anthropophagy. In 2000, Dočkalová and Roblíčková, in their report on the human and animal remains, do not mention this interpretation, although in the same volume Hrala (2000, 257) ascribes the mixed deposit of human and animal remains in Feature 23 to anthropophagy. Dočkalová and Roblíčková (2000, 325) do describe cut-

and chop-marked human and animal remains, with evidence for animal gnawing on human bones being less frequent than that found on animal bones. They also provide summary tables documenting peri-mortem fracturing in the form of helical (spiral) fractures and other forms of intentional bone breakage, some of which would have revealed the medullary canal, as well as some weapon-related trauma identified in cranial remains (Dočkalová and Roblíčková 2000, 321 Fig. 23; Dočkalová 1990, 201 Fig. 13). They conclude their preliminary report in the following manner, though:

> "Cuts on animal bones are usually assigned without hesitation to the class of butchery marks on food remains. It is highly probable that the whole taphonomical situation reflects a secondary position of human and animal remains and associated archaeological waste material, swept into the shallow feature no. 23. The possibility that these remains are food residues will be studied in detail at a later date."

The evidence for anthropophagy, then, derives from the anecdotal evidence deriving from an incomplete analysis of a single feature at the site, Feature 23, where the remains are found in an apparently secondary deposit.

Although interesting and enthusiastically argued, none of these interpretations is supported by detailed contextual analyses of the human and animal remains. This results from an incomplete integration of studies of the human and animal remains with considerations of the archaeological features at the site. What seems obvious, however, is the importance of understanding the treatment accorded to animals and humans for understanding the nature of the site, as well as its abandonment. In order to distinguish ritual sacrifice and cannibalism from interpersonal killing and butchery, it is not only the presence of these remains in the same features that is important, but also how their treatment and contextual patterning compares. In its simplest expression the question hinges on whether human and animals were treated in a similar manner at the site, but to answer this question one requires the application of protocols specifically designed for fragmented and largely disarticulated assemblages.

METHODS AND PROTOCOLS

In circumstances where human burials are not 'normative' and deposits contain disarticulated, or semi-articulated, human skeletons mixed with faunal remains, the use of specialists – working apart and using different recording systems – is not appropriate. A greater level of integration is called for, beyond joint meetings and site visits. Fragmented and commingled osseous assemblages are hard to interpret and tend to be riddled with taphonomic equifinality – that is, a number of closely related behaviours, though distinct on detailed analysis, produce very similar patterning of remains in the field. Resolution of such difficulties will be greatly aided, however, by the generation of mutually comprehensible datasets. The best way to achieve this is by the faunal and human specialists working directly together using a single unified recording system such as that suggested by Knüsel and Outram (2005). Integrated approaches are not entirely new, but are still very rare and usually restricted to attempts to identify instances of cannibalism (e.g. Villa *et al*. 1986; Defleur *et al*. 1999; DeGusta 1999; 2000). There are many more forms of archaeological deposition of human and animal remains that deserve equally detailed and integrated treatment, especially in prehistory when burial traditions appear to have been much less codified and more diverse that those encountered in more recent historic periods. This type of recording system can be employed in any period to characterise recovery, completeness, and preservation of assemblages, human or animal.

A fully integrated approach was adopted for the study of the Velim bones. The approach involved:

- recording the same suite of data for human and animal specimens, using the same methods and protocols;
- the human and animal osteologists working physically together during the analysis;
- recording the data within a single unified computer database;
- close liaison with and, for the most part, the physical presence of the excavator.

As such, the integration extended beyond simply creating directly comparable data for the human and animal remains. It enabled the selection of the very best techniques and protocols from the fields of zooarchaeology and physical anthropology. The human and animal bone specialists carrying out the analysis worked together in the same room and constant discussion mediated against inter-observer errors and confusion over the different terminologies used in the two disciplines. The analysts used identical recording sheets, and another individual inputted the data into a unified database designed to allow direct comparison between species and/or contexts. Data input was carried out in parallel with the analysis, allowing for clarification of possible errors and enabling the computer operator to act as a quality controller to ensure consistency of notation. The excavator's presence allowed for clarification of contextual issues.

In formulation of the methods, much attention was given to developing a form of analysis that drew heavily upon zooarchaeological techniques designed to deal with disarticulated and fragmented remains. This is an area of distinct weakness within the field of physical anthropology, where approaches are more

generally designed to deal with complete inhumations of individuals. Zooarchaeological practice tends to assume the need to investigate patterns of dismemberment, fragmentation and mixed deposition. On the other hand, the detailed nature of human osteological studies, particularly with regard to the identification and recording of trauma, heavily influenced the protocols. Aspects of this integrated approach are discussed in detail in previous publications (Knüsel and Outram 2004, 2006; Outram *et al*. 2005), but the methods are summarized below.

All specimens that were identifiable to species were assigned a unique number and information on the following was recorded: context, species, anatomical element, bone zone, fusion state, side, butchery/trauma, other surface modifications (e.g. root etching, animal gnawing etc.), level of burning, fracture type and other notes (e.g. degree of preservation, pathology, age and sex, if such information was available). Following Outram (2001), specimens that were indeterminate to species were also recorded in relation to fracture and fragmentation patterns.

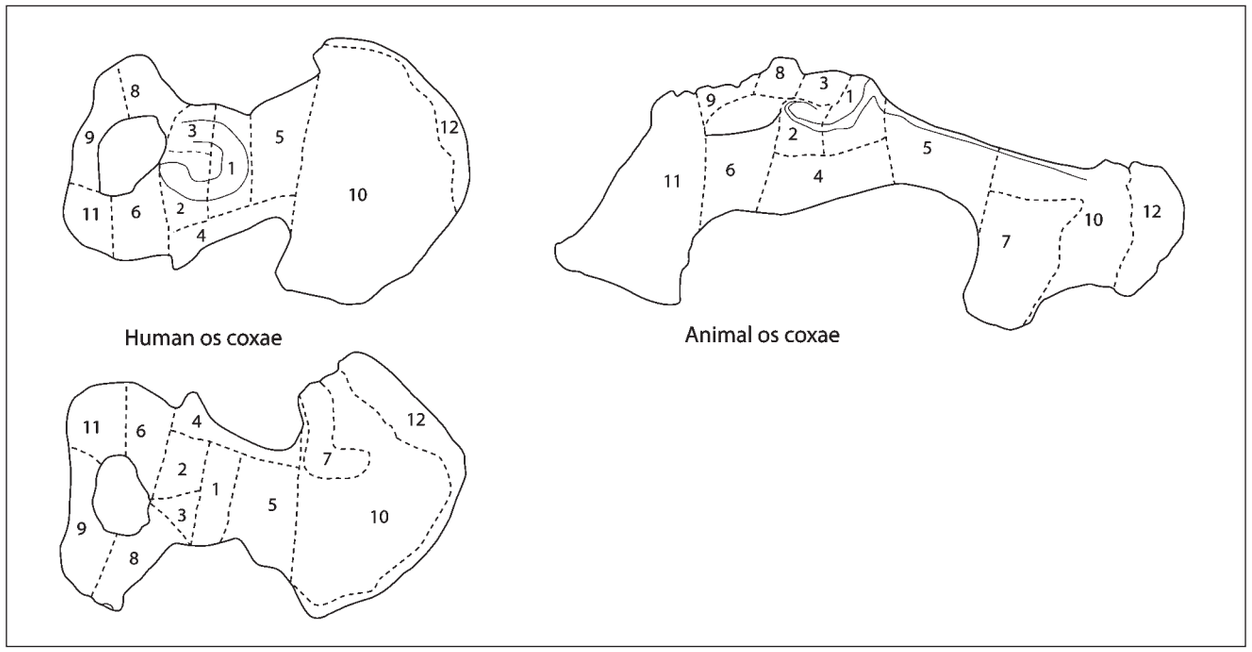
Identification, zonation and quantification

Specimens were identified to species and element. Human material was recorded by the physical anthropologists and animal material by the zooarchaeologists, but with constant dialogue about identifications of problematic specimens.

Zooarchaeologists commonly record fragments to the resolution of element, end (proximal or distal) and side (Klein and Cruz-Uribe 1984). This is sufficient for most analyses. However, the division of bones into 'zones' enhances resolution, allows more accurate calculation of minimum numbers and facilitates conjoining exercises. Dobney and Rielly's (1988) animal bone zonation system was adopted because it separates bones into readily recognizable zones that commonly occur due to the natural tendency of elements to break in particular places. Their system is applicable to the animal species relevant to our study, but human anatomical structures are not quite the same. The system was then adapted to create equivalent zones for the human skeleton (see Knüsel and Outram 2004 for details). An example of Dobney and Rielly's bone zonation and its adapted human form can be seen in Fig. 8.1.

Quantification was by NISP (Number of Identifiable Specimens), MNI (Minimum Number of Individuals) (Klein and Cruz-Uribe 1984) and MNE (Minimum Number of Elements) (Binford 1978). The NISP best represents the raw identifications of elements without modification. However, NISPs suffer distortion related to fragmentation; large bones can be broken into many identifiable specimens and differential levels of fragmentation between elements or species can seriously skew patterns. The calculation of MNE mediates against this distortion through discounting fragments that could derive from the same bone. This process is made more precise by the use of 'zones'. Minimum Number of Individuals (MNI) counts do the same thing for whole individuals. There is debate regarding the value of MNIs in zooarchaeology, since whole animals are not always present on a site, but can be transported or traded or exchanged as carcass parts (Lyman 1994). In this case, whether actually complete or not, it is useful to know how many humans were likely to have been deposited at the site. In the application of minimum numbers methods, both side and fusion states were recorded and used in the calculations.

Fig. 8.1. An example of Dobney and Rielly's (1988) bone zonation for the *os coxae* and its adapted human form



Using a method developed by Morlan (1994), the 'percentage completeness' of each element was calculated for all bones by both archaeological context and animal species. Morlan's work was based on bison, so the procedure is most relevant to *Bos* bone. However, with the exception of the metapodials, bone structure is fairly similar between the domestic species, so the method was also applied to other large mammals, including humans, where sample sizes were sufficient. Percentage completeness is determined by working out the average number of zones per bone element, and making this number into a percentage count using the maximum possible number of zones per element.

This method provides a means by which to quantify the breakage of bone by element, which can then be used in conjunction with analysis of fracture types when investigating the extent, nature and sequence of breakage.

Butchery/trauma

Butchery/trauma marks were initially identified through examining the bone surfaces with a hand lens in good light. Interpretation of marks followed standard conventions in the literature (Blumenschine *et al*. 1996; Bunn 1981; Greenfield 1999; Olsen and Shipman 1988; Potts and Shipman 1981; Walker and Long 1977). Distinguishing cut marks from other surface features, like scratches, via SEM examination (Olsen and Shipman 1988) was achieved by taking high- resolution casts using the finest type of dental impression material (a low-consistency, light-bodied polyvinylsiloxane impression material). This method produces excellent results and leaves one with durable, damage-resistant and archivable casts. Casts were taken of all potential cut marks on human material and from a representative sample of animal bone modifications. Photographs were also taken of these and a photographic record accompanied the general recording of material.

The position of such modifications was recorded on multi-view, outline diagrams of the element in question. Different symbols were used to indicate different types of modification (e.g. cut, scrape or chop). The blank diagrams were reproduced several to a page and each specimen was recorded on an individual diagram, along with contextual information and other identifiers. These master records were later copied and cut into individual diagrams that could then be sorted. This information was then entered onto similar outlines within a layered computer illustration package. The use of layering in the illustration files allowed separated or composite viewing of analytical groupings, aiding comparison and analysis. Complete skeleton summary diagrams to show the butchery/trauma patterns on different species were then created. Diagrams showing the interpretation of where major portions of carcass division were situated, based upon the cut mark evidence, were then produced for animal species, following a method form devised by Knight (2002).

Burning/heating

Instances of heat-induced changes were recorded for all fragments. The level of the heating/burning event was also recorded using discoloration and other criteria as outlined in Shipman *et al.* (1984) and Shahack-Gross *et al.* (1997). Depending on the temperature bones reach, different levels of discoloration result (Lyman 1994). Three classifications were used. 'Scorching' indicated darkening (yellow/brown) of the surface. Such mild changes tend to occur at temperatures below 400°C (Lyman 1994). 'Carbonized' indicated blackening caused by destructive distillation of the organic fraction, which occurs between about 390 and 525°C (Shipman *et al.* (1984). 'Calcined' indicated a grey/white bone, almost ceramic in nature, where the crystal structure of the hydroxyapatite had changed. This happens at about 645°C (Shipman *et al.* 1984).

For indeterminate fragments, the numbers of fragments exhibiting these modifications were recorded. For identified specimens, the anatomical area covered by the modification was recorded as for butchery/trauma using a pictorial recording system. The position of burning on elements can shed light upon the nature of the heating event, potentially indicating whether bones were disarticulated, fleshed or defleshed when heated, and can reveal information about cooking methods (Albarella and Sergeantson 2002).

Surface modifications

Post-depositional surface modifications were also recorded, including carnivore gnawing, rodent gnawing, root etching, abrasion etc. A sample of these surface marks was photographed and casts made for SEM investigation. Pathological specimens were also identified and photographed.

Fracture analysis

The recording of fracture patterns on all specimens, including those indeterminate to species and element, followed Outram (2001). The only exceptions were very eroded or small fragments where patterns could not be identified accurately. Fracture types were identified following criteria in Johnson (1985), Morlan (1984) and Outram (2002). The principal criteria were fracture angle (to the cortical surface), outline shape of the fracture, and fracture surface texture and colour. Individual fractures were categorized as helical (fracture of bone in a fresh, green state), dry (fractured after partial loss of moisture and organic content), mineralized (broken after almost total loss of organic fraction), and new (breaks that occurred during or after excavation). For identifiable specimens, the approximate percentage of each fracture type present was recorded. For

indeterminate specimens, presence/absence of such fracture types was recorded.

The presence/absence of dynamic impact scars (Johnson 1985; Outram 2001) was also recorded as evidence for deliberate fracture of fresh bone during the peri-mortem interval (i.e. at or about the time of death). Dynamic impact scars result from a near direct impact onto bone that causes the displacement of a bone cone. They can be interpreted in a very similar way to conchoidal bulbs of percussion on flaked stone artefacts. Fleshed long bones, when dynamically impacted, tend to produce 'butterfly' fractures (Sauer 1998, Fig. 4).

Anatomical positions of impact scars and butterfly fractures were recorded in a similar manner to butchery/trauma marks. The position of all helical fractures on human material was also recorded. Due to high frequencies of helical fractures on animal bones, only their presence was noted, position recording being restricted to impact scars.

Fragmentation patterns

An advantage of dividing elements into bone zones is that it facilitates calculation of 'percentage completeness' (Morlan 1994; see above) for each element. Beyond that measure, which is restricted to fragments identifiable to species, specimens that were indeterminate to species and element also carry valuable information about assemblage fragmentation and were studied using methods devised by Outram (1999, 2001, 2003). Such fragments were classified by maximum dimension (20mm, 20-29mm, 30-39mm, 40-49mm, 50-59mm, 60-79mm, 80-99mm, 100-119mm and over 120mm). These fragments are not necessarily devoid of anatomical information. It is often quite simple to classify small fragments by general 'type' of bone, even though the element is not identified. Studying fragmentation levels between different types of bone is very informative when considering causes of fragmentation, e.g. bone grease extraction (Outram 2001), or more general taphonomic history (Outram 2004). In this study there was a simple division between axial and appendicular fragments.

Pathological conditions

Pathological bone changes were identified from the diagnostic features of lesions and described based on terminology developed in the Biological Research Centre, University of Bradford (Knüsel n.d.; Knüsel and Ogden forthcoming). Differential diagnoses were performed with assistance from standard works, such as those of Ortner (2003), Aufderheide and Rodriquez-Martín (1998), and Roberts and Manchester (1995), as well as other published accounts (see below).

Measurements

Measurements on animal bones followed von den Driesch (1976). Assessment of age-at-death and determination of sex of human remains followed standards presented in Bass (1987), Buikstra and Ubelaker (1994), and Krogman and Iscan (1986). Stature calculations were performed based on the formulae presented in Trotter and Gleser (1952, 1958) and Trotter (1970).

COMPARISON OF THE HUMAN AND FAUNAL ASSEMBLAGE

Number of Identifiable Specimens (NISP)

The total number of bone fragments examined at Velim was approximately 18,600. Of these 4,454 were identified to species and of those 1,753 were human and 2,701 from animals. The neonate, Kostra 46, is not included in these figures or those below, but was analysed separately. Of the 1,753 identifiable human specimens, 32 are of single identifiable teeth and eight long bone fragments not assigned to individual elements. The great majority of the human remains assemblage from Velim-Skalka consists of ribs (N=334), followed by identifiable cranial fragments (175), those of the thoracic vertebrae (111), *ossa coxae* (84), femora (99), and tibiae (84). This would suggest that there is a higher number of fragmented elements associated with the torso contributing to the assemblage, and more long bones of the lower limb and *ossa coxae* than of elements coming from the upper limbs. All anatomical areas of the body, though, are represented in the assemblage from the cranium to manual and pedal elements, although the frequencies are not equally distributed (Fig. 8.2). In order to determine if these frequencies are due simply to the extent of fragmentation, minimum numbers of elements were calculated and Morlan's 'Survivability Index' calculated (see below).

Minimum Number of Individuals (MNI) based on Zonation MNEs

The most commonly occurring element in the analysed assemblage from the site is the femur, of which there were 95 fragments, among which there were 48 right and 45 left-side fragments.1 Of the right-side fragments, 23 were from unfused elements and 17 from fused elements, with eight for which fusion could not be determined due to incompleteness. Of the left-side fragments, 20 elements derived from unfused elements, whereas 19 were from fused elements, with six for which fusion could not be determined due to incompleteness. The most commonly occurring zones for the left femora are zones 5 (N=24) and 8 (N=25), from which the minimum number of elements was calculated. These frequency counts for the left femora, then, indicate that a minimum of 10 sub-adults and 13 adults, in addition to one infant, contributed to the formation of the analysed assemblage for a minimum total of 24 individuals. From the left femoral data, this group included 13 adults and 10 sub-adults, as well as a three to six month-old infant (Kostra 46). These

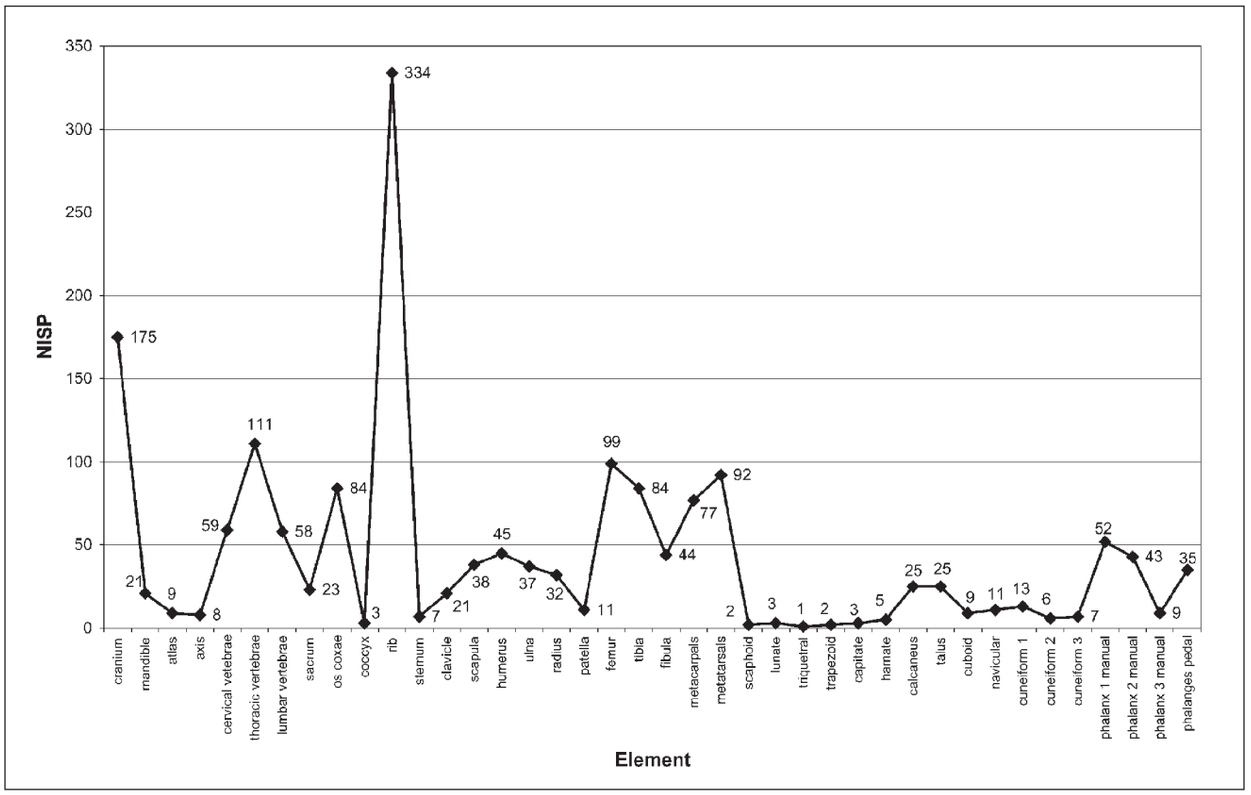
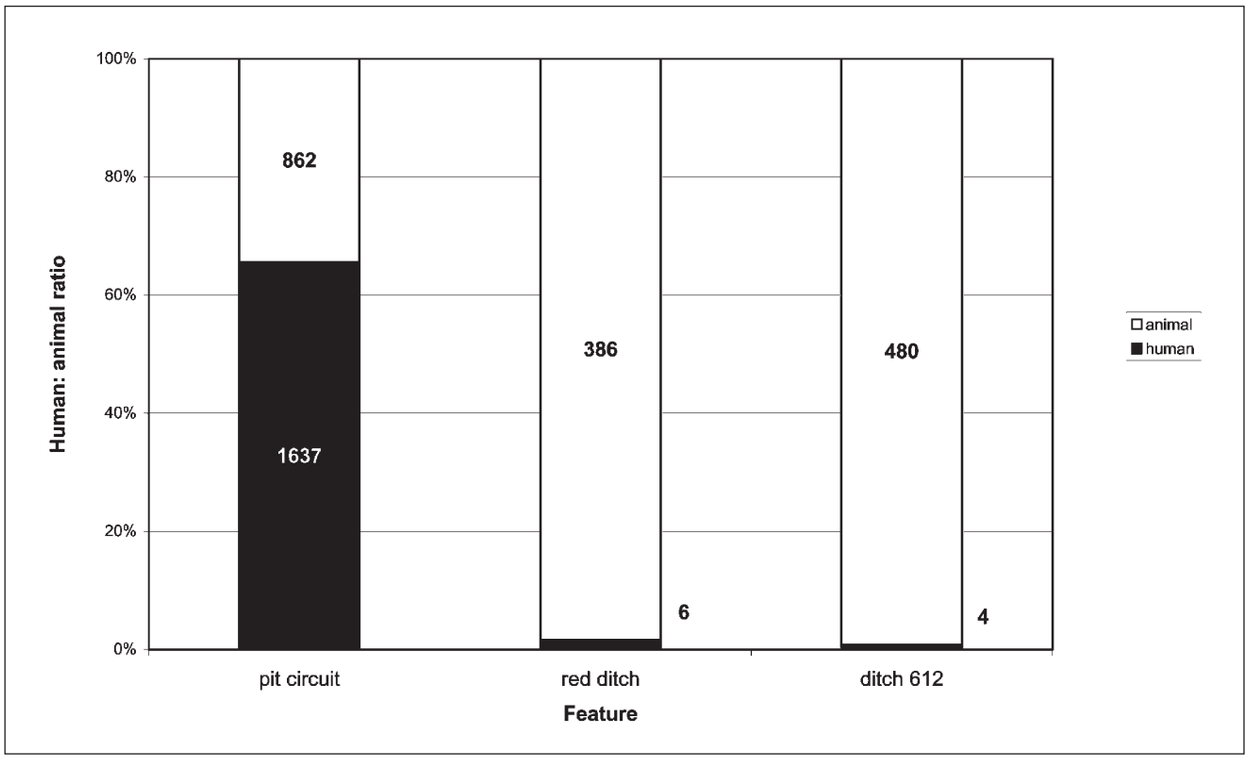


Fig. 8.2. Human element representation at Velim-Skalka

Fig. 8.3. Graph of composition (Human versus Animal NISP)



figures are based on the relative frequency of zone 5 for the left femur in both fused and unfused states.

The vast majority of the osseous remains came from three pit/ditch features. These features are the pit circuit (Objekt 64), the 'Red Ditch' (Objekt 45/45A) and Ditch 612 (see Chapter 2). This chapter will concentrate on comparing the material found in these three features.

Fig. 8.3 shows the proportions of animal and human remains (by NISP) in the three features. It is

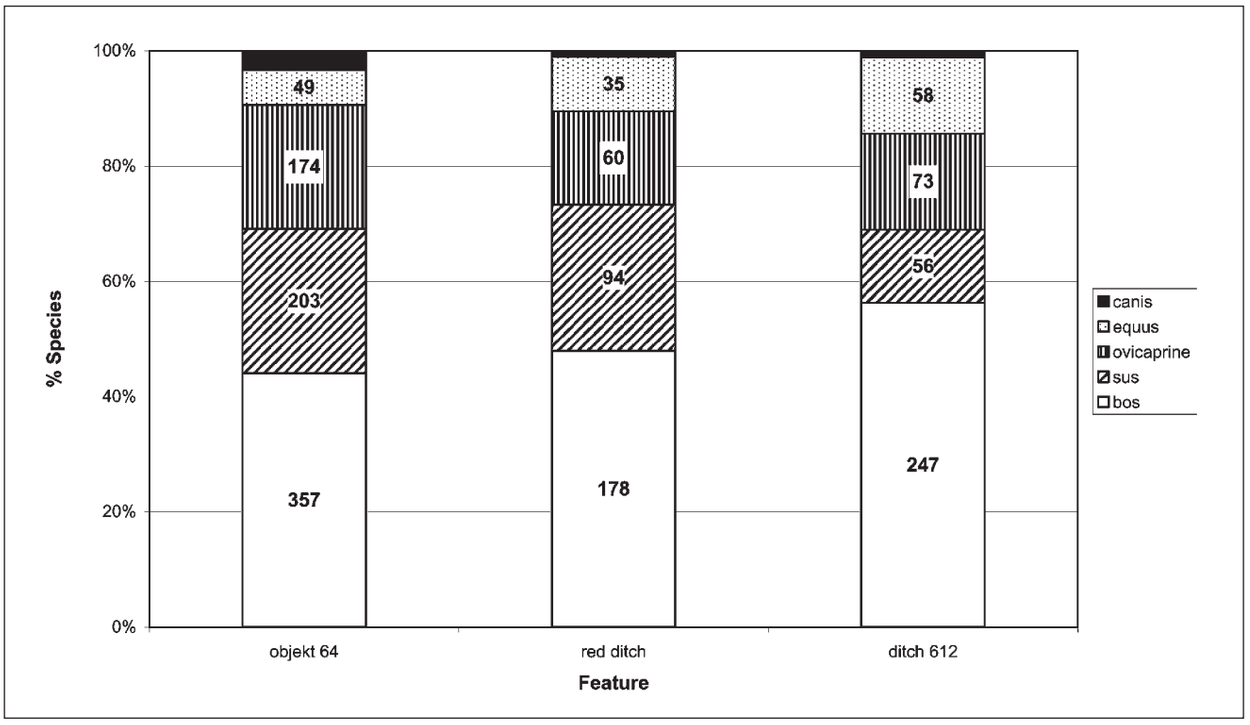


Fig. 8.4. Graph of the proportions of the five main animal species (by NISP)

clear that the vast majority of the human remains occurred in the pit circuit, but these are admixed with a substantial quantity of animal bones. Very little human material was recovered from either of the other two features. Chapter 7 discusses the animal assemblage in detail and provides details of all species present. Fig. 8.4 displays the proportions (by NISP) of the five main animal species present in each of the three features. Cattle dominate in all three, with significant numbers of ovicaprids, pigs and horses being present along with a small number of dogs. There are minor variations in the proportions present in each feature, but no significant differences that would suggest that there was a particularly skewed deposition of animal species in the different contexts. Humans were clearly selectively deposited in Objekt 64, but there appears to be no such selectivity with regard to the animals.

It is important to note the way in which skeletal materials was deposited in each of these features. Ditch 612 was a relatively shallow and narrow feature that, nonetheless, produced substantial quantities of bone. The material was fairly dense at the base of the ditch and there was little evidence for the deposition of articulated skeletal units. The 'Red Ditch' (Objekt 45/45A) is a very substantial feature, yet it contained relatively few bones and these were scattered and disarticulated. The density of bone deposition in Objekt 64 was quite high. This was a mixture of disarticulated animal bone with disarticulated, semi- and fully-articulated human skeletons. See Figs 6.7 – 6.10.

The contexts of human remains

The contexts with the number of identifiable human specimens greater than 50 are 220 (77), 234 (151), 243 (90), 2617 (148), 2620 (81), 2636 (199), 3000 (201), 3001 (95), 3009 (129), and 3012 (122). Of these, Contexts 2636 and 3000 contain the greatest number of identifiable specimens with 199 and 201, respectively. Contexts 234 and 2636 contain the remains of more complete individuals, Kostra 41 (a 5 to 6 year-old child) in the former case, and Kostra 47 a and b and Kostra 48, in the latter. Kostra 47b consists only of the sternal ends of the claviculae, one portion of the acromial end of the right scapula, and a left fibula of a size smaller than that of Kostra 47a. Kostra 47a represents the remains of a 6 to 8 year-old child, while those of Kostra 47b are those of an individual aged 5 to 6 years at death. In these contexts ribs account for the majority of the elements in each, with the exception of Context 220, in which thoracic vertebrae (N=12) make up a greater part of the identifiable specimens in the context.

Of the human elements recovered, slightly over 93% (N= 1637) come from the middle pit circuit, Sonda 12B and 12C, the latter being a group of pits and trenches (Fig. 8.5). Most of the human remains come from the pit circuit, Objekt 64, with almost two-thirds coming from the North and South pits, in particular. (Note that the 'burial cut' feature shows 0% because the human remains from this pit were not available at the time of study.) This stands in stark contrast to the animal remains from the site, which are more diffusely distributed among site features, namely Objekt 64 (NISP= 862), the Red Ditch

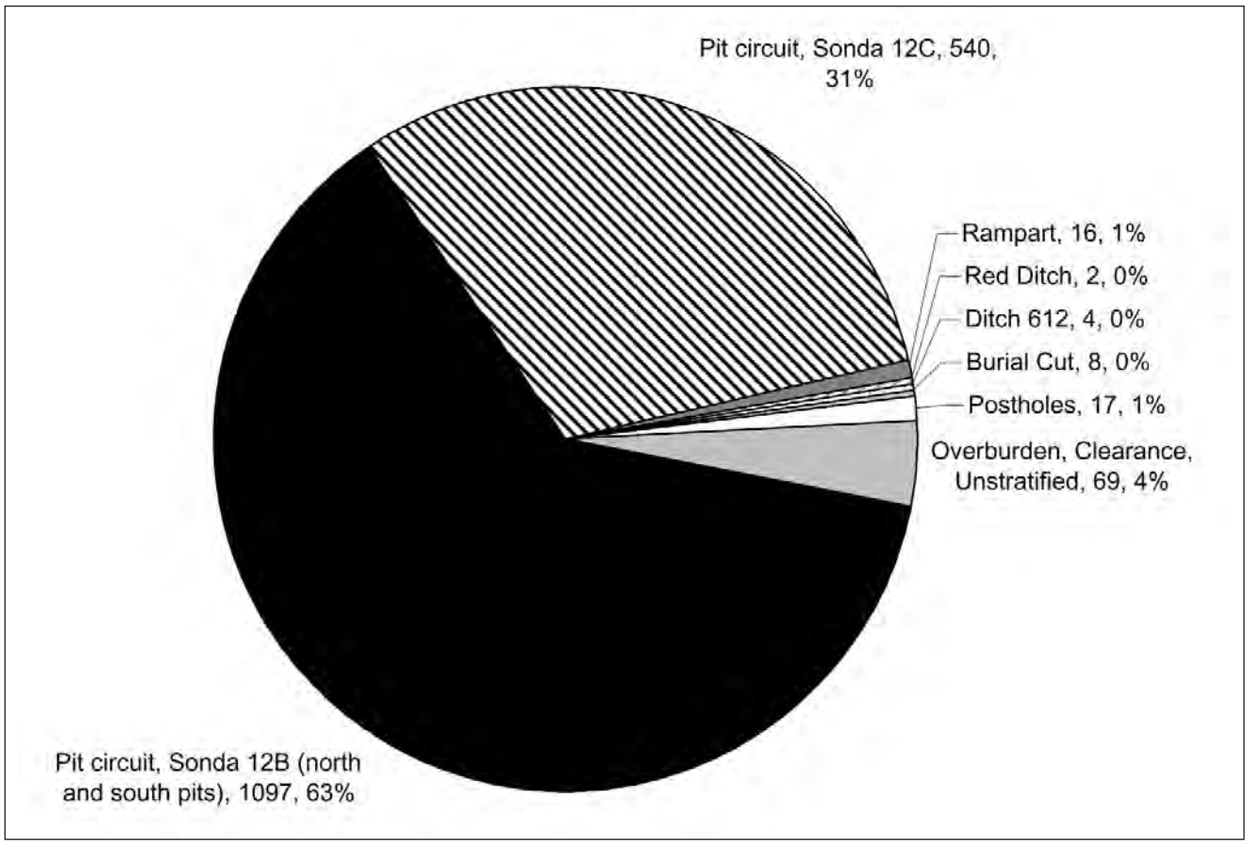


Fig. 8.5. Pie chart showing the distribution of human bone by feature (numbers indicate NISP by feature and percentage of NISP for the whole human bone assemblage)

(NISP=386), and Ditch 612 (NISP= 480) (Fig. 8.3). The remaining 7% of the human remains come from the disturbed uppermost layers of the site (4.3%, N=71) with the postholes contributing about 1% (N=18) and the possible rampart contributing 16 elements (0.9% of the total), the Red Ditch (Objekt 45/45A) with 10 elements (0.6% of the total), followed by Context 612 (four elements, 0.2%). There are no human remains from the palisade trench.

The heavy concentration of human remains in the North and South pits of Objekt 64 (the middle pit circuit) present a very different distribution pattern. While the North Pit contains disarticulated remains and apparently no complete individuals, the South Pit contains the majority of the more articulated remains, including Kostra 46, an infant, and Kostra 41, a child. The remaining articulated individuals, Kostra 47 a and b and Kostra 48 were found in Trench b of Sonda 12C, part of the pit circuit. Objekt 64 North Pit contains a high proportion of dry and mineralised fractures (see below, Fig. 8.50). This pit contains about one third (N=685) of the total number of such fractures at the site. The presence of these 'dry' fractures – fractures that occur after much collagen has been leached from the bones – indicates that these remains had been disturbed in antiquity, presumably during phases when features were altered at the site.

Skeletal part representation and percent completeness of elements

Figs 8.6 – 8.11 display the skeletal part representation and percent completeness of elements (after Morlan 1994) for humans, all non-human animals, cattle, ovicaprids, pigs and horses, respectively. The representation in these graphs is by MNE counts for the major elements of the appendicular skeleton, as well as the scapula, *os coxae* and mandible. In all cases, there is no evidence for any significant selective pattern of deposition of particular skeletal parts, whether the result of logistical concerns, such as differential transport, or structured cultural practices of deposition. It seems apparent that all parts of human and animal bodies reached the site, and it is likely that, whether dead or alive, they reached the site whole.

Percent survival calculations display very similar patterns for all species. There are not great differences in the extent to which different elements have been broken up. The calcaneus and metapodials, being strong and compact elements, tend to have better percent survival values, but in general it seems that there were not any strongly selective taphonomic processes to bias skeletal part abundances.

Using Morlan's (1994) method on the human remains, the percentage completeness of each element was calculated. This method uses the NISP of each

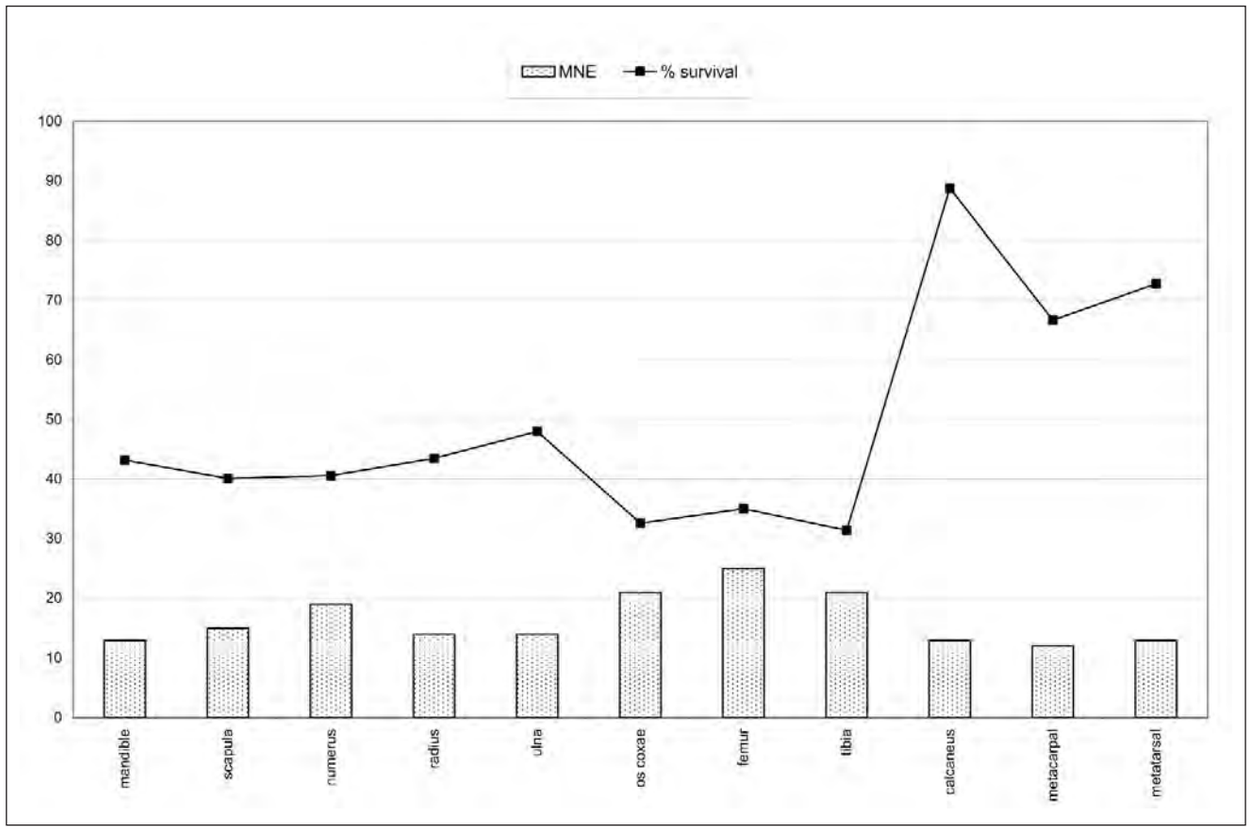
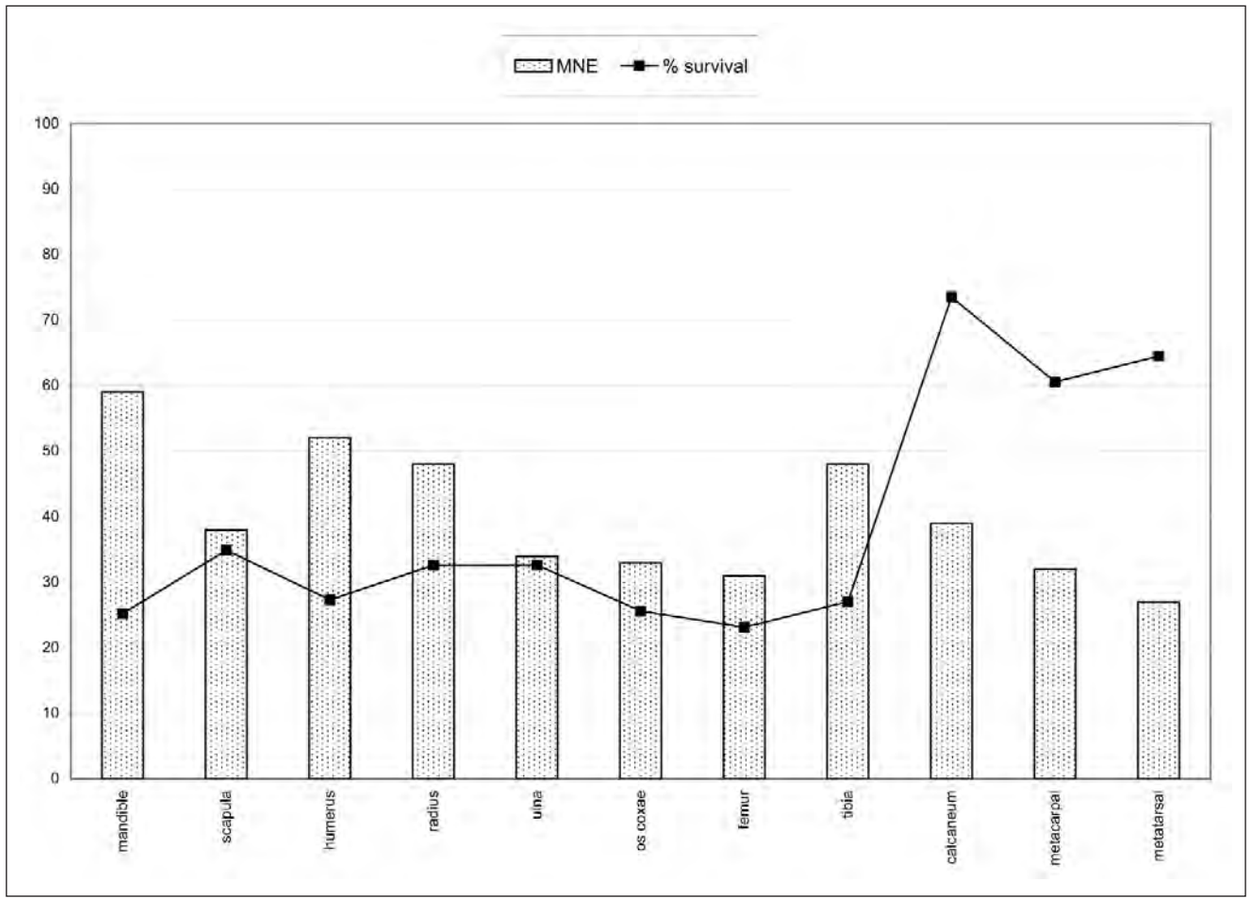


Fig. 8.6. Graph of human part representation and % completeness

Fig. 8.7. Graph of all animal part representation and % completeness



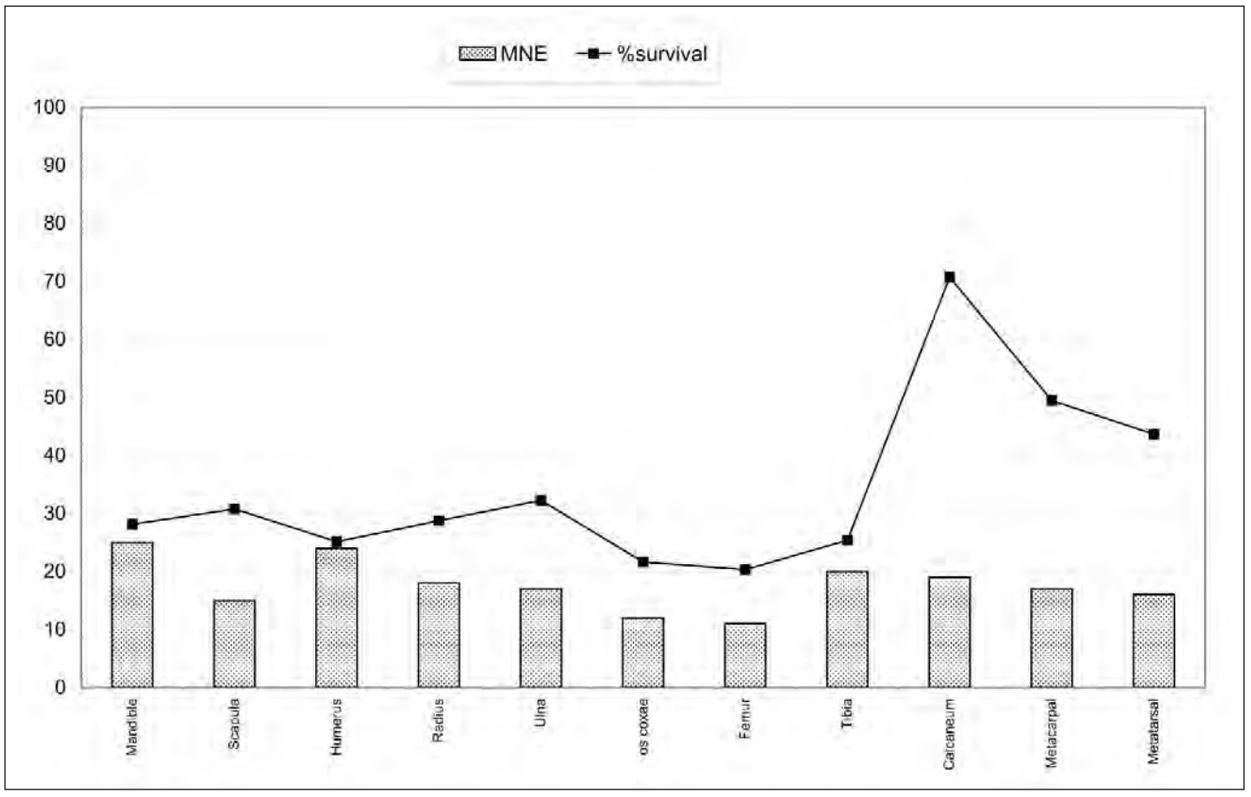
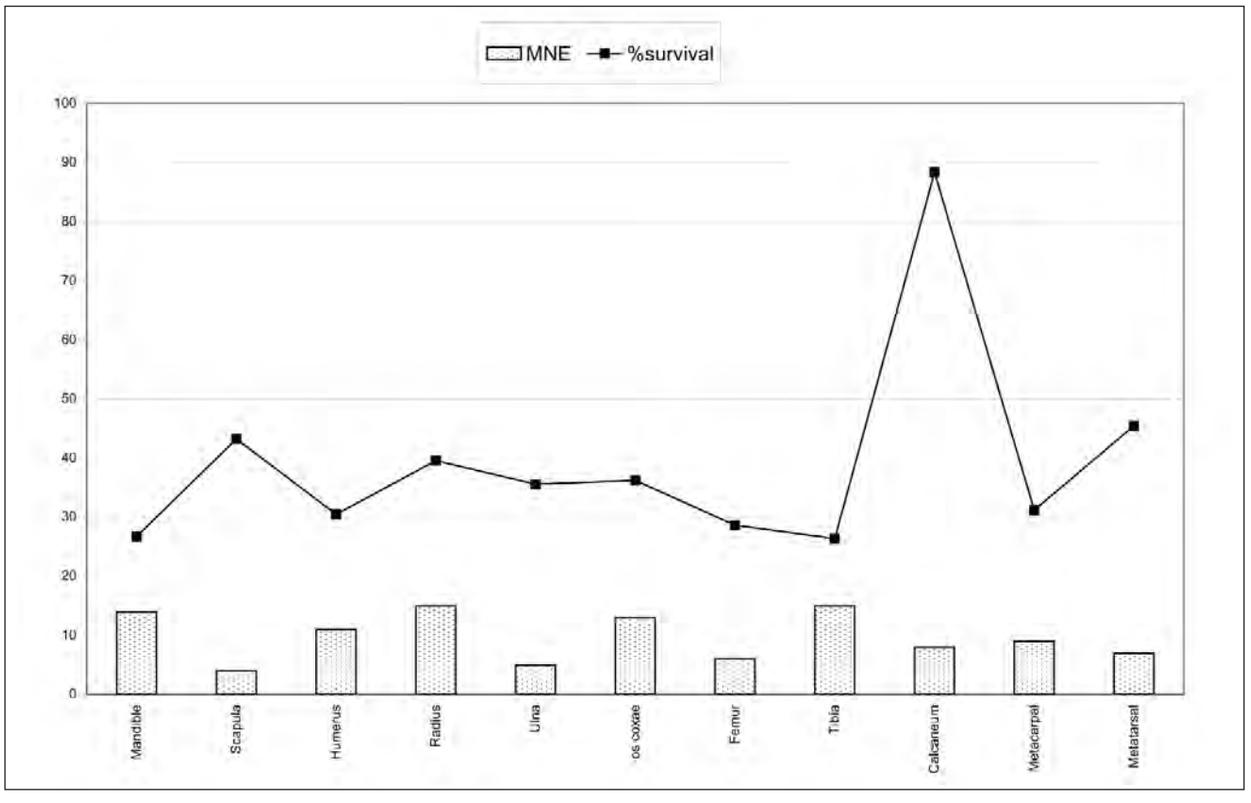


Fig. 8.8. Graph of cattle part representation and % completeness

Fig. 8.9. Graph of ovicaprid part representation and % completeness



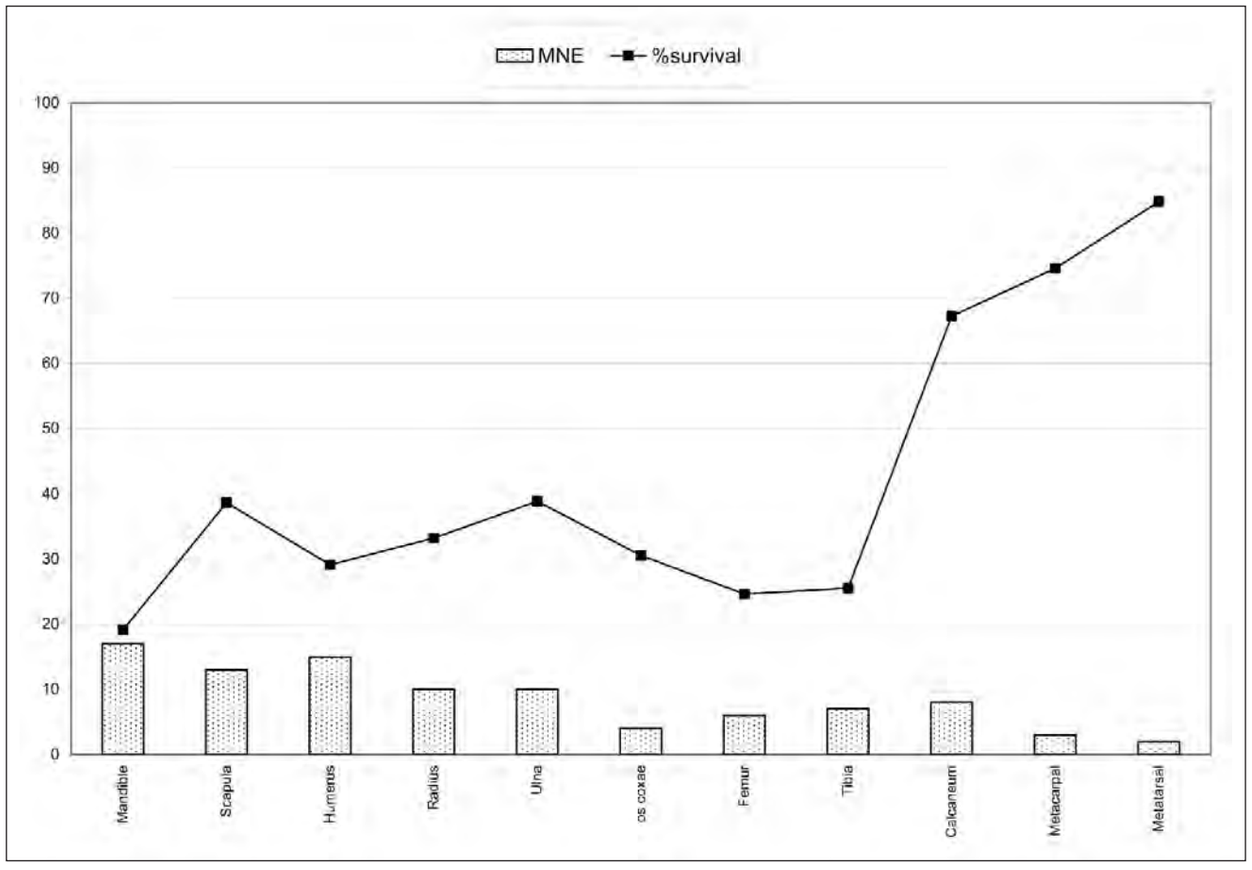
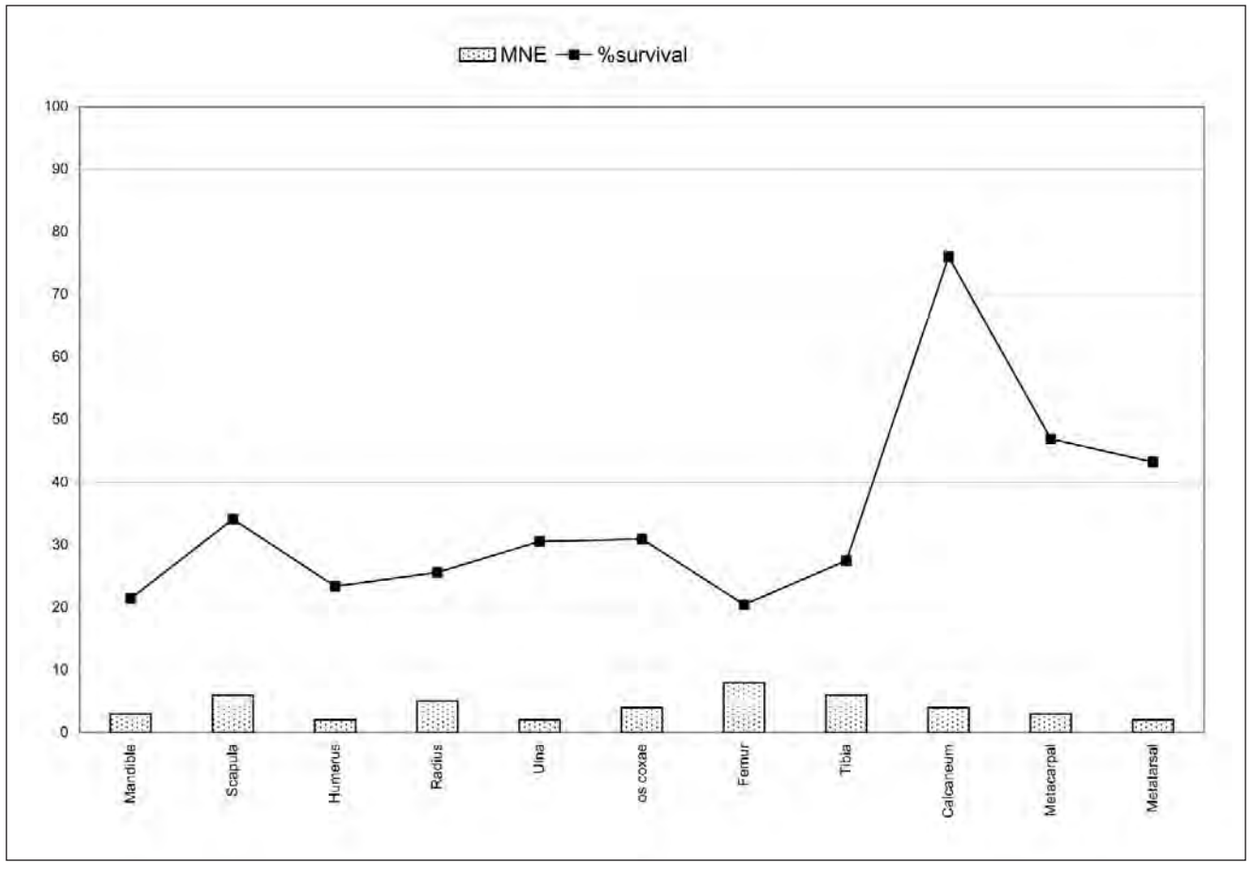


Fig. 8.10. Graph of pig part representation and % completeness

Fig. 8.11. Graph of horse part representation and % completeness



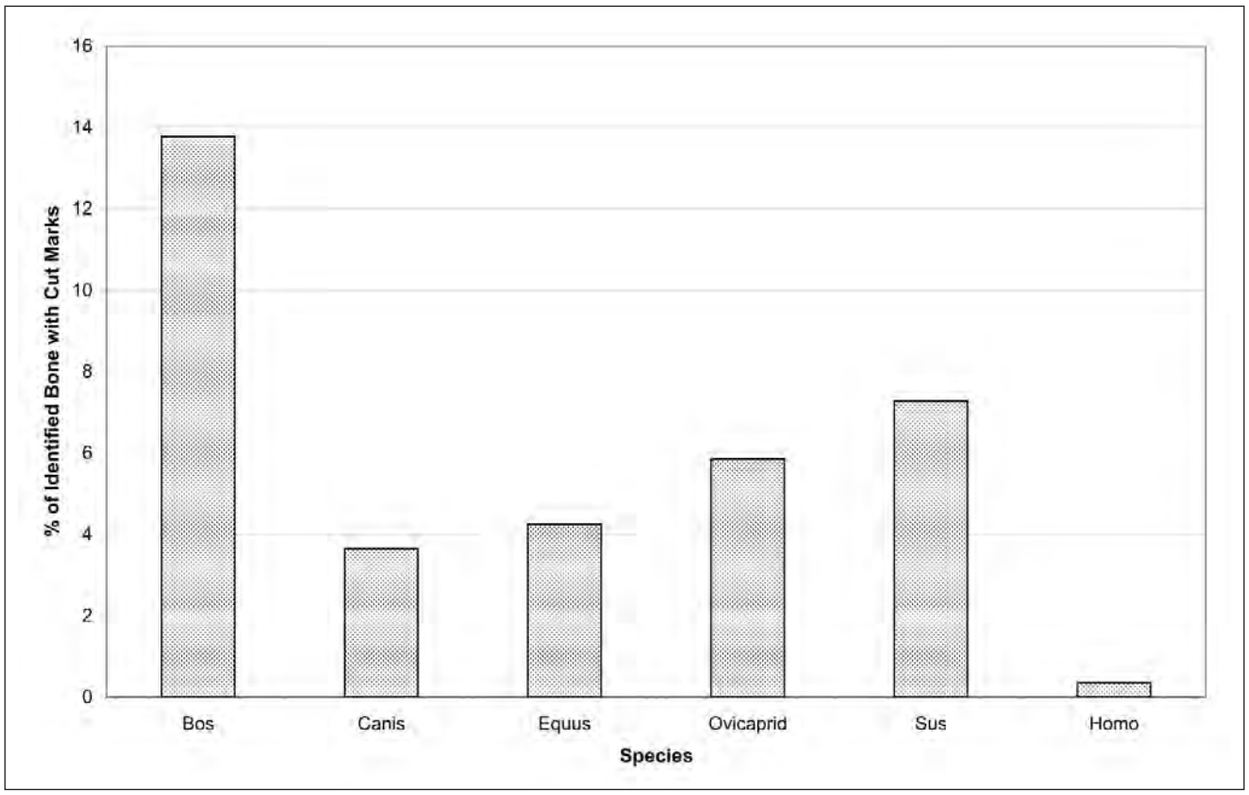
recorded skeletal element, the number of zones recorded from those elements and divides them by total number of zones that should be present, given 100% preservation and no fragmentation. This calculation allows one to determine which elements contributed most to the fragment counts, or in other words, which elements suffered the greatest fragmentation. From these data, it is clear that some bones, namely those making up the feet and hands (metacarpals and metatarsals, phalanges, ankle and wrist elements), patellae (100%), vertebral column (between 67.1 and 73.4% complete), ribs (54.9%) were largely complete, as were the claviculae (87.3%). These elements, then, were the least fragmented. Other bones, however, were much less complete, for example the femora were only 35% complete, the tibiae only 31.6%, fibulae only 40.3%, scapula 39.6% humerus 40.5%, radius 43.4%, ulna only 48.9%, sternal body 33.3%, *ossa coxae* 35%, mandible 43.2% and cranium 9.3%. Thus, in general the most fragmented elements were the cranium and limb bones.

Cut marks

This section addresses peri-mortem surface modifications to bones. The types of marks encountered include cut marks from stone or metal knives, chop marks from the dynamic impact of a blade, and scrape marks. Fig. 8.12 displays as a bar chart the percentages of identifiable bone fragments displaying butchery/trauma marks. The highest prevalence of marks, by far, is on cattle bones, followed by pigs and ovicaprids, then horses and dogs. The percentage of human bones displaying such modifications is very significantly smaller than any of those animal species. Fig. 8.13 displays the proportions of different types of modification by species (and small, medium and large mammals, where speciation was not possible). Cut marks are the most prevalent modification, but chop marks are also common, whilst scrapes are not present in large numbers.

Fig. 8.14 is a composite diagram of all marks recorded on human elements. This diagram also displays the positions of peri-mortem fractures, which are discussed below. Objekt 64 North pit produced a human rib (12/3006), possibly rib 6, with two anterior-posteriorly oriented cutmarks on its inferior border; these look like the result of a penetrating injury to the thorax (Fig. 8.15). From their micro-morphology, as revealed by SEM analysis, these cut marks exhibit the even-sided v-shape of cuts made with a metal object (Walker and Long 1977, Greenfield 1999) (Figs 8.16, 8.17; compare with Fig. 8.18, which represent marks most likely made during excavation by a trowel). A context in Trench B of Sonda 12C produced one of the more unusual specimens, a left proximal end of a human femur (12/2636) that ended in a dry fracture of the diaphysis, as well as three incised cutmarks that run in a medio-lateral direction across the posterior aspect of the femur cutting through the major extensor and medial rotator of the the thigh, *M. gluteus maximus*, the muscle bellies of the hamstring muscles, specifically *M. semitendinosus* and *M. semimembranosus* in the postero-medial

Fig. 8.12. Graph comparing proportions butchered, all species



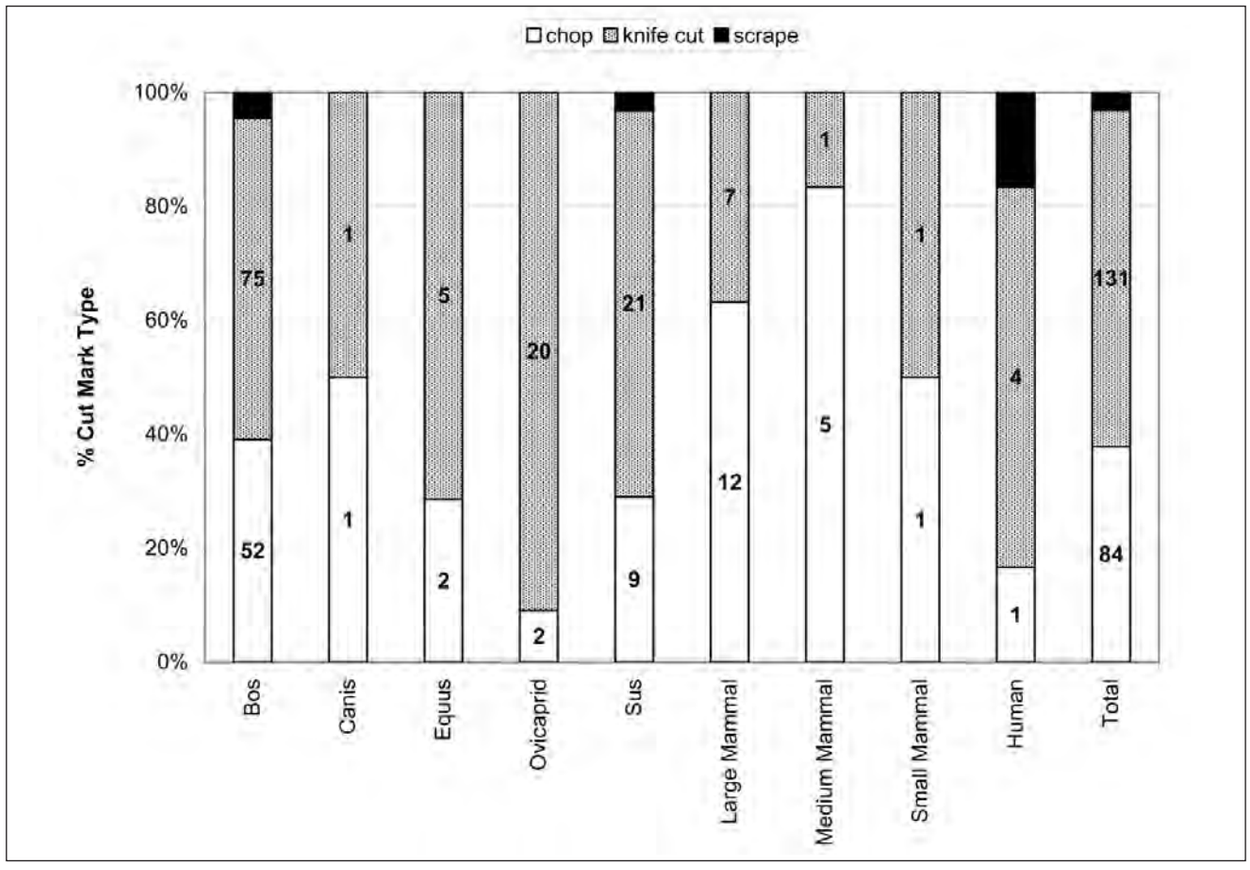


Fig. 8.13. Graph of proportions of butchery type

Fig. 8.14. Diagram of human trauma

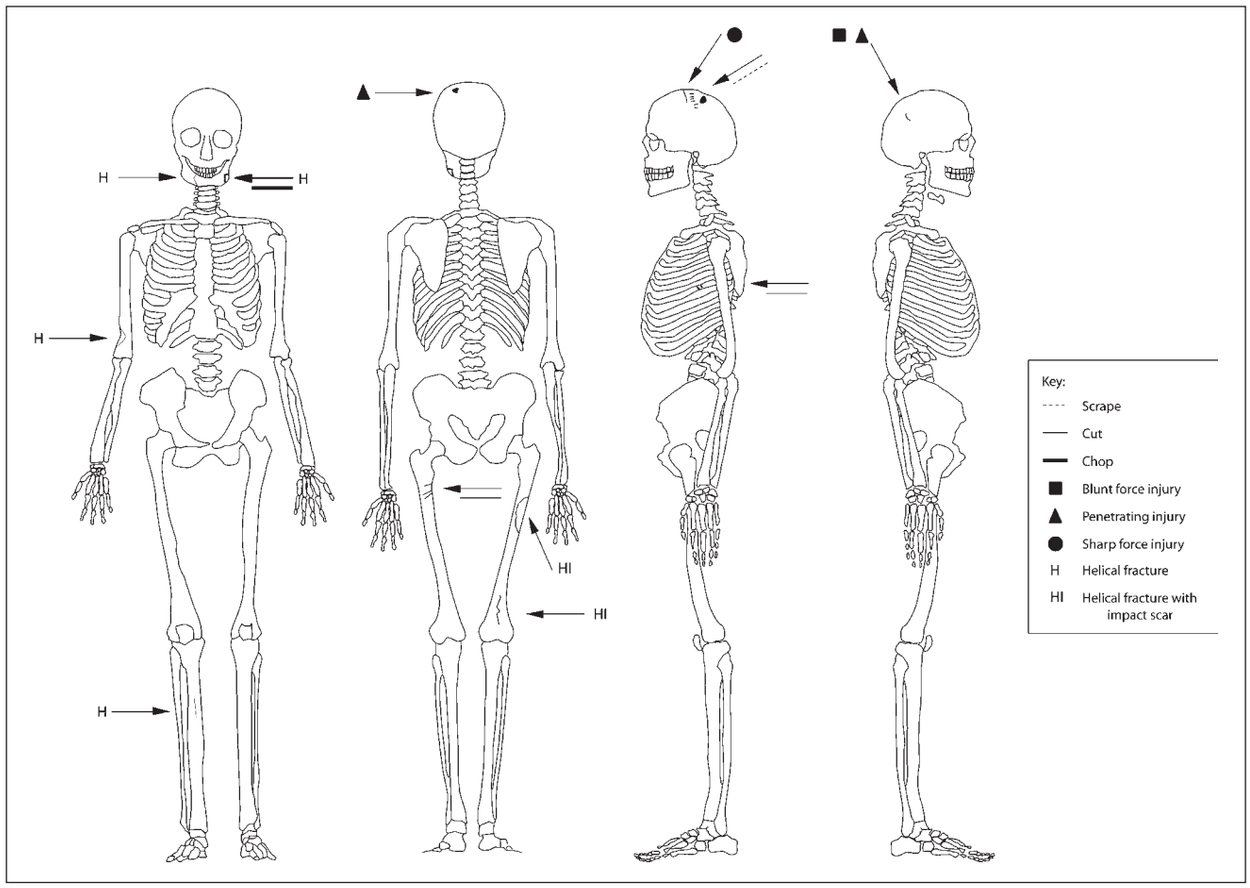
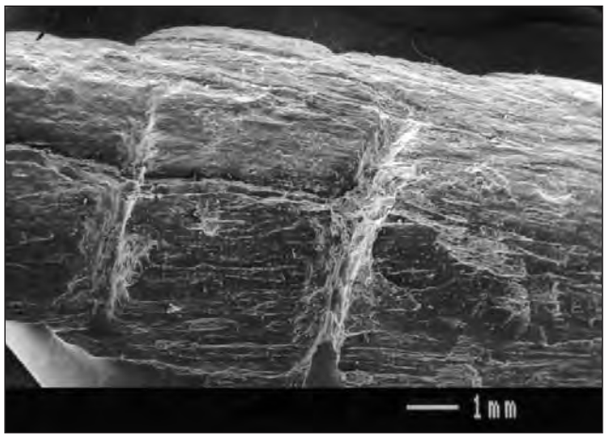


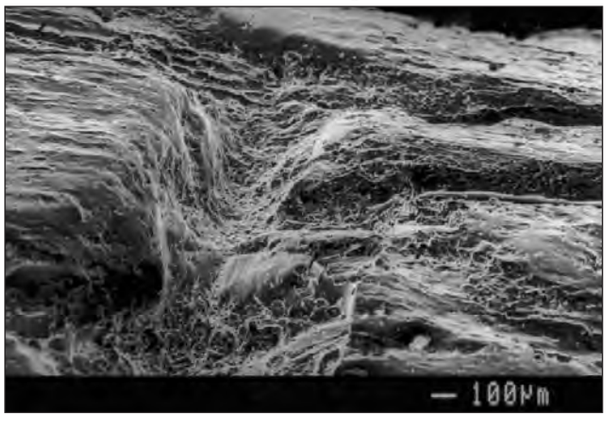
Fig. 8.15. Human rib with two parallel cutmarks

Fig. 8.16. Scanning electron micrograph x 10 of the human rib cutmarks depicted in Fig. 8.15



compartment of the thigh, and the deeper muscles of the thigh, including the adductors of the thigh, *M. adductor brevis*, and *M. pectineus*, as well as the flexor *M. vastus medialis* (Figs 8.19 and 8.20). The extent of this damage would have incapacitated this individual, affecting standing posture as well as movement. This injury is similar to those produced by staff weapons, such as the halberd, in the medieval period (cf Waller 2000, 150; Knüsel and Boylston 2000, 174; Novak 2000, 248, 250); some of these injuries having been identified in individuals who fell at the

Fig. 8.17. Scanning electron micrograph x 50 of the human rib cutmarks depicted in Fig. 8.15



late Medieval battle of Towton (AD 1461). However, the cut marks in this example are very fine and are, perhaps, more consistent with a sharp knife than a halberd.

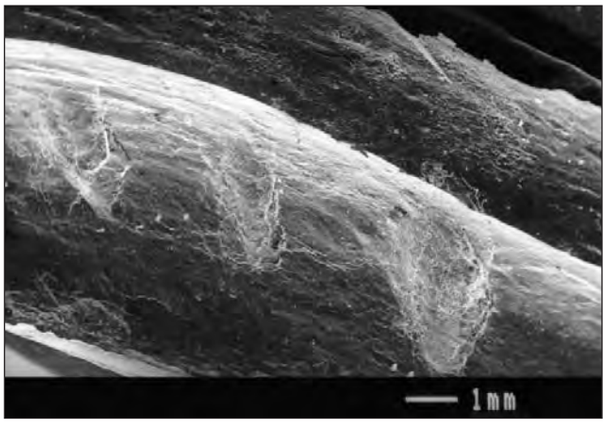
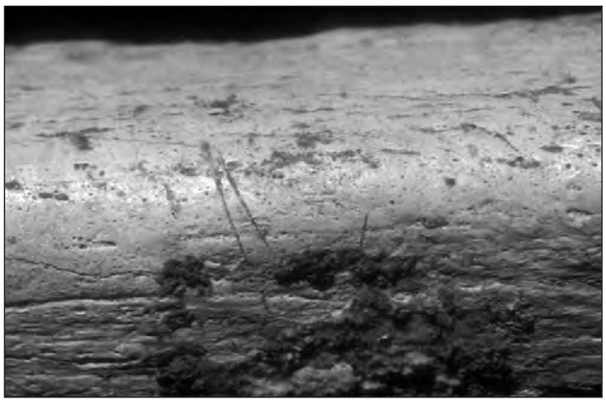


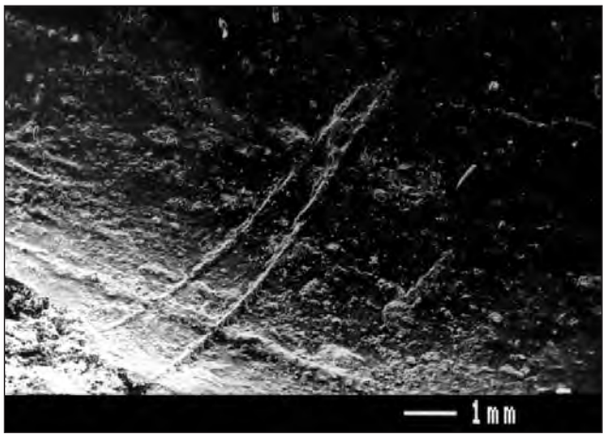
Fig. 8.18. Scanning electron micrograph x 10 on a human rib fragment bearing marks from excavation trowel damage

Fig. 8.19. Three incised cutmarks on the posterior proximal aspect left human femur



The upper layers of what would eventually reveal the North and South Pits of Objekt 64 produced a mandible (12/220) with a fracture of the left side of the corpus in the area of the gonial angle; this has the

Fig. 8.20. Scanning electron micrograph of the incised cutmarks on a proximal left human femur depicted in Fig. 8.19



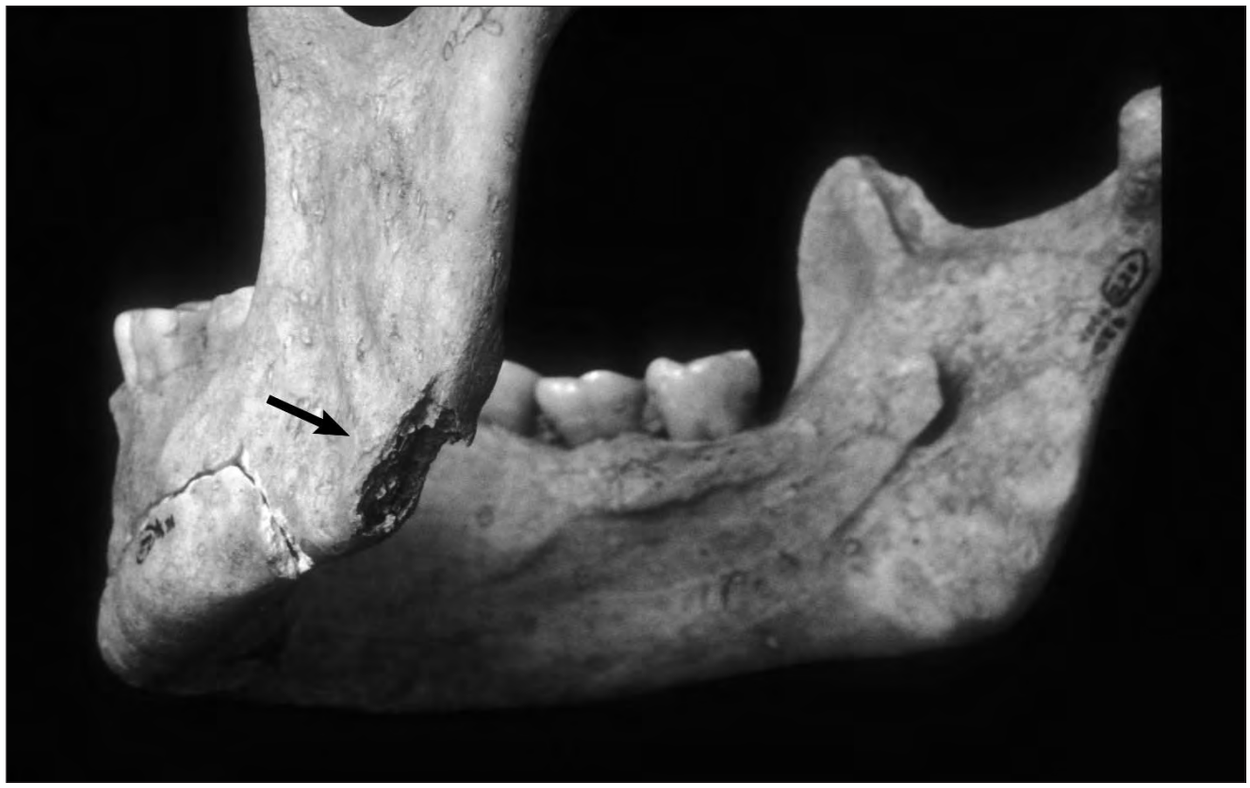


Fig. 8.21. Traumatic decapitation-type injury to the gonial angle of a human mandible

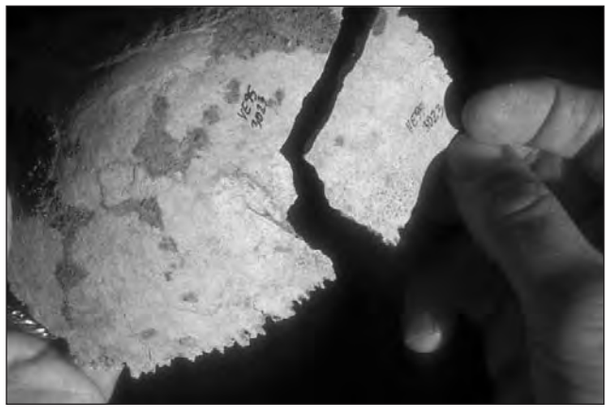


Fig. 8.22. Left parietal fragment bearing evidence for linear sharp force traumatic injury with crushing of the surrounding ectocranial bone

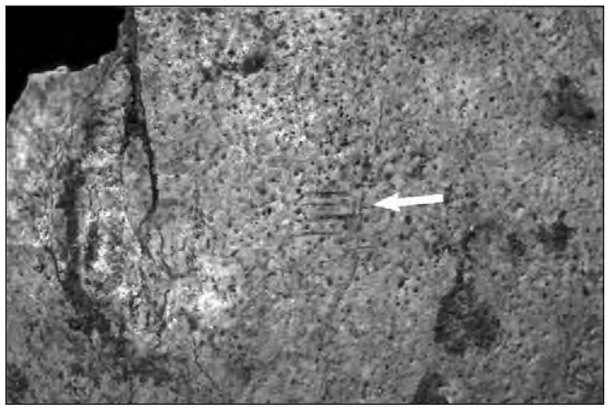


Fig. 8.24. Photograph of cutmarks located in the vicinity of the lesion depicted in Figs 8.22 and 8.23

Fig. 8.23. Ectocranial view of the same lesion depicted in Fig. 8.23 and 8.24, with the internal bevel

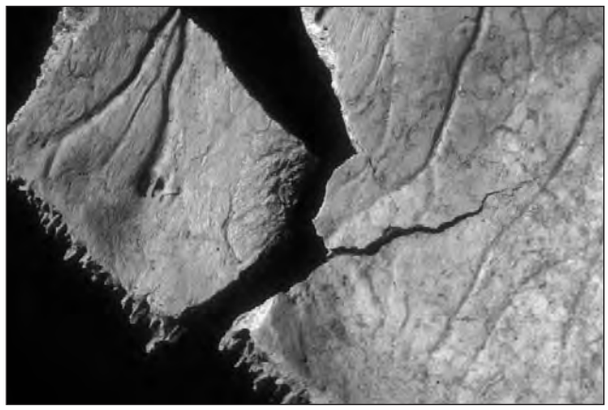
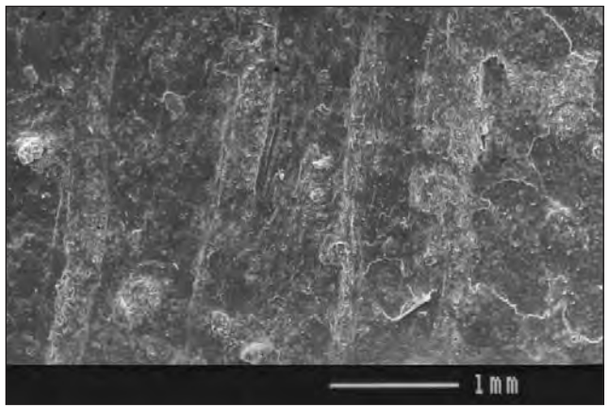


Fig. 8.25. Scanning electron micrograph of the cutmarks depicted in Fig. 8.24



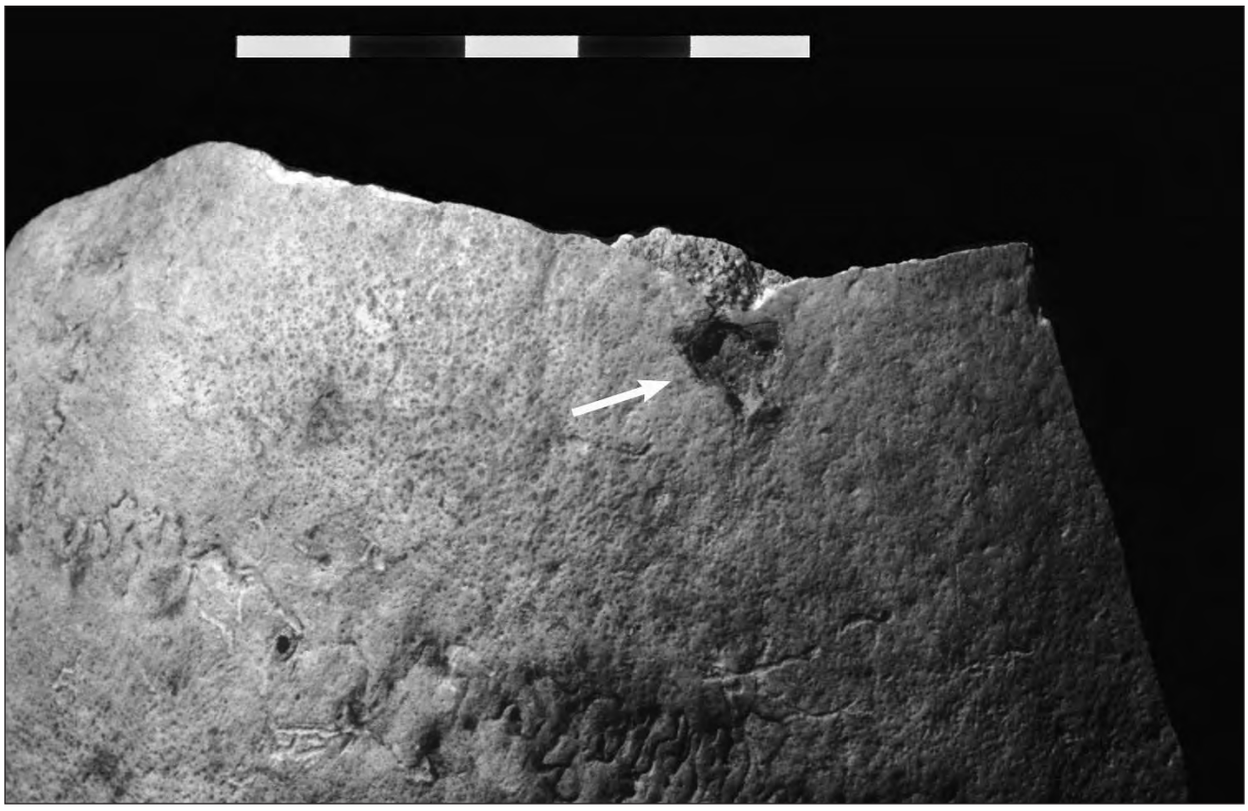


Fig. 8.26. Depressed penetrating injury to the ectocranial surface of the left parietal with a radiating fracture line revealing the diploë layer beneath

appearance of a decapitation injury (Fig. 8.21). The size and rugosity of the mandible suggest that this individual was male. The North Pit also produced two examples of peri-mortem fractures of the cranium. The first consists a left parietal fragment (12/3023), from a younger adult (due to the open appearance of the cranial sutures) with a linear sharp force fracture (Figs 8.22-8.23). This injury was accompanied by a series of small cutmarks around the lesion that might indicate some sort of remedial treatment had been attempted (Figs. 8.24 and 8.25). The second comes from a large fragment consisting of the greater part of a calotte (12/3011), the left parietal of which demonstrates a 'frustrated' penetrating depressed fracture injury (Figs 8.26, 8.27, 8.28). The cross-section of this lesion has the appearnce of having been made by a bronze spearhead. Sonda 12/501 from the overburden/clearance of the site produced a helical fracture on the right ascending ramus of a mandibular fragment and a penetrating injury on a cranial fragment. All of these fractures are of a peri-mortem nature (i.e. those that occurred around the time of death) which thus reveal no signs of healing.

Figs 8.29 – 8.32 display composites of the positions of cut, chop and scrape marks recorded from cattle, ovicaprid, pig and horse bones respectively. These diagrams also include the anatomical position of areas

Fig. 8.27. View of the diploë layer with a 'bulb of percussion'-like appearance of the same specimen depicted in 8.26

Fig. 8.28. Endocranial surface hinge fracture with a portion of incomplete bevel produced by shear forces

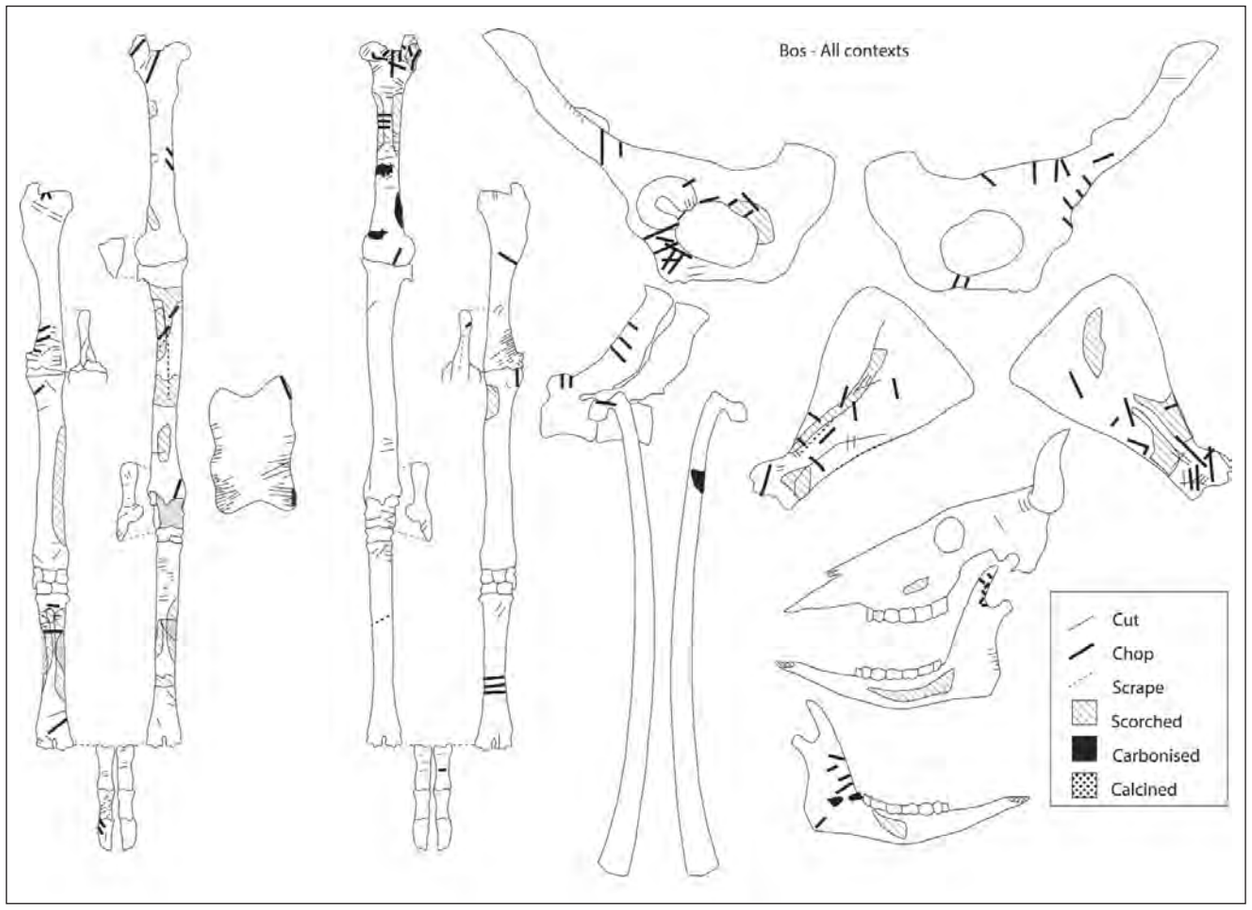


Fig. 8.29. Diagram of cattle butchery

of burnt bone, which are discussed later. Fig. 8.33, rather than displaying all marks, provides a summary of the most common areas of the skeleton bearing marks for all four species considered. Fig. 8.34 provides an interpretation of the patterning in terms of the most common areas of carcass division during the butchery process (after Knight 2002).

Cattle provide a wealth of surface modifications. Following classifications used by Binford (1978, 1981) in his ethnoarchaeological investigations, it is clear that the vast majority of cuts and chops relate either to disarticulation or to filleting. Marks that might be regarded as relating to disarticulation include the many cuts visible on the astragalus and those near the articular surfaces of long bones. Certain zones, such as the distal shaft of the metacarpal or across the ilium and pubis, seem to have derived from separation of joints achieved by chopping though the bone. Clusters of cuts near muscle attachments, for instance near the distal end of the humeral diaphysis, can be regarded as filleting marks. This pattern is entirely consistent with expected patterns of butchery. Whilst the precise patterns, styles and cuts produced by butchery are a form of material culture in themselves, there is nothing in the patterning displayed here that would necessarily suggest any form of non-functional rite in the way that cattle carcasses were divided.

Ovicaprids and pigs do not display the same intensity of butchery, but both disarticulation and filleting marks are apparent and none of the patterning is suggestive of anything other than butchery. Horses display but a few marks, insufficient to see any real pattern. It is likely that both horses and dogs were occasionally, but not so routinely, butchered for their meat.

The patterning of the cut and chop marks on the animal remains are much more frequent than those identified on the human remains. The position of these marks on the non-human remains are interpreted as having been created by tools during the process of butchery. The placement and pattern seen on the human remains is unlike that seen on the faunal remains. Rather than reflecting an organized butchery process involving the reduction of animal carcasses by disarticulation at the joints, the cut marks on the human remains are placed away from joints and represent deliberate infliction of injury, including sharp, blunt and penetrating trauma, to cranial and infra-cranial bones.

Burning

Burning of bones could occur as a result of a variety of activities. Deliberate activities would include cremation (as a funerary rite, which can sometimes include animals), cooking, use of bone as

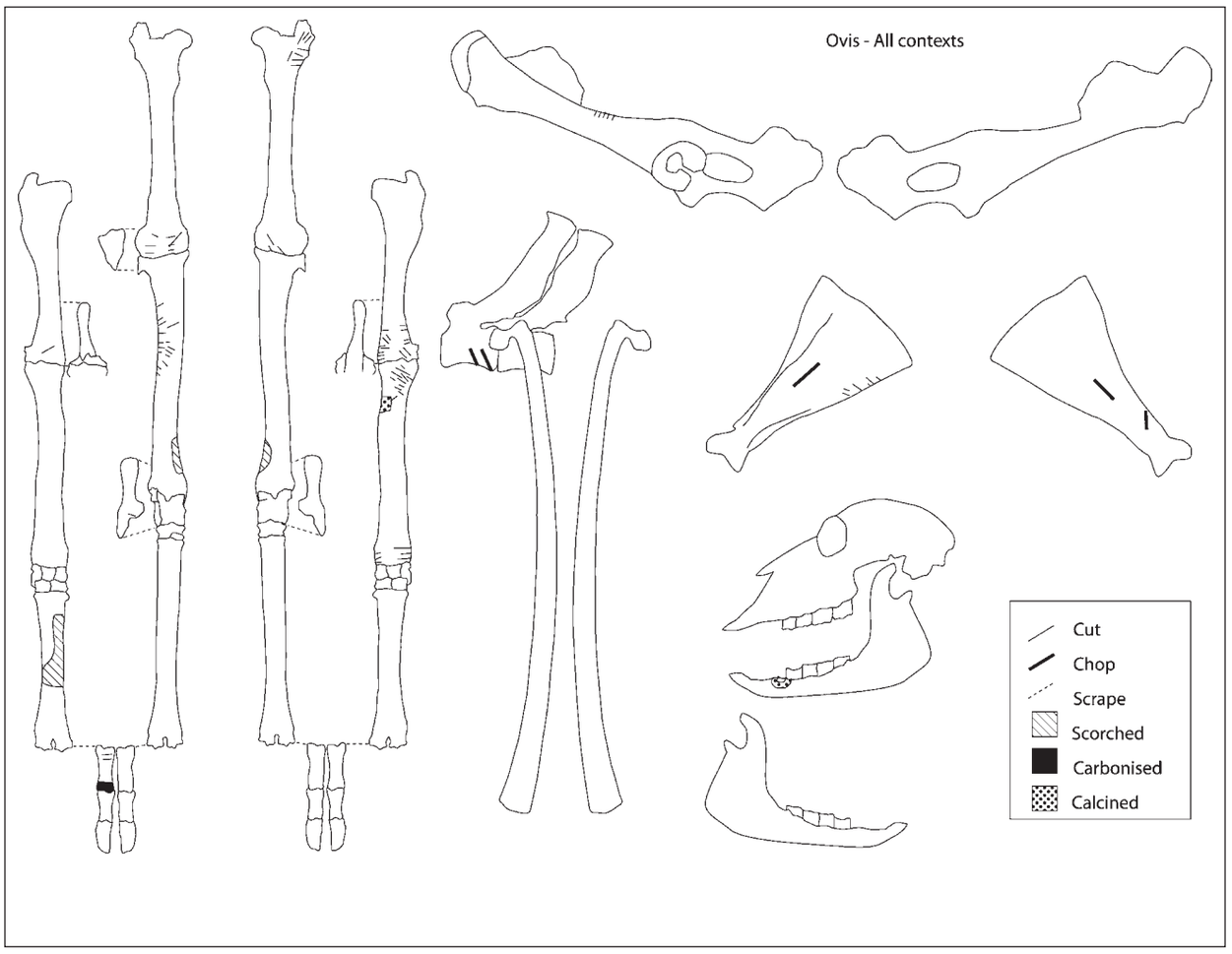


Fig. 8.30. Diagram of ovicaprid butchery

fuel, or use of fire to dispose of waste. Cooking activities, such as the roasting of joints, can leave identifiable evidence, in particular if similar butchery cuts are repeatedly used, because only the bone portions exposed to the fire at either end of the joint will char (Albarella and Sergeantson 2002). Cooking accidents can, of course, also result in burning. Other deliberate or accidental conflagrations may also cause unintentional burning of bones. Different heating events will lead to different levels of change to bone fragments, hence the categorisation of burning into 'scorched', 'carbonized' and 'calcined'.

With regard to animals, Figs 8.29 – 8.32 show the positions of different types of burning upon the bones of cattle, ovicaprids, pigs and horses, respectively. Summaries of all four species can be seen in Fig. 8.33. Only cattle display sufficient instances of burning to potentially display a meaningful pattern. If one studies Fig. 8.29, it is not really possible to see any particular pattern. There does not appear to be repeated burning of joint ends likely to be associated with roasting. Burning is fairly random and at a relatively low level.

Fig. 8.35 shows the percentages of bone fragments displaying signs of burning for both humans and animals. Whilst signs of burning are not particularly common in either category, it is clear that there are more instances of burning amongst animal bone fragments. One obvious possible reason for this is that the animal bones were burned to a greater extent as a result of cooking activities.

Fig. 8.36 displays the proportions of different forms of burning in the three features studied. The highest proportion of calcined bone is form in the Red Ditch. This is perhaps not surprising given the evidence that fortifications associated with this ditch underwent a huge and very hot conflagration (see Chapter 2 above). Fig. 8.37 shows the breakdown of burning types on bone fragments of different species and unidentified bone fragments (classified as to whether they are from appendicular or axial elements). This information does not yield any clear pattern.

In order to understand whether burning is associated with any specific functional or repeated ritual activity, the positions of burning were recorded in detail. The positions of burning on human specimens are summarized in composite form in Fig. 8.38. There were insufficient instances of burning on human material, consisting of only ten fragments, to construct any significant human behavioural pattern, though there were three non-

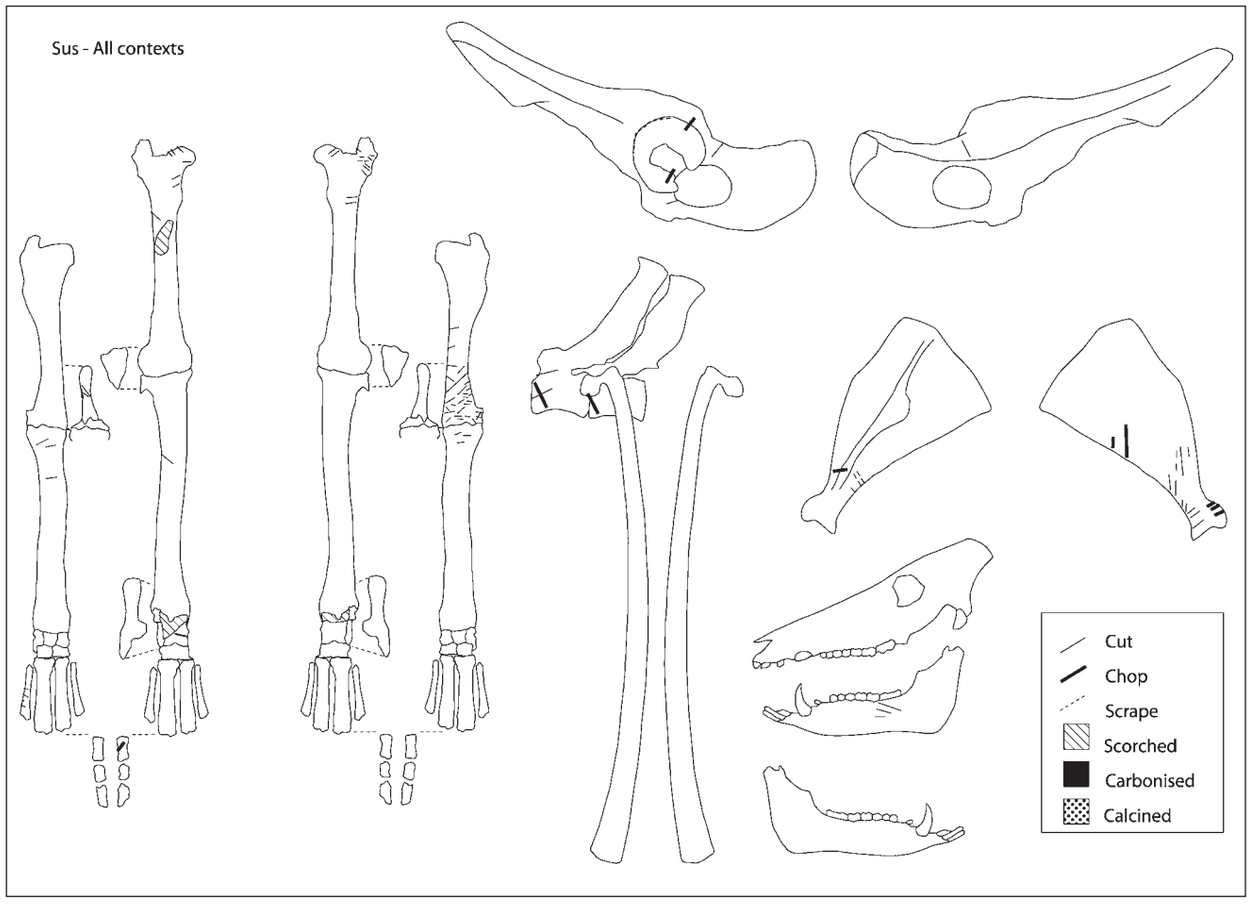


Fig. 8.31. Diagram of pig butchery

consecutive vertebrae that had been carbonised. These include the remains of both adults (N=3) and subadults (N=2), including a mandible from a seven or eight-year-old child and an epiphysis from the greater trochanter of another individual; unfused, therefore, an adolescent. These elements come from both the axial and appendicular skeletons. Fig. 8.39 shows a heavily calcined human intermediate phalanx (12/541) from Ditch 612, while a fragment from a proximal left femur (12/3002) coming from the North Pit of Objekt 64 shows scorching (Figs 8.40 and 8.41). Because the cancellous bone in this fragmented femoral specimen is carbonized, this element appears to have been fragmented prior to exposure to fire.

Other surface modifications

There are three surface modifications that might inform taphonomic and depositional interpretations. Dog and rodent gnawing indicates the presence of those scavengers in the past and, because these animals find only fresh bone attractive, shows that bones were left available for a period between deposition and burial. Root etching is less diagnostic, but improves our understanding of taphonomy in that it occurs on bones nearer the surface of a feature. They can also be used to determine whether or not a bone was broken before or after exposure to the plant roots (Valentin and Le Goff 1998). An SEM image of some root etching from the site can be seen in Fig. 8.42.

Fig. 8.43 compares the percentages of animal and human fragments affected by gnawing or root etching. Almost 10% of animal bones were gnawed, whilst virtually no human bones were. It appears that animal remains were much more available to scavengers following their deposition. Instances of root etching are very high amongst animal remains, but low for human remains. Fig. 8.44 shows the percentage of bone fragments in the three main features affected by root etching, dog gnawing and rodent gnawing. It can be seen that most of the gnawing is dog gnawing rather than the result of rodents. Root etching is much more prevalent in Ditch 612, probably because it was quite shallow and more material was within the reach of plant roots. This explains the higher prevalence of etching amongst animal remains, since Ditch 612 contains a large proportion of the animal assemblage but very little human material. One other type of surface modification that was tentatively identified was claw marks. Fig. 8.45 is a photograph of possible claw marks on a human humerus is combined with an SEM image of these marks.

Fracture Patterns

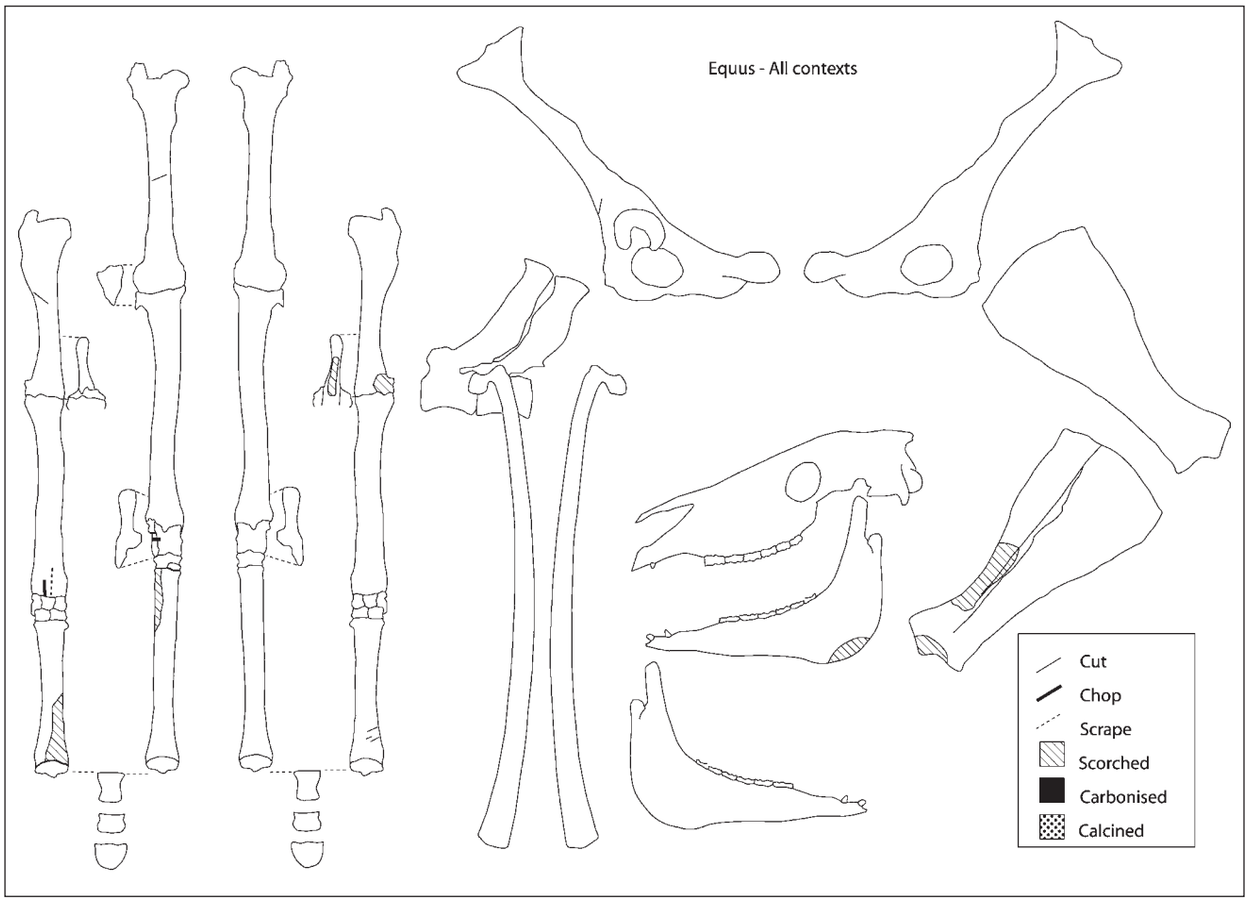


Fig. 8.32. Diagram of horse butchery

Bone fracture morphology is indicative of both the timing of bone fracture (e.g. peri-mortem, when still fresh, or when in the early stages of deposition) and the method of fracture (e.g. by direct or indirect dynamic sharp or blunt force). Fig. 8.46 shows the proportions of helical (peri-mortem), dry and mineralised fractures identified on specimens of different species. There is also a total summary for all fragments and one for all non-human animals. The general pattern is a stark one. Helical fractures are very rare on human bones, showing that very few bones were broken at or around the time of death. Instead the human fractures are either dry or mineralised, indicating that the majority of breaks occurred after there had been a degree of drying and collagen loss. In other words, most breakage appears to be part of the assemblage's post-depositional taphonomic history, rather than as a consequence of peri-mortem events.

In contrast, all the animal species show a significant level of helical fracture. Cattle show the highest level of such breakage. Such fracturing could be part of the method of butchery of an animal and, in particular, could be related to the extraction of marrow from bones with medullary cavities. Fig. 8.47 attempts to elucidate this possibility by showing the proportions of fracture type for animal bones classified as having either a low or high marrow fat yield, calculated by using average fat yield data derived from Binford (1978) and Outram and Rowley-Conwy (1998). This chart shows that helical fracture is far more common on animal bones with higher marrow fat yields. This is clear support for the interpretation that marrow exploitation is the principal reason for the presence of these fractures in the assemblage. Fig. 8.48 show the same diagram for human bones. The helical fractures on human remains also tend to be on the bones yielding more marrow, but the total number of helical fractures is so low, and is so unlike the proportions in the animal bone, that a similar interpretation for the human remains seems unlikely.

Detailed results of the human fracture and fragmentation pattern

The extent of fragmentation was determined using Morlan's (1994) percentage completeness (Fig. 8.49). The great majority of the elements from these assemblages sustained fractures (i.e. breaks) other than helical fractures (Fig. 8.50), which would indicate that the breakages occurred after deposition and not before; this represents post-mortem fragmentation and was not a peri-mortem process, as one might expect if fragmentation was a part of a mortuary rite. Ribs, which are friable and thus easily fragmented, form the greater majority of the fragments (N=334) (Fig. 8.2). The cranium is also amongst the most

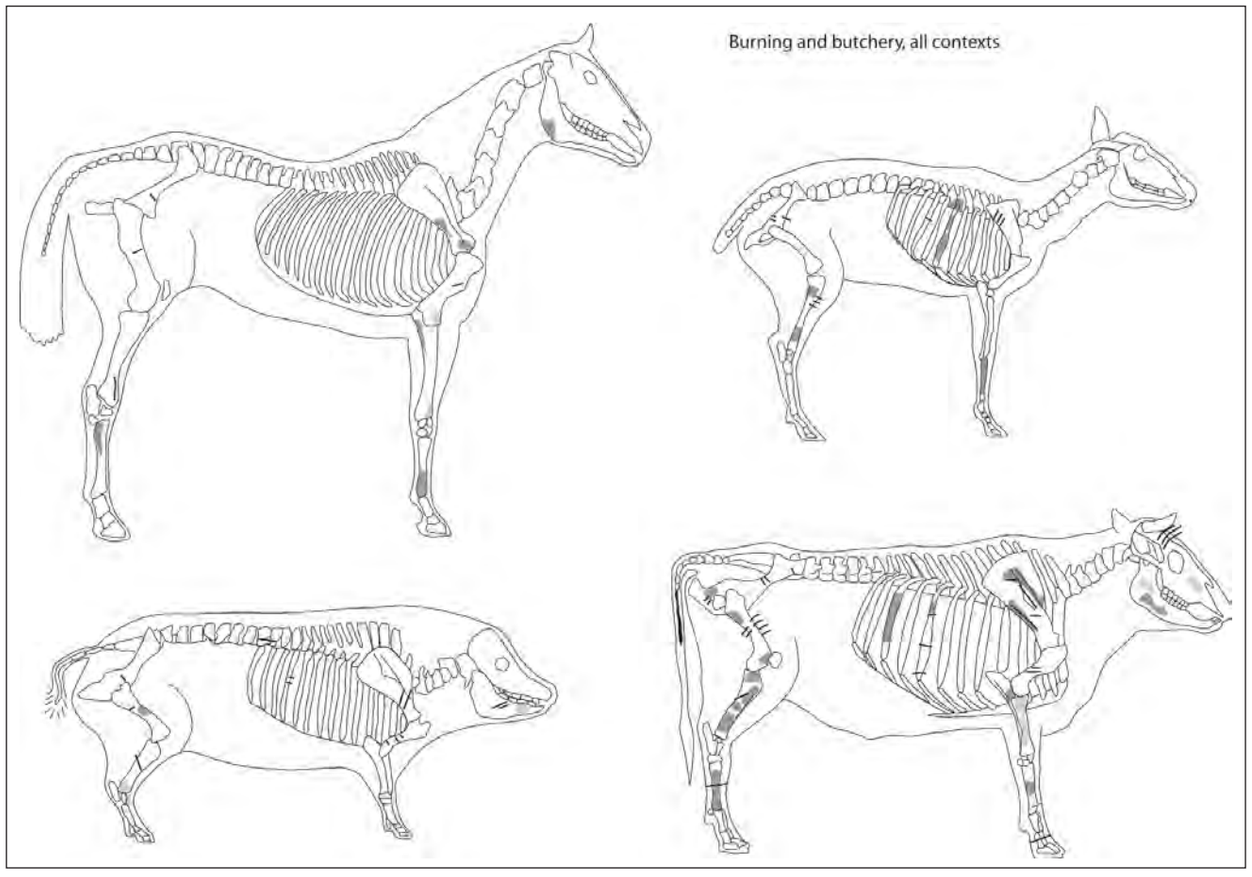
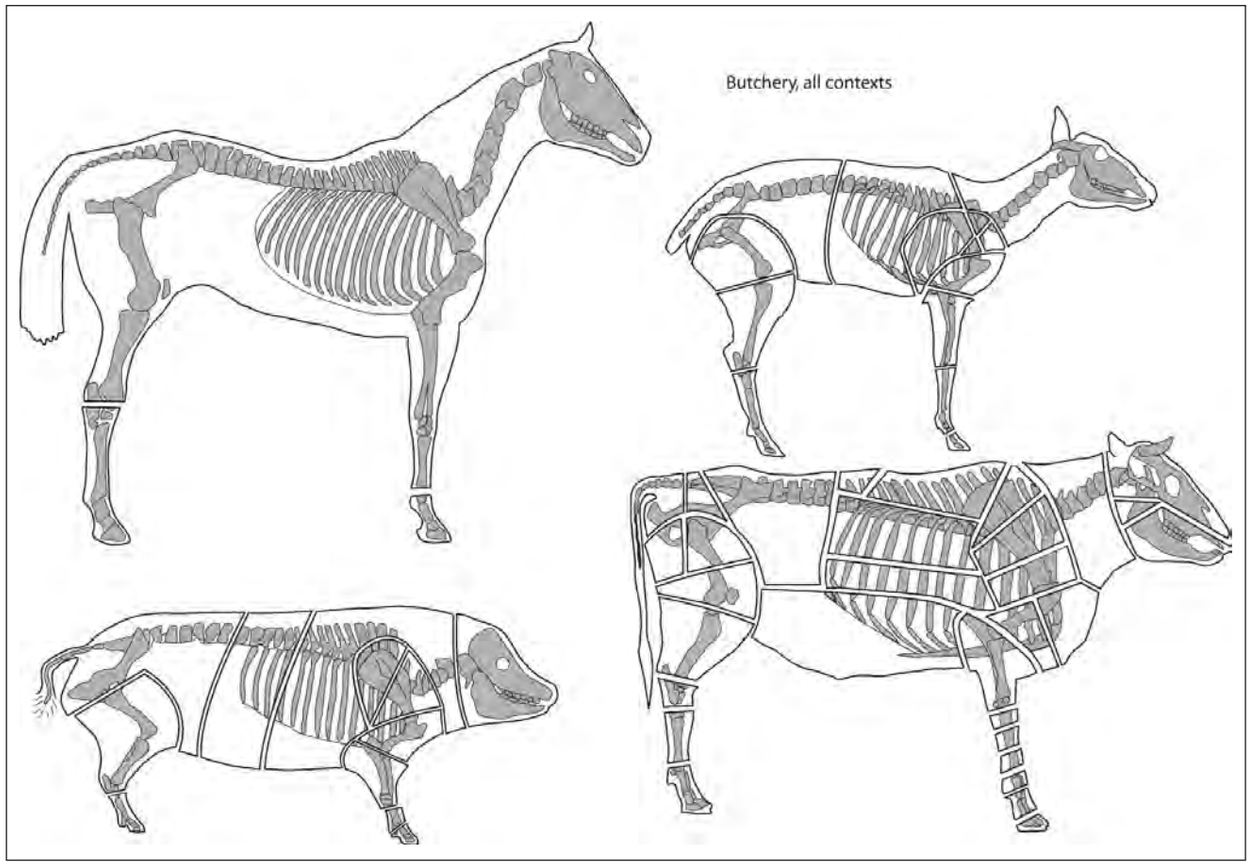


Fig. 8.33. Summary diagram of animal butchery

Fig. 8.34. Interpretation diagram of animal butchery



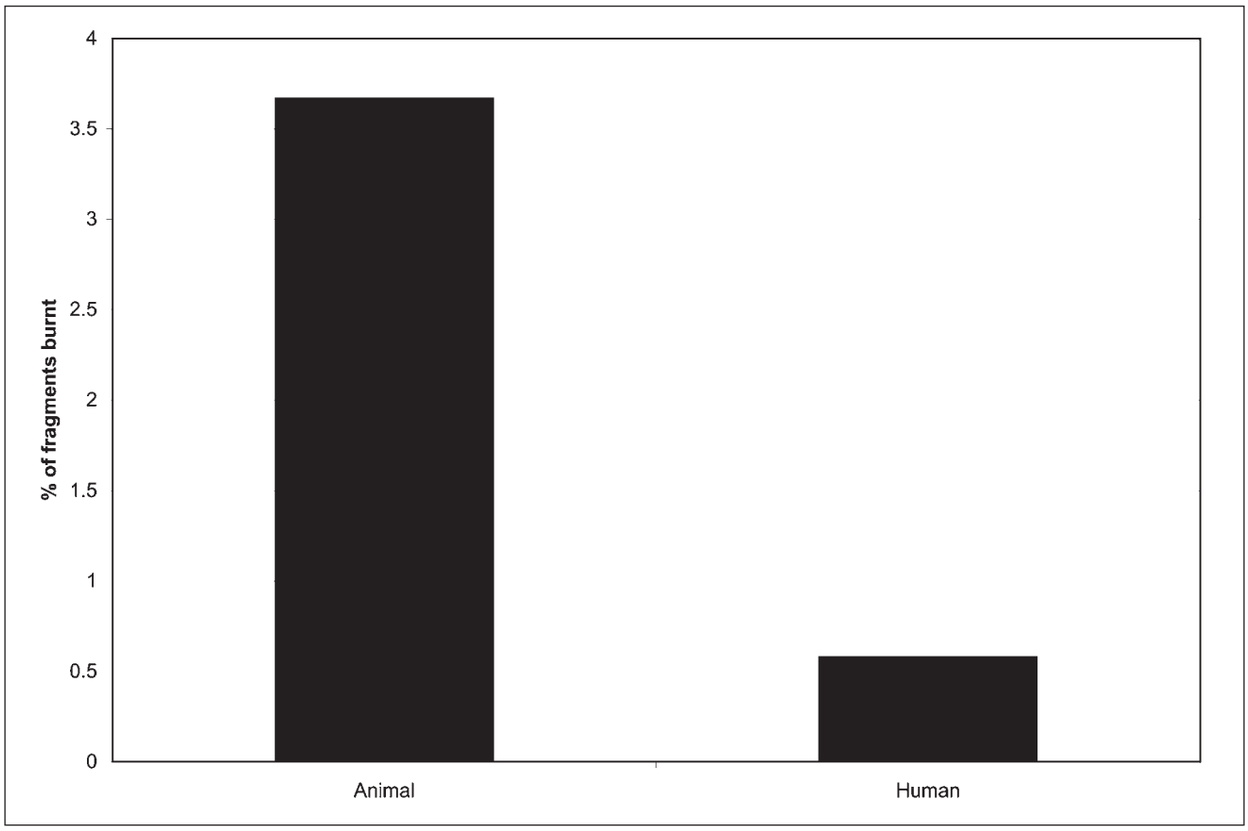
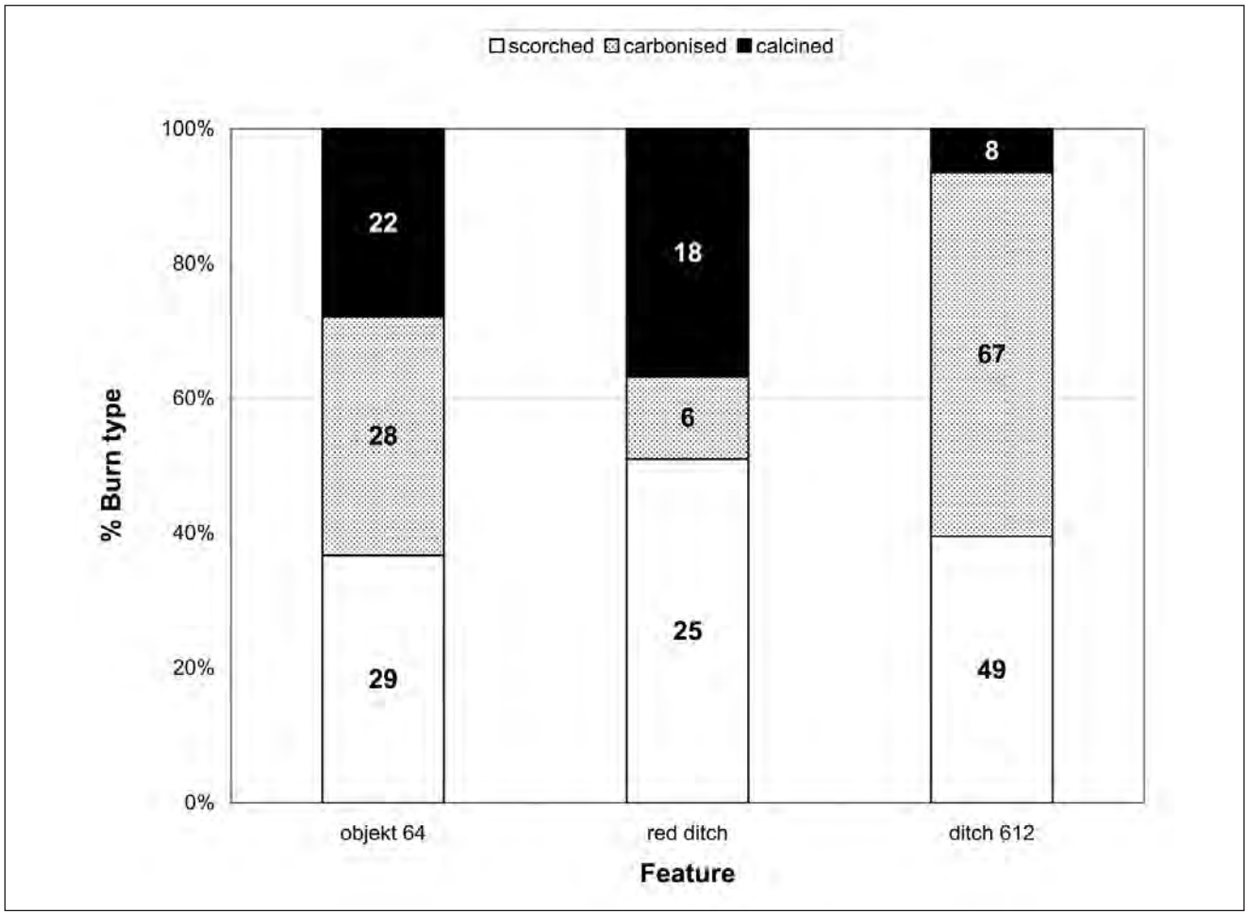


Fig. 8.35. Graph of burning proportions human/animal

Fig. 8.36. Graph of proportions of burning type by context



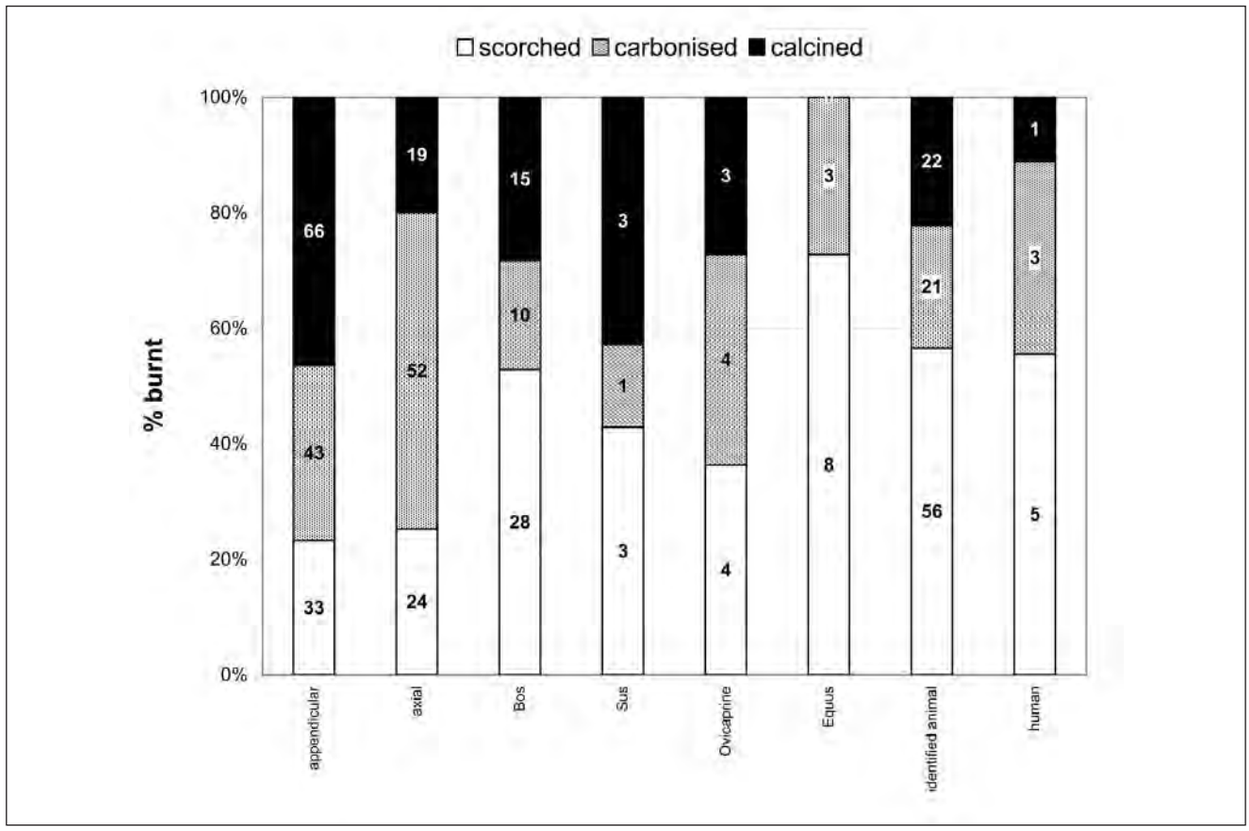


Fig. 8.37. Graph of proportions of burning type by species

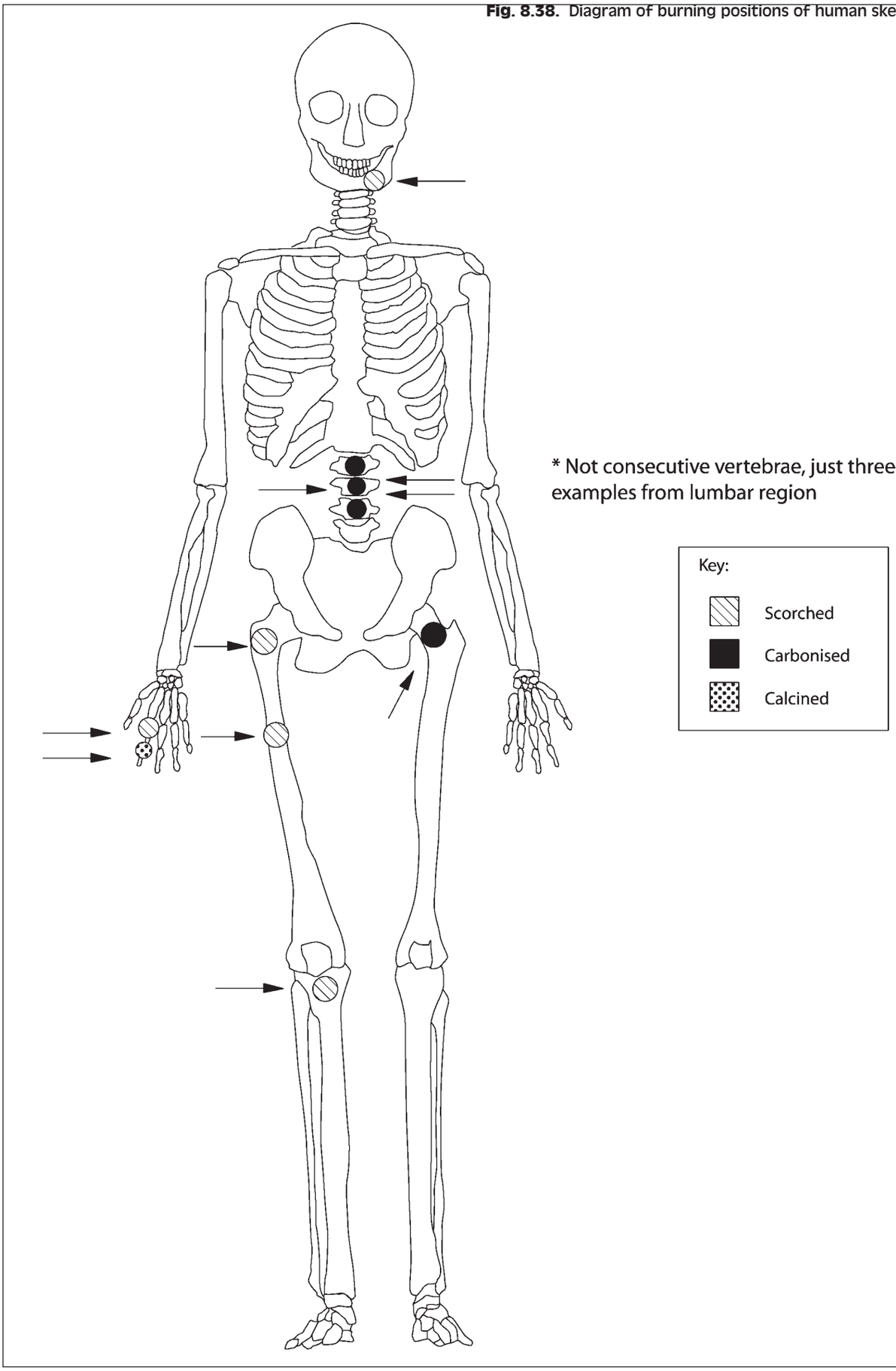
fragmented skeletal structures (N=175), while the small bones of the hands and feet, the patella, and coccyx are least fragmented. In addition the clavicle and axis are also among those elements that are less fragmented; these occur in an unfragmented state in over 90% of occurrences. When Objekt 64 North and South Pits in Sonda 12B are compared with Objekt 64 features excavated in Sonda 12C, the pattern of fragmentation and completeness is very similar. This suggests that these features were equally disturbed in the past. The only exceptional difference occurs with the mandible; the North and South Pits contain four complete mandibulae (Figs 8.51 and 8.52).

Only six elements (1.4%) possessed helical (i.e. peri-mortem) fractures, with the great majority falling in the dry fracture category (69.6%) and the next most common fracture type being of the mineralised variety (i.e. recent) (28.9%) (Fig. 8.50). This assessment of the situation is supported by reference to the extent of fragmentation in the non-human remains from the site. These remains are much more greatly fragmented when homologous elements are compared. Thus, for example, only 23.1% of the femoral zones are represented among the identifiable non-human specimens; whereas, among the human remains the femora are represented by 35% of the zones (compare Figs 8.7 and 8.49).

When human and non-human relative completeness of elements is compared, they are similar across species. Generally, though, the percentage survival is higher in humans than in non-humans, which again suggests that the human remains are less fragmented than those of non-human species (compare Figs 8.7 and 8.49). For example, the smaller, dense human metacarpals and metatarsals are less fragmented than are their homologues in the non-human species present. This reflects the greater fragmentation in the large ungulate metapodials for retrieval of marrow. The human metapodial survivorship is most similar to that of the pigs, a species with smaller bones that are not as frequently broken for marrow extraction due to their smaller size and density.

Fig. 8.14 shows the positions of helical fractures and dynamic impact scars on a composite human skeleton. Figs 8.53-8.57 are photographs illustrating some of these fractures in detail. The rampart area of Sonda 12 produced a helically fractured fragment of a humerus (12/503); this is a butterfly-type helical fracture of the diaphysis of a humerus (Fig. 8.53). Trench A of Sonda 12C produced a fragment of a right femoral diaphysis with an impact scar and helical fracture (12/2615) (Fig. 8.54). In addition, this feature provided a right femoral fragment with an impact scar and helical fracture (12/221) (Fig. 8.55). Feature 64 from Trench B of Sonda 12C produced one of the more unusual specimens, a left proximal end of a human femur (12/2636) that ended in a dry fracture of the diaphysis (Figs 8.56 and 8.57).

Fig. 8.38. Diagram of burning positions of human skeleton



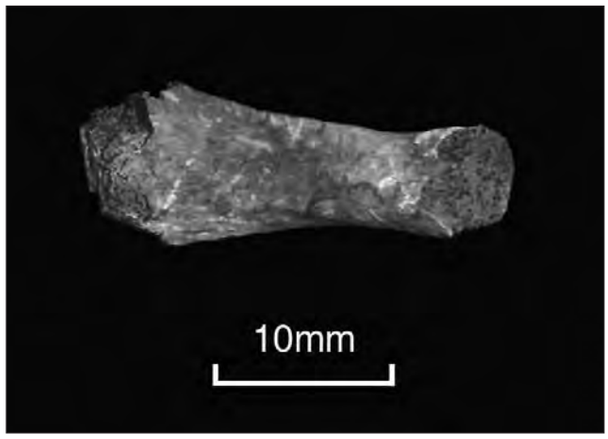
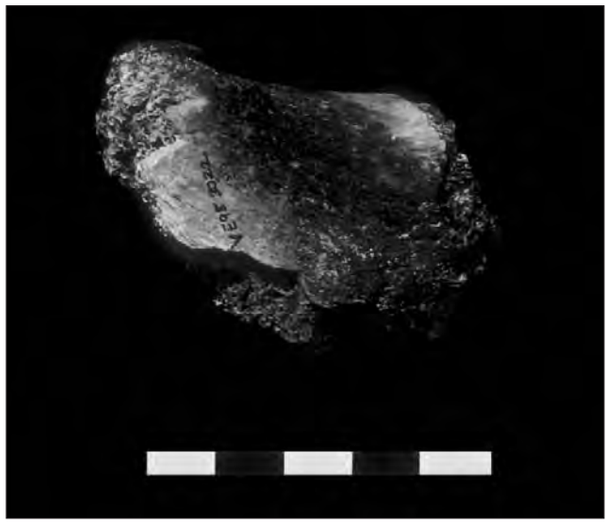


Fig. 8.39. Heavily calcined human intermediate phalanx

Fig. 8.40. Human femur fragment with evidence of scorching



Consideration of the proportions of fracture patterns in the three main features is particularly revealing. Objekt 64 has a much higher proportion of dry and mineralized fractures and relatively few helical fractures. At first sight, this could simply be a function of the fact that Objekt 64 had a high proportion of human content and, above, it has already been established that human remains have a low prevalence of helical factures. The high human content of this feature is not the reason for the pattern, however, since Figs 8.58 and 8.59, which illustrate the fracture patterns in features for identifiable animal bones only and unidentifiable fragments, show that the low prevalence of helical fractures is repeated on all types of bone fragments. The high level of dry and mineralized fracturing in Objekt 64 must, therefore, be the result of the taphonomic history of that feature. The dry and mineralized fractures may well be indicative of post-depositional disturbance of the deposits of a nature sufficient to cause fracture rather than just displacement. This pattern is confirmed by the human remains from the same feature, which also demonstrate a substantially higher frequency of dry and mineralised fractures compared to a very small prevalence of helical fractures (Fig. 8.50).

Fragmentation Patterns

Fig. 8.60 shows degrees of fragmentation of the assemblage, by feature, with regard to the size class of bone fragments. The pit circuit (Objekt 64) clearly contains many more small bone fragments. The higher level of fragmentation supports the interpretation that additional dry and mineralized fracturing occurred within that context.

DISCUSSION

As part of his analysis of the human remains from Blučina, Jelínek (1957) reviewed the burial evidence for the Middle and Late Bronze Age of Moravia and neighbouring regions. He opposed the lack of regular patterning of the burials of the Middle and Late Bronze Age with the more regular patterning of the Early Bronze Age Únětice Culture, with individuals being found in crouched positions on their sides, or occasionally seated, and

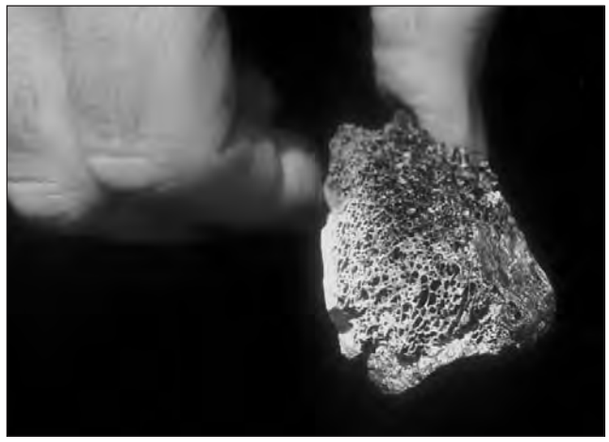
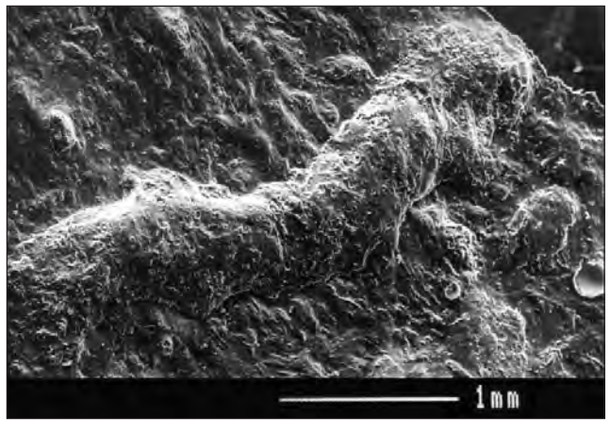


Fig. 8.41. The same specimen as depicted in Fig. 8.40 showing the scorched cancellous bone within the femoral fragment

Fig. 8.42. Scanning electron micrograph image of root etching



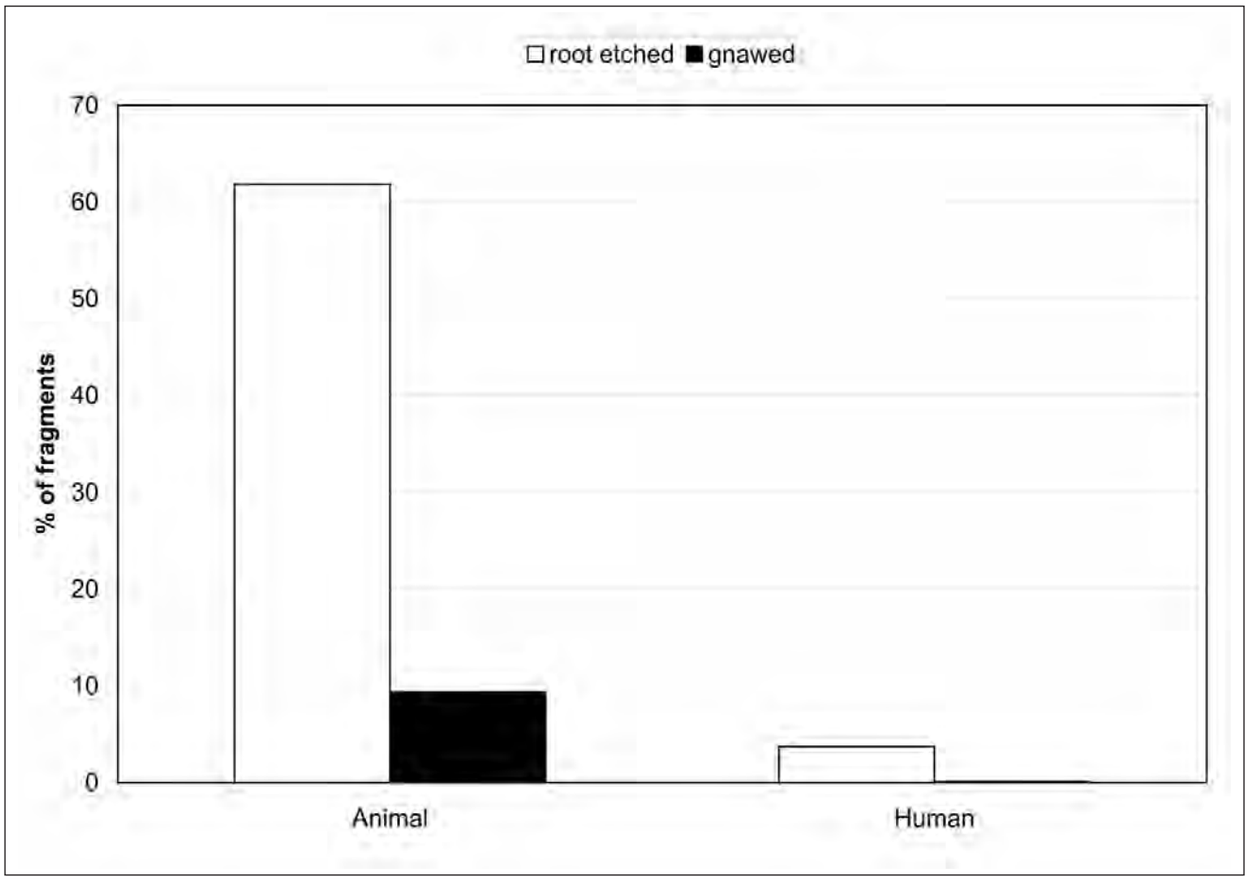
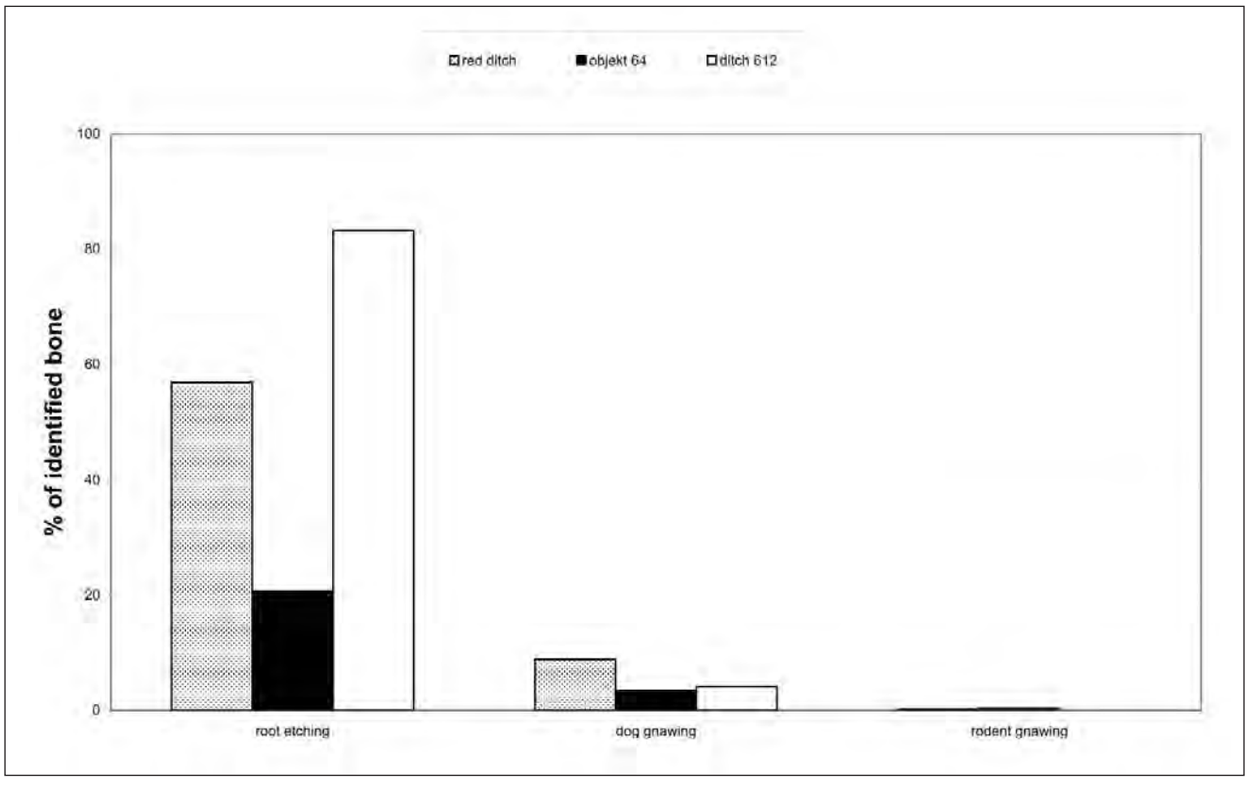


Fig. 8.43. Graph of root etching and gnawing human/animal

Fig. 8.44. Graph of root etching and gnawing by context



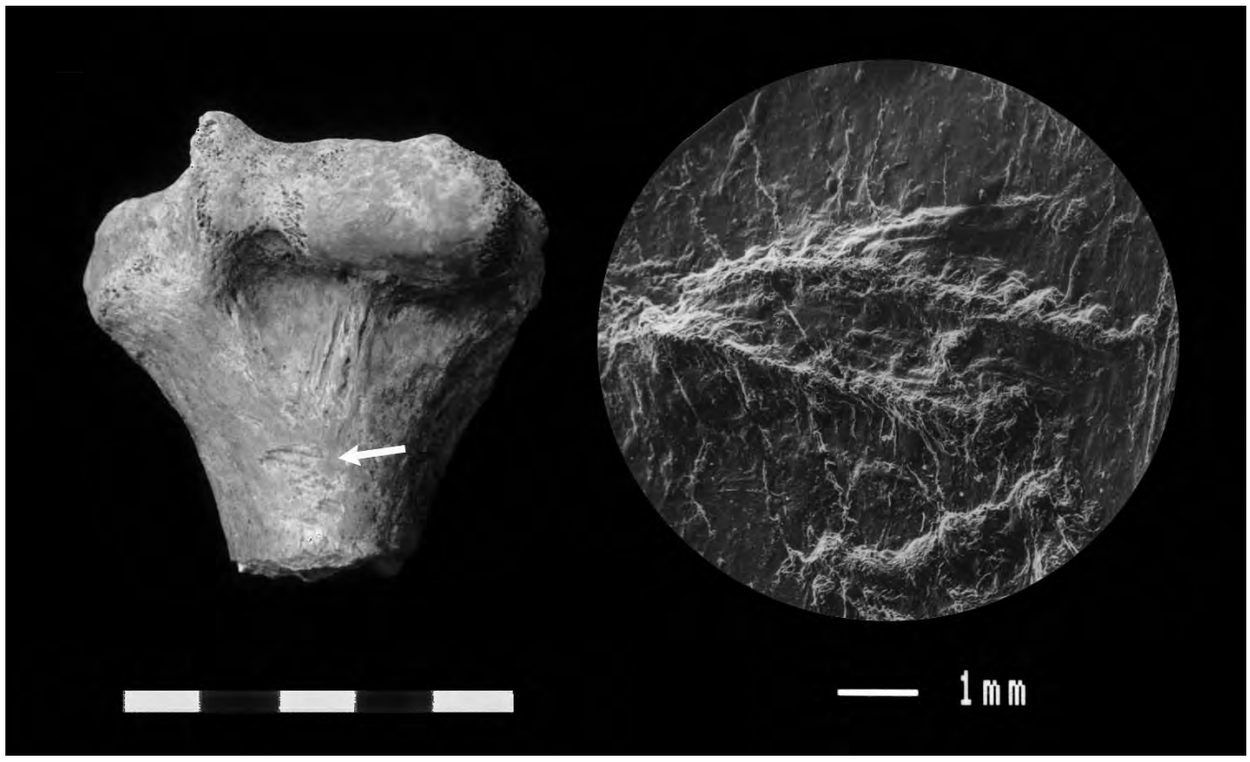
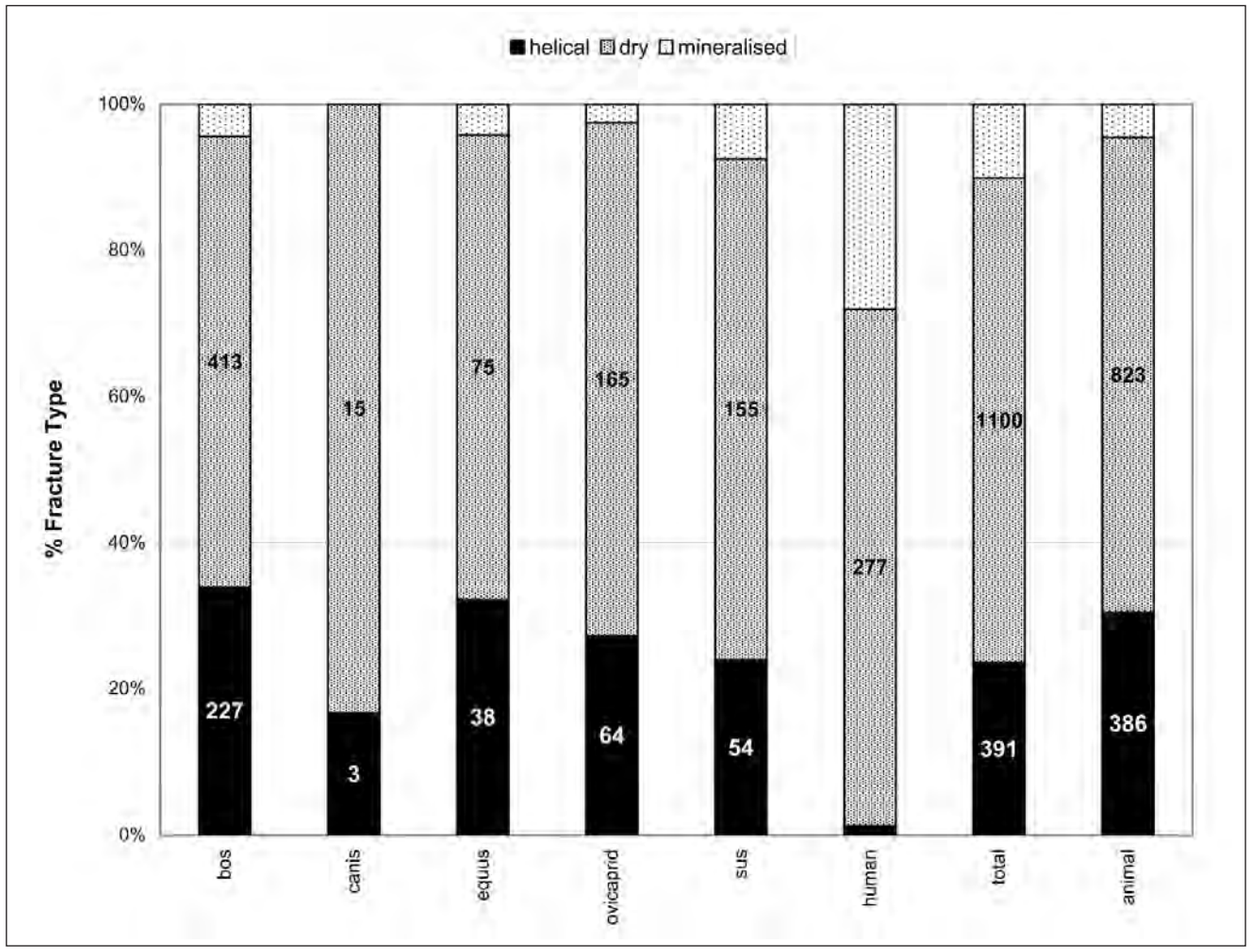


Fig. 8.45. A distal right human humerus with abrasions on the anterior diaphysis

Fig. 8.46. Graph of fracture type by species



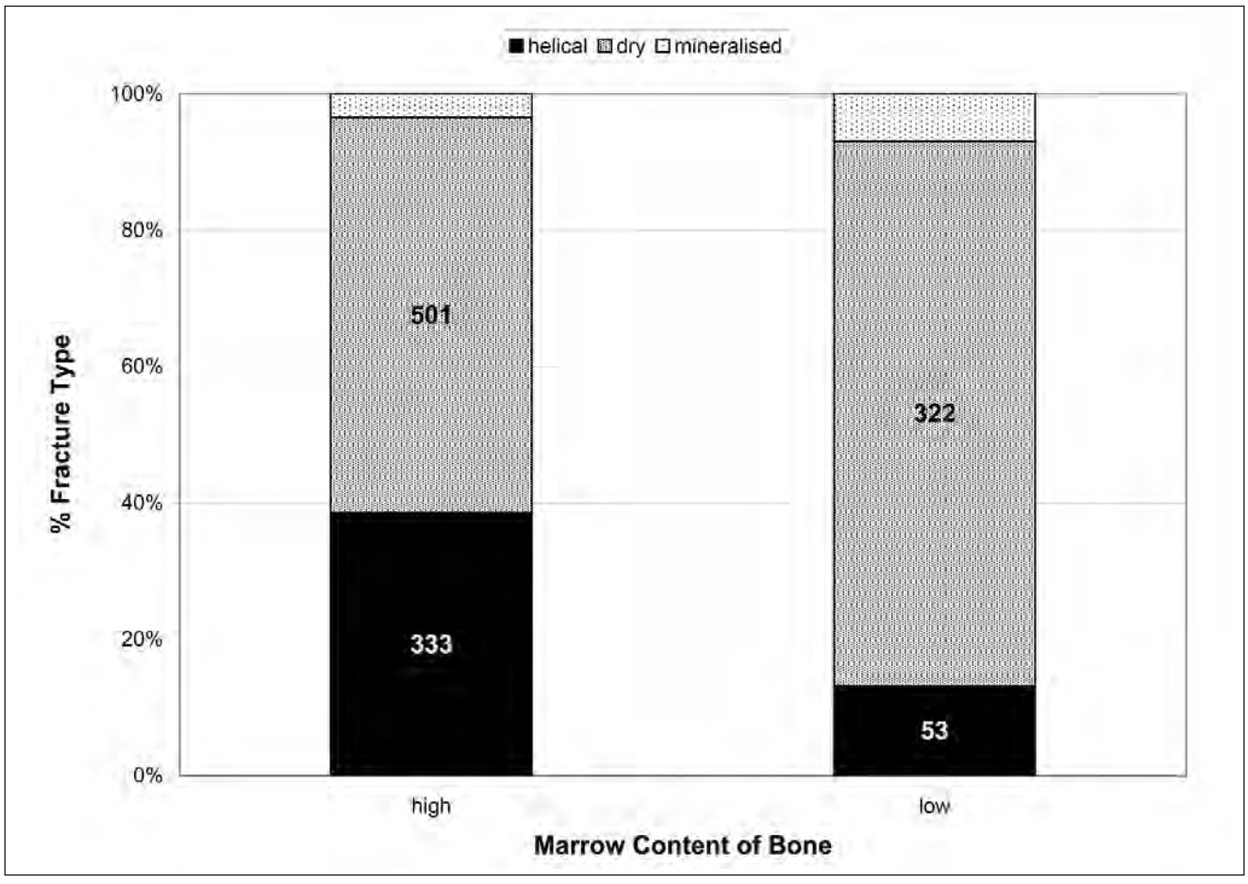
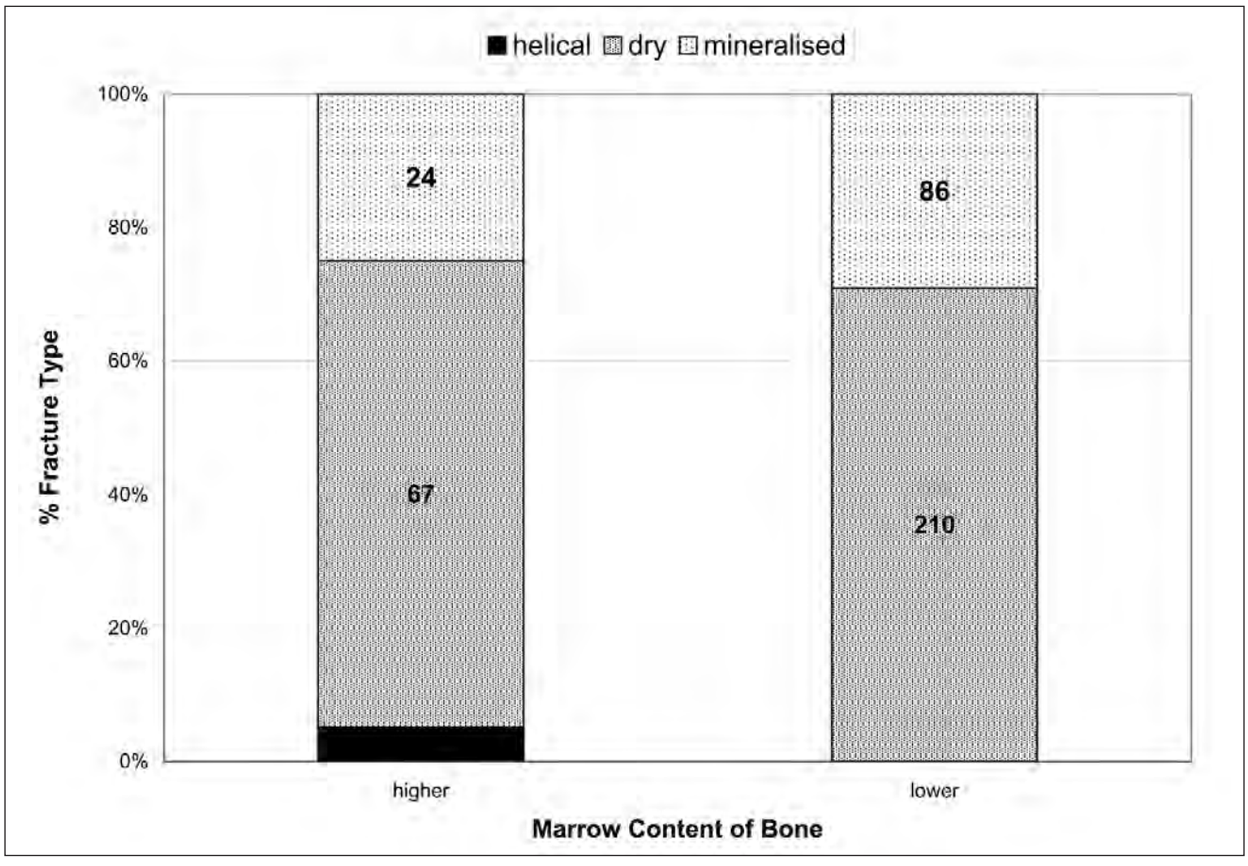


Fig. 8.47. Graph of animal fractures high marrow/low marrow

Fig. 8.48. Graph of human fractures high marrow/low marrow



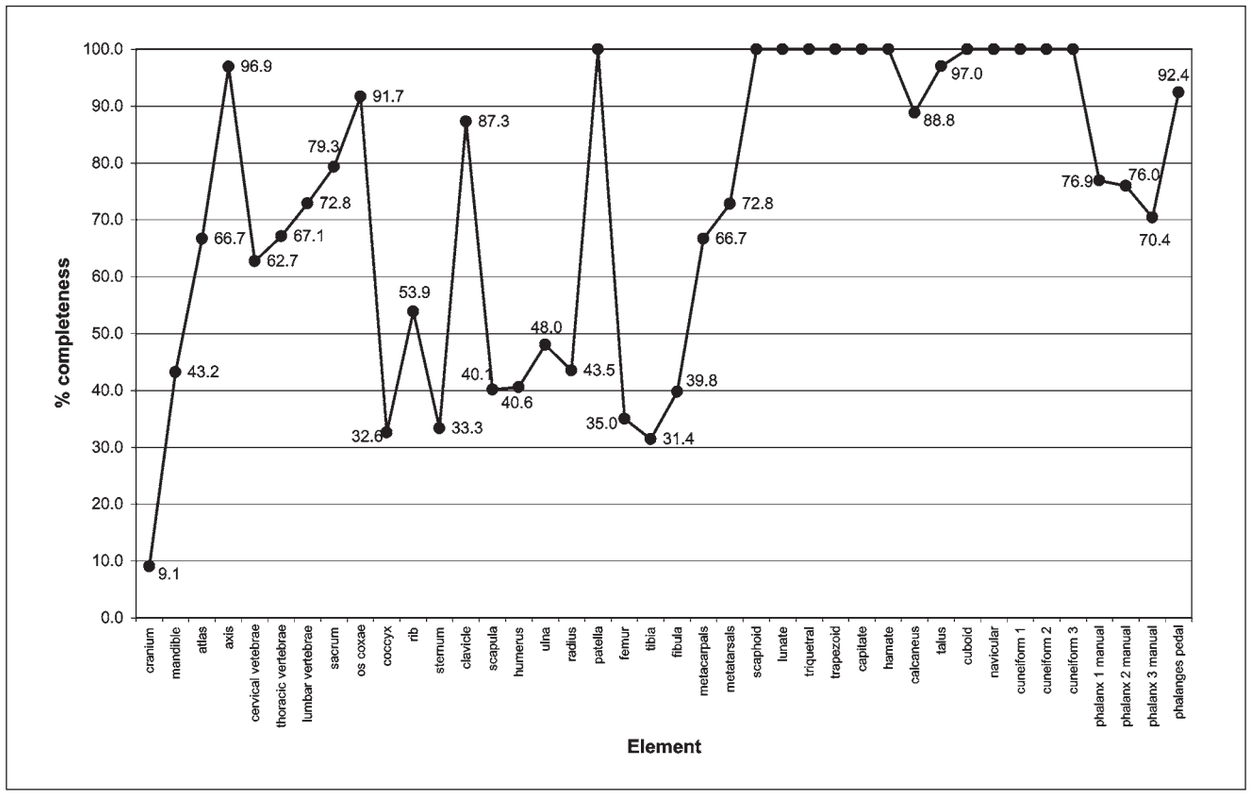
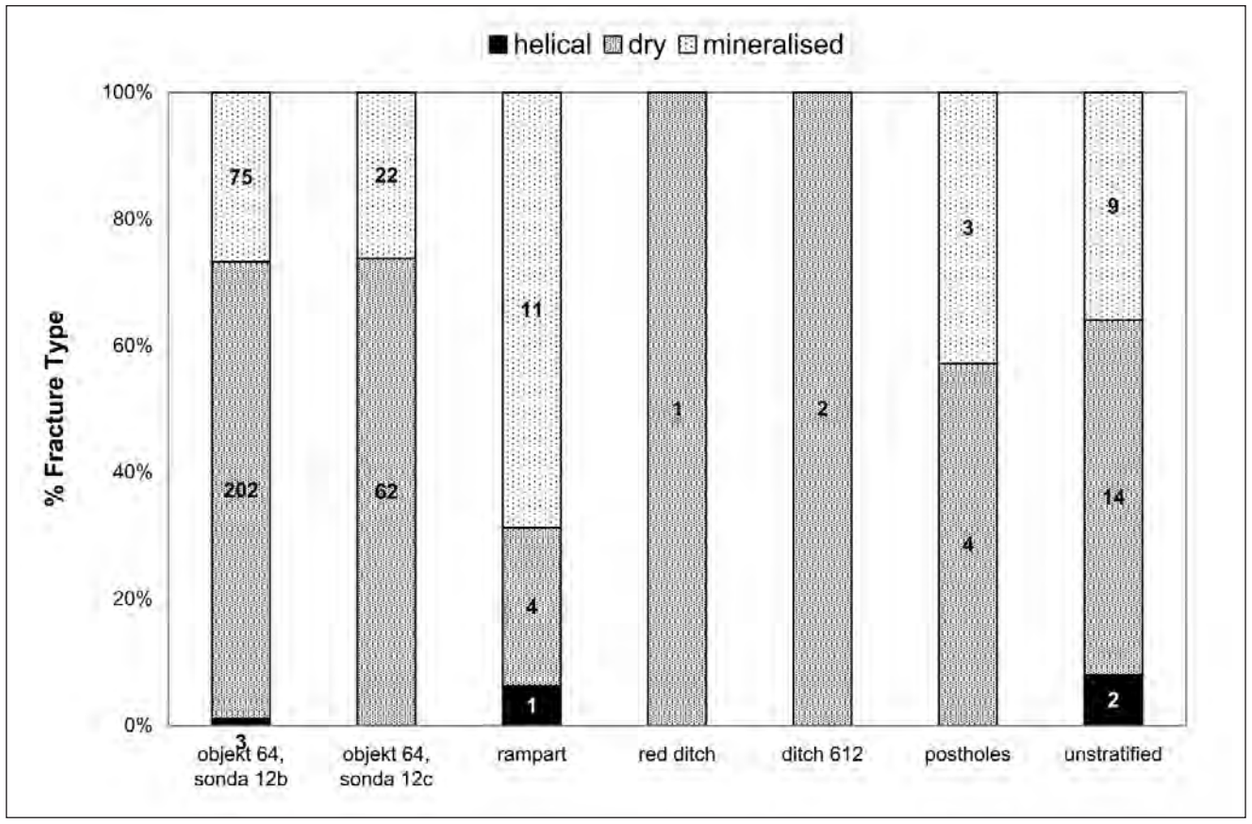


Fig. 8.49. Morlan's percentage completeness for human remains

Fig. 8.50. Fracture type proportions for human remains



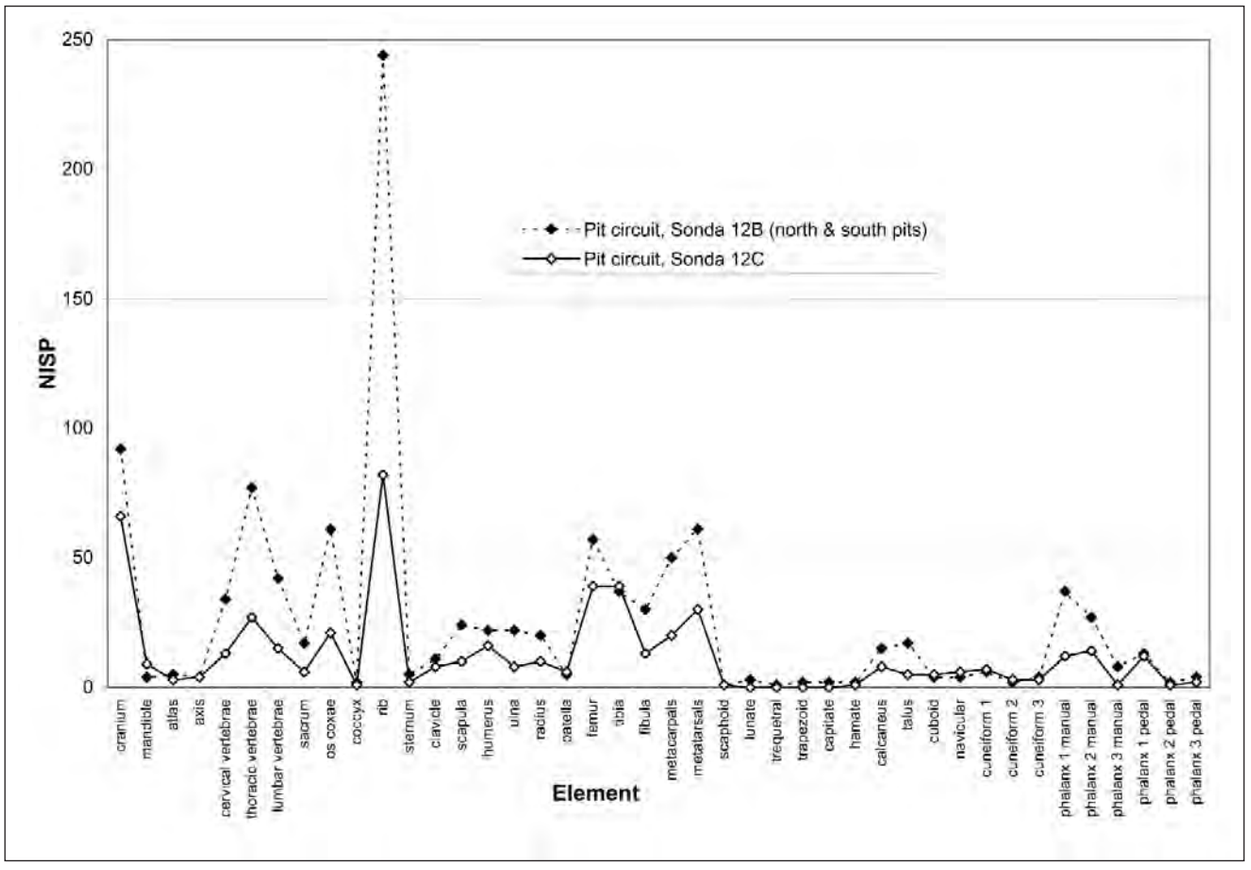


Fig. 8.51. NISP for North and South pits and Sonda 12C

Fig. 8.52. Percentage completeness for human remains from Sondage 12B and 12C

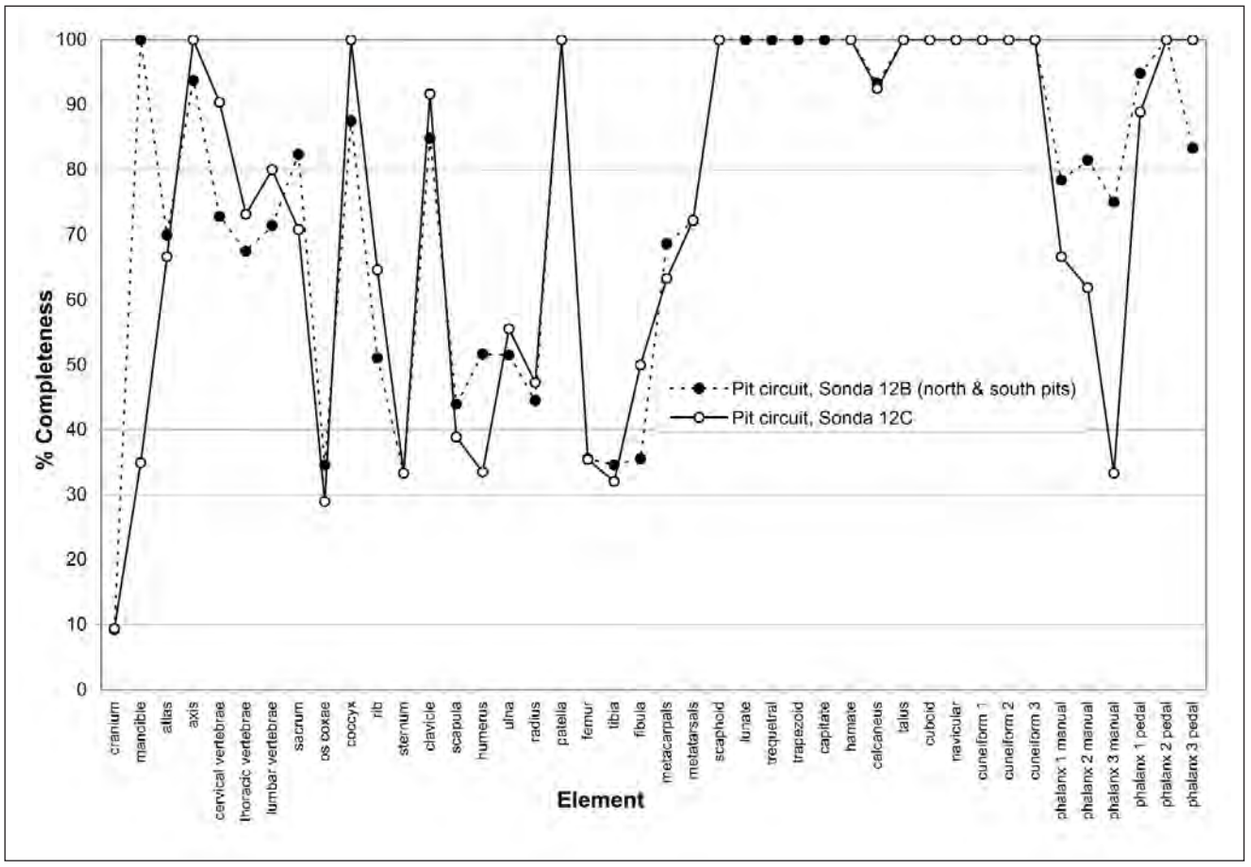


Fig. 8.53. Butterfly fracture from the diaphysis of a human humerus from Context 12/503

Fig. 8.54. Helical fracture from a human right femoral fragment that also bears an impact from Context 12/2615

Fig. 8.56. Cut-marked human proximal left femur with dry fracture

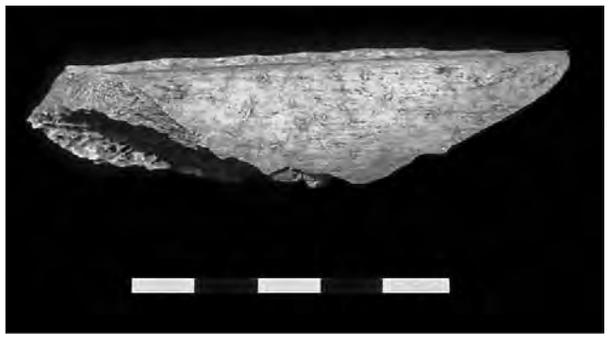


Fig. 8.55. Helical fracture from a human right femoral fragment that also bears an impact from Context 12/221

accompanied by grave inclusions. These highly organised burials, he surmised, represented a 'deep reverence for the dead' (Jelínek 1957, 119) that contrasted sharply with later burials, which were more often found in pits at large enclosures and settlement sites and do not possess the same regularity in burial position. Moreover, Jelínek noted that, occasionally, burials of Early Bronze Age date were found in situations resembling those of a later date, and in order to explain this contrast in what he understood as burial traditions, he invoked what is today referred to as 'gustatory' and/or ritual cannibalism since the human remains were found mixed with those of food animal species. He could not attribute this situation to what is now called 'survival cannibalism', where through necessity and in the absence of suitable animal meat people eat human flesh. He wrote:

> "Matiegka [the excavator of a settlement at Knovíz published in 1893-1895] reaches the conclusion in his work that true anthropophagy (and not partial

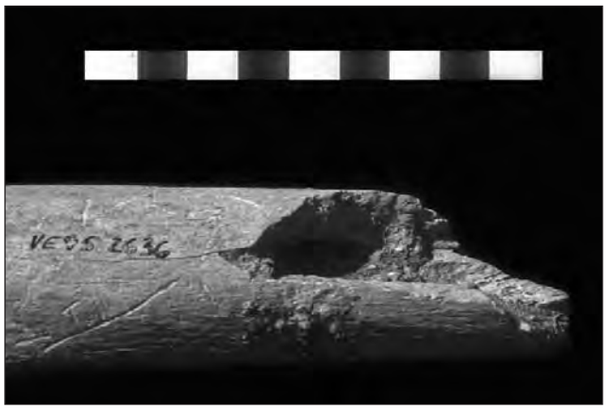


Fig. 8.57. Close-up of the dry fracture present on the femur depicted in Fig. 8.56

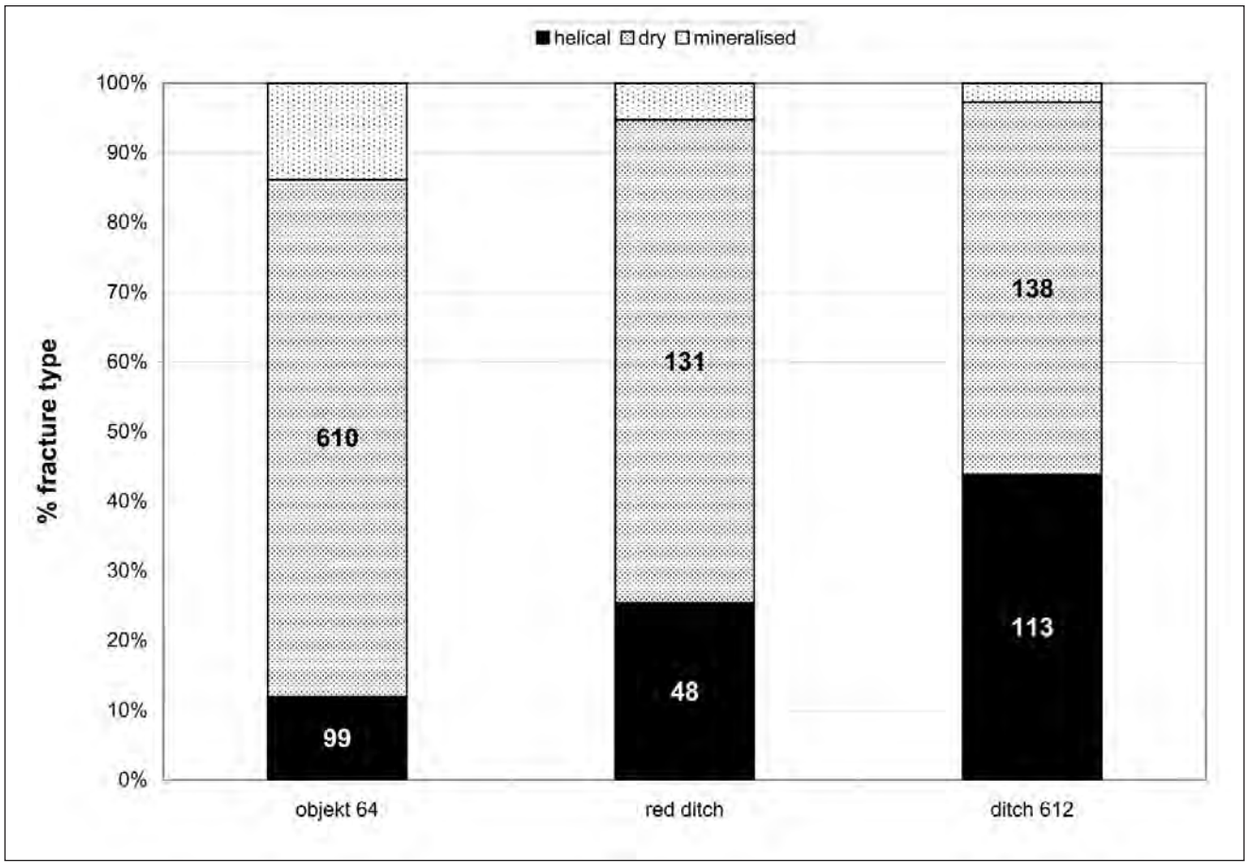
or symbolic) was carried at the Knovíz settlement, as is testified to by the placing of he bones and their being split, cut, and burnt. This anthropophagy was not carried on out of necessity, since along with the human bones there were also found numerous animal bones. Matiegka points out that the preference was given to y[o]uthful individuals. The parts of the human remains prefer[r]ed were the bone marrow, the brain, perhaps the soles of the feet and the palms and certainly the flesh of the trunk and limbs. 'The flesh was baked, perhaps also boiled' [quotation in original]".

Jelínek considered that cannibalistic behaviour constituted one of the funerary rites of the Middle and Late Bronze Age. In other words, and following a culture-historical model, he intimated that this funerary behaviour had its origins in the Early Bronze Age, where it occurred sporadically, but became more common in the subsequent Middle and Late Bronze Age periods in the region. He wrote:

> "I have reached the conclusion that as early as the Old [i.e. Early] Bronze Age we encounter quite isolated examples of burials, and sometimes multiple burials, whose character points to a connection with finds from the Mid and Late Bronze Ages. Even though some of the finds from neighbouring regions are remarkable… nevertheless I have not found completely convincing evidence of anthropophagy in the Moravian material for this [early] period. The majority of the burials belonging to this period are carried out with a ceremonial placing of the dead in the grave which testifies to reverence for the deceased."

Although he did not at any point provide a definitive list of attributes of these assemblages, influenced by the writings and impressions of the previous excavators' reports and commentaries, he associated the following features of these assemblages with cannibalism: pit burial of scattered human

Fig. 8.58. NISP for graph of fractures by context for identified animal



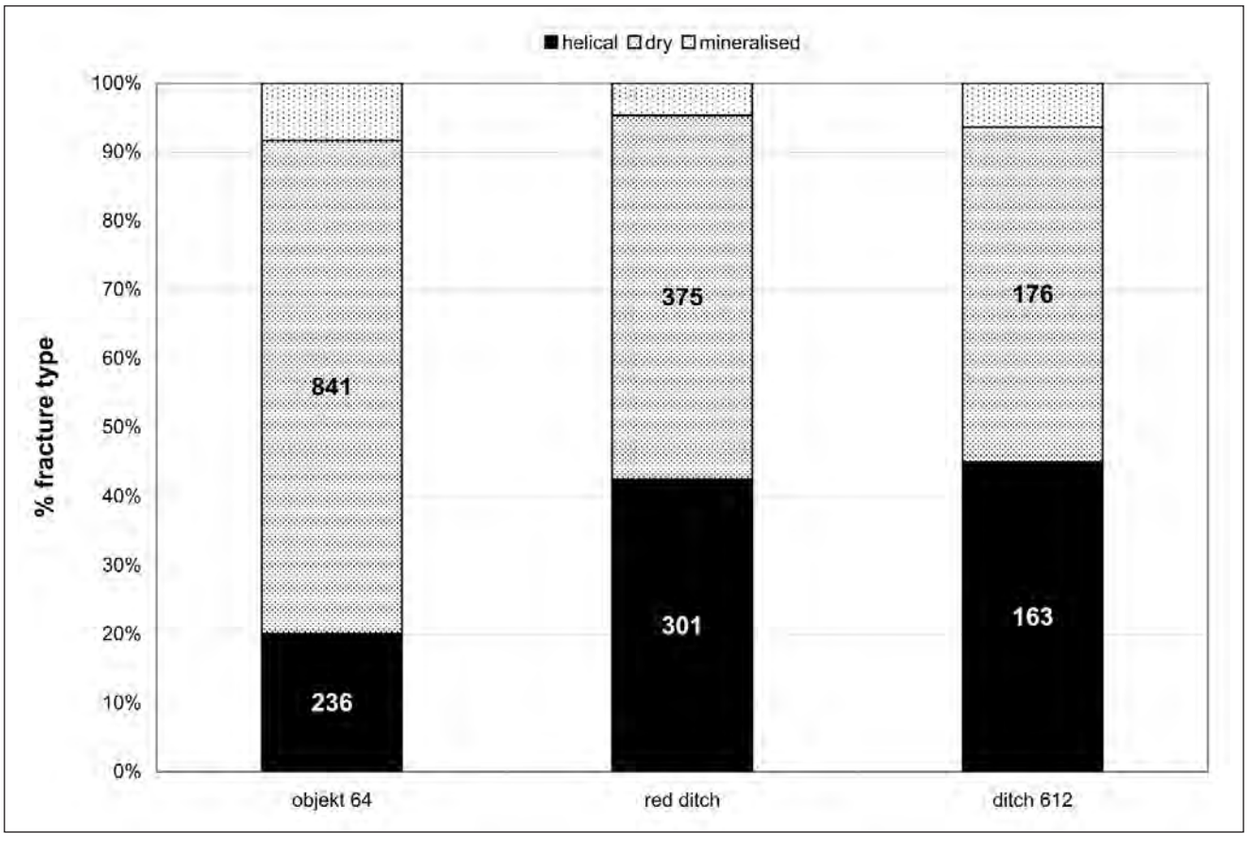


Fig. 8.59. Graph of fractures by context for unidentified fragments

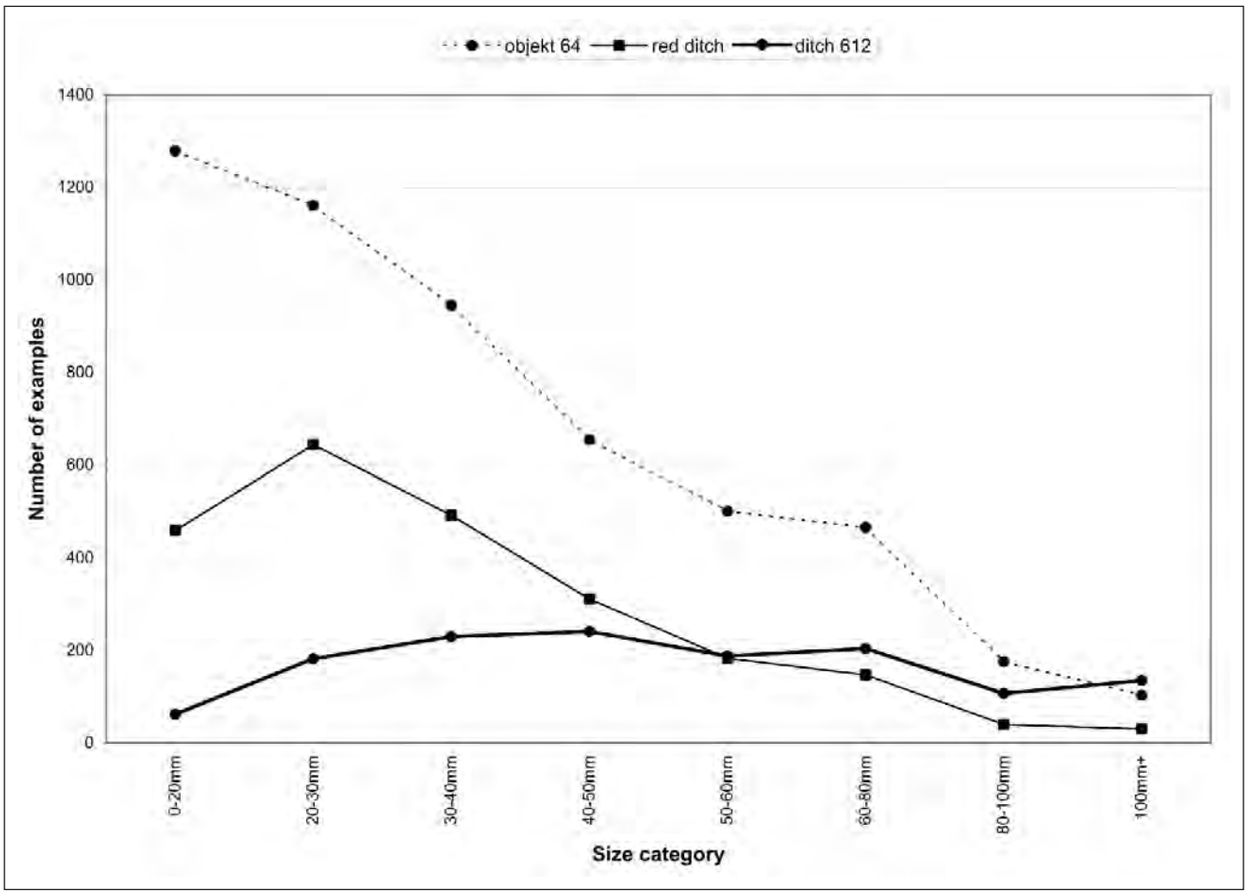


Fig. 8.60. Graph of fragment sizes by context

remains (often of infants and children) or isolated elements no longer in anatomical order, split and cut-marked human bones mixed with similarly treated animal bones, including crania that had had their foramen magnum broken (to achieve access to the brain), that occasionally showed evidence of burning (the absence of which he averred was due to boiling) and were also sometimes accompanied by, or in close association with, ceramic vessels and fragments of vessels interpreted to have served as food vessels. A similarly constituted constellation of material was uncovered in Feature 23 and other features at Velim-Skalka that were, subsequently, also interpreted as evidence for anthropophagy due to the mixed human and animal bone assemblage found in it and the presence of cut and chop marks. A large amount of pottery was also found in this deposit (Hrala *et al*. 2000, 260).

The major feature of these assemblages is that there was no uniformity in their placement, rather seeming to have been carelessly deposited. This set of attributes recalls many similar early assessments of apparently non-normative, 'disrespectful' or 'irreverent' burials, many of which – due to their curious assemblage composition – were considered to have resulted from the once adhering flesh having been consumed (Knüsel and Outram 2006). What is clear from the photographs that accompany Jelínek's report is that there are some elements that appear to possess cut marks, the positioning of the remains is haphazard, there does seem to be some possible cranial breakage, but this and the fragmentation depicted may not be of a peri-mortem nature, and the demographic profile of these sites is a broad one that includes both adults and children. At the time that Jelínek was writing, bone breakage was poorly understood, so that the timing of fractures could not be ascertained, especially peri-mortem versus post-mortem and dry fractures. As a whole, though, the arguments for cannibalism rest on suspected anecdotal type specimens and associations with animal remains and ceramic vessels, rather than on assemblage analysis and comparison of human and animal remains in their archaeological context. After nearly 50 years of research it is now clear that much more rigorous analysis of assemblages is required to distinguish among a variety of funerary treatments and taphonomic occurrences that can produce assemblages that superficially resemble one another.

From the review of Knüsel and Outram (2006), the archaeological indicators of cannibalism include:

1. Human and animal remains found in the same context and in the same spatial relationships (through recording and conjoining) meaning that the discard history is similar;
2. Element representation similar between humans and animals;
3. Patterns of bone modification similar – cut and chop marks, percussion striae, anvil abrasions, internal vault release (bevelling), adhering flakes, inner conchoidal scars, crushing of cancellous bone, and peeling of cortical bone. The remains have these features in the same frequency and anatomical location;
4. Peri-mortem fractures similar in both human and faunal remains. These are indicative of processing to retrieve marrow and brains for consumption;
5. Evidence for burning and/or cooking of both whole elements and of previously fractured elements. These features relate to similar preparation of human and non-human animal remains;
6. The presence of human tooth impressions.

Additional observations act as covering arguments to discount certain influences on the formation and appearance of the assemblage. These include:

7. Little evidence of carnivore or rodent gnawing. As a covering signature, the absence of such tends to exclude other animal activities in the processes observed;
8. No age or sex dependent aspect of the assemblage- both males and females, infants, children, adolescents, and adults may be included in the palaeodemographic profile (i.e. unlike modern battle-related sites, where males may predominate). In other words, in most cases the age-at-death profile is most like a catastrophic palaeodemographic assemblage, one that includes individuals of both sexes and all ages;
9. No evidence for mortuary ritual, such as care in the placement and positioning of the deceased, grave cuts, or burial treatment, or artefact inclusions that respect the body.

Of these indicators, the human remains from Velim-Skalka lack a standard burial position and grave inclusions (see below with respect to the latter), and they are found in the same features with animal bones. They differ, however, in their element part representation (see p. 000 above). It is important to note that the vertebrae, which are often missing in assemblages thought to have been cannibalised (Villa 1986; Turner and Turner 1999; White 1992), are as well represented as the lower limb long bones. This suggests that the cancellous-filled axial elements, more porous and more susceptible to taphonomic destruction, are as well represented as bones of the appendicular skeleton that, due to their dense cortical bone, are more impervious to taphonomic loss. In addition, the human remains do not appear to have experienced the same type of processing both before deposition at the site and after burial. Their peri-mortem fractures and pattern of bone modification are dissimilar, with the human fractures more indicative of trauma from violent injuries and dry fractures from post-depositional disturbance, rather than from butchery. Furthermore, peri-mortem features do not occur in the vicinity of joints, as they do in the animals

from the site. There is some evidence of burning, but this is sporadic, not element or element-part specific, and when it does occur appears to be related to entire elements that were exposed to fire after they had become disarticulated. There are no observable human tooth impressions on any of the material. There is little evidence of gnawing by animals, which attests to the remains having been buried quickly after death. In general, then, humans do not appear to have been treated in the same manner as animals from the site. Cannibalism, it seems – whether an endocannibalistic or ectocannibalistic form – does not suffice to explain the assemblages.

If the remains do not attest to cannibalistic rites, then other possibilities must be entertained to explain their appearance and patterning. The remains do not seem to represent the debris from an exposure rite (e.g. 'sky burial') that includes a period of time to permit defleshing of the remains. Exposure is often followed by a secondary interment of retrieved or selected material in a secondary location other than the primary one; such deposits may occur collectively, for a number of individuals over a period of time to create an ossuary (Ubelaker 1974; Russell 1987a, 1987b; Williamson and Pfeiffer 2003) after cremation (Duday 2006), or for single individuals (Valentin and Le Goff 1998; Orschiedt 2003). This type of funerary treatment has been documented in the European Middle and Upper Palaeolithic, Mesolithic and Neolithic. The secondary deposit is often in the form of a bone bundle that consists of only a portion of the complete skeleton, or for example, an articulated portion of the body, such as the torso or a single limb (Williamson *et al*. 2003). The associated archaeological indicators of such a rite would include those due to their exposure to the elements after death: 1) animal gnawing on bones, 2) scattered, isolated, and fragmentary, weathered or splintered bones, 3) disarticulated skeletons, and 4) incomplete skeletons lacking phalanges, a limb, or other parts (Carr and Knüsel 1997; cf Duday 1998). Disarticulation may proceed naturally until the skeleton is reduced to 'dry' bones, or the process may be aided by the removal of adhering flesh from the bones using tools. Olsen and Shipman (1994, 380) list the following characteristics of assemblages that have been treated in this manner:

1) a partial skeleton
2) high cut mark frequencies on bone elements
3) defleshing marks on the cranium
4) mandibular cut marks common
5) abundant post-cranial cut marks
6) patterned orientation an distribution of post-cranial cut marks
7) types of cut marks that include those produced by scraping and enlarging the foramen magnum.

Although the remains are fragmentary, there is no evidence that remains were scattered or isolated on the palaeo-surface of the site; most, as noted, were found in pits or ditches at the site. Furthermore, the remains lack substantial evidence for gnawing by animals or weathering that one would expect in remains left exposed above ground for a period after death. The remains also provide no evidence for intentional disarticulation of skeletons; cut marks are not found at the joints of the remains that would indicate a desire to divide or disarticulate a corpse into joints (cf Russell 1987a, 1987b; Olsen and Shipman 1994; Orschiedt 2002). Although there is evidence for semi-articulated remains, there is no evidence for bone bundles and there is no pattern to the remains that were found in a semi-articulated state that would suggest selection of skeletal material. Most importantly, though, the skeletal part representation does not support this type of mortuary practice. The small bones of the hands and feet are not under-represented due to loss of such elements through their early disarticulation and removal by animals (cf Duday 1998). As also seen in Fig. 8.2 the manual and pedal phalanges are somewhat under-represented compared to the other elements of the body. The under-representation of these small elements is often used as an indication that corpses were exposed for a period and these elements were lost to scavengers or taphonomic destruction. In this instance, though, the general absence of evidence for gnawing would seem to suggest that this reasoning is insufficient to explain their relative absence at Velim-Skalka. It may be, though, that these elements became disarticulated and separated from the remaining hand and foot bones when once buried remains were disturbed. In fact, the calcaneus, metacarpals and metatarsals are better represented than are the major limb bones (see Fig. 8..2). This also indicates that individuals entered the site contexts as complete individuals. Thus a funerary rite involving exposure and secondary deposition does not seem to fit the appearance and patterning of the human remains from Velim-Skalka.

Hrala (2000) argued that Velim-Skalka represents a cult centre. He based this interpretation of the site principally on the presence of what he interpreted as groupings of human skulls (a 'skull cult'), hoards, and the lack of apparent habitations within the enclosure, meaning that the defences did not seem to be protecting anything. He also suggested (2000, 266) that human sacrifice had occurred at Velim-Skalka. In the photographs provided by Vávra. (2000, Fig. III.27, cf Dočkalová & Roblíčková 2000, Figs 2-3), crania, rather then complete skulls, are shown. If this indicates ritual activity, then this would be one based on collecting apparently defleshed crania and not whole heads. This defleshing seems to have occurred without the use of tools because there is no mention of cutmarks on the crania and none was found as a result of this analysis, indicating that a natural decay process may be implicit in their appearance. This is inconsistent with sacrifice by decapitation where vertebrae and mandibles would be expected to occur with crania (Boylston *et al*. 2000), although it remains

a possibility that defleshed crania had a special significance that motivated their collection and that they ended up in general debris from the site when deposited. No such collections derive from the British excavations.

Archaeological evidence for human sacrifice depends on a close contextual analysis of human remains, their appearance, and placement. By definition, the difference between execution and sacrifice may be slight, and its physical manifestations difficult to differentiate – especially if strangulation of a non-manual variety was the means by which individuals were despatched, because this may leave no osteological signature (as in the commonly encountered fractures of the hyoid bone and the thyroid cartilage in manual strangulation, especially in older individuals when these structures are fully ossified: DiMaio and DiMaio 2001) – and to differentiate from one another. Evidence for restraint in the form of ligatures at the neck or bound limbs and repeated, patterned injuries, often involving cut marks on the anterior bodies of cervical vertebrae (from having had the throat slit) and blunt or sharp force cranial trauma are physical manifestations of burials of individuals that had been sacrificed or, indeed, executed. In addition, both sacrifice and execution often occur at special monuments or include identifiable ritual paraphernalia that accompany the deceased and, occasionally, trophy collecting, the repeated removal of particular skeletal remains (Verano 1986, 2001). A suspected European example of sacrifice comes from the Iron Age site of Acy Romance (Ardennes), where a male bearing a peri-mortem cut mark to the left temporal and parietal was found with the forearms and wrists in close approximation and *behind* the vertebral column suggested to Lambot (1998) that this individual had been sacrificed. The site itself has been considered a habitation site that contained a cult centre based on its structural features.

The apparent absence of occupation evidence in the centre of the site at Velim-Skalka, in the form of habitations or suspected cult structures, as well as the absence of the limb-binding and patterned skeletal trauma, would seem to rule out the possibility that sacrifice or execution was practiced at the site. Although Hrala (2000, 242, 260) describes the human remains as 'sacrifices', there is no patterning of traumatic injuries mentioned by Dočkalová (2000) in her report that would support such an interpretation for the site as a whole, nor was any found in the recent analyses. In addition to these findings, the peri-mortem injuries identified as a result of this analysis show no repeated pattern (Fig. 8.14). They appear to be more akin to the varied trauma seen in armed conflict with its changing postural positions and varied weapon types. In addition, there was at least one sub-adult affected (cranial fragment 12/501), as well as adults. The cross-section of the penetrating depressed fracture of specimen 12/3011 bears resemblance to a Bronze Age spearhead or projectile point, and the linear crushing fracture of specimen 12/3032 (Figs. 8.26, 8.27 and 8.28) and the decapitation-type injury to the mandibular specimen 12/220 (Fig. 8.21) appears most likely to relate to sharp force trauma with a heavy weapon. Similarly, the cutmarks of rib 12/3000 suggests sharp force trauma with a knife-like weapon. The occurrence of injuries to the head and face (cranial vault and mandible) and weapon-related trauma suggests that the intent behind them was lethal harm, rather than being the result of accidents or domestic violence. The infra-cranial injuries, including a butter-fly fracture of specimen 12/503 (Fig. 8.53) and specimen 12/2615 (Fig. 8.54) with its impact scar, could have resulted from blows or from the impact of falling stones on the body in the peri-mortem interval. In this regard, it may be important to note that, although no projectile injuries were noted by Hrala *et al*. (2000, 237), some 26 bronze arrowheads were retrieved from pits and ditches at Velim (ibid. Fig. VII.20). The apparent absence of injuries associated with these weapons (although see above for a possible exception) may not be so inexplicable in light of Milner's (2005) observations that historical bow projectile use produced a relatively low prevalence of injury to the skeleton (only about a third of those striking the body) when compared to the number of injuries such weapons produced. It may be that some of these projectile points that co-occur with human remains in these pits were lodged in the soft tissues of these individuals prior to their eventual burial.

In a more recent interpretation of the site, although Peter-Röcher (2005) also contended that the site was a sacred area used for burial, she argued against the notion that it contained the remains of sacrificed individuals on the basis that the age-at-death profile resembles a normal distribution of age groups and this would preclude such an association. The palaeodemographic profile of the assemblage from the British excavations, as assessed following Bishop and Knüsel (2005), falls within that expected of a living population, with fewer females (as determined by dividing the number of limb bones of female and of probable female sex by two) (N=3) than males (N=4, calculated in the same way), and 13 adults altogether as determined from the MNE as opposed to nine children between the ages of 7 and 17 years of age at death (as determined from mandibular dentition, see Chapter 6, above) (Fig. 8.60). This result suggests the possibility that the entire population perished in some sort of catastrophic event (i.e. all those alive at one time). This may be an artefact of the comparatively small sample size of the most recently analysed assemblage, or it may be a localised phenomenon for that part of the site. When this profile is combined with the profile of the site as a whole (all excavated remains) to increase the sample size, the resulting profile most closely associates with that of an attritional cemetery – that is, one that would

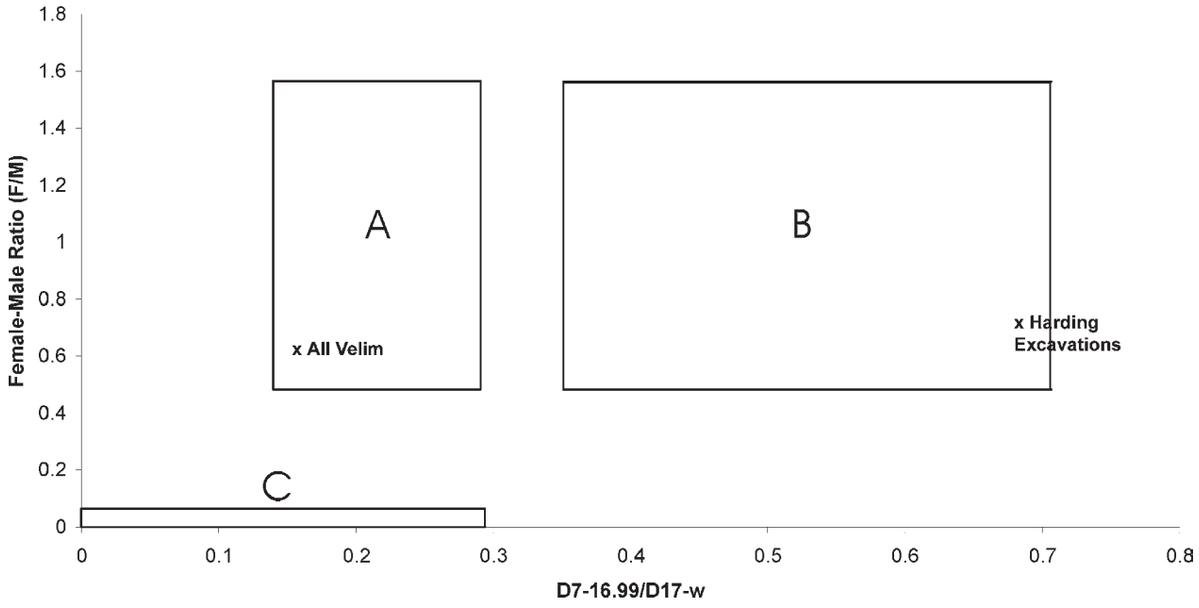


Fig. 8.61. The assemblages from Velim-Skalka plotted in the feasible regions of an attritional cemetery (A), a predicted living group (B), and historical warfare-related groups (C) (after Bishop and Knüsel 2005)

develop from the accumulated deaths over a period of time (Fig. 8.610). From the figures of Dočkalová and Roblíčková (2000, Table 4), it has a disproportionate number of adults (N= 532), especially prime adults (N=460, some 65% of the total, 76% (N=538), if mature and old adults are included) compared to children (Infans II) and juveniles (N= 87, just over 12% of the total).

Although the site as a whole presents a conflicting view (i.e. it appears to represent an attritional cemetery), the number of prime adults in the mortality profile exceeds the number of prime adults encountered in a pre-industrial population with high infant mortality where the expected mortality rate would be less than 20% (data from Turpeinen 1979; Coale and Demeny 1983). A portion of this high total may be due to the truncation of the demographic profile caused by the systematic under-estimation of adult age (cf Chamberlain 2006, 10-11), but the under-representation of juveniles of less than 4% (3.8%, Dočkalová and Roblíčková 2000, Table 4) cannot be attributed to a similar phenomenon due to the increased precision of age determination of these growing individuals. Juveniles, those individuals between 14, when the second molar has usually erupted, to the time the spheno-occipital synchondrosis has fused in the late teenage years (Scheuer and Black 2000), should make up about 10% of the attritional profile, using the Level 5 'West' Model Life Table of Coale and Demeny (1983), with average life expectancy at birth of 30 years. This discrepancy suggests that there are individuals from this age category missing from the mortality sample population. Therefore, the mortality profile from Velim-Skalka shows two apparent departures from an attritional mortality profile, where one would expect fewer prime adults and a greater proportion of juveniles. It may be that these individuals were carried off, escaped an attack, or were buried elsewhere.

Furthermore, the number of prime adults present in the assemblage is far in excess of the roughly 21% of young adults who died in a Medieval mass contagion, or 36% when both young (25 to 34.99 years of age at death) and middle (35 to 44.99 years of age at death) adults are combined, or 51% for all adults (Margerison and Knüsel 2002). The combined proportion of adults from Velim-Skalka as a whole is similar to that found at the Neolithic site at Schletz, Lower Austria (some 60% of the total, N=40.5) (Teschler-Nicola *et al*. 1999) and the 53% (18 adults out of 34 individuals) from the Neolithic mass grave at Talheim, Baden-Württemberg (Wahl and König 1987), site profiles interpreted to have resulted from mass killings of large segments of communities. As at Schletz, females are under-represented at Velim-Skalka, a feature attributed at the former site to the abduction of females by the attackers, a feature of ethnographically-recorded warfare, often to increase numbers after the depredations of warfare (Ewers 1994; Keeley 1996, 85 ff.). Although this remains a possibility to explain an apparent under-representation of females, this loss of adults in this proportion would have had a far more profound effect on population structure than would have had an epidemic disease. Using the juvenile: adult ratio (Jackes 1992), the mortality profile at Velim-Skalka produces a figure of 0.33. Compared with those from

Talheim (0.88) and Schletz (0.58), this figure indicates that there are fewer under-25-year-olds at Velim. This would indicate that with regard to age-at-death, the profile from Velim high fertility and an increasing population, and that it may be that younger individuals were not interred at the site and may have been carried off and perished elsewhere.

Obviously, this assumes that the remains accumulated over the same time-span. Certainly, this seems to be the case for some features, if not for the site as a whole. Although one could invoke disease or violence as an explanation, the two are not necessarily exclusive, as they often come as a combination in a society under stress. The presence of violent injuries, noted in this study (see above) and by Dočkalová (1990) and Dočkalová and Roblíčková (2000), as well as the haphazard burial positions, would suggest the population died in a period of time when social mores had been suspended to deter or prevent the funerary rites associated with normative burial in the area. The other possibility, given the disorder reflected in the burials, is that this site was attacked on more than a single occasion, and these are the accumulated deaths of these multiple attacks.

Hrala *et al*. (2000) and, more recently Vávra and Šťastný (2004), entertained the possibility that the site had sustained an attack or attacks and the human remains derive from people who were killed in this confrontation. As noted above, this interpretation accords with Dvořák's initial assessment of the site. Jelínek (1957) entertained but rejected this explanation for the near-contemporary site at Blučina, on the basis that the rampart was already in a collapsed state by the Late Bronze Age and, despite careful examination, there were apparently no signs of sword wounds that should have been present if the populace had perished in hand-to-hand fighting. In addition, only eleven bone and metal arrowheads were found and no other weapons. Stloukal's osteological report (in Tihelka *et al*. 1969) makes no mention of such traumatic lesions, although it seems directed at determining the age and sex of the deceased only. More recently, HÍrde (2005) has observed that in the Early Bronze Age Nitra culture in Slovakia the weapons commonly deposited in graves (daggers and projectile points) do not seem to have left their trace in the human remains. Rather the injuries indicate the use of blunt weapons and, possibly, sling stones, despite the fact that axes, hammers, hammer-axes and wooden clubs – those weapons that would produce blunt force injuries – are not found in graves, in the case of wooden clubs because of lack of preservation of these objects. If this relationship also characterises the Middle and Later Bronze Age, then blunt force injuries should be the expected type of trauma, but this type of trauma is less easily recognised in unreconstructed crania that have been highly fragmented. Jelínek (1957) also dismissed landslides and epidemic disease as possibilities, the former because it did not seem to affect the placement of the human remains, and the latter because it did not explain the ash-covered locations of human remains, which he felt were ceremonial in origin and associated with the consumption of human flesh.

Tihelka and colleagues later described the human remains from Blučina as deriving from pits that had not been dug specifically for the burial of individuals (Tihelka *et al*. 1969, 3). The remains, of males (36), females (23), and children (63) with another 83 that could not be identified to age, were found "lying in very strange and unusual positions" in association with a stone layer formed by the collapse of a stone rampart. Isolated crania, many of children, were found amid stones and "many bones had been crushed by big stones". Sometimes they were deposited in together with animal bones in heaps (Tihelka *et al*. 1969, 28). As Tihelka says: "At first the experts on the commission were of the opinion that this site on Cezavy Hill was an exceptional example of a defeat of a prehistoric settlement in some war conflict which ended in mass slaughter." This interpretation was considered 'rash' (Tihelka *et al*. 1969, 28), and later another group of visiting archaeologists "… did not rule out the pos[s]ibility of cannibalism", which, however, did not manifest itself in intentional splitting, gnawing and burning. In the apparent absence of injuries on the skeletal remains, the authors invoked 'penal cannibalism' based on the presence of disarticulated human remains being found amongst animal remains, and 'quartering' of corpses, which left its signature in the form of articulated elements which were displaced when still held together by ligaments. This form of cannibalism did not result in damage to the cranium or in the splitting of bones. Oddly, though, the authors note that 73 individuals, more than half the total, were accompanied by a variety of items of personal adornment, such as bronze bracelets, pins, rings, glass and amber beads from necklaces, in addition to razors, ceramic vessels, and objects fashioned in gold.

They also note evidence for 'fighting' in the form of eight bronze, stone, or bone-tipped arrowheads, most of them damaged, one being found next to the remains of a male in a trench that was also accompanied by a perforated boar's tusk and the skeletal remains of a dog. Milner (2005) notes that from historical cases of known projectile injuries only one out of three arrow wounds impacted bone, and of those receiving projectile injuries about one-half survived the traumatic episode. If this historical analogy holds for earlier time periods, then the presence of projectile points may represent substantial evidence for violent encounters, even in the apparent absence of embedded points. Thus projectile points found in the near vicinity of human remains may have once lodged in soft tissues of the body.

Tihelka *et al*. (1969, 29) also describe two multiple burials at Blučina: one, burial 132 of a young woman, is the 'richest' at the site. Her remains were adorned

with bronze objects, and she was found holding a neonate, upon which rested the cranium of a child of about one and half years of age-at-death, all of whom were found within the fill of a ditch in a niche excavated into its side. In the vicinity of this burial was another consisting of six young individuals, buried either in a contracted or supine position, also accompanied by similar bronze objects. Other burials, mainly of children and females, lay beneath this one in the ditch. The interpretation of these burials as deriving from violence, though, was rejected as a general one for the site because the burials did not seem to come from a single episode. These remains, then, were thought to represent a stratum of society for which this form of burial was the norm.

These descriptions and the accompanying photographs, when viewed in the context of well-excavated and planned features such as those at Velim-Skalka, and epitomised by features with multiple human burials in a variety of burial positions, some, like those in Feature 30 (Hrala *et al*. 2000, 28, Fig. III.17) and Pit 2 (*ibid*., 26, Fig. III.16) and those of Kostra 48 and 47[a], in which articulated skeletal remains from different individuals are found in contact with one another, are suggestive of the remains found in more recent mass graves that result from the multiple killings of ethnic violence. Mass graves may be identified by the following features (compiled from Mant 1987; Haglund 2002; Schmitt 2002; Skinner *et al*. 2002):

1. the presence of a body mass or masses within a grave cut or cuts;
2. the presence of disorder in the orientation of the bodies indicating an apparent disregard for the manner of deposition that is often outside the bounds of normative practice;
3. bodies that are in contact with one another;
4. the presence of traumatic injuries;
5. a common pattern of trait or traits related to cause and manner of death.

The first four of these characteristics accord with the findings from Velim-Skalka; only the fifth does not and, in the absence of patterned killing, it seems that the individuals at Velim were not executed (taken here to be repetitive killing in a similar manner), as is sometimes the case in more recent cases of ethnic violence. As noted above, all previous discussions (Peter-Röcher apart) agree that the human remains at Velim-Skalka do not appear to be normative burials. Further support for this assessment comes with a comparison of Defleur's (1993) definition of an intentional burial as one that: 1) possesses a skeleton in anatomical alignment, deriving from rapid burial after death; 2) positioning of the skeleton in a standard manner; 3) the presence of a grave pit, and 4) grave inclusions. Essentially, as Le Clerc (1990) has argued, one must show intent in the deposition of burial before identifying context containing human remains as burials. Although some of the individuals from Velim-Skalka were found in anatomical alignment (see *L'anthropologie de terrain*, Chapter 6 above), they do not possess a standard position, they are not found in an individual grave pit, nor do they have grave inclusions. Furthermore, they do not resemble other Tumulus Culture burials, which are normally contracted burials placed on their sides beneath a cairn or earth mound with a large, though variable, number of grave goods suggesting social differentiation.

Evidence for violent confrontation comes from a number of sources, the most important of which is skeletal trauma, a proportion of which can be ascribed to blunt, penetrating and sharp force weapon trauma (as discussed above). The previous reports by Dočkalová (1990) and Dočkalová and Roblíčková (2000) on the majority of the material excavated from the site record both blunt and sharp force trauma in (mainly) cranial remains. The injuries identified as part of this research include blunt and sharp force trauma, as well as penetrating trauma. The presence of these injuries belies the apparent absence of weapons at Velim-Skalka. Weapons or implements, it seems, were used and other injuries of a peri-mortem variety could have been produced by falls or by materials falling on individuals, alive or recently dead. The collapse of walls may be implicated in some cases. The latest ditch circuit (the 'Red Ditch', Objekt 45/45A) was reddened by exposure to heat and the accompanying rampart probably collapsed in the violent conflagration that brought the site to an end.

CONCLUSION

Harde (2005) notes that the transitional Nitra-Únětice Phase in Slovakia was accompanied by increased evidence for violence in the form of weapon injuries, well provisioned 'cenotaphs' (for apparently fallen but unrecovered warriors) and martial display in male graves. At sites such as Velim-Skalka, we may be seeing a similar, although perhaps more extreme violent transition.

Due to the extensive disarticulation of the human remains at the site and the high prevalence of dry fractures, both of which are found in association especially in the North Pit, it seems that the disposition of these remains at the site did not prevent them from disturbance by the living. This would suggest that the site was not intended solely as a burial site, or at least these burials did not prevent the site from experiencing further use by the living. Perhaps this means that they were deposited during a perhaps protracted period of social upheaval when normative burial mores were suspended or superseded by other concerns. Due to the unusual palaeodemographic profile of these burials, which include a number of infants, children, and adults in

their prime, it may be that these individuals represent those who died in unexpected or unusual circumstances.

Ritual can be defined as repetitive patterning of activities that may be identified by a similar repetitive effect on the material record. At Velim-Skalka the human remains show no depositional pattern. In fact, no two individuals are buried in the same manner; although their deposition is similar in that they occur in pits and ditches, the burial positions are different in each case. They are non-normative. There is also no patterning to the injuries sustained; they, too, show no pattern. These do not appear to have been sacrifices or executions, both of which would expect to demonstrate a repetitive pattern based on the definition of a mass grave from ethnic violence. Rather, these appear to have been casualties of armed conflict that claimed the lives of many adults and young children, with a proportion of juveniles and perhaps females taken as captives, or who managed to escape.

The interpretation of Velim-Skalka as a ritual site rests heavily on the gold hoards and cranial deposits found at the site (Hrala *et al*. (2000, 257-262). These phenomena, though, may be incidental, rather than indicative features. The cranial deposits suggest that crania (though not heads) were deposited secondarily, after being removed or disturbed from their primary burial locations.

It is curious that none of the bodies seemed to have been clothed with any ornaments when deposited in the ditches and pits at the site; a situation that differs markedly from the more formal burials at other Bronze Age sites in Bohemia. It may be, then, that these are not intentional deposits at all, but rather happenstance inclusions that went unnoticed and, therefore, uncollected in the past. This interpretation is similar to the one applied to the three-banded gilt silver ring found on a proximal phalanx of the fifth digit of the left hand of an individual killed at the Battle of Towton and subsequently buried in a mass grave. These bodies had been stripped of all clothing before being deposited in the grave, and this delicate ring, a symbol of the triune, was probably overlooked during this process. The absence of standard burial rites for the humans at Velim-Skalka is equalled by the lack of a standard deposition of the hoards. This similarity in deposition may indicate that neither was intentional or planned. In addition, there are instances of weapons being found in the same contexts as are human remains. A broken piece of a stone battle-axe was found among the human remains in Feature 27 (Hrala *et* al. 2000, 256). The presence of arrowheads provides further circumstantial support for the site having been attacked, burned, and a large proportion of the population killed directly by weapon trauma or possibly by the collapse of defensive structures.

Although it is clear that the ditch and pit circuits at the site were used for the disposal of human remains, the fragmented and disarticulated nature of the majority of these remains and the unusual positions of those interred at the site suggest non-normative burial rites. These haphazardly placed remains and the evidence for weapon injuries suggest that these are not normative burials. The demographic profile resulting from the present research is close to a living population profile with a high proportion of young individuals, including children and adolescents, with all ages and both sexes represented. The closest parallels for this type of profile comes from the mass grave at Talheim, Baden-Württemberg (Wahl & König 1987), and from a similar site at Schletz, Austria (Teschler-Nicola *et al*. 1999). These aspects, along with the three concentric circuits of ditch and pit features at Velim-Skalka and a palisade inside the outermost ditch, provide ample evidence that the occupants of the Velim site ofexpected violence.

Chapter 9. Carbonized plant macrofossils from Velim Skalka: preliminary observations

CAROL PALMER

INTRODUCTION

This contribution provides a summary report on the carbonized plant macrofossils from the British-led excavations at Velim Skalka. A sampling programme for charred plant macrofossils was employed on site during the excavations with contexts sampled in 1992, 1993 and 1994. In addition, selected samples from the Czech-led excavations were also processed, some also yielding large concentrations of plant remains, though these are not reported on here. This sampling programme represents the first systematic flotation programme implemented on this site.

The aim of this treatment is to report on the location and concentration of the charred plant macrofossils, particularly in relation to the commingled human and animal remains, and to provide an overview of the crop species recovered, including a finding of the 'new' glume wheat (Jones *et al*. 2000). This report is primarily intended for a general readership with a more comprehensive archaeobotanical report planned for the future.

METHODS

The sampling regime was designed by James Rackham who also set-up the Siraf-style flotation equipment used. A bag of excavated sediment, *c.* 10-15 litres, was sampled from every securely sealed context. The flot containing the majority of the charred plant material was collected using a 500µ mesh and the heavy residue held in a 1 mm mesh. Residues were sorted for bone and small finds, as well as any charred plant remains that did not float. In 1992 sampling was fairly intensive, with most sealed contexts sampled. Sampling intensity was reduced in 1993 and 1994, though contexts that seemed to represent obvious features were sampled (notably post-holes and pits). No samples were taken in 1995, partly because of pressures of time, and partly because the excavators had the impression that little of significance had been recovered in the previous seasons.

The plant macrofossils were sorted on a Leica MZ16 microscope with identifications determined using up to X40 magnification. Identifications were made using reference materials in possession of the author and held by the University of Sheffield, as well as consulting major reference texts including Jacomet (2006) and Cappers *et al.* (2006). Wheat nomenclature follows Miller (1987).

A type of 'minimum numbers' approach was used to count the remains (Jones 1991, 65-66) on which the summary data presented here is based. Whole grains and seeds were counted as one, but broken cereal and grass grains only counted where the embryo end was preserved. Glume wheat spikelet bases, the individual segments of the cereal ear that would have once held the grains, were counted as two and individual glumes as one (each spikelet base consisting of two glumes fused together).

RESULTS

Charred plant macrofossils were recovered from 53 out of 67 samples submitted for analysis (excluding the samples from the Czech-led excavations). Table 9.1 summarises the concentration of carbonized macrofossils by context according to the presence of large cereal grains (wheat and barley), broomcorn millet grains, glume wheat chaff, and wild or weed taxa. In general, concentrations were low, but contexts 640 and 541 from Sonda 12, Objekt 612, and contexts 27, 34, and 58 from Sonda 27 contained rich deposits (greater than 50 identifiable items). All these richer samples are dominated by charred wheat grains, glume wheat chaff and wild or weedy taxa. In addition to the samples examined as part of this analysis, further samples from a charred layer, context 3021, at the base of Objekt 64 North pit are known to have contained high quantities of broomcorn millet, *Panicum miliaceum*. These millet-rich samples were submitted for radiocarbon dating and unavailable for analysis at the time of writing.[1]

In samples containing low numbers of items, preservation was generally poor, often preventing identification to type of the large-grained cereals. However, in the rich samples, preservation was good to excellent, with, as well as the dominant wheat species, a wide spectrum of well-preserved wild or weedy taxa.

1 While this report was in proof stage, the residue of the samples in question was returned from the radiocarbon laboratory. Unfortunately Carol Palmer was not available to incorporate these into her report. The material has been confirmed by Professor Peter Rowley-Conwy to be millet; it will be treated as part of a larger study of the Velim plant material by Dr Palmer in due course (ed.).

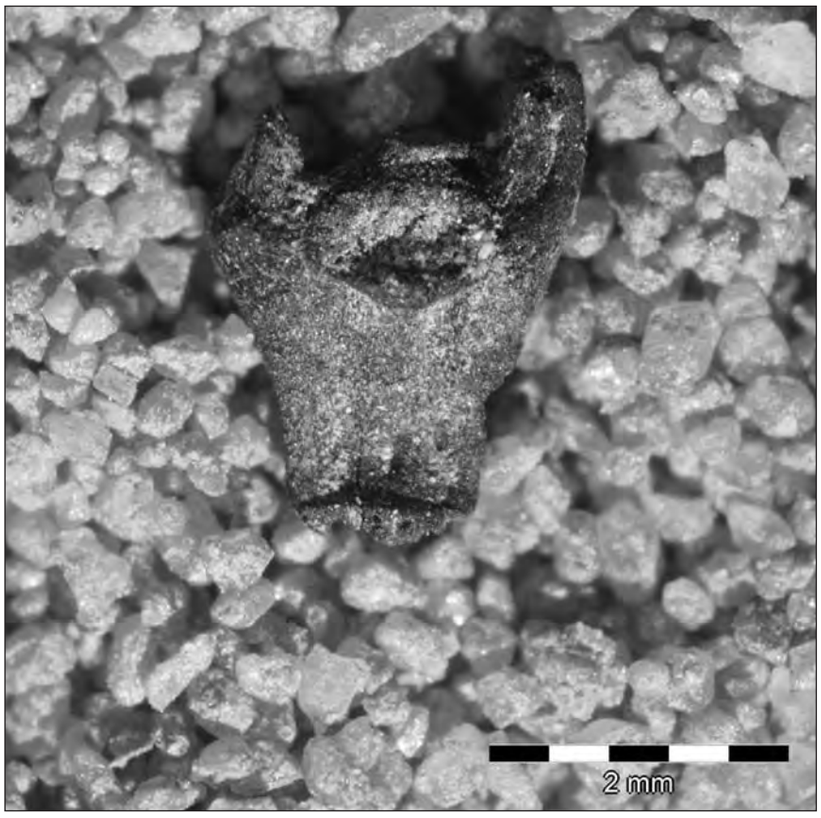


Fig. 9.1. Abaxial view of a spikelet base of the 'new' type glume wheat (Jones *et al.* 2000)

The crop species

Wheat grains and chaff dominated the richer samples, representing a remarkable range of types. The following wheat species were identified from chaff morphology: the diploid wheat einkorn (*Triticum monococcum* L., usually containing one grain per spikelet), tetraploid emmer (*Triticum dicoccum* (Schrank.) Schulb., usually containing two grains per spikelet), hexaploid spelt (*T. spelta* L.), and the 'new type' of glume wheat understood to be a tetraploid wheat (Jones *et al.* 2000). Amongst the grains, typical einkorn, emmer and spelt grains were noted. Further investigation is required to determine whether or not 'new' type glume wheat grains (Kohler-Schneider 2003) are also present. A minor admixture of free-threshing naked type grains was observed. In general, however, it is more reliable to identify wheat species from chaff morphology because less intra-and inter-specific variation is thought to exist and charring can cause considerable distortion in grains (Hillman *et al.* 1996).

The grains of the glume wheats are encased in robust husks, or glumes (inserted on either side of the upper part of each rachis segment of the ear), that require extra processing to release the grain, compared with the so-called free-threshing wheats (such as bread wheat). Partly due to their robustness and in part due to the fact that glume wheats are thought to have been commonly stored as whole spikelets rather than cleaned grain, the glumes of these wheats are often preserved on

Fig. 9.2. Abaxial views of (left to right) einkorn (T. *monococcum*), emmer (*T. dicoccum*) and the 'new' type glume wheat spikelet bases from Velim Skalka context 640, Sonda 12

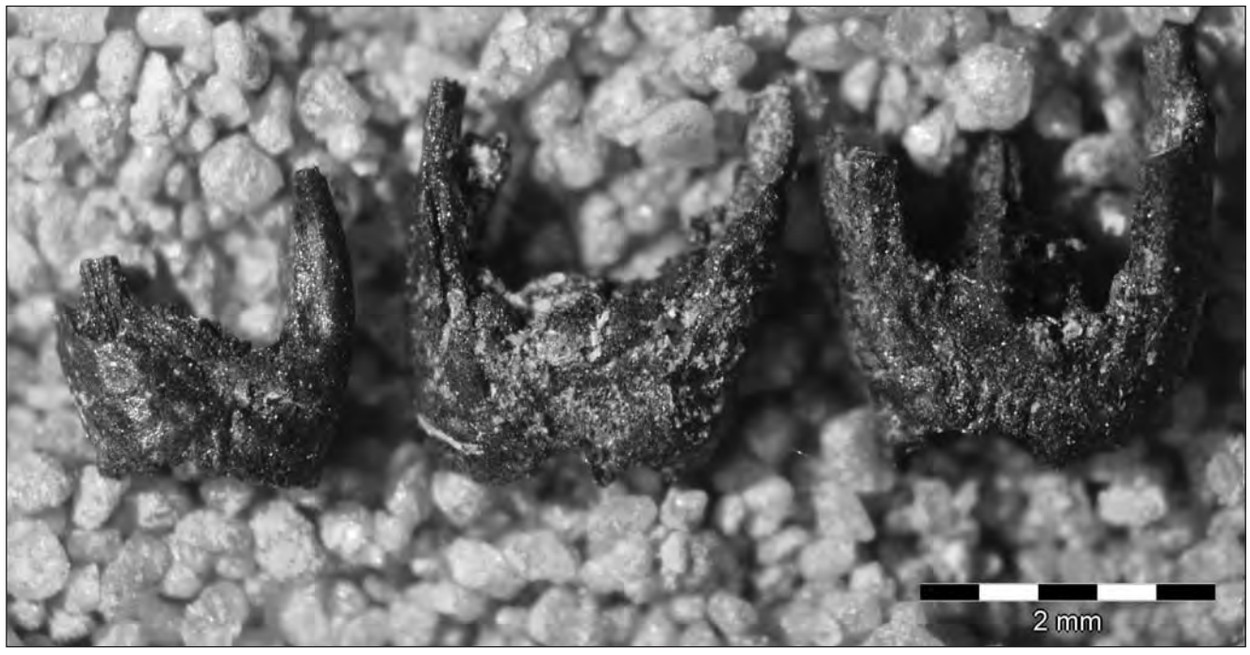
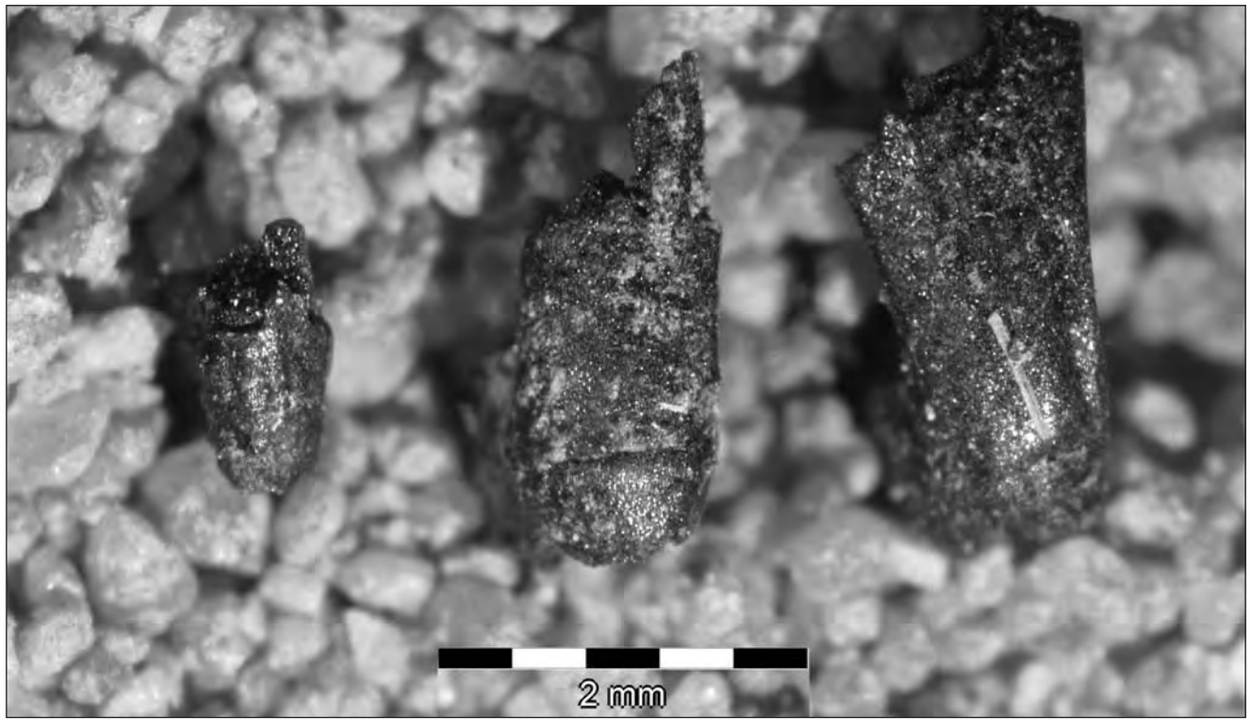


Fig. 9.3. Adaxial views of the spikelet bases shown in Fig. 9.2

archaeological sites. The chaff fragments of free-threshing wheats, the rachis segments (the glumes are very fragile), are very much rarer and none were recovered from these samples. At Velim, einkorn, emmer and the 'new' glume wheat were generally preserved as fused spikelet bases, whereas spelt was commonly broken into two glume bases. In context 640, spelt glume bases were the most numerous, followed by emmer spikelet bases, and then 'new' glume wheat and einkorn spikelets. In contexts 640 and 541 wheat chaff and grains are represented in approximately the correct proportions to suggest that remains represent fragmented whole ears rather than cleaned grains or only chaff, a by-product of crop-processing.

Fig. 9.4. Lateral views of the spikelet bases shown in Figs 9.2 - 9.3



The 'new' glume wheat was distinguished by a number of key characteristics following the observations of Jones *et al.* (2000) and Kohler-Schneider (2003). The glumes extend out abruptly and laterally before ascending upwards (forming a distinct U-shape) at approximately the same height as the wide and round disarticulation scar (Figure 9.1). The primary keel, on the same side (the abaxial side) as the disarticulation scar, projects strongly forwards and also (Figure 9.2), on the reverse side (Figure 9.3, the adaxial view), the secondary keel is strong, often with a deep vein running alongside it (though less clear in the specimen shown). The 'new' type glume wheat is a similar size to emmer (Figure 9.2-4), but appears, in the specimens from Velim Skalka, more robust, the spikelet base frequently retaining a greater part of the rachis segment than those of emmer (Figure 9.1). Both the emmer and 'new' glume wheat are larger than einkorn (Figure 9.4) and veining on the lateral face of the glumes is similar to emmer and much less strongly veined than spelt (not shown).

Other crop species present at Velim Skalka include broomcorn millet (*Panicum miliaceum* L.), which is present in approximately half the samples (52%), and was clearly an important crop. Barley grains (*Hordeum vulgare* L.) are present in low frequencies with occasional fragments of chaff. Pea (*Pisum sativum* L.) and lentil (*Lens culinaris* Medicus) are also present with a single well-preserved specimen of each found in Sonda 27 context 31.

DISCUSSION

The plant macrofossils in context

The recovery of charred plant macrofossils from Velim Skalka is significant in itself as this is the first direct evidence that crops were present at a site most famous for its unusual deposition of human remains. In the analysed assemblage, the contexts with the highest concentrations of charred plant macrofossils derive from Objekt 612, specifically contexts 541 and 640 (this is the ditch cut by the palisade in Sonda 12B; see above p. 00). Animal bone was plentiful in this feature and the combined animal and plant evidence appears to represent debris from food discard. The presence of approximately proportionately equal numbers of grains and chaff suggest the presence of whole ears.

Three other comparatively rich and well-preserved samples derive from Objekt 76 in Sonda 27: contexts 27 and 34 (both from ditch fill) as well as context 58 (a 'deposit'). Originally, Objekt 76 was thought to be a continuation northwards of the 'Red Ditch', but in excavation it was not apparent. In general, samples from Objekt 45, the 'Red Ditch', contained low frequencies or no charred plant macrofossils. Although post- and gate-holes were regularly sampled, they were the most likely to contain no charred plant remains or very low levels of them.

Some of the contexts containing high concentrations of human remains were sampled for plant macrofossils. A sample from deposit 2022 yielded *c.* 30 plant macrofossils, for example. Sampled contexts in Sonda 12, Objekt 64 North pit, associated with human remains and containing plant macrofossils are 220 and 2028 (with less in 2044 and 2059), although these contexts do not appear to be securely stratified. Most importantly, however, the large concentration of broomcorn millet submitted for radiocarbon dating came from Objekt 64 North pit (lowest levels; see p. 00). In sum, plant remains are also present in the pit circuit with the human remains.

The 'new' type glume wheat

Since Jones *et al.* (2000) drew attention to the 'new' type glume wheat recovered from Neolithic and Bronze Age sites in Greece, there has been an increasing number of findings at sites in south-east Europe and Turkey, as well as central Europe (for example, Bieniek 2002 and Kohler-Schneider 2003), to add to the suggestion that a number of previously published examples may also conform to the 'new' type. Jones *et al.* (2000) calculated that it is most likely to be a tetraploid glume wheat, based on the proportion of glumes to grains at their sites, and cautiously proposed a close relationship with *Triticum timopheevi* Zhuk., a rare wheat known to contemporary wheat systematists from its cultivation in western Georgia. A number of other explanations are explored by Jones *et al.* (2000), however, including the suggestion that it may simply be a variant of the emmer group – *T. dicoccoides and T. dicoccum*. Although the exact identification remains unresolved at present, the recovery at Velim Skalka of this 'new' type, adds further weight to the widespread existence of this morphologically distinctive type in European prehistory, a type that seems to have disappeared by the end of the Bronze Age. As at Velim Skalka, the 'new' glume wheat is not found as a 'pure' crop, but mixed with other glume wheats.

Bronze Age agriculture

As the wheat species present at Velim Skalka were mixed in the same samples, it is likely they were grown together as a maslin, a mixture of species cultivated together in the same plot. The ethnographic work of Leonor Peña Choccaro (1999, 36) in Asturias, north-western Spain, where spelt and emmer are still cultivated in small plots, suggests that while farmers are aware of the differences between the two species and may cultivate them separately, they may indeed be grown as a maslin and treated as one (locally called 'escanda'). Structurally, they both require the removal of their robust glumes to obtain the grain, and this appears to be the most important factor in their local classification. It is likely that the wheats at Velim Skalka were grown together as a winter crop, as in Asturias today, but this requires further analysis.

While this report has concentrated on the variety

of wheat types recovered, broomcorn millet was common and clearly important, and remained a commonly cultivated summer crop in central Europe until relatively recently. Millet has gained increasing interest in archaeological science, because as a C4 plant with a different photosynthetic pathway to other crops, its adoption across Europe in the Neolithic and Bronze Age (for a summary of evidence in central Europe, see Wasylikowa *et al.* 1991) and contribution to ancient diets can be traced through the isotopic analysis of bone (for example, Le Huray *et al.* 2006).

CONCLUSIONS AND FUTURE RESEARCH

The plant macrofossils from Velim Skalka point towards strong agricultural elements to activities at the site. Although the samples examined here appear to represent discard in ditches of charred materials rather than storage in contexts, with the exception perhaps of the concentration of broomcorn millet at the base of Objekt 64, there is the opportunity to extend the analysis of the samples reported on here with the samples collected by the Czech team in the period 1990-92 and processed in 1992-93. Future analyses will concentrate on the assessment of these additional samples, more detailed examination of the crops found in the richer samples assessed here, and gain a greater understanding of crop cultivation and processing techniques through the examination of the wild and weedy taxa.

Acknowledgements

I am grateful to the Biological Anthropology Research Centre (BARC), University of Bradford, for use of laboratory and microscope facilities and the University of Sheffield for access to seed reference material. Professor Glynis Jones, University of Sheffield, kindly confirmed and commented upon the 'new' type glume wheat at Velim Skalka. Thanks are also extended to Amy Thomson, University of Bradford, who assisted with digital photography.

Table 9.1. Summary table of the distribution and concentration of carbonized plant macrofossils in the sampled contexts from Velim Skalka. Key: * = 1; ** = 2-5; *** = 5-20; **** = 21-50; ***** 50+

Year	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
Sonda	19	19	19	19	19	19	19	19	19	19	19	19
Context number	30			4					12	3	29	7
Sample number	0	1	2	3	4	5	6	7	8	9	10	11
Context description	post-hole			red ditch extension?						fill		ditch upcast
Objekt/feature no.				45						45	45A	45
large cereal grain			**	****	**	**		**	*			
millet grain			***	****	****	***	***	****				
glume wheat chaff	*						*	*				
wild/weed taxa			*	*	*	***	**	***	*	**	*	
no charred macrofossils		0										0

Year	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	
Sonda	19	19	19	19	19	19	19	27	27	27	27	
Context number	31	34	38	39	5	29	29	5	1	3	2	
Sample number	12	13	14	15	16	17	18	19	101	102	104	
Context description	fill	post-hole	ditch fill	fill	over-burden	fill	fill	red ditch	over-burden	over-burden	pot con-centration	
Objekt/feature no.		344	45		45	45A	45A	45		76	76A	
large cereal grain	**			*	*			**	**	*	**	
millet grain					*	**			**		**	
glume wheat chaff											**	
wild/weed taxa	***				***	**		**			*	
no charred macrofossils		0	0					0				

Year	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
Sonda	27	27	27	27	27	27	27	27	27	27	27	27
Context number	31	34	6	40	39	45	47	43	41	51	52	52
Sample number	106	107	108	109	110	111	112	113	114	115	116	117
Context description	sherd scatter	ditch fill	lens	fill	fill	linear feature fill	small pit or post-hole	feature fill	ditch fill?	ditch fill or natural	prob-ably natural	prob-ably natural
Objekt/feature no.	76B	76	76	76	76	76	76B	76B	76	76	test pit	test pit
large cereal grain	**	****		*	*	*			**	**		
millet grain		***	*	*	*	**	*	**	*			
glume wheat chaff	**	***	*	*	**							
wild/weed taxa	***	***	**			***	*	**	*			
no charred macrofossils											0	0

Year	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1993	
Sonda	27	27	27	27	27	27	27	27	27	27	12	
Context number	12	58	13	15	56	61	63	65	73	58	11	
Sample number	118	119	120	121	122	123	124	125	126	127	2	
Context description	post-hole	deposit	post-hole hole	post-hole	post-hole	post-hole	post-hole	post-hole		deposit	post-hole	
Objekt/feature no.	721	76	724	725	722	726	727	723		76C	palisade?	
large cereal grain		**				*	***		**	****		
millet grain							**		**	**		
glume wheat chaff		*					**		*	*****		
wild/weed taxa	***							***		***		
no charred macrofossils	0		0	0	0						0	
Year	1993	1993	1993	1993	1993	1993	1993	1993	1993	1994		
Sonda	12	12	12	12	12	12	12	12	12	12B		
Context number	518	520	530	531	512	540	83	605	541	107		
Sample number	3	4	5	6	7	8	9	11	12			
Context description	post-hole	post-hole	post-hole	post-hole	post-hole	post-hole	post-hole?	bone rich deposit	burnt layer	primary fill		
Objekt/feature no.	517	519	521	521	510	539		612, below pit 524	612	78		
large cereal grain	**					**		***	*****			
millet grain		*		**	*				**			
glume wheat chaff									*****			
wild/weed taxa			*	*	*		***	***	*****			
no charred macrofossils										0		
Year	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994		
Sonda	12B	12	12C	12C	12C	12C	12C	12C		12C	12C	
Context number	220	640	2000	2007	2022	2028	2038	2043	2044	2059		
Sample number												
Context description	over-burden	upper ditch fill	over-burden	shallow pit in pit circuit	burial	over-burden	post-hole	post-hole	shallow pit fill	pit fill		
Objekt/feature no.	64	612, south extension	64			64			64	2060		
large cereal grain	**	*****	**	**	**	**		**	**			
millet grain	***	**	**		***	***				**		
glume wheat chaff		*****			**	**		*		*		
wild/weed taxa	***	*****	**	*	***	**		****	**	***		
no charred macrofossils							0					

Chapter 10. Interpretation and discussion

The Bronze Age site at Velim has long been regarded as mysterious in form and function. The discovery of hoards of gold and bronze marked the place out from an early stage of investigation as something special, while the frequent occurrence of bone, both human and animal, indicated that special activities took place there. With the discovery in excavation of ditch and pit circuits another possibility came to the fore, that the site was defended, and that the presence of numerous human bodies lying in disarray in pits and ditches indicated an attack on the site by hostile groups. In this chapter, we shall look at each possible interpretation in turn, in the light of the specific evidence recovered from the British excavations and bearing in mind the published indications from the Czech work (Hrala *et al*. 1992, 2000).

The form of the site

The interpretation of the Skalka site is bedevilled by the fact that a relatively small area of the total has been excavated, and of that, an even smaller amount is continuous. Furthermore, within the excavated areas, several features were only seen on the surface and not dug out, or if they were excavated, only a small sample of the whole could be recovered. This was an inevitable factor of the circumstances of the excavation in the 1980s and 1990s, when archaeological work had to proceed in advance of development work in individual plots. As a result, our knowledge of the overall form of the site, and the features on it, is severely restricted.

The Czech excavators have published a number of plans (one may take Plan 2 in Hrala *et al*. 2000 as authoritative) which are essentially reconstructions of the form of the site, on the assumption that individual pits or ditch segments joined up between the excavated portions. While some of these reconstructed features, notably Ditch Circuits A/B and G/H are likely to be accurate, others are not. In particular it is far from clear that Circuits C, D, E and F were originally complete circuits. The British excavations only had the opportunity to look at features supposed to belong to Circuit E, and in this it was plain that the supposed ditch was not what it was alleged to be, either in its nature or its course. Feature 64 consisted of two discrete pits, and the same was probably true of the ditches in S.12C, which were demonstrably not continuous; nor it is clear that these features represented a continuation of Ditch Circuit E. Nor is the nature of Circuit B completely clear, since in S.17 the ditch joined up with Feature 27, the deep pit with many human remains (including the "golden woman").

Fig. 10.1 is a plan of the major excavated areas on Skalka since 1984, insofar as these can be determined. It is evident that many of the features are more likely to be individual pits than parts of ditch circuits. The site appears to consist, therefore, of an inner ditch and palisade circuit (A and B), an outer ditch and palisade circuit (G and H), and a series of isolated pits, disposed irregularly across the site. Most, if not all, contained human bone; but as discussed above, Feature 64 had more of a domestic and ritual character than a funerary one.

The centre of the site is presumed to have lain inside Ditch Circuits A and B, and almost nothing is known about it because it has mostly been destroyed by sand-digging and quarrying. A rectangular post-built structure (142) lay at the eastern edge of the excavated area (Vávra 2000, 36) and a few pits were found in S.25, 11 and 1/84, some containing bone. Geophysical survey merely confirmed the course of the ditch circuits, and S.35 produced no results. As a consequence, we have to base our reconstruction of the form and function of the site on the parts between and outside the inner ditches.

That said, a number of things are clear: the outer ditch circuit was a massive affair and appears continuous over much of the northern slope of Skalka, fading out as it neared the bottom of the hill (to judge from the evidence of S.24) Outside it were series of large post-holes, that may have formed or framed a monumental gateway. Inside were large pits of extraordinary complexity, with human and animal remains, pottery, and other artefacts being deposited over the lifetimes of the pits, probably in fairly quick succession (to judge from the nature of the finds). Other pits were relatively shallow and might contain specifically selected bone (e.g. crania in Pit 154: Vávra 2000, 38-9, Fig. III.27).

We have, therefore, a range of features at Skalka, within a fairly small space. The problem is how to interpret them. Three possibilities arise immediately: the site was a defended fort; it was a centre of ritual; or it was a burial place. Of course there are not mutually exclusive categories, but the evidence for each needs to be considered in turn.

It is worth pointing out that almost all the twentieth century excavation at Velim, and certainly all the excavation reported in this account, took place *outside* the inner enclosure ditches, and therefore relates to activities that may or may not be representative of the site as a whole.

Fig. 10.1. Velim-Skalka: plan showing all excavated areas

The evidence for defence and attack

How can we know whether or not the site of Skalka was attacked, and the inhabitants slaughtered? The short answer is that we can never be sure. But we can make informed speculation, based on the evidence before us. This falls into a number of different categories: trauma on skeletons; weaponry; and defensive installations.

Trauma

The question of trauma has been dealt with in detail in Chapter 8, but also in previous reports . Dočkalová there indicated that human skeletal material exhibited marks of trauma in a number of instances. Because of the method of recording used, this could not be quantified, so that there was no possible way of knowing what proportion of the individuals represented on the site actually suffered from peri-mortem trauma. In 1990 she pointed to human bones with a variety of indications of trauma, including spiral fractures, splitting of bones, cuts, hammer fractures (blunt force trauma), trepanation, and healed wounds. More specific information was provided in the 2000 report. This included a group of crania (without mandibles) in Pit 154 (discovered in 1992), of which one infant skull showed intentional breaking, another showed multiple healed lesions, a third had been broken and possibly trepanned, while an adult tibia showed traces of violent breaking. All this is in addition to the fact that skulls do not find their way into pits by themselves. Crania were apparently collected and deposited separately, at least in some instances. Coupled with the evidence of attempts at decapitation from the mandible in context 220, this strongly suggests that decapitation, either before or soon after death, was an occasional occurrence on this site.

In Feature 23, part of Ditch Circuit E, parts of a minimum of thirty human individuals, represented by 710 bones, were discovered, lying in considerable disorder; a single articulated skeleton was present. Although no details are given, the report indicates that "traces of cutting, breaking and chopping" were evident on both human and animal bones.

Chapter 8 lists a number of occurrences in the human bone material from Sonda 12B of unhealed cuts and blows, indicative of peri-mortem trauma. To

this might be added the unusual position of many of the articulated skeletons, which were rarely placed in anatomical order but apparently thrown haphazardly into pits and ditches, or moved in post-depositional disturbance. This evidence, though partial, does indicate the consistent presence of trauma on a proportion of the buried population of Velim, and might be taken as support for the idea that a hostile attack on the site resulted in many deaths.

Weaponry

The evidence of weaponry depends almost entirely on the presence on the site of arrowheads. Twenty-six socketed bronze arrowheads were found in the Czech excavations up to 1992 (Hrala *et al*. 2000, 236 f., Fig. VII. 13; 254 f. Fig. VII. 20). Of them, five came from Feature 1 (Ditch B), four from Features 5 and 58 (Ditch A), seven from or near Features 23 and 27, seven from or near Feature 30, and three from or beside Feature 45A (Ditch circuit H). Of these, only the latter can unequivocally be associated with a defensive perimeter circuit; the rest come from pits or ditches that were apparently dug to contain skeletons. Unfortunately the precise location of the arrowheads (i.e. whether they were in close association with skeletal remains or not) is not stated, so that it remains uncertain whether they could have been the cause of death of some of the buried individuals.[1] Their presence in Ditch circuit H is, however, suggestive, and in any case the fact that a relatively large number of arrowheads appear on the site certainly suggests that they had been shot and not deposited by some other means. None was found in the British excavations, either in the extensive surface levels of Sondas 12 and 34, or in the deeper deposits of Features 64 and 612; but this is likely to be a matter of chance.

The two pieces of daggers from the Czech excavations (Hrala *et al*. 2000, 236 Fig. VII. 13, 96-97) are too fragmentary for any conclusions to be drawn, and may well have emanated from graves of an earlier period.

Defence

The largest pieces of evidence we have to deal with concerns the function of the ditches that surround, or appear to surround, the site. As has been made plain above, however, most of these features do not have a genuinely defensive character. Only Ditch circuits A/B and G/H are continuous (where they have been fully excavated), and accompanied by a palisade, the latter in all probability having a stone-faced rampart in its earlier phase. All of the other circuits consist of series of large pits, usually containing human and animal bone and other debris. They were not accompanied by ramparts and in many cases had gaps between the pits (or at least sections where the soil was not excavated to a significant depth). It is also unclear to what extent the "circuits" really are circuits rather than stretches of consecutive pits; this is particularly true of circuit E, to which Features 64, 23 and 30 would belong (see Hrala *et al*. 2000, 22, Plans 1 and 2), and probably too of circuits C and D, which do not look like circuits at all. This uncertainty lends the site plan as reconstructed by Hrala *et al*. its curiously lop-sided appearance.

Circuits A and B, as recovered by the fairly extensive excavations of Sondas 1/84 and 1/85, and by the geophysical survey in the orchard, clearly do form the larger part of a complete circuit, perhaps two-thirds, with the remaining third lost to disturbance by quarrying, sand-digging and the 1920s house and garden. The diameter of the area thus enclosed is estimated to be around 160 m. The published sections of Ditches A and B (e.g. Vávra 2000, 14-15 Figs III. 1-2) show that they were complex affairs and probably recut on more than one occasion. The published accounts do not indicate how much bone was found in them, but it appears that Feature 27, the very deep pit that contained among other finds that of the "Golden Lady", was dug into Ditch circuit A (though Vávra 2000, 16 ff appears to assign it to Circuit D). The fact that pits were dug through the ditches at some points does not mean that the circuits were not continuous; though it does shed light on the general practice of pit-digging. In fact the course of Ditch circuits A and B is far from clear in the western part of the excavated area (Sondas 17 and 18).

Circuits G and H, on the other hand (known colloquially as the Red Ditch because of the highly coloured marl in the fill), had a quite different character. As explained above, a complex construction sequence probably saw a rampart built and rebuilt as the ditch was added to, with in the final stages a catastrophic burning event which destroyed the entire built construction, the material tumbling in disorder into the outer ditch (H). Even here there are signs that bone was being used in particular ways (basal deposits in Sondas 19 and 12B), but this looks more as if it has an intentional foundation character than any kind of burial.

This also raises the question of the function of the large post-holes that lie north-west of the Red Ditch as recovered in Sonda 12B. As discussed above, these seem most likely to represent some kind of structure that was associated with an entrance into the site, though there is no corresponding gap at this point in the course of the Red Ditch. A possible gap is, however, present some 35 metres to the north, in Sonda 27, where it was only present as a slight depression and not a proper ditch.

1 In a few cases the depth (below the surface?) is stated; in most such cases it is slight (<45 cm), and only in the case of the piece from Features 27 and 30 were the arrowheads buried deeply – in the former at a depth of 2.40 m, the latter 0.90 m. In these two cases it is possible that they represent the manner of death of an individual buried nearby.

It is unfortunate that the course of the Red Ditch is not known with any more certainty. Air photographs, confirmed by geophysics, have shown that a double ditch runs north-south through the field to the east of Skalka on the other side of the Nová Ves road (Gojda 2000; Majer 2000, 343 Fig. 4), and in the north-east corner of these fields there appears to be a right-angled turn to the west, but what happens to it after that and whether it could join up with Ditch circuits G and H is unknown since the modern village prevents further investigation. The possible southward extension of the circuit is also unknown since it must disappear into the quarry, if indeed it continues in that direction.

The conclusion from this discussion of the possible defensive nature of the Red Ditch is that it looks reasonably effective as a fortification and did not serve the same purpose as the rest of the ditches and pits at Velim; but in the absence of any possibility of tracing its course more extensively a final judgement is impossible.

The evidence for domestic activity

The evidence for domestic activity at Velim is ambiguous and hard to interpret. The Czech excavators found post-built structures in Sondas 6A and 8 (Features 1 and 45A), as well as in the north-west corner of the site (Sonda 23), where "at least three constructions of different orientations could be traced… out of the tangle of post-holes. Long walls of another building (c. 6 m long) oriented E-W were found in NW corner of this sounding" (Hrala *et al*. 1992, 305). Later, Feature 142 in Sonda 25 was recovered, "an oblong structure delimited by gullies, oriented N-S on the longer axis. Dimensions 12.3 x 8 m" (Vávra 2000, 36). The latter structure, while forming a rectangular trench foundation, lies in the midst of the palisade inside Ditch Circuit A, apparently overlying and therefore postdating it. The post structures in Sonda 23 are co-axial with the large post-holes in Sonda 12E. They certainly appear to form lines of posts running N-S, but it is unclear whether there are concomitant E-W wall lines to coincide with them, or whether they are an extension of the putative gate feature that the S.12E post-holes may represent. They are certainly not clear evidence of domestic structures.

Carol Palmer's analysis of the carbonised plant remains at Velim (Chapter 9) indicates that there was plant processing being carried on in or near the site. We may add to this the evidence of Objekt 64 North pit, which produced, in addition to large stones and scattered human and animal bone, the sherds of large coarse storage vessels, two large querns and one smaller one, and a deposit of millet. In addition, the bone was fragmented and the animal bone was probably food waste. In general, the impression given by the Objekt 64 deposits was that of domestic rubbish thrown into a pit that had originally been dug for storage. The incorporation of individual human bones, which were in no cases articulated, indicates that such material was lying around the site following disturbance from the frequent pit-digging activities that are so evident. Objekt 64 was unlike most of those recovered by the Czech team in having no evidence for the intentional deposition of human bone in it; instead, it contained a distinctly domestic assemblage.

A further aspect of the domestic-type activity at Velim relates to the evidence for on-site metalworking. As discussed above, the finds from 1992-95 include fragments of crucible and slag, which join earlier finds of stone mould and waste metal, with possible metalworking tools being present in the bronzes found in earlier years. We have no indication of where or how such metalworking was carried on; too much of the site has been destroyed for this to have been possible. But these finds make it virtually certain that the activity occurred in the immediate vicinity.

Jockenhövel (1986) has discussed the nature and frequency of metallurgy on Urnfield period sites in southern Germany, with consideration of practical questions relating to fire and other hazards. In fact a majority of the known Bronze Age metalworking sites are settlements, and not locations outside which might have kept such potentially dangerous work away from households. It would be going too far to say that these metallurgical remains suggest the presence of a settlement, but certainly there were activities occurring at Velim which were fully in line with the normal run of domestic practice.

Cult and ritual

It is very evident from the descriptions of features in this report, and in both previous reports on the Czech excavations, that many aspects of the Velim site have no obvious explanation, at least not in modern terms. These include not only the archaeological features themselves (ditches and pits) but also their contents (articulated and disarticulated human skeletons, human and animal bone in particular dispositions, trauma on human bone, the outer ditch circuit, and so on). Virtually no aspect of the site is explicable simply in modern, 'rational', terms. Even in Objekt 64, for which, as we have seen, there is good evidence to suggest a predominantly domestic function, the strange figurine 95/1937 was found (cf above p. 000), and while this is not of such a form as to ensure an interpretation as a ritual object, its connection with the domestic sphere is equally uncertain.

In what follows, some aspects of these difficult matters are explored, with reference to comparanda from central Europe and further afield.

Previous views on cult activity at Velim

Hrala's discussion of these matters in his final statement on the matter devoted particular attention to the hoards found at or near Skalka . He further drew attention to the presence of human skeletons, or parts thereof, especially the phenomenon of severed heads. Ritual pits were also examined, and pits at Gzin near Chełmno in eastern Poland were thought to represent a good analogy for those at Velim, in spite of the much later date. Feature 23, with very large quantities of human and animal bone, was thought to be particularly significant by Hrala in the understanding of ritual at Velim. Finally, the surrounding ditch systems were taken as enclosing ritual space, a space that was particularly prominent because of the protruding rock formations that are known to have been present and which almost certainly made the spot especially visible in ancient times.

It is striking, however, that Hrala's co-excavator tended to stress the fortification aspect of the site, rather than the ritual. This is particularly evident in some of the shorter reports that have emanated from his pen (Vávra in Hrala *et al*. 1992).

A completely different approach has recently been taken by H. Peter-Röcher, who argues that the site was primarily a burial site, rather than primarily a place where sacrifices or other rituals took place . In this she makes a distinction between Velim and other sites, principally Blučina, which she is apparently content to regard as a sanctuary. Her main grounds for arguing this are that burials must have taken place from an early stage in the use of the site, since some of them lie deep in large pits; the presence of grave-goods in some instances, particularly with the 'golden lady' in Pit 27, is seen as especially significant. Added to this is the fact that the skeletal material is said to represent all ages and both sexes, without any special selection having taken place.

Another argument for this having represented the 'norm' for burial in this area is that there are no other graves, for instance tumulus graves such as one finds in western Bohemia. It is certainly true that in this part of Bohemia there are no tumulus cemeteries, but it is not the case that there are no Middle Bronze Age or transitional Middle-Late Bronze Age finds. Šumberová's discussion and Fig. 11.3 (Chapter 11) makes this clear.

The arguments for and against cult activity

To what extent did the deposition of bodies in the pits at Velim indicate special practice, and to what extent could it be seen as the normal burial rite for the area and period? Velim is unique in Bohemia, according to our present knowledge, so nothing can be said about its position in the range of possibilities that might have been available for burial. There are analogies elsewhere, which we shall examine later; but there too the information available is too scanty for certainty in our statements.

There are a number of reasons why, in contradiction to the statements of Peter-Röcher, we can see the deposition of bodies at Velim as unusual – excepting those few that were laid out in anatomical order and with grave-goods.

1. Bodies were deposited throughout the use-life of pits. This is very evident from Feature 27, the enormously large and deep feature containing several distinct pits, one with the body of the 'Golden Lady' and at least ten other individuals. This burial was by no means at the bottom of Feature 27, which had not been completely excavated by the end of the 1995 season (all the material presented in Vávra 2000 relates to earlier excavation years). Other pits containing many skeletons or skeletal elements were Features 23 and 30. In some cases it appears that a number of individuals were deposited at one time – this is especially the case for Feature 30. In other cases, there is a scatter of individual elements and sometimes a single articulated skeleton. But in virtually every case (Feature 64 north pit is an exception) there were multiple bone layers, with articulated skeletons being exceptional.

2. By far the largest quantity of human bone comes from individual elements, or sometimes element groups, and not from complete skeletons. Even in Feature 64 North pit, which had other elements suggesting a domestic function, there were scatters of bone at various levels. This suggests that taphonomic processes had a large role in the dissemination of bone across the site, and into buried features.

3. Otherwise complete skeletons were sometimes missing one element, or were placed with parts of the body moved out of position.

4. A few burials were laid on their sides, the legs drawn up, as was the "normal" practice for inhumations in the Early and Middle Bronze Age. But a much larger number were laid haphazardly, as if thrown into a pit without any care being taken. This is particularly the case in the British excavations in two contexts: in Feature 64 South pit, where an infant and a neonate lay in wholly unnatural positions; and in context 2616 (Sonda 12C), where a skeleton consisted of the torso, pelvic girdle and lower limbs of a single individual, the two bone groups displaced laterally from one another. It was suggested above that bodies, or parts of them, were placed in the ditches, and were subsequently shifted when disintegration of the tissue was sufficiently far advanced that parts of the corpse would detach from one another.

In addition, the percentage of dry fractures noted in both human and animal bone assemblages suggests a certain amount of disturbance and breakage after decomposition.

5. There is little or nothing that can be interpreted as grave-goods. Indeed, it is possible that bodies had been stripped of clothing when deposited. There are pins on the site, but never found with bodies in a position that might indicate dress fastenings *in situ*. Such pins may have been on individuals during their lifetime, but they were either removed at the time of death or ended up in their final resting-place after subsequent disturbance.

It is necessary to consider the implications of these facts. First, pit-digging at Velim was a major and continuing undertaking. Even with the benefit of modern tools and bulldozers, our excavation work produced large amounts of spoil that was not easy to manage. It is unclear how many pits, or how much of complex pits like Feature 27, were open at one time. Second, it seems likely that the process of deposition was a continuous one in many pits simultaneously, or almost so, rather than a successive one, though this remains to be proved by microanalysis (e.g. through C14 dating). Where a number of skeletons lay at the same level in a pit, then presumably enough space was opened up for all of them to be deposited together. Where a single skeleton lay on its own, a relatively small space may have been cleared. The biggest puzzle comes from those pits where depositions must have taken place continuously over a period of time – though whether that period was days, months, or years it is at present impossible to tell. Conceivably a programme of AMS dating on bone from different levels in a single pit might shed light on the matter; but even this is unlikely to have sufficient resolution to determine more than the general timescale, at the level of scores of years.

Third, pits were reopened, or left open, for skeletons deposited earlier to be revisited – though there is little evidence of rodent gnawing. This is the only possible explanation for the treatment of the skeleton in context 2616, where part of the body had been laterally displaced. It may account, in part at least, for the large number of human bones found isolated, which must have become part of a general site debris, lying about and incorporated into ditch and pit fills more or less haphazardly.

Fourth, some bodies were tipped unceremoniously into open pits, as was the case with the two infants in Feature 64 South pit. Since if they were left in their unnatural positions open to the elements they would have been subject to gnawing by predators and gradual collapse, it is clear that they must have been covered with earth immediately after deposition – though the pit as a whole may have remained visible.

Fifth, skulls were sometimes removed from bodies, apparently with the use of force, to judge from the trauma on the individual in context 220 (see Chapter 8, above p. 000). As mentioned already, the body in context 2616 lacked a head, though this may be a depositional feature. On the other hand, crania were evidently collected at times after decomposition, as Feature 154 from the Czech excavations shows. This was a fairly small pit containing a cluster of six human crania, with no mandibles. Isolated crania were encountered in the British excavations too.

Does this mean that we are dealing with formal burial? To the extent that some bodies were deposited in pits and covered over, the answer might be yes; this would also be the case with those few burials where grave-goods were provided, though it is worth pointing out that in some instances the goods are placed *under* the body, not *with* it, as if hidden away. But several other facts indicate that these formal burials were far from "normal", whatever that may mean in the context of the Kolín region in the Middle Bronze Age. The lack of proper positioning, or laying out of the dead; the removal of skulls or collection or crania; the evidence of peri-mortem trauma on a number of bones; the lack of grave-goods; the post-mortem treatment of skeletons; all bespeak a highly unusual attitude to the dead, which is so different from everything that is known of the Tumulus period in Bohemia that it is necessary to invoke special practices to account for it.

Analogies

Blučina, Hradisko and other Moravian sites

Velim is unique in its essential attributes, but nevertheless there are sites where we may point to aspects that recall what was happening there. First among these is the Cezavy hill at Blučina, in south Moravia. The excavations by Karel Tihelka (1969, summarising many campaigns of work since 1948) discovered no less than 132 burials, containing 205 skeletons, buried in a ditch that runs along the side of the hill (cf Jelínek 1957, 94 ff.). The pottery from the site indicates a close similarity in age to that from Velim, containing a mixture of Tumulus and Lausitz elements, with some shapes of the early Velatice culture; in other words a period that like Velim must belong to the Br C2/D transition, or thereabouts. Tihelka's account indicates that there were a number of similarities to the situation at Velim. There were "accumulations of both complete and fragmentary human skeletons", multiple burials, and burials containing a mixture of human and animal bone, which is described as being most frequently that of cattle. There were burials "placed unritually or deposited casually", and some were positioned in strange attitudes, as if struggling. There are also isolated skulls or crania, many of them of children (cf too Salaš 1993-94 [1997]).

Tihelka further remarks that there are "indications that fighting took place near the ditch… eight bronze, stone or bone arrowheads, most of them damaged

[were found]". The tip of one arrowhead was bent, and there are good grounds for believing that one of the male skeletons had been killed by an arrowshot. The presence of arrowheads, albeit in smaller numbers, indicates a similarity with Velim.

One significant difference from Velim was that many, perhaps most, of the skeletons were laid out in anatomical order and not subsequently disturbed: fifty were contracted burials lying on their sides, and a further thirteen lay on their backs. In 73 burials there were grave-goods: a very marked difference from the situation at Velim; and in certain childrens' graves there were signs of careful deposition with grave-goods that suggest a sentimental attachment to the deceased. The rich female grave 8/58, accompanied by bronzes, amber and glass beads, is especially indicative of this rite (Tihelka 1961).

More recently, a long campaign of excavations at Blučina by Milan Salaš has clarified a number of points about the earlier work. More burials were recovered, for instance the partial skeleton of a child, with the skull and some of the long bones burnt and laid to one side (Salaš 1985 [1987]). It is significant perhaps that Salaš has found several accumulations of bronze objects and metallurgical debris, as well as indications of settlement debris in the form of pits containing wheat and millet (Salaš 1985b; 1986 [1989]; 1987 [1990]; 1988 [1991]).

Although Tihelka made no mention of trauma on the skeletons that he found, analysis by Jan Jelínek found many examples, for instance cut marks on both human and animal bones . Jelínek argued for ritual cannibalism, on the grounds that there were many signs of butchery (cut marks and splitting of bone), but such ideas are nowadays open to a considerable degree of scepticism (cf Knüsel, above).

Tihelka believed that the Blučina burials could not be interpreted as the result of mass slaughter following an attack on the site, not least because there were no signs that they all emanated from the same event. He preferred a ritual explanation, including the possibility of cannibalism, and drew analogies with the burials in the ditch at Hradisko near Kroměříž (Spurný 1954, 1961a), and in pits at Přítluky in Moravia (Trňáčková 1954). Unfortunately neither set of excavations has been properly published so detailed comparison is not possible. At Přítluky, as well as the daub and stones emanating from houses, part of a large pit or ditch was found, 3-4 m wide and 11 m long as recovered, and in the excavated part four human skulls and parts of at least four others were found; two had mandibles with them, and five other mandibles lay at the bottom of the pit along with many other human bones, many of them from young individuals, and considerable quantities of animal bone, including the complete skull of a horse (Trňáčková 1954; Jelínek 1957, 89-90). Much pottery accompanied these finds, as well as a bundle of gold wire. Other analogies with Velim include the bronze hoard, containing six armrings, two daggers, two sickles, a palstave and a piece of ingot, there was also a group of four armrings. At Hradisko the excavator found abundant human skeletal material in the ditch fill of the defensive surround of the site, the remains of perhaps 15-17 individuals (Jelínek 1957, 90-91; Spurný 1961a); it was mixed with animal bones. From a pit in cultural layer B, belonging to the Věteřov-Tumulus transitional layer, came human and animal bones, some of them bearing cut marks. Other sites where human bone was found in pits and ditches include Rataj, Bezměrov and Hulín; this type of occurrence may well be much more common than is usually realised, as individual human bones in pits may often have been overlooked if they occurred with animal bones.

Summarising the situation at Blučina, it is clear that while there are interesting similarities to Velim, there are also significant differences, principally as concerns the way in which the dead were deposited. In all probability, the ditch area at Blučina was used as a burial location over a period of years, the dead usually being laid out in anatomical order and accompanied by grave-goods. This was true for some individuals at Velim, for instance the burials in Feature 30; but at Velim a much larger number were treated without any respect for the dead and provided with no goods. The area was certainly marked out as intended for death and the dead; the question is, was that the only purpose it served?

A different sort of "ritual pit" has been suggested for a feature from Přáslavice (Olomouc), where the rescue excavation of a Middle and Late Bronze Age settlement recovered a pit containing a large quantity of pottery and of daub (145 pieces, including 67 pieces that were shaped and burnt, weighing over 42 kg) . This daub did not form part of a house wall, nor was it part of a domed oven, but is reconstructed as a large flat oval pan and a pedestal base. The pit seems to have been used over time and was not filled with rubbish in one phase at the end of its life; nor was it part of a kiln for pot-firing. Clay features with burnt walls occur quite commonly in Middle Bronze Age Moravia, and are usually interpreted as having a cultic function; but this pit is not like most of them and cannot certainly be seen as cultic in character. In terms of deposition, especially with daub, one is reminded more of pits for the deposition of pot hoards, or for daub deposition such as at Early Iron Age Sobiejuchy (Żnin) (Harding *et al*. 2004, 27 Fig. 21). A further possibility for these oval pans and ring pedestals, which does not seem to have been considered in the literature, is that they represent salt-boiling installations. This topic will be discussed further in another forum.

The various constructions on Middle Bronze Age sites in Moravia that are termed cultic in the literature seem somewhat removed from what is present at Velim (Hrubý 1958). These "sacrificial places" (Černčín, Viničné Šumice, Uherský Brod) appear to consist of pits and platforms, with human and animal

bones and whole or fragmentary pots. This difference may be more apparent than real, however, since the precise context of these sites is not well known.

Deposition of material in pits occurs quite commonly in Bronze Age contexts. In the specific instance of Velim, one should recall the pit at Křečhoř which, as mentioned above (p. 000), was carefully structured with the 39 pots of 'Velim type'being deposited in layers. Of the many other instances one might mention in Bronze Age contexts (Harding 2000, 331-3), examples from Moravia and Slovakia provide useful analogies ; the pit at Olbramovice is a typical case in point , where a pit of oval shape 1.40 m in diameter and 62 cm deep contained 16 whole pots and an antler horse cheek-piece. Eight other such hoards are known from Moravia alone . In Austria, the hoard from Schrattenberg, district Mistelbach in Lower Austria is geographically and chronologically close to Velim (Eibner 1969), as is that from Maisbirbaum, district Korneuburg, also in Lower Austria (Doneus 1991). Whether this type of pit deposition relates at all to the bone deposition of Velim is unclear, but it is surely significant that pit depositions were commonly found in different parts of central Europe during the late Tumulus and transitional Tumulus-Urnfield periods. Sometimes such deposits may have included "offerings" of food and drink, though too little analytical work on possible food remnants has so far been carried out (Horst 1977).

Knovíz and Lausitz culture sites in Bohemia and beyond

In the Knovíz culture of northern Bohemia, where cremation in urns was the normal burial practice, a number of instances of whole or partial skeletons have been recovered from pits on settlements (Bouzek & Koutecký 1980). These authors have distinguished between burials in specially made pits, burials in storage pits, and other forms, for instance incomplete skeletons, skulls, mass burials, deposition of individuals who had apparently been forcibly killed, and so on. They are distinct, for the most part, from the stone cist burials of the Knovíz culture, which are few in number (Bouzek 1981). The settlement site of Konobrže (Most), for instance, though at a considerable distance from Velim, offers a number of instructive analogies. The site spans the Tumulus, transitional Tumulus-Knovíz, and Knovíz periods, and includes numerous pits, some of which contain human bone in all the periods represented. The pattern is repeated at other sites studied. These authors concluded that normal burials, i.e. complete skeletons with no sign of violence, represented the exception, and that these pit burials were signs of special activity.

Human bones were found in one of the pits at Mutějovice, okr. Rakovník, and animal bones in some of the others (Hrala & Fridrich 1972). More remarkable at this site was a horseshoe-shaped formation of ditches which are interpreted as a "cult house"; they produced no finds but are remarkably similar to a feature at Prague-Čakovice (never published; short accounts and plan: Soudský 1966; Pleiner 1978, 465, 567 fig. 174). This consisted of a circular ditched enclosure 17 m in diameter, with a small gap facing away from the houses of the settlement; only its unusual form marked it out as different, suggesting to the excavator that it was a cultic installation. These ditched features, which are in any case somewhat later than the Velim-Skalka site, find no resonance at Velim – unless the rectangular structure in Sonda 25 (Feature 142: Hrala *et al*. 2000, 36) is to be interpreted in this way.

While sites that are specifically like Velim-Skalka are very few, there are signs elsewhere in central Bohemia that mass burial was not as uncommon as one might think. The mass burial in Grave 4 in the Lausitz cemetery at Velký Osek, district Kolín, for instance, contained at least 12 individuals, of all ages and both sexes, and included three animals (Hrala 1992). This was one grave in a cemetery that is presumed to have been much larger than the six graves actually recovered; the existence of such a cemetery gives the lie to the notion that no normal cemeteries are to be found in the Kolín area (Peter-Röcher 2005). It is not known, however, how frequently such mass burials occur. Mass burials do occur at other periods, of course, such as the burial of eight humans and an animal in the Věteřov-period Feature 6 at Velké Pavlovice (Břeclav) (Stuchlíková *et al*. 1985). This grave at least is interpreted merely as a family grave rather than anything more enigmatic.

A case has been made that many features on Lausitz culture sites have cultic significance, particularly those where large pits or shafts are present, or where there appears to be evidence for unusual treatment of the dead (including allegations of cannibalism) (Dąbrowski 2001). It is undoubtedly true that the separation of domestic and ritual which applies to modern societies did not obtain in prehistory; but this does not mean that every unusual occurrence has to be interpreted as a sign of ritual or cult. As the experience of Velim shows, every manifestation must be treated on its own merits and phenomena such as cannibalism demonstrated rather than assumed.

Zauschwitz and other sites in Saxony

One of the most extraordinary, but still poorly known sites that seems relevant to Velim is that of Zauschwitz, Kr. Borna, near Leipzig (Vogt 1989).[2]

2 The site was excavated in advance of brick-clay extraction by staff of the Landesmuseum für Vorgeschichte Dresden over a period of 25 years through the 1950s, 60s and 70s, but only preliminary accounts have appeared, highlighting particular features. The information provided here comes from the interim reports of Coblenz and others, summarised by Vogt, and on the interpretation of the records by Louis Nebelsick and others. I am grateful to him for the references.

Thanks to an investigation of the surviving records of the excavation by L. Nebelsick (1996), we have some idea of what was found. This hill was repeatedly occupied from the Early Bronze Age onwards, and was apparently important for the production of briquetage. A row of elongated pits, measuring some 1.60 m across, ran in a line across the hill. In the upper levels the pits joined each other, the outlines of separate pits only becoming recognisable at a depth of 0.65 m and only forming individual features 1 m deep; given the depth of topsoil above, it is suggested that the pits were originally 2.50 m deep; they had a pointed or v-shaped base. On the bottom of each pit lay gravel, apparently thrown in at the start of the ritual; the majority of finds occurred in the upper half of the pits, including stone and bone tools (hammers, awls), bronze rings, pits and a knife with antenna handle, and much pottery. More important in the context of Velim was the fact that 25 of the 51 excavated pits contained disarticulated human skeletons, in which skulls and limb extremities were predominant, as well as complete inhumations and, more seldom, cremations. Some of the bones are said to show signs of violence, but no full report on this has been published. There is no information available about the chronology of the site except that it covers the whole period from the Middle Bronze Age to the Hallstatt period, and some of the material from the pits dates to the latest part of the Bronze Age. This scanty information does little more than frustrate, and it is to be hoped that a full publication will eventually see the light of day.

If one turns away from human skeletal remains, there are many other sites which have been designated "offering pits" of cultic usage. One example is the Late Bronze Age well from Großschorlopp, Lkr. Leipziger Land (Maraszek and Egold 2001). This is one of a number of wells from the area of eastern Germany. It contained pottery (typically jars and biconical vases), seven torc-like rings of bronze, and animal bones (a complete piglet and isolated bones of horse and cow). It joins a whole series of such sites, found not only in eastern Germany but much wider afield; the famous finds from Budsene, Jutland, and St Moritz, Switzerland, are only the best known (Harding 2000, 315 with refs). This is to ignore the whole phenomenon of hoarding, including the hoarding of pots, which must bear on the general problem of ritual deposition, and to which we shall return in the following chapter.

The collection and deposition of skulls and crania in Bronze Age contexts in central Europe is known from a number of sites and areas, of varying dates and types; Peter Schauer, among others, has collected examples of this practice in central Europe (Schauer 1996, 398 ff.) and examples may be found in other parts of Europe (for instance, the probable intentional deposition of crania in the Thames: Bradley and Gordon 1988).

Neolithic enclosures

One of the most striking analogies to the Velim site, and its curious depositions, is represented by the Neolithic enclosures of western Europe, and in particular the causewayed enclosures of Britain and Denmark (Oswald *et al*. 2001; Darvill & Thomas 2001). While there is some variability in the precise form of the sites and the deposition practices encountered on them, a number of features recur with sufficient regularity to make them worthy of note here. A relatively small number of the British examples have been excavated to any degree and a smaller number still published; the situation in continental Europe is best known from a rather small number of excavated sites.

The first, and most obvious, analogy, is that these enclosures, like Velim, surrounded a bounded area. The act of enclosure itself, whether for utilitarian or symbolic purposes, must have been important to those carrying out the work. Secondly, the causewayed nature of the sites, in other words the interrupted nature of the ditches (and presumably the accompanying banks) is evident even from surface indications and confirmed in most cases upon excavation. What is more, even where the ditches appear at higher levels to be continuous, this is not always the case at lower levels. Segments of ditch, or elongated pits, are usually found on British examples, placed end to end like a string of sausages; the segments are usually less than 20 m and in some cases are only a few metres long, with variation on the same site. The phenomenon of digging causewayed ditches has been observed on a variety of other monument classes, including henge monuments, long barrows, mortuary enclosures, and some round barrows. It may well have been present more frequently than is commonly supposed, given that large numbers of Neolithic ritual sites remain unexcavated.

Recutting has often been observed, suggesting that there were practices involving repeated use of the same stretch of ditch.

Next, palisades sometimes occur inside the ditches, as is the case at Velim; in other words, the ditch and bank was supplemented by additional works in timber, presumably to reinforce the real or perceived barrier that the earthworks represented,

Perhaps most important in this discussion of Neolithic analogies to Velim is the deposition of bone, both human and animal, in a number of causewayed enclosures. This is best known from Hambledon Hill, Dorset (Mercer 1980, 63), but is known to have occurred at a significant number of other sites (Drewett 1977, 224-6 for an attempt at quantifying this occurrence). In this, the non-survival of bone on fast-draining gravels is a complicating factor. It can be stated with certainty, however, that bone did occur on some gravel sites (e.g. Staines), and did not occur, or is not known to have occurred, on some chalk sites where preservation would be good (e.g. Combe Hill, Whitesheet Hill).

The bone includes both articulated and disarticulated material, which could mean that intentional burial was the norm, and that reuse of the same subsurface area caused previous depositions to become displaced and scattered. On the other hand, the evidently intentional placing of skulls on the ditch bottom at Hambledon Hill (Mercer 1980, 30 ff.; 1990, 50) speaks for a very specific form of practice, which, however "normal" in Neolithic Wessex, can hardly have represented burial, *sensu* disposal of the dead, in its usual sense.

This is not the place to enter into an extended discussion of the function of the causeways on Neolithic causewayed enclosures, but it seems likely that the purposes served by them were not dissimilar to those at Velim. There have been many attempts over the years to explain this apparently baffling feature of the enclosures, starting from the standpoint that a defensive function seems to be excluded. The ditch circuit then becomes more of a symbolic barrier than a real impediment to movement; a line which might only be crossed by certain people or under certain circumstances. The presence of human bones in the ditch might then give such a line additional significance. Few people would argue that causewayed enclosures were primarily burial sites, though Mercer comes close to this in some of his preliminary statements about Hambledon Hill; the deposition of bone on them is more often seen as an act connected with concern for the ancestors, imposing their presence on the monuments years, decades or even centuries later. It may be something very similar that we are witnessing at Velim.

Conclusions

The foregoing discussion indicates that while many of the features of the Skalka site at Velim can be paralleled elsewhere in later prehistoric Europe, the detailed combination of features is essentially unique. Certainly in the immediate area of Kolín, and indeed in central and eastern Bohemia more generally, there are no similar sites known, while the superficially similar situation at Blučina, which falls close in date to Velim, shows many differences in detail in spite of the extraordinary nature of the deposition of human bodies on the site. The similarities to Neolithic enclosures in north and west Europe are indeed striking, but while they may have something to tell us about the processes of undertaking cultic activity in prehistory then cannot be connected in any direct way with Velim.

We have attempted to demonstrate above that Velim was not a standard burial place, as has been argued by Peter-Röcher. As far as defence was concerned, the indications are that the inner features on the site would not have served such a purpose, while the outer ditch circuits (the Red Ditch and palisade) were possibly defensive in nature though not necessarily making a complete circuit. The situation of Skalka also speaks against a truly defensive function for the site and its ditches and pits. If defence was intended, it was defence of a very particular kind.

In view of the particular treatment and placing of the dead, as discussed by both Knüsel and Outram, it is hard to avoid the conclusion that whatever else was intended, there was a cultic significance to at least part of what went on at Velim. This did not include cannibalism, as the analysis of human and animal bone shows, but it did involve peri-mortem trauma to individuals on numerous occasions. There were also undeniably post-mortem activities, including the movement of semi-defleshed bodies and the collection of crania, and the disturbance of fully decomposed bodies, that are clearly apparent in the record as recovered.

At the same time, there were domestic activities of some kind on the site, though there are no clear indications that the site was ever a settlement in the usual sense. Objekt 64 North pit, with its querns and grain deposit, seems quite different from the large pits full of human bone found by the Czech team nearby. Probably it is wrong to separate the pit functions very clearly from each other since the domestic and ritual spheres were not regarded as separate by the occupants of the site; but in terms of our interpretation of the archaeological evidence it is reasonable to view some features as "more domestic" than others.

The huge scale of pit-digging at Velim and the concomitant large volumes of earth that were being moved over significant periods of time have implications for labour and manpower requirements. Put simply, much of the area of Skalka must have been a scene of disorder, a mass of piles of spoil, for a lot of the time during which it was occupied and used. The extraordinary depth and complexity of some of the pits, notably Feature 27, suggests that significant numbers of people must have spent time shifting earth back and forth. Whatever one decides about the ultimate function of the Velim site, it is an extraordinary scene to imagine.

Chapter 11. Velim-Skalka and its territory in the Bronze Age

RADKA ŠUMBEROVÁ

Velim-Skalka has stimulated discussion from the time of the first excavations not only thanks to the special character of the finds, but also because of its situation. The hill, which is not especially marked as it rises from the Labe lowlands, and is overshadowed on the southern side by the dominant hill of Bedřichov, was seemingly not the most suitable place for a fortified settlement from the strategic point of view. Only when we look at older cartographic data showing the still visible old branches of the Labe (Fig. 11.1), and if we take into account the extent of the fortified area (Fig. 11.2), do we discover that the site occupied a very convenient area almost on the banks of the river, at that time undoubtedly the most important and most frequented communication artery in the region. It is a stretch of country that is not in any way dominant, but with its rocky surface outcrops is still easily identifiable, lying in an area with the river close at hand, but still safe from flooding.

It would also be possible to judge the suitability of this area by looking at settlement from periods other than the Bronze Age, but it is not particularly evident (most recently assembled by Vávra & Šťastný 2000) and does not provide evidence of anything other than normal settlement, of farming or fishing character. It was Skalka above all that occupies an unusual position in the structure of settlement in the Middle Bronze Age and the transition from Middle to Late Bronze Age. And the questions "why then?" and "why there?" remain unanswered to this day, perhaps precisely because the function and significance of this spot is a matter of constant debate.

The Kolín area, after a marked population explosion attested by the quantity of finds from the Early Bronze Age, apparently became, together with neighbouring Kutná Hora, an area of marginal interest at the beginning of the Middle Bronze Age. Settlement findspots of the Tumulus Culture are completely isolated and appear mainly in the western part of the region (Fig. 11.3). If we put only settlement

Fig. 11.1. Extract from 1st Military Survey of Bohemia (1764-68)

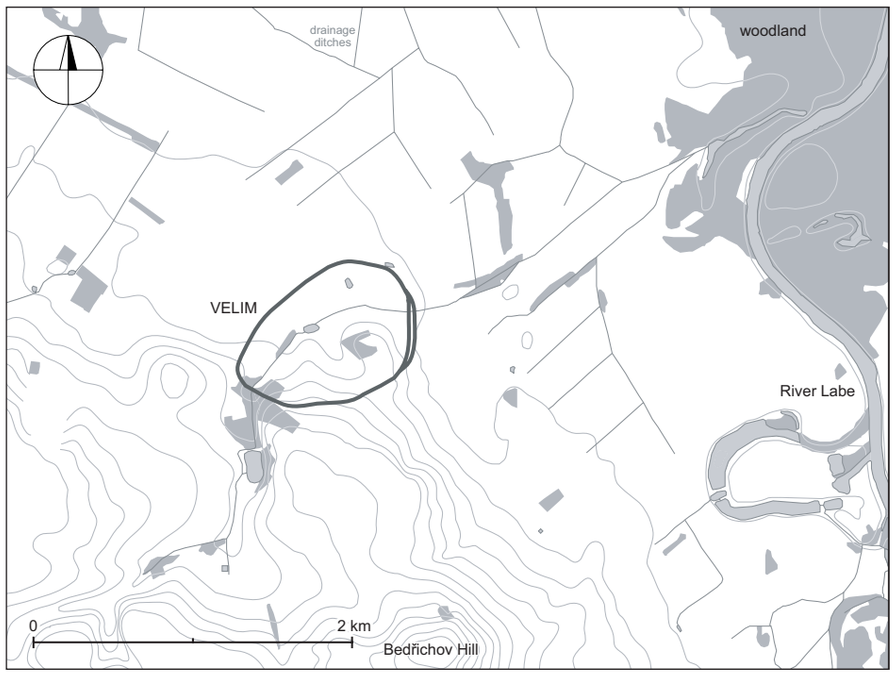


Fig. 11.2. Location of the outermost ditch circuit enclosing the area from Skalka to Velim village

finds on the map, Skalka is the easternmost site in the region, and its situation may be regarded as lying on a border. Isolated grave finds do occur further east, indicating some activity even on the right (east) side of the Labe. In the woods at Býchory a bronze pin of the Tumulus Culture was found, and an inhumation burial turned up in the village (Dvořák 1936, 127). At Lžovice, lying right on the Labe, a burial with a bronze bracelet was found (Dvořák 1936, 140); and a grave of the "Velim culture" is also mentioned at Kořenice, south-west of Kolín (Dvořák 1936, 137). A Tumulus Culture jug comes from the Labe river-bed in the region of present-day Kolín (Dvořák 1936, 135); this must emanate from a grave, and may be seen in connection with the use of the Labe as a communication route, or it might indicate the presence of a ford. Classic settlement finds along the course of the Labe in the Kolín area do not continue further eastwards.

The construction of fortified sites on the edges of the settled (or controlled) territory repeatedly appears in other periods of prehistory too. The tiny quantity of other settlement evidence, on the other hand, forces us to consider whether one can talk at all of a settled area, and where the hundreds of workers needed for the construction of such an enormous fortification system as that found at Skalka would have come from. From the finds and some of the findspots, one can suppose that a more extensive settlement existed only near Cerhenice (Sedláček 1976; Sedláček & Veselý 1987, 25), with signs of settlement also in the neighbourhood of Třebovle (Vávra 1987, 214) and Molitorov (Prkno, Vávra & Zápařka 1987, 87); but both these localities are more than 10 km from Velim, just like Opolánky in the neighbouring Poděbrady region. If we were to suppose that Skalka is connected instead with the east Bohemian region, it would be separated from its territory by a large almost unoccupied zone on the right side of the Labe, and somewhat illogically positioned behind a natural obstacle. It seems then that the siting of the locality does not connect directly with the settled area, but is tied to the Labe as an important communication artery.

One reason for this lack of findspots may be that our observations on settlement at certain periods of prehistory are very incomplete, whether because of the state of research or because the type of existence at particular periods leaves few traces. The Kolín area belongs to a region with a very long history of archaeological investigation, but here too one must expect new finds to markedly influence our perspective. Even if we cannot expect a radical increase in the number of finds, new discoveries from the Kolín district and neighbouring areas attest to a somewhat greater importance of the region in the following period that of the occupation of Skalka. One may recall for example the isolated finds of pottery of Věteřov type from Skalka from the Spurný excavations (Spurný 2002); most recently Věteřov pottery was found together with early Tumulus pottery by M. Vávra in 2000 (Vávra & Šťastný 2002, 187). It seems, therefore, that we can trace the history of the site in some manner from the beginning of the Middle Bronze Age. An analogous situation exists in the Kutná Hora area, where Věteřov settlement features have been attested beside a late and final Tumulus settlement at Čáslav-Skála, in an apparently unoccupied region (Šumberová 2004). This settlement was successively utilised in the early Lausitz period without any evidence for a destruction horizon. One must stress, however, that even in the Kutná Hora region this is the only site of the Tumulus Culture examined on a large scale, and previously only a single site was known, from Kutná Hora itself (Beneš 1981), and possibly some individual vessels (Hrala 1996). The Věteřov phase was similarly known only from a single feature at Přítoky (Pavlů 1975). In both regions the situation changes radically at the start of the Late Bronze Age, when dozens of settlements and cemeteries of the Lausitz Culture appear in the whole settled territory, followed by intensive settlement of the Knovíz Culture.

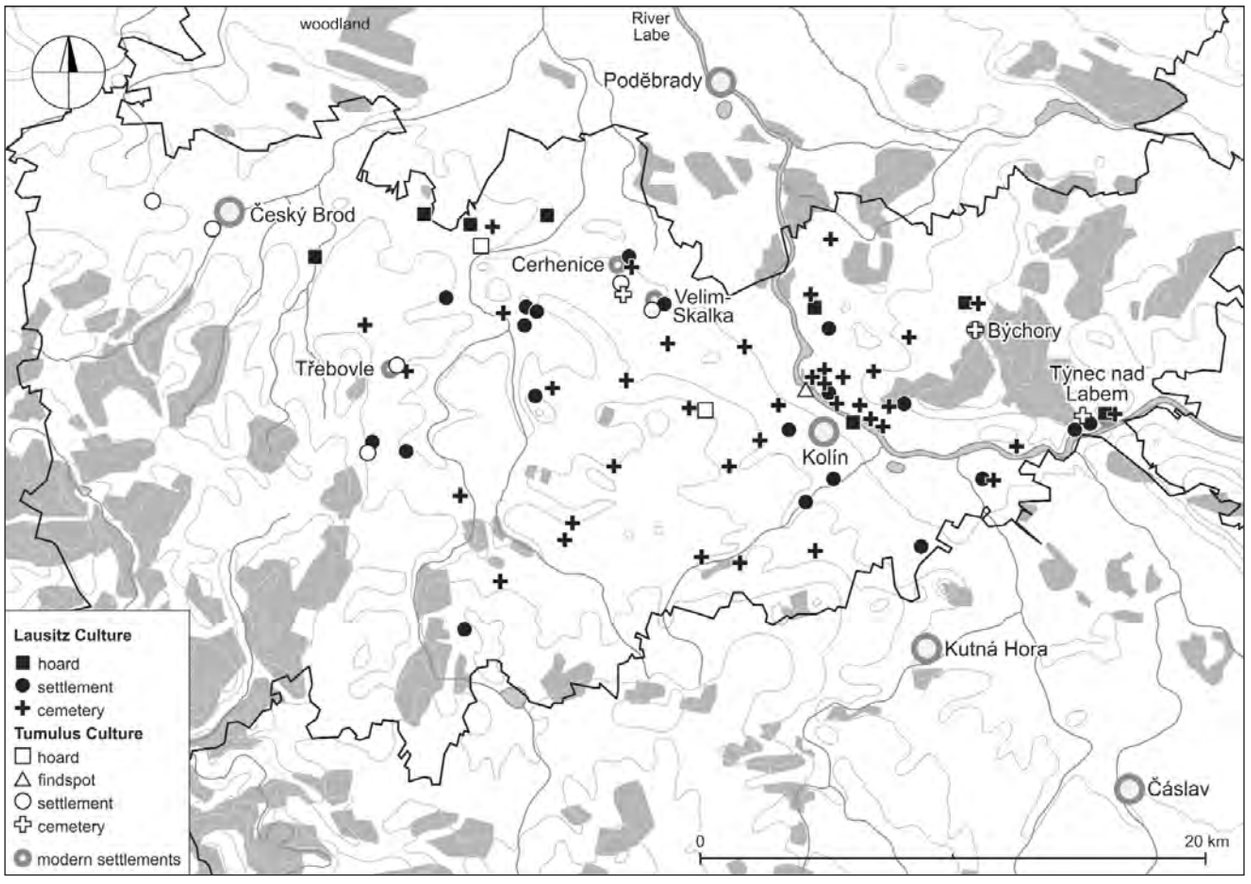


Fig. 11.3. Kolín district, showing findspots of the Tumulus and Lausitz cultures

Our ideas about intensity of use of the territory at the close of the Middle Bronze Age in the Kolín area change somewhat when we move from normal settlement finds and look at the appearance of hoards of gold objects. In a circle of radius 10 km from Velim, apart from the Velim hoards, a further three hoards of gold are known, and from the present-day Kolín district there are nine. This concentration corresponds with the increased quantity of gold hoards in East Bohemia, where at the close of the Middle Bronze Age and beginning of the Late Bronze Age twice as much gold has been found as in all the rest of the country put together (Hrala 1997, 193). In this respect Skalka really does show a connection with the East Bohemian area. Some of these hoards must be related to the importance of the Labe as a communication route, but far from all of them lie close to it, indicating further activity outside this axial route. If we were to accept the hypothesis that hoards were placed in the ground at times of instability, problems, or war, eastern Bohemia would be a veritable hearth of warlike conflict at this time, and indirectly the idea of a warlike origin for the fortifications at Skalka would be supported. The placing of some hoards on prominent landscape features, however, often attests instead to cult deposition (cf Smrž & Blažek 2002 on Kletečna), and some finds from the Kolín area would correspond to this mode of deposition by virtue of their situation on hills (i.e. Chotule and Lžovice). A similar ritual significance attaches to hoards of pottery (libation ceremonies: Bouzek & Sklenář 1987; Bouzek 1997), of which one was found at Křechoř (Jelínková 1959), barely 6 km from Skalka. It contained exclusively cups of the so-called Velim type, and the formal correspondence of its contents to the finds from Skalka is obvious. Similarly a ritual significance attaches to the hoard from Poděbrady, around 16 km north of Velim.

The concentration of ritual activities in the region under consideration is obviously marked, and we can posit a certain symbolic significance not just of one locality, but of the whole countryside around the bend of the Labe, and especially of the natural eminences in the area. Skalka at Velim, by its extent and clearly also by its marked economic importance, could have been the centre of these ritual activities, and perhaps this symbolic function was especially important at some periods (further supposed functions of the fort could have been connected incidentally with ritual activities). Because it could then have served as a ceremonial meeting-place for many communities (cf Neustupný 1995, 650) – bearing in mind that the Labe was accessible over long distances – we may have an explanation for the sparse Bronze Age settlement in the area (naturally neither the country of the gods nor the country of the dead were suitable for living in!).

We come back to the question "why here?", but because the symbolic functions of prehistoric phenomena and the thought processes and ideas of Bronze Age cultures remain hidden to us, and because

people from our contemporary over-technological world will never be able to grasp them, we must reconcile ourselves to the realisation that this "why" will remain unanswered. Although Skalka itself lost its regional importance after the destruction of the fortification at the transition from Middle to Late Bronze Age, the landscape did not. J. Valentová (2002) has pointed to the special situation of the land around the bend of the Labe in the context of a widely perceived communication function for the period far back into prehistory, and especially for the La Tčne period. In the Iron Age Skalka was reoccupied, but the hill never again saw occupation like it had in the Bronze Age. In the La Tčne period the area around Týnec nad Labem, on the opposite edge of the territory under investigation, where a small oppidum may have arisen on the Kolo hill, assumed the pre-eminent position in the region.

Chapter 12. The wider scene

In chapter 10, a number of potential analogies for Velim-Skalka were introduced, from different parts of Europe and (in the case of the causewayed enclosures of the West) a different time-period. It remains to look at how Velim might fit within the wider picture of Bronze Age activity in the middle of the second millennium BC.

Defence and the development of Bronze Age warfare

The extent to which Velim can be considered a defensive site, or at least a site with defences, must be judged from a consideration of how defences developed in Bronze Age Europe.

First, however, it is necessary to consider what constitutes a defence work. Typically one expects that this will consist of a ditch and bank, sometimes a palisade, or a combination of all or some of these. But how substantial does such a work need to be in order for it to be called defensive? What would characterise defence against animal predators as opposed to defence against humans? There are no clear-cut answers to these questions. In general, one might suppose that a ditch and bank would not be very effective at keeping animals out unless they were supplemented by additional features, such as a fence or wall on top of the bank; otherwise an agile animal will simply climb over. Even a thorn hedge, extremely effective against humans, may not work so well against animals, which can worm their way through small gaps without suffering much discomfort from the thorns. Arguably, therefore, it is mainly palisades and fences – of sufficient height that animals cannot simply jump over them – which should indicate protection against predators.

Humans are less agile than animals, but their ingenuity means that there is no defence which cannot be breached with sufficient determination. But the simple expedient of a ditch with inner bank running upslope continuously from it can act as a major deterrent to human attack. Although in recent years there has been a trend to see "fortifications" as more than merely defensive, there can be no doubt that humans will have some difficulty in running up a steep slope, typically a minimum of five metres from bottom to top, while simultaneously being subjected to an onslaught of projectiles from defenders above. Whatever else a ditch and bank may signify, it is likely to include an element of deterrence to those outside. It would be simplistic to suppose that palisades and fences were intended merely to protect against animals, and ditches and banks against humans, but there are elements of truth in this proposition.

Seen in this light, we can view the development of defences, or at least enclosed sites, as an integral part of the history of the Bronze Age (cf Harding 2007). In central Europe, the Early Bronze Age saw the creation of fortified sites in western Slovakia in some numbers (Furmánek *et al*.1991, 179 ff.), with examples also being found in central and eastern Slovakia as well as in Moravia (Stuchlíková 1982). In Hungary, some tell sites were surrounded by ditches and banks, for instance Jászdózsa-Kápolnahalom (Stanczik 1982) though others were not (e.g. Füzesabony: Szathmári 1992). Examples of Early Bronze Age fortifications occur at many locations through Europe, though nowhere in as concentrated a form as Slovakia and Moravia. In Bohemia, there is some indication of a tradition of fortification that went back to the Eneolithic, as at the site of Homolka on the outskirts of Prague (Ehrich and Pleslová-Štíková 1968), though this is little more than a hill-top settlement surrounded by a palisade.

A number of hill sites in southern Germany and the Alpine area can now be shown to have been occupied in the Early Bronze Age, including the site excavated by M. Primas with her collaborators at the Ochsenberg, Wartau, canton St Gallen (Schmid-Sikimić 1999; Primas 2002, 47-50). Likewise the site of Sotciastel on a rocky spur in the Italian Alps has occupation of the Early Bronze Age and a wall cutting off the most accessible slope (Tecchiati 1998). On the other hand, Primas point outs (2002, 44) that west of Austria dated Early Bronze Age forts are rare, even if some settlements were situated on higher ground.

In the Tumulus period, there is little sign of fortified sites in Bohemia or adjacent parts of Germany, though admittedly the dating of Tumulus settlement pottery is far from a precise art. In Hungary, numerous sites of the Vatya culture are fortified (Bándi 1982), and moving further south, the proto-urban hilltop centre of Monkodonja in Istria, of Vattina culture date, has stone walls surrounding it (and it is surely not alone in belonging to this date) (Teržan *et al*. 1998).

It is with the Late Bronze Age, however, that fortification became much more common, certainly in central Europe and probably throughout the continent (with infrequent exceptions). The dating of sites that have not been excavated is always problematical, especially as many forts are covered in woodland with few exposures of cultural strata. Thus in Württemberg, Biel's analysis showed that most datable sites belonged to Ha A and B (Biel 1980; 1987), and other analyses have been conducted over the years (Herrmann 1969; Harding and Ostoja-Zagórski 1993; Harding 2000, 296 ff.) showing how the Urnfield period was a major formative period in the development of forts, whether on hills or not.

The development of defences in this manner is almost certainly connected with changing modes of warfare, and in particular the rise of raiding by parties of armed warriors. This hypothesis has been advanced by a number of authors (e.g. Osgood 1998, 2000; Harding 2000, 274). For hillforts and stockades of the Late Bronze and Early Iron Ages, it is indeed plausible, even allowing for the fact that ditches and ramparts may not always have served a strictly defensive purpose. But in the centuries prior to the Late Bronze Age it seems much less certain that settlements were sited specifically for such reasons. Even in an Iron Age context it has been suggested that positioning a site "defensively" was not necessarily all it seemed (Bowden & McOmish 1987, 1989): erecting defences, i.e. ditches and ramparts, was part of the process of creating the "required barrier", a means of defining space, both outer and inner. Examples have been given of "forts" that were not fortifiable, and seem to have been created merely for the sake of it.

In such a situation, the digging of ditches and pits, and the erection of ramparts, may be seen as part of a wider sphere of action than purely military, and it is in this context that it is most plausible to view the activities that occurred at Velim in the fifteenth century cal. BC. Whether one wishes to call this "ritual" or "cult" is perhaps a matter of personal taste; what seems indisputable is that the circuits of ditches and pits cannot have acted as a very effective barrier to those determined to get in.

Identifying cult

Many authors have discussed the thorny question of cult and ritual on prehistoric sites. Renfrew (1985) provided a list of features which might indicate such practices, in the context of the "sanctuary" at Phylakopi on Melos. These included location (place with special associations, special building), conspicuous display and wealth, iconography and repeated symbols (the symbolism related to the deities worshipped), structure, facilities and equipment, evidence of human or animal sacrifice, and evidence of food and drink, whether or not used for feasting. A site such as Phylakopi, with clay figurines, frescoes, and so on, seems more amenable to such treatment than do sites where little overt symbolism is present, and in the case of Velim, are characterised above all by manipulation of human bone. This is not to say that symbolism did not play an important role in Bronze Age Europe: it surely did, as studies of recurring motifs such axes, birds or heart-shaped pendants have shown (Kossack 1954; Schumacher-Matthäus 1985), but they do not normally occur in specific places that appear cultic in nature.

I have considered elsewhere the nature of religious sites in Bronze Age Europe (Harding 2000, 309 ff.). In some instances we might use Renfrew's checklist to persuade ourselves that sites are cultic in nature (for instance, the use of special places – such as caves or wet locations; special buildings, such as the "temple" at Sălacea or the wooden construction at Bargeroosterveld). In others we have little idea what we are really looking at, since the separation of activities into cultic, domestic or military is a facet of our own contextual situation and need have no relevance to societies other than our own. Pit-digging can be seen as habitual action on the part of those for whom it was important, *habitus* if one wishes to use the term.

The digging of pits raises wider questions about the structure of the archaeological record. As we have seen, there are good reasons to believe that many of the Velim pits were dug and filled in an intentional manner; the deposits are structured. Structured deposition in pits has been the subject of considerable interest in recent years (e.g. Hill 1995; Chapman 2000a), with many authors asserting that apparently random accumulations of archaeological material were in fact carefully deposited. The Velim depositions can be seen as an important part of that debate. It would be of considerable interest if it could be shown that material, for instance human bone, was intentionally divided between different deposition contexts, since it would confirm the 'fragmentation hypothesis that has been espoused in recent years (Chapman 2000b). As things stand, such a procedure has not been attempted, but it is by no means impossible.

Also part of the practice of pit-digging was the treatment of the dead. This has been considered exhaustively in Chapters 8 and 10, and needs no labouring here. Our conclusions, that Velim was no ordinary burial site but a locale of special importance where many people died violent deaths, is coupled with the observation that there is evidence for peri-mortem violence but none for cannibalism. We cannot fully explain the lack of 'normative' burials in the eastern part of central Bohemia, but we are encouraged in our view because abundant tumulus burials, usually taken as typical for the Middle Bronze Age, in fact occur in very specific areas of Europe and by no means everywhere. Were Velim-type sites to be found in other areas lacking tumuli, the view that Velim was merely a burial site might have more relevance; but as things stand, it is impossible to entertain seriously the view that what is found there is normative.

Velim and the transition to the Urnfield cultures

Since the date of Velim and the Velim type lies, as we have seen, at the junction of the Middle and Late Bronze Ages (Br C2-D, *ca* 1400 cal BC), we are justified in asking whether the marked changes that occurred widely across Europe around that time find their reflection in what we observe at Velim. The beginning of the Late Bronze Age in Br D saw, as is well-known, a remarkable shift in burial practice, from inhumation to cremation. The reasons for this shift have been much discussed and remain far from clear. Given that major changes in burial are usually thought to be undertaken only after comparably far-reaching changes in the social or political sphere, it has been suggested that the Urnfield cremation rite occurred as the result of the

arrival of new people (the "Urnfielders"). The Lausitz culture, which occupied the parts of Bohemia and adjacent areas that concern us here, was one part of that Urnfield phenomenon. In days gone by, the 'arrival' of Lausitz folk was widely held to represent a new people, sweeping in from 'outside'. For south-east Europe, particularly Greece, that may have been a sustainable position; but it can hardly be maintained for the whole of continental Europe. Quite simply, where would all these people come from, and what would have happened to those already present?

At the same time, the transition to the Urnfields does bespeak major changes in economy, demography and (arguably) society. Populations seem to have increased dramatically (though the relative invisibility of inhumations in the preceding period may have something to do with this); huge numbers of people were buried during the centuries that occupied the Late Bronze Age (Urnfield period). The accompanying increase in resource exploitation is often assumed to relate, albeit indirectly, to the increasing levels of tension that the rise of forts and warrior bands attest. In this process, the deposits of Velim, or of Blučina, are highly suggestive. We may not be able to point to other instances of *large-scale* violence against groups of individuals in the Late Bronze Age, but all the indications from grave-goods and settlement form and location are that aggression between quasi-political units became the norm in Late Bronze Age Europe.

Some of this violence may have been directed against "indigenes" by "newcomers", but theories involving massive population replacement, and consequent culture change, can hardly be sustained in modern archaeology. True, the change to cremation that is the true hallmark of the Urnfields was a dramatic and far-reaching one; but the way in which it was preceded by cultural elements (e.g. in pottery forms) that foreshadow what was to come later strongly suggests that the change in culture was no sudden replacement. In any case, if one were to imagine hordes of invaders sweeping through central Europe, destroying sites and killing people before them, one would expect far more instances of the sort of phenomenon that is manifest at Velim.

Final words: what next for Velim?

There can be no question that Velim-Skalka is a site of major importance in Czech and European prehistory. Although many aspects of the site remain underresearched and poorly understood, what has been found is remarkable for the complexity and richness of its character. Further publication of the detailed find circumstances of the Czech excavations since 1984 would undoubtedly add to our understanding of the site, and this must remain a major goal for the excavation team. It is very unfortunate that most of the site is now unavailable for further work, being covered by roads, houses and gardens; a situation that will persist for the foreseeable future; and it is a sad reflection on the planning practices that existed in the early 1980s in socialist Czechoslovakia that such an important site, well-known to archaeologists and supposedly protected by heritage legislation, should have suffered such a fate.

All is not completely lost, however. Although those parts of the site where deep foundations or septic tanks have been inserted are lost forever, the garden areas and the roads will not have disturbed the deeper features; small sondages by Vávra at various points have recovered evidence for the supposed course of ditches across much of the site and these small trenches could in the future be reopened and extended. Although a huge pit such as Objekt ?27 will never be available in its entireity, smaller pits such as Objekt 64 North pit could be excavated in garden plots. Such work would be very useful for testing the extent to which this pit was typical of the Velim situation. Smaller features such as palisades and post-holes may have been lost, though they may survive under the roads.

What is more, there remain parts of the orchard on the higher ground, where Sonda 35 was dug, that could yet provide fruitful evidence, particularly as the geophysical survey made it clear that the inner ditch circuits continue through that area. It was unfortunate that Sonda 35 produced no archaeological features, and may lie on the edge of the heavily disturbed zone; but further west it is entirely possible that good archaeological deposits remain relatively intact.

The site of Velim-Skalka has been well-known in the literature for many years, albeit on a very incomplete basis of knowledge. Given the recent history of the site, it seems destined to remain known only to archaeologists in the coming decades, unless changes of ownership and landuse for the orchard area and adjacent fields bring about archaeological fieldwork in advance of development. It is too late to rescue most of the site from destruction or disturbance, and the danger is that knowledge of its existence will disappear as the years pass and the memory of the recent excavation campaigns fades. Unfortunately, the extraordinary remains uncovered in the excavations are not such as could be displayed to the public, both because of their depth and because of their lateral extent: a series of large pits, emptied of their contents, would tell one the public little or nothing. Yet, as this account has attempted to show, Skalka represents one of the most important sites of its period, indeed of the entire Bronze Age. Its existence should be known to more than professional archaeologists; it should be the subject of constant interpretation and re-interpretation. Just as the inhabitants of Velim in the decades around 1400 BC constantly dug and redug their world, so our task as modern interpreters of those actions should be to tell and retell their stories.

Appendix 1. Particle size analysis of samples from Velim

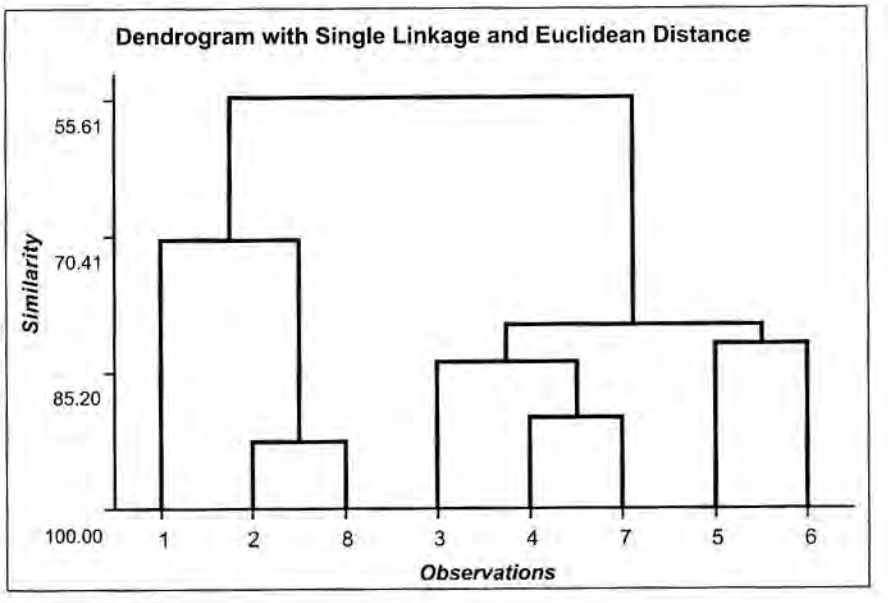
ROBERT S. SHIEL

The samples were analysed in duplicate using a modified method of separating the different size fractions. 25 g of each sample was shaken overnight in 200 ml of water with 5 ml of 10% Calgon as a deflocculating agent. The samples were then washed through a stack of 2 mm, 212 µm and 63 µm sieves and the coarse and fine sand fractions collected, dried and weighed. The remaining suspension containing the silt and clay was made up to 1 litre in a tall measuring cylinder and was agitated; a sample was taken immediately at 5 cm depth using a 25 ml Andreason pipette and this fraction, containing the silt and clay, was put in an oven to dry. The remaining suspension was left for an appropriate period (about 4 hours) and a further sample taken at 5 cm depth containing the clay only; this was treated as for the silt plus clay. Allowance was made for the weight of Calgon in the suspension. The weight of the silt was found by difference, and the total weight of silt and clay were multiplied up to the original volume; the results are shown below.

Number	%sand	%coarse sand	%fine sand	%clay+silt	% silt	% clay	Context
1	65.3	31.1	34.1	34.7	4.2	30.5	87 (Red Ditch, yellow material
2	90.6	57.1	33.3	9.4	0.9	8.5	86 (Red Ditch, red material)
3	30.9	13.1	17.2	69.1	43.3	25.8	2722 (post-pipe from pit 2710)
4	20.7	6.5	14.2	79.3	31.7	47.6	107 (Red Ditch, basal material)
5	5.2	2.6	2.6	94.8	26.7	68.1	Old surface near Red Ditch*
6	4.3	0.8	3.5	95.7	46.2	49.5	Old surface near Red Ditch*
7	27.2	16.7	10.5	72.8	29.6	43.3	Topsoil near S.19*
8	85.1	57.5	26.6	14.9	4.1	10.9	86 (Red Ditch, red material)

*Nos 5, 6 and 7 were taken as background samples for comparison with those from specific archaeological contexts

There was considerable variation between some of the samples so a Cluster Analysis (Minitab) was used to produce the dendrogram below. It appears that samples 2 and 8 are most alike, followed by samples 2 and 7. Sample 3 has some resemblance to 2 and 7 while 5 and 6 form another pair with similarity to 2, 3 and 7. These samples are very different to 1, 2 and 8; sample 1 has only a little resemblance to samples 2 and 8. As the boundaries between size fractions are arbitrary, and different values are used in different countries the proportion in a size fraction can vary considerably between samples that are closely related; for this reason the cluster analysis approach is preferred to a simple comparison of individual values.



Appendix 2. Introduction

Six samples of organic material, mainly carbonised plant material, were submitted to the Centre for Isotope Research of Rijksuniversiteit Groningen for ^{14}C dating. Five of these came from the lowest levels (95/3019 and 3021) of Pit 64, and one (94/107) from the Red Ditch. The results, as transmitted by Dr J. van der Pflicht on 14 March 2003 are as follows:

Lab ID	Site ID	Age BP	$^{13}\delta$(‰)
GrN-27615	Velim 94/107 (charcoal)	3080 ± 20	
GrN-27617	Velim 3021 N quadrant	3160 ± 20	-16.14
GrN-27618	Velim 3021/NE	3125 ± 20	-10.98
GrN-27619	Velim 3021 SW(1)	2990 ± 80	
GrN-27620	Velim 3021 SW(2)	3115 ± 35	

The sample 95/3019 was too small for conventional dating.

Two $^{13}\delta$ values were remarkable and are reported. For GrN-27618, the $^{13}\delta$ value is in accordance with millet (a C4 plant). For GrN-27617 the $^{13}\delta$ value points to a mixture of C3 and C4 material. Using common $^{13}\delta$ values, the admixture of millet is about 60%.

The $^{13}\delta$ values are used for fractionation correction of the ^{14}C dates.

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SUPPLEMENTARY FIGURES

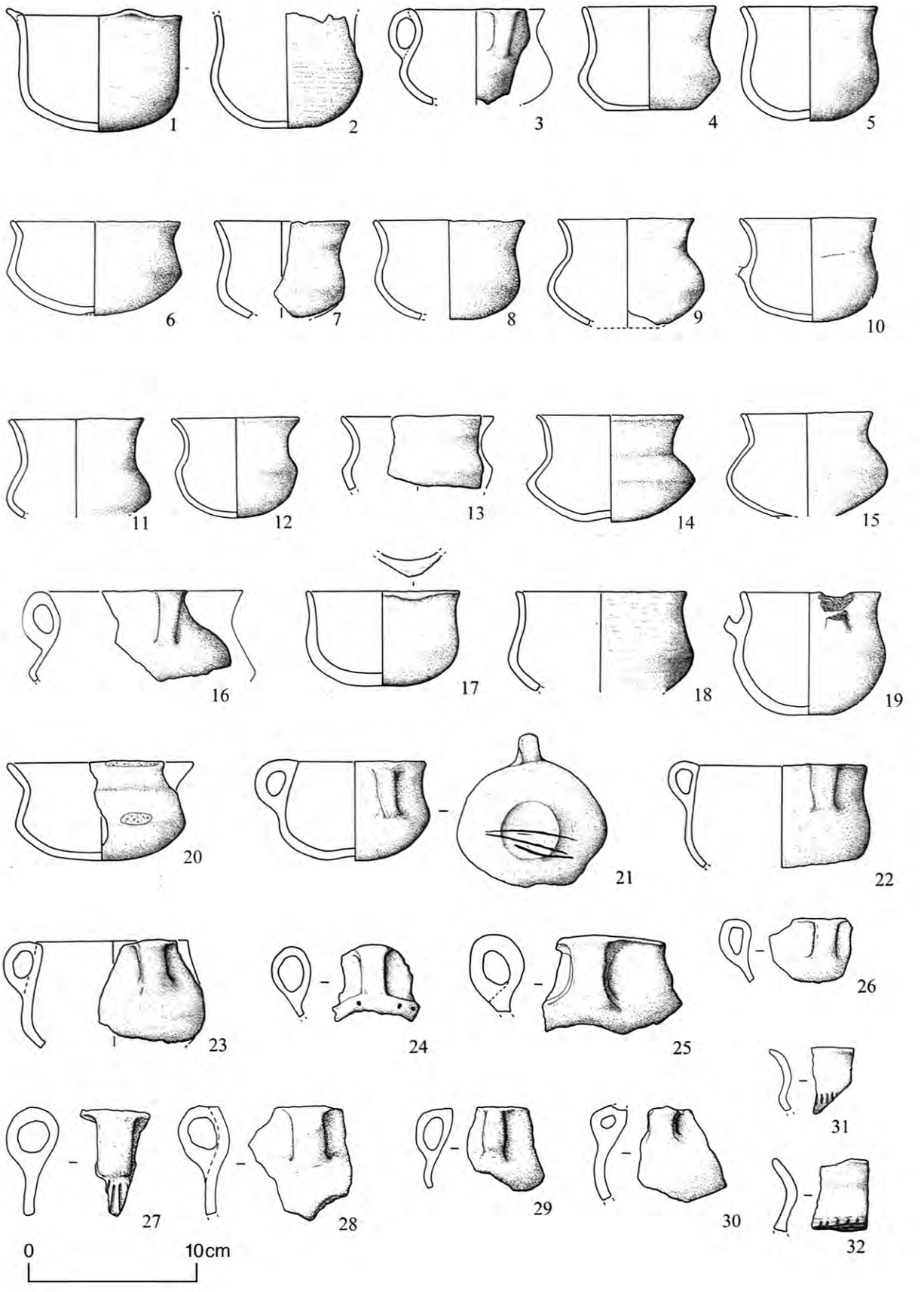


Plate 1. Pottery: cups (1-26, 29-32), jars (27-28)

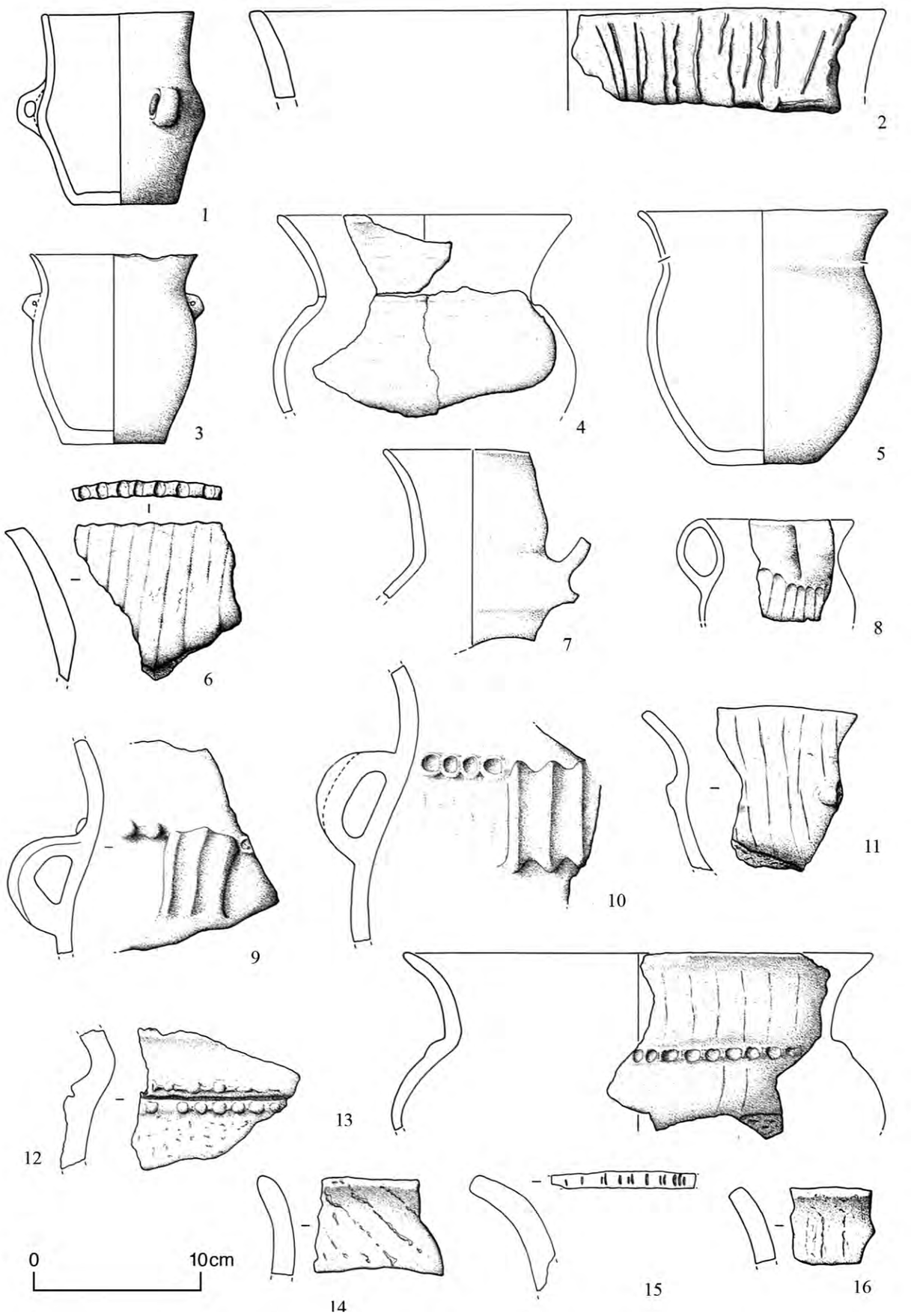


Plate 2. Pottery: jars (1-6), jug (7), jars and storage vessels (8-16)

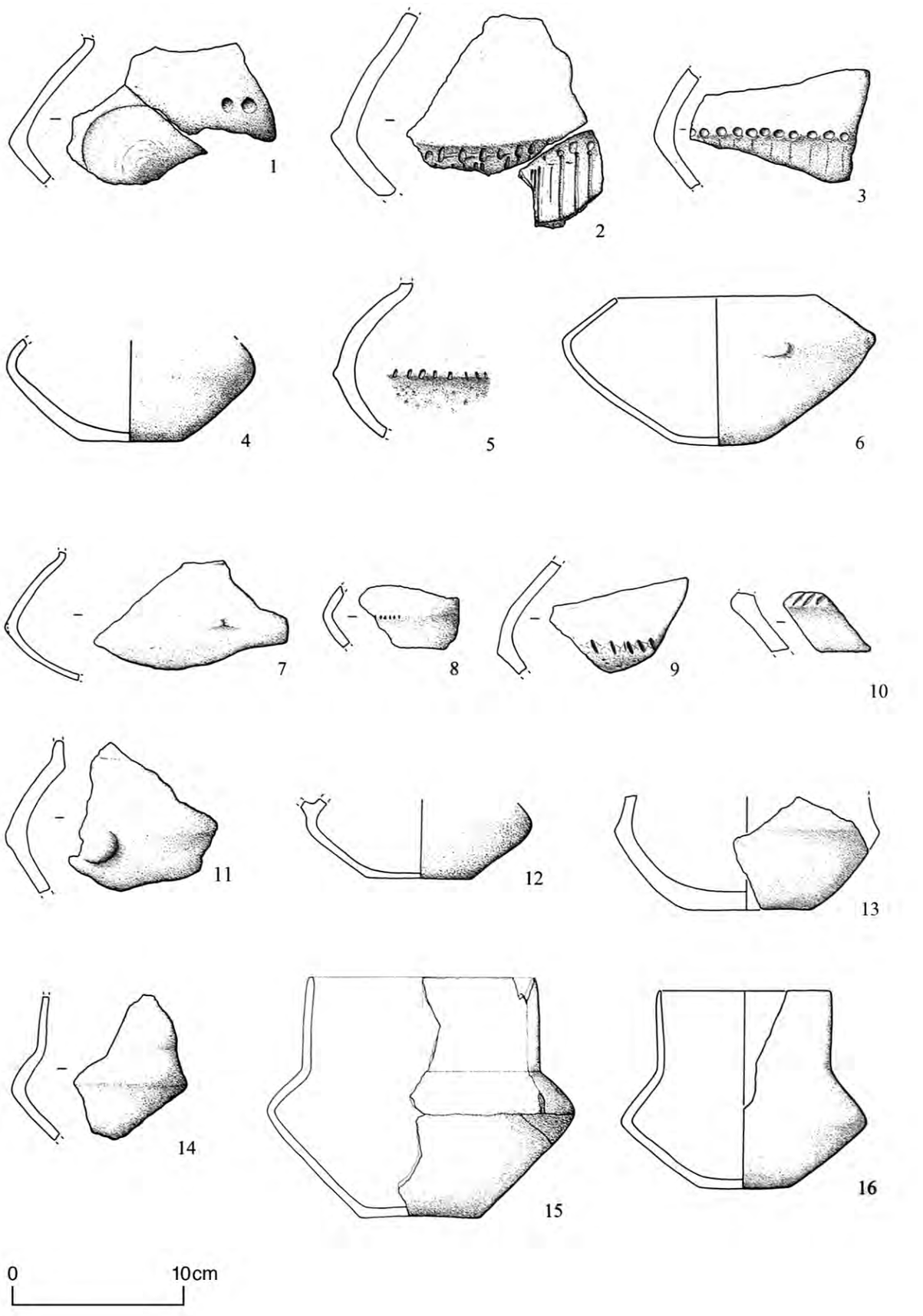
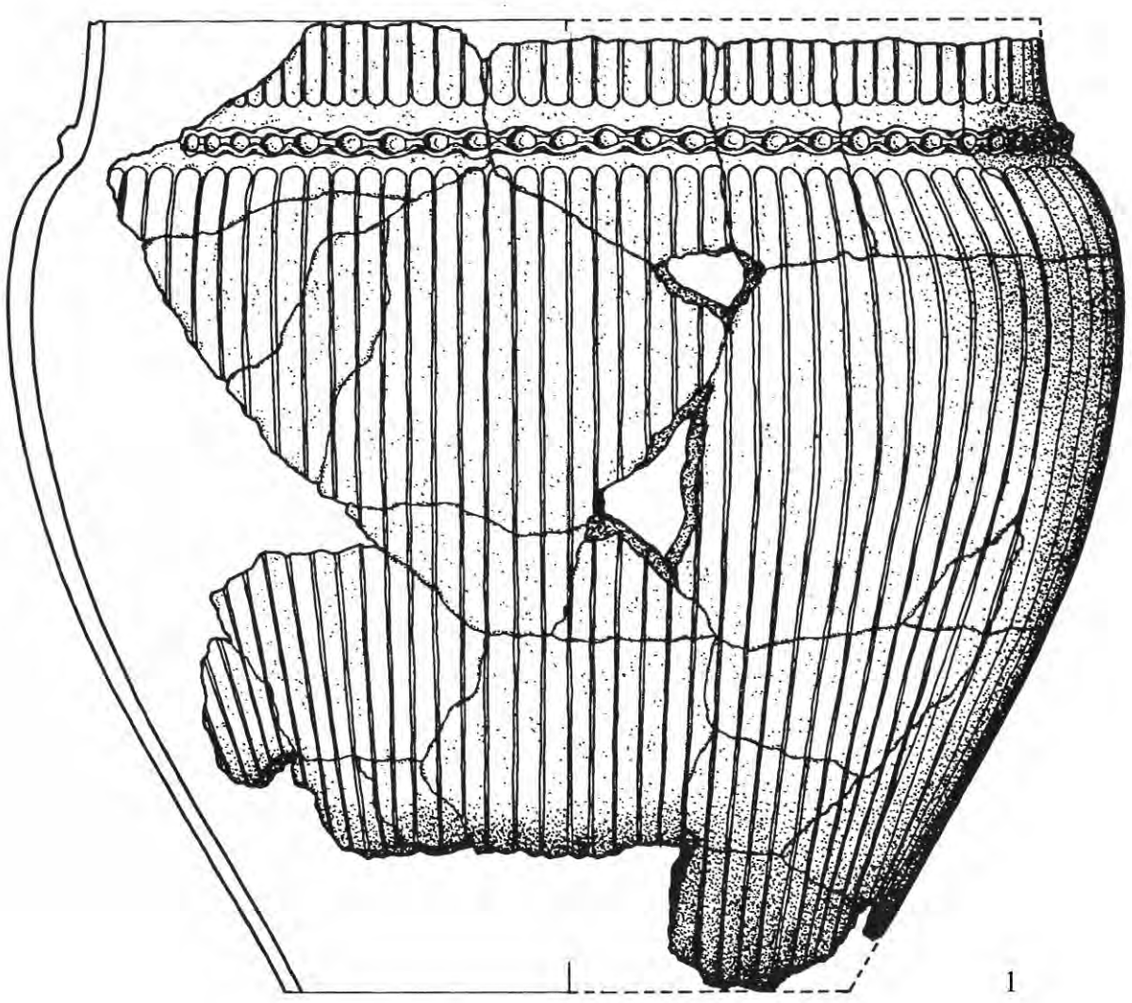


Plate 3. Pottery: jugs (1, 6-7, 12), amphorae (2-5, 8-11, 13-16)



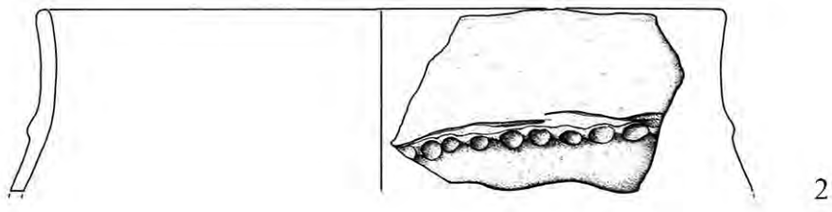


Plate 4. Pottery: large storage vessels

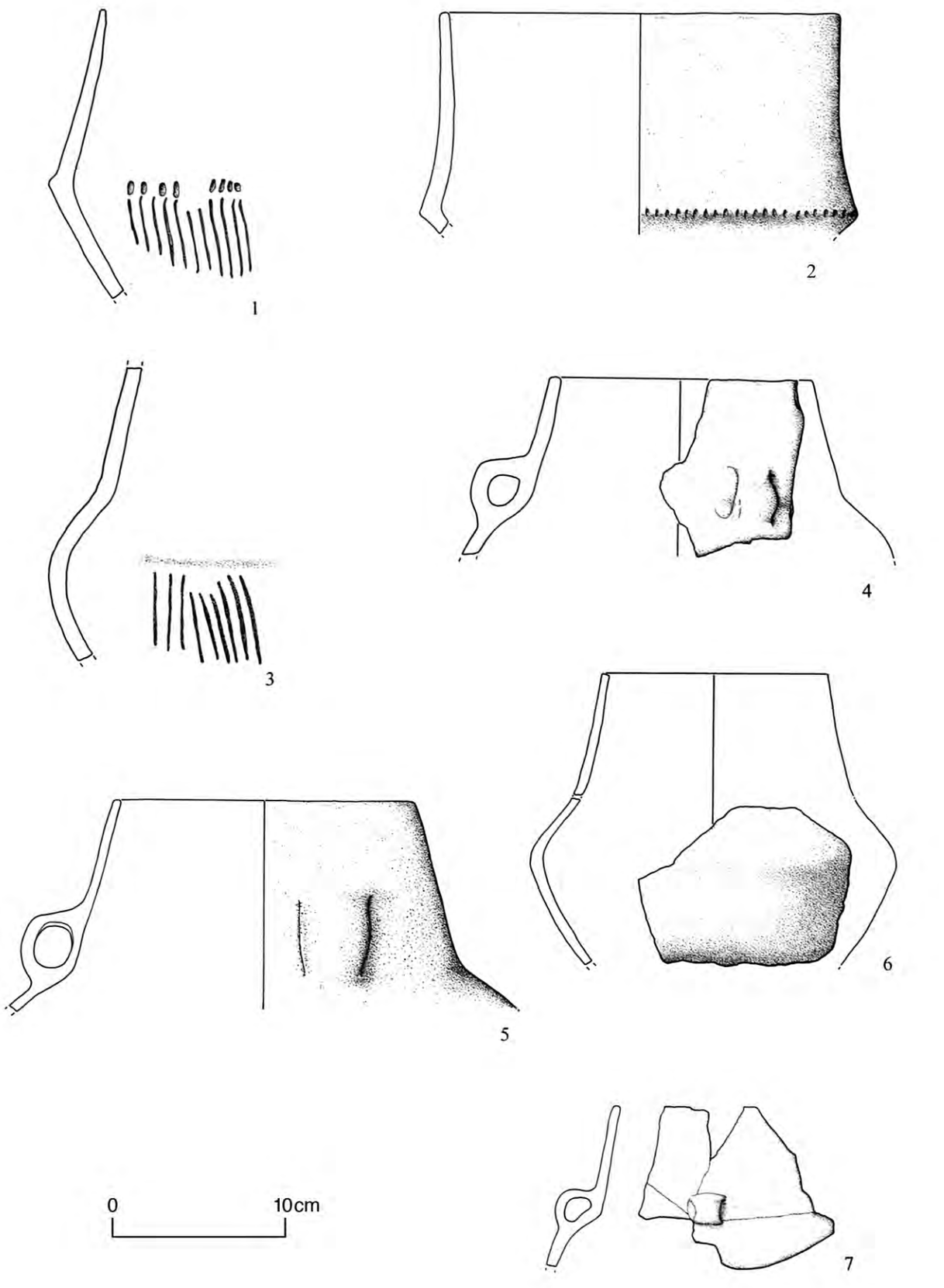


Plate 5. Pottery: biconical vessels and amphorae

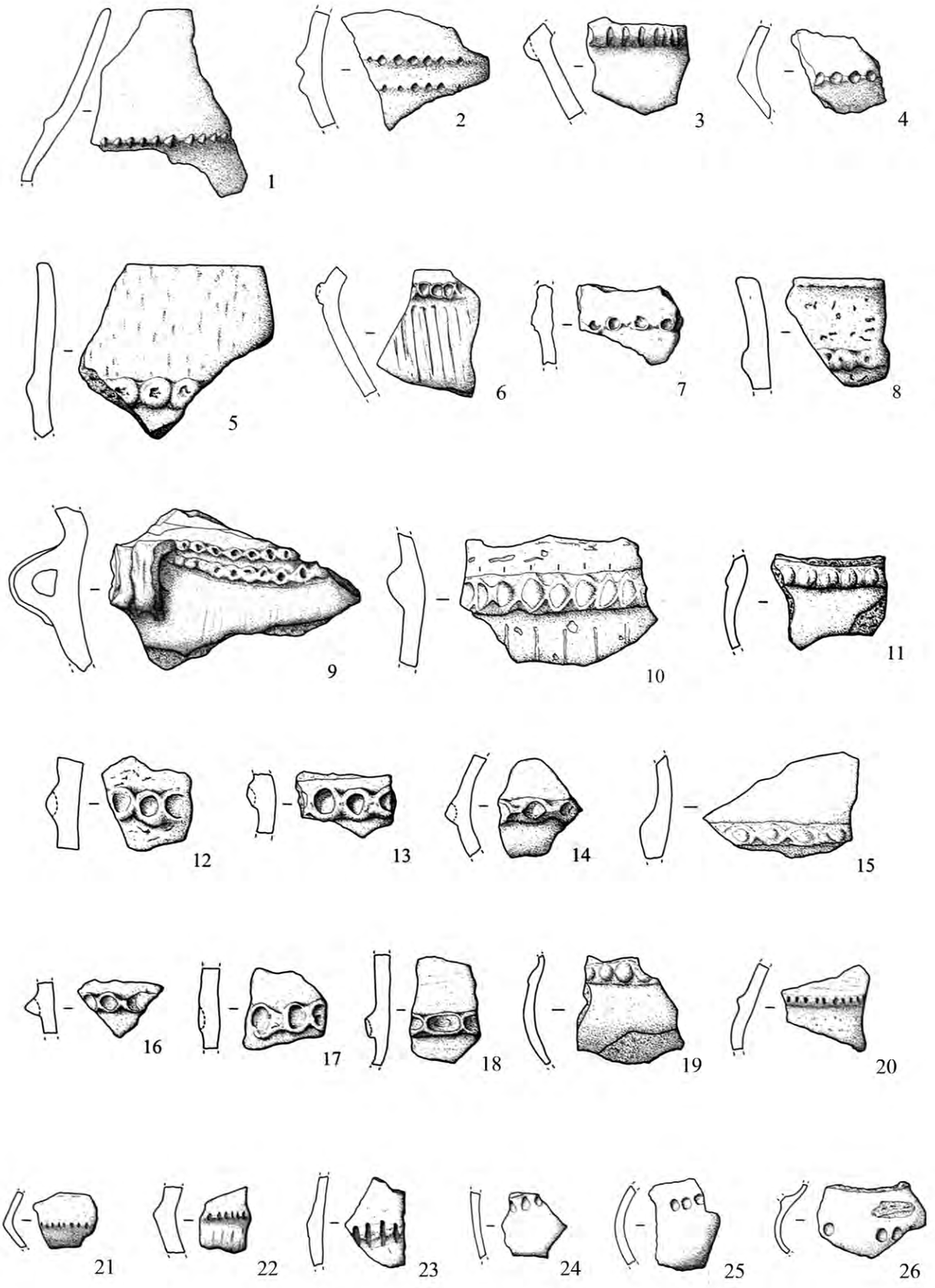


Plate 6. Pottery: fingernail and finger-impressed decoration, cordons

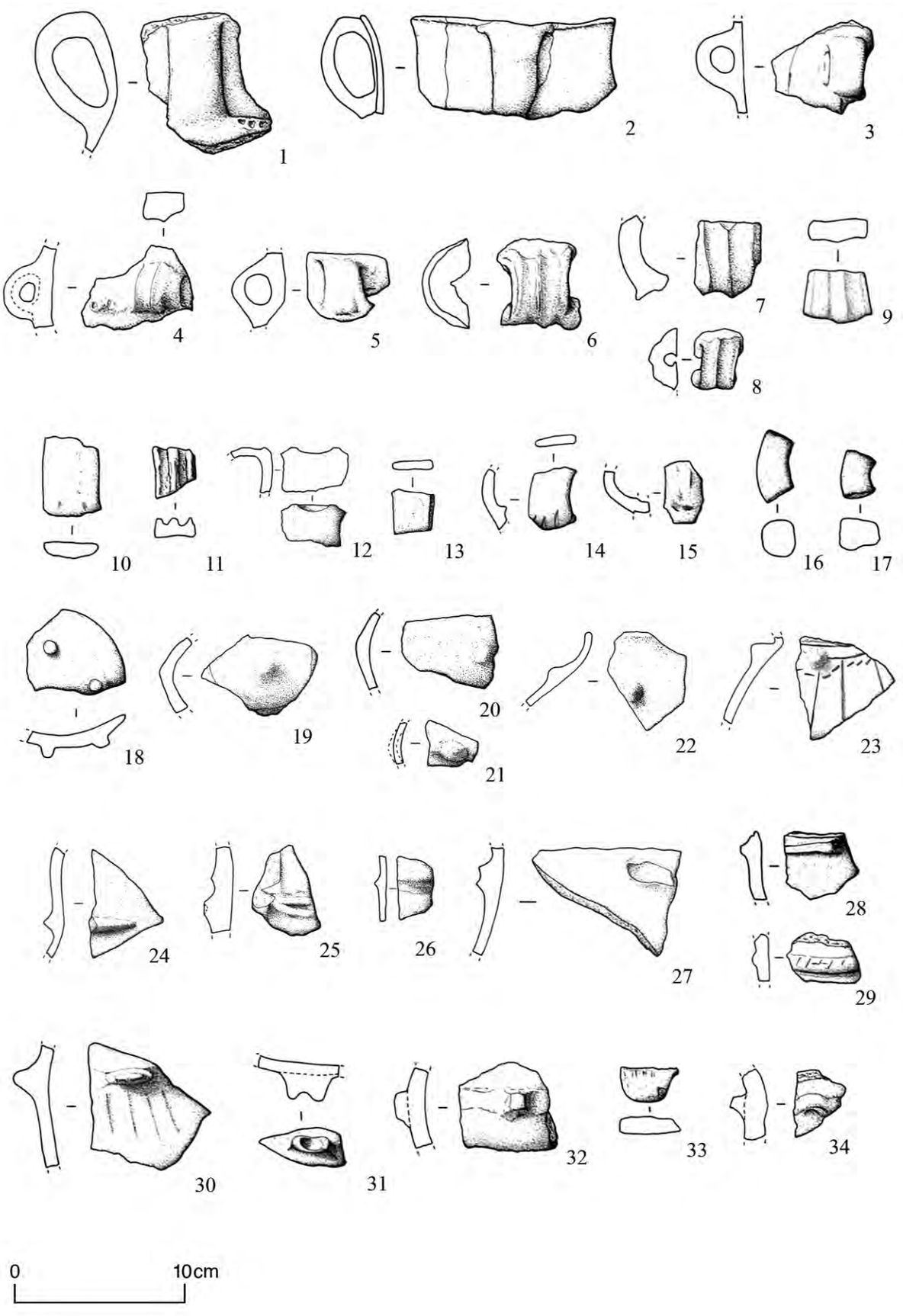


Plate 7. Pottery: handles, ledges and knobs

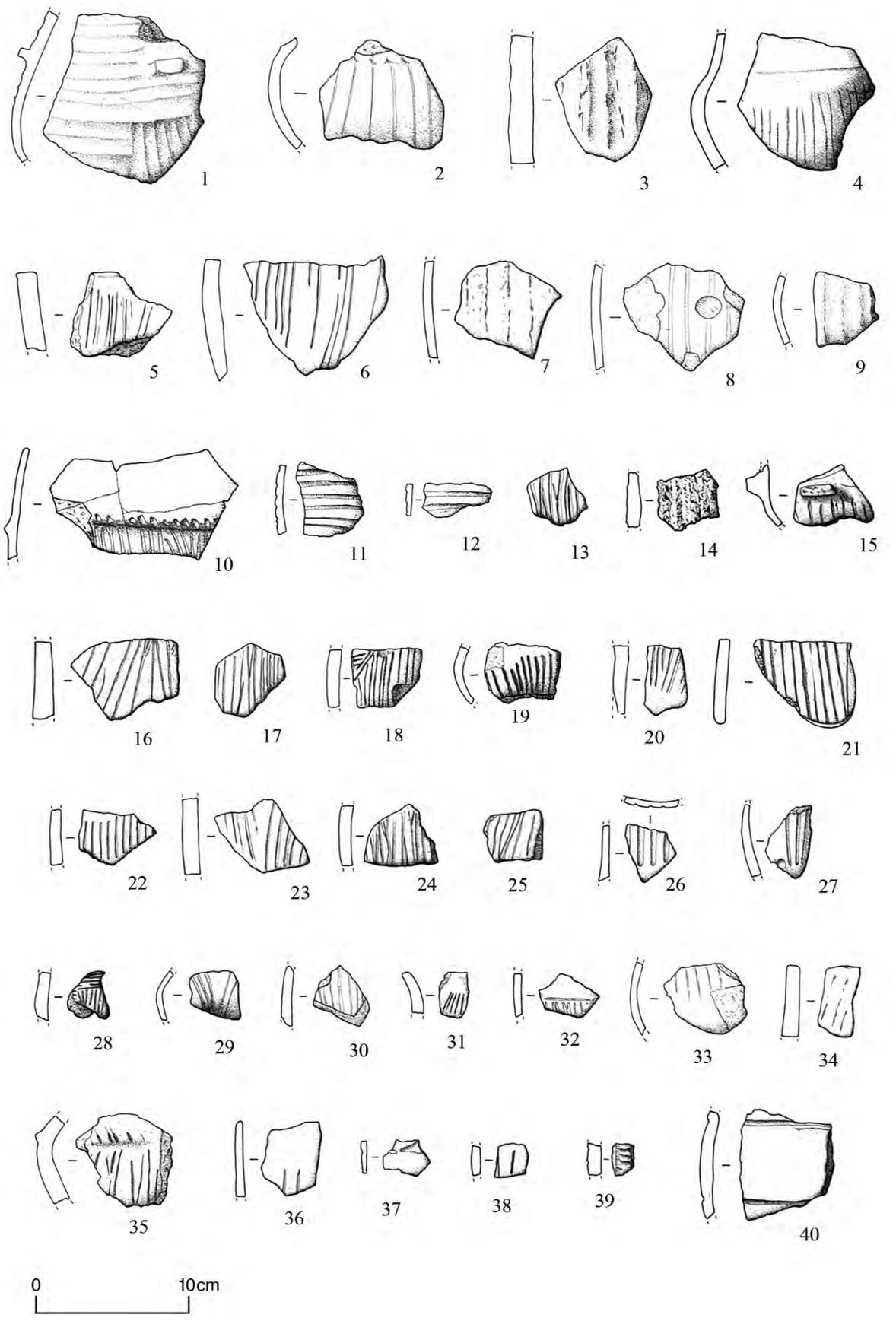


Plate 8. Pottery: incised line and groove decoration

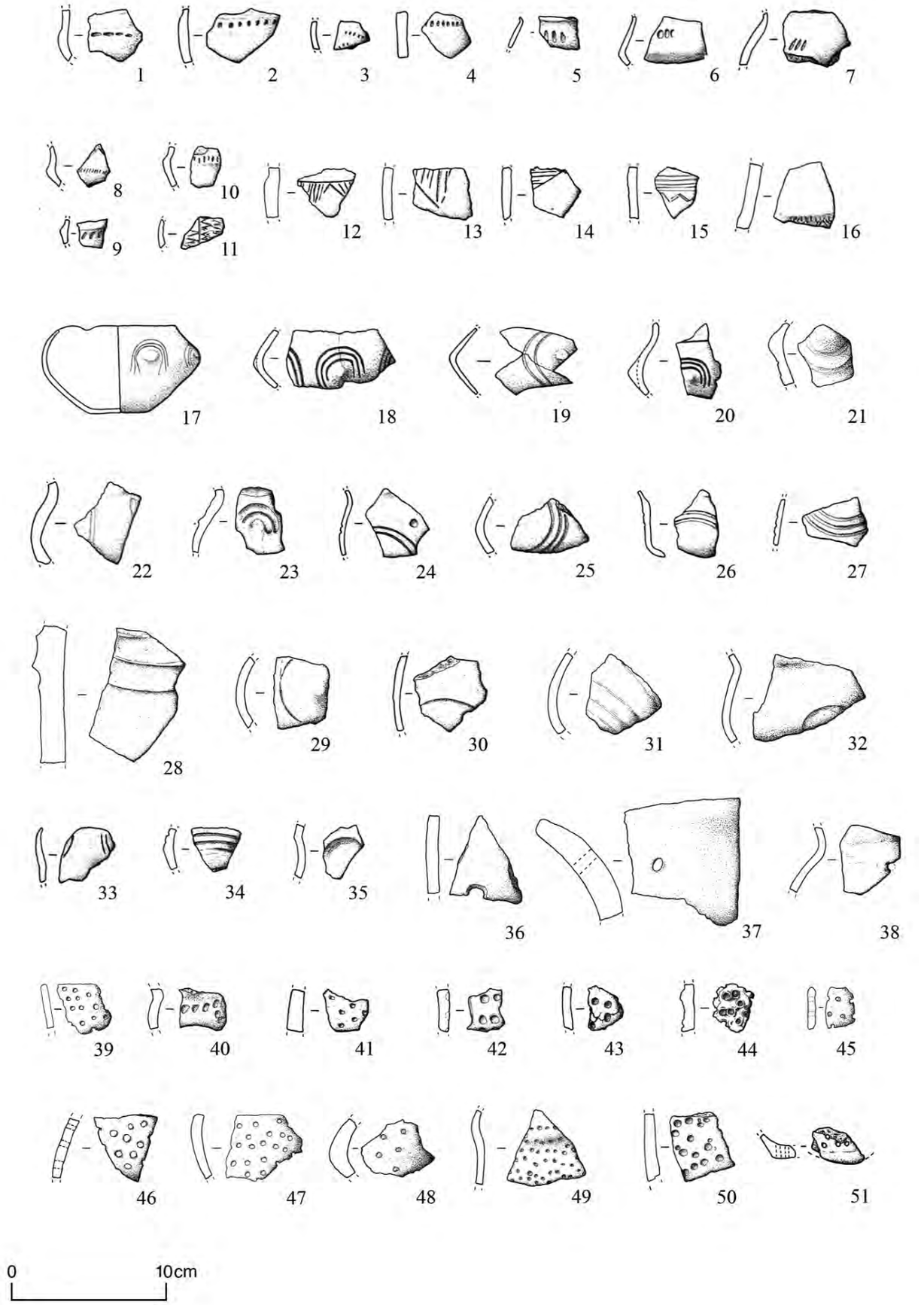


Plate 9. Pottery: pricked and bossed decoration, and perforated sherds

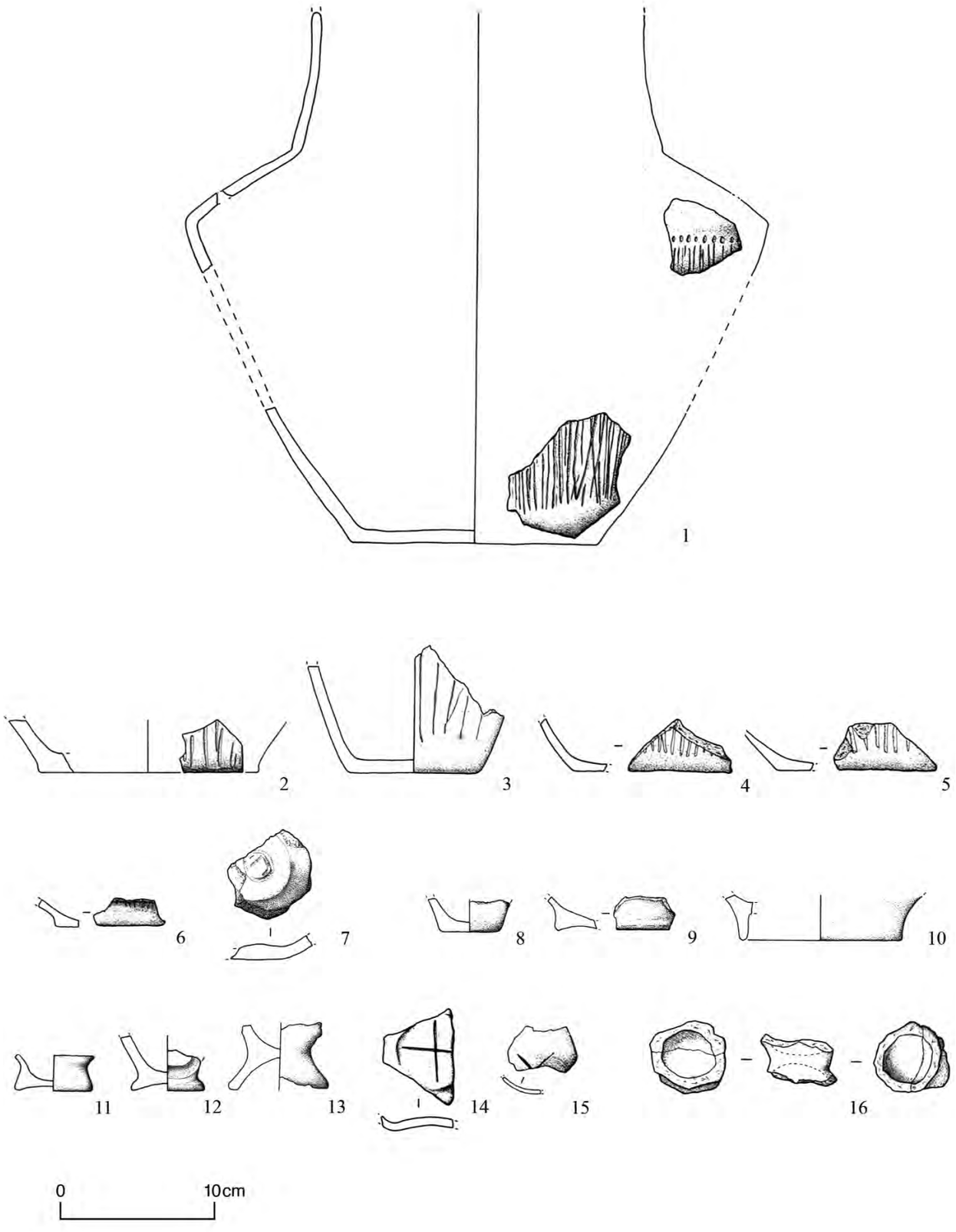


Plate 10. Pottery: amphora (1), bases (2-16)

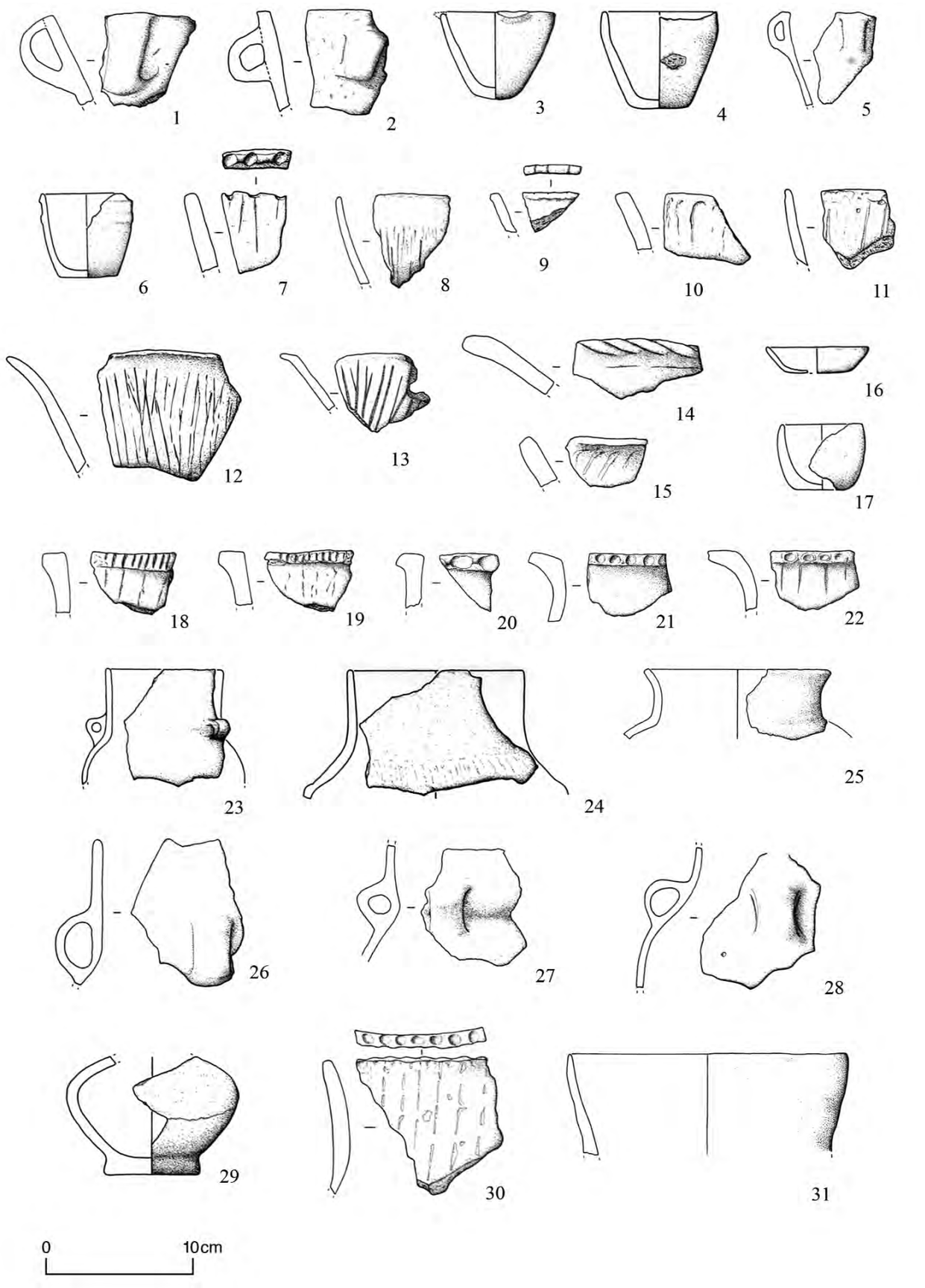


Plate 11. Pottery: bowls (1-2, 5, 7-15), conical cups (3-4, 6), miniature vessels (16-17), jars (18-22), amphorae (23-31)

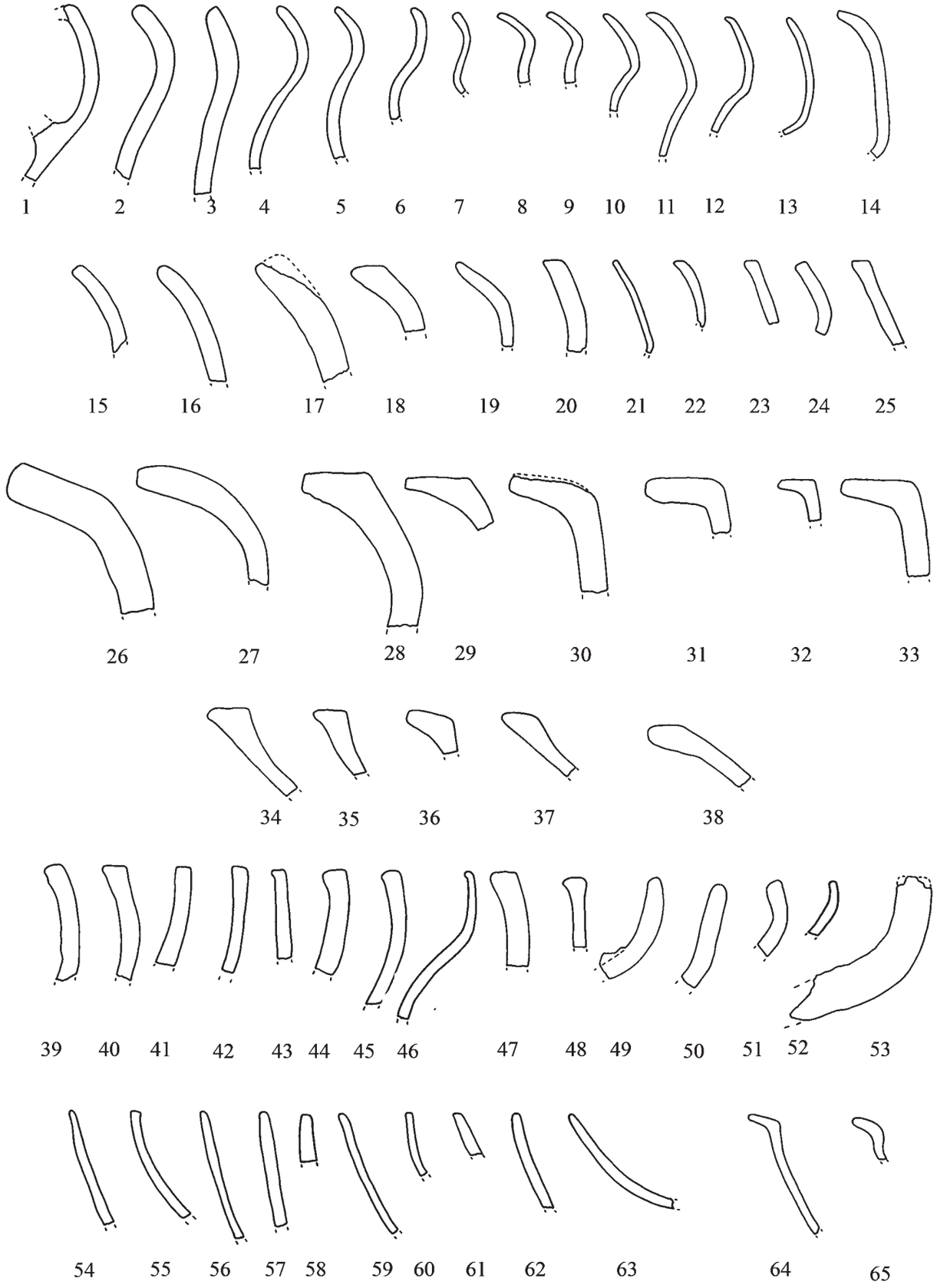


Plate 12. Pottery: rims: everted, flaring, horizontal, bowls, and straight

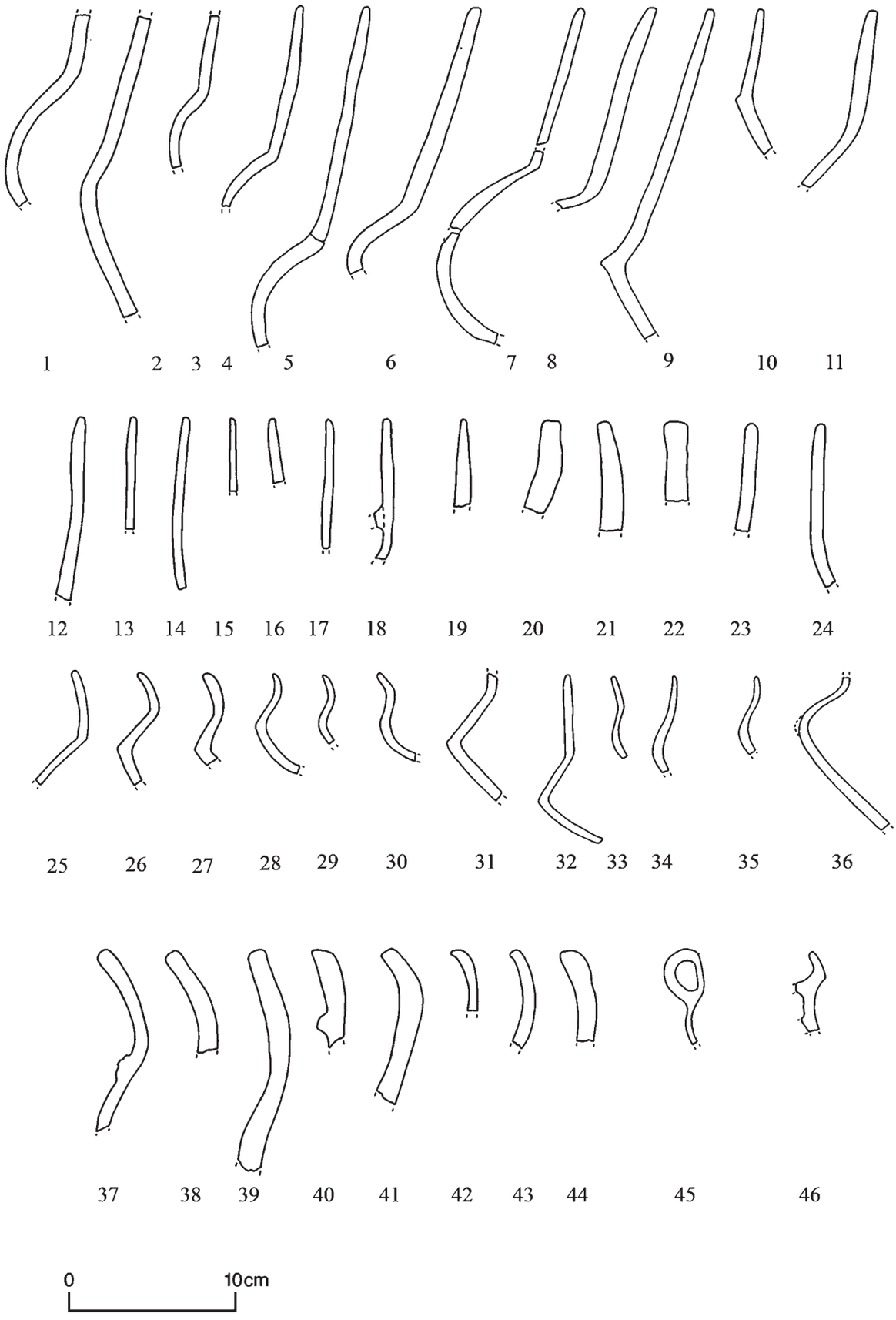


Plate 13. Pottery: rims: incurving, straight, carinated vessels, bellied vessels

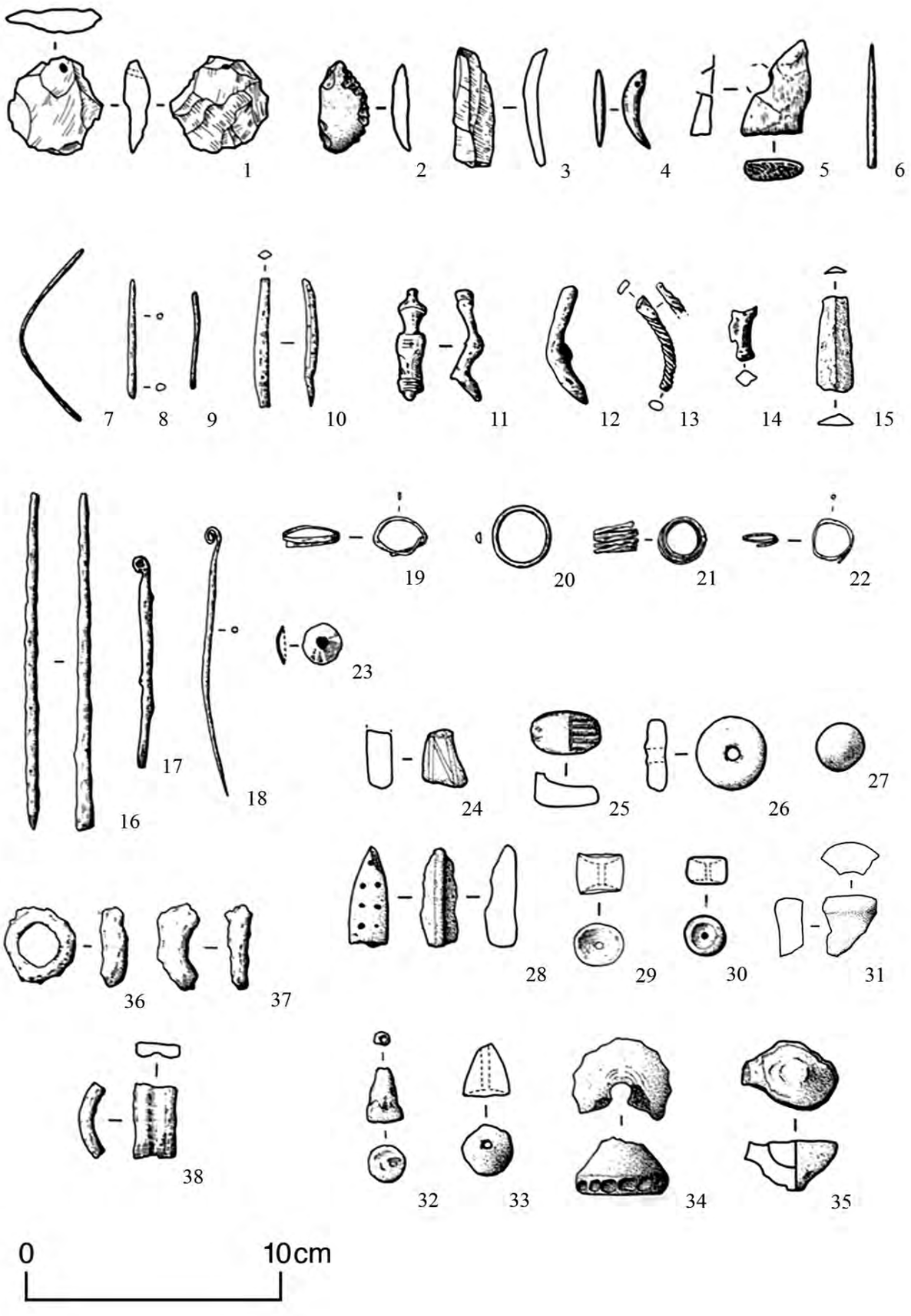


Plate 14. Miscellaneous finds: flint (1-3), bone (4-6), copper alloy (7-23), fired clay (24-35), iron (36-38)

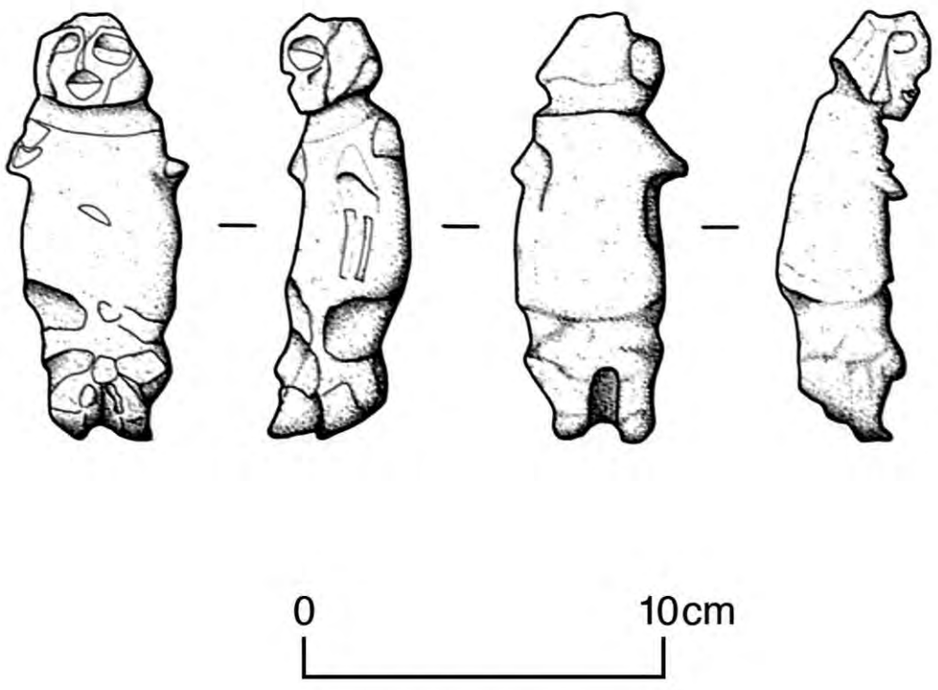


Plate 15. Figurine 95/1937

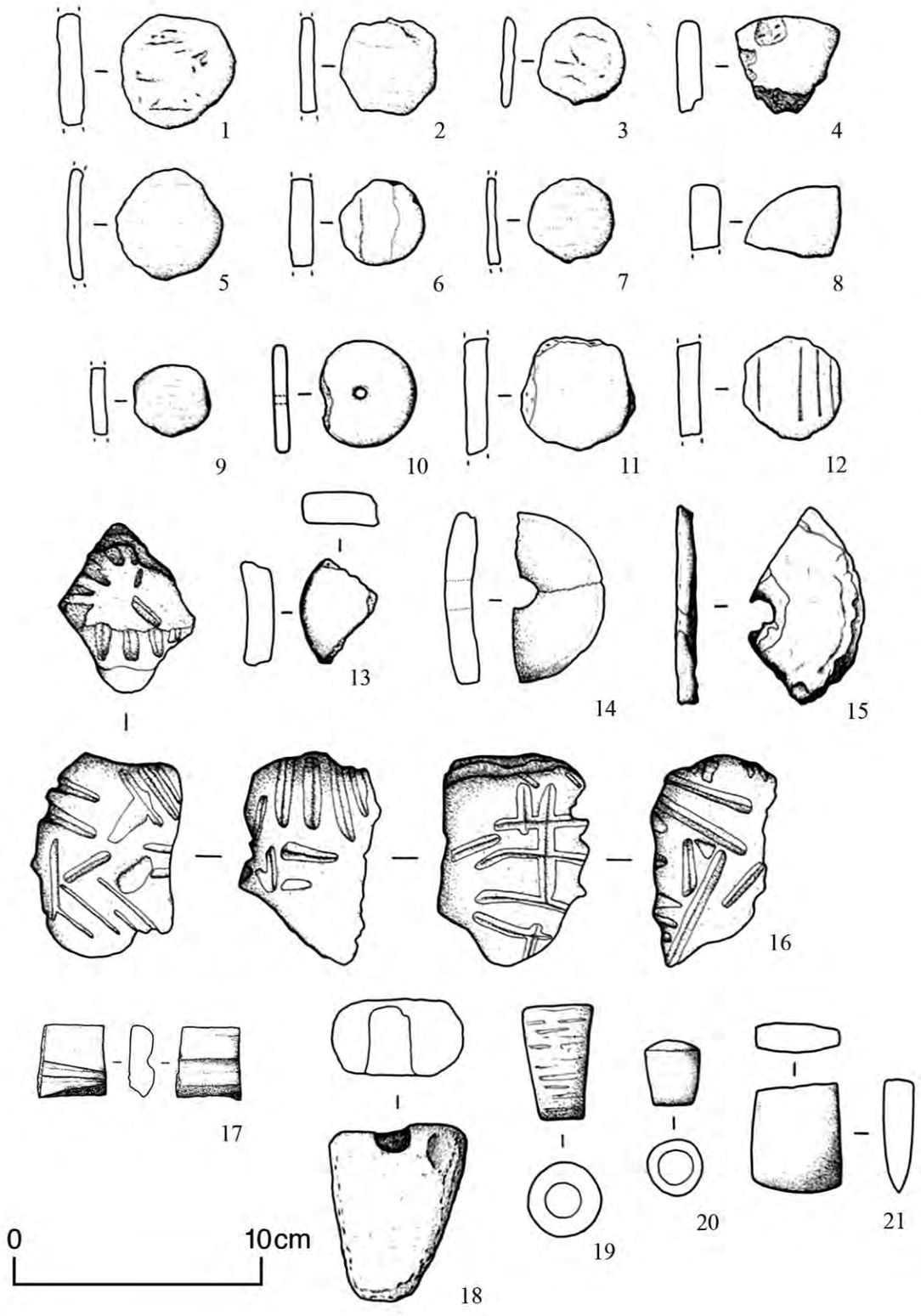


Plate 16. Ceramic discs (1-9, 11-13), perforated discs or whorls (10, 14-15), stone (16-21)

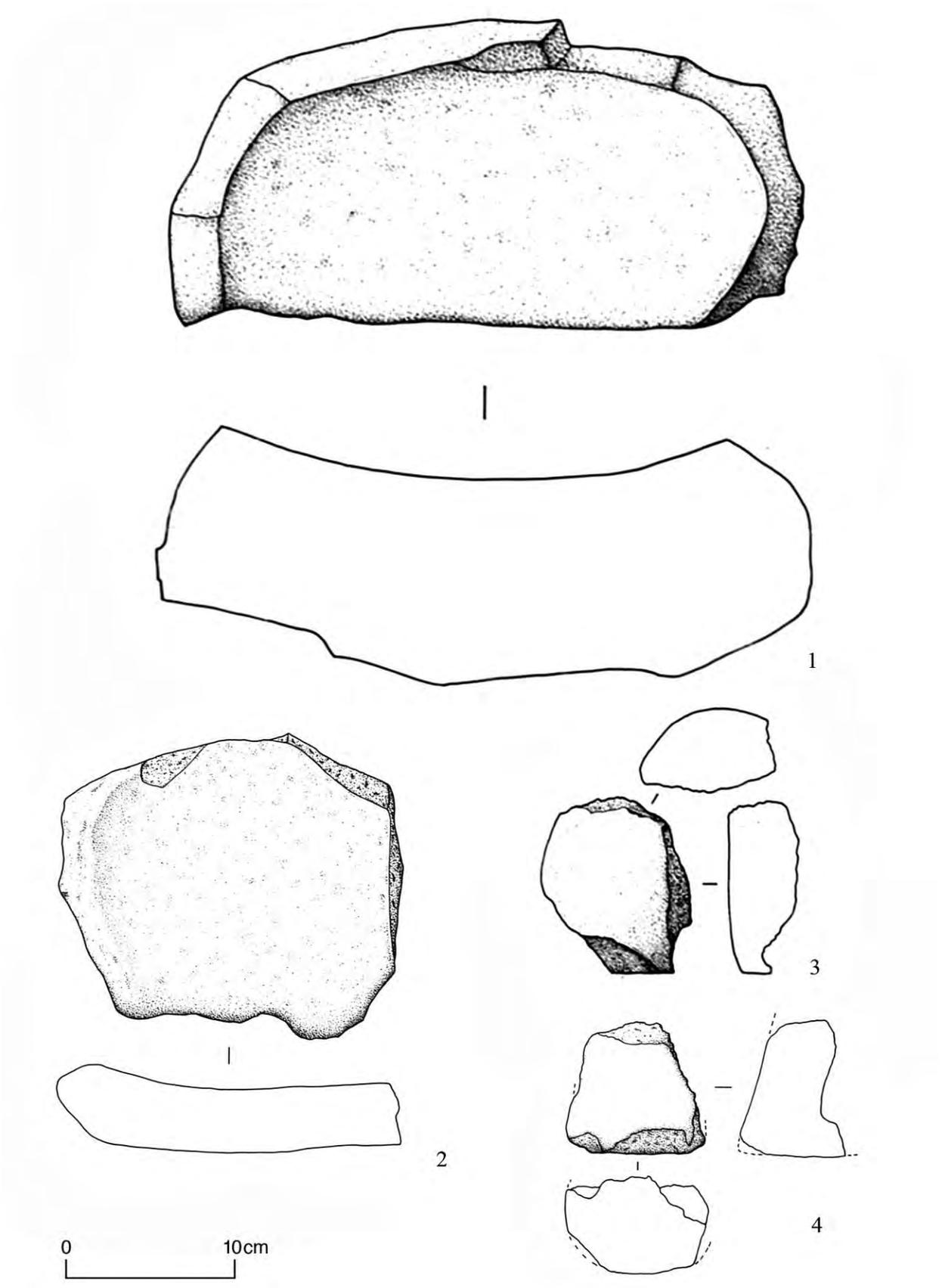


Plate 17. Querns (1-2), clay weight fragments (3-4)

A. Aerial view of Skalka from the south-west, 1993. The main excavation area lies in the housing development; the quarry lies top right, with the orchard between. Photo: M. Gojda

B. View of Skalka from the east. The excavation area lies behind the central group of trees; the quarry is partly visible on the left

C. Sonda 12B, Objekt 64, South pit, showing upper levels of Kostra (skeleton) 41 (1994)

D. Sonda 12B, Objekt 64, South pit, showing context 234 (Kostra 41) in matrix 220 (1995)

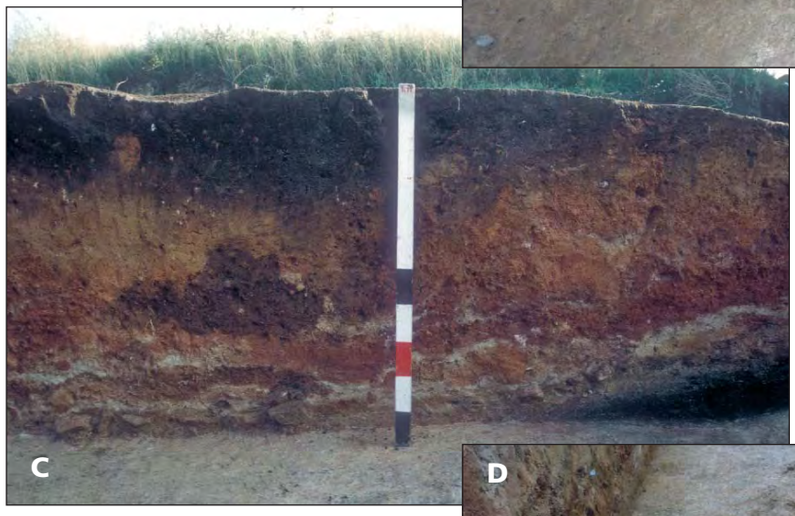
A. Sonda 12B, Objekt 64, North pit viewed from north, at level of context 3009 (1995)

B. Sonda 12B, Objekt 64, North pit viewed from south, at level of context 3012 (1995)

C. Sonda 12B, Objekt 64, North pit viewed from west, completely excavated (1995)

A. Sonda 12B, Red Ditch, north-facing section, north-west part (1994)

B. Sonda 12B, Red Ditch, south-facing section, detail showing lumps of coloured marl (1994)



C. Sonda 12B, Red Ditch, north-facing section, detail from the section shown in A above (1994)

D. Sonda 12B, Red Ditch, basal deposit 117 viewed from north-west (1994

A. Sonda 12B, Ditch 612, section in trench d, viewed from south-west (1994)

B. Sonda 12C, palisade (prior to excavation) viewed from south (1995)

C. Sonda 12C, trench B, context 2636 (with parts of Kostra 47a, 47b and 48) viewed from north (1995)

D. Sonda 12B/12E, pit rows viewed from south (1993)

VELIM

Violence and Death in Bronze Age Bohemia

The results of fieldwork 1992-95, with a consideration of peri-mortem trauma and deposition in the Bronze Age

by
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Velim (Central Bohemia, Czech Republic) is one of the most important sites of the Bronze Age of Central Europe. Dating to the end of the Middle Bronze Age, it has been known to archaeologists for many years, but it was only with the start of rescue excavations in 1984 that its wider significance became apparent, leading to a debate about its function and meaning. Opinion has been divided between those who favour a ritual explanation and those who see the extensive human skeletal material as resulting from a hostile attack. The present volume describes the excavation and survey work carried out between 1992 and 1995 by a British team. In addition to the presentation of the finds, there is an extensive discussion of the human and animal bone, with a consideration of its significance for our understanding of the treatment of the dead at Velim. Radiocarbon dating suggests a date for the transition to the Urnfield period earlier than traditionally accepted.

The volume is a companion to that published in 2000 describing the Czech excavations between 1984 and 1995.

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