

**ASPECTS OF BRONZE AGE METALWORK IN
NORTHERN EAST ANGLIA**

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**Thesis submitted to the University of Nottingham
for the degree of Doctor of Philosophy, October 1992**



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ABSTRACT

Aspects of Bronze Age Metalwork in Northern East Anglia

by C F Pendleton

The bronze age metalwork of northern East Anglia is well known, both for its quality and quantity. The main concentration occurs along the south-eastern fen edges which are recognised as one of the primary centres of metalwork in Britain. Due to the 'wet' nature of the fenland the metalwork from the area has formed one of the main supports for the belief, over the last 25 years, in a practice of bronze age wetland ritual or votive deposition. The main theme of this work examines this important issue. The fenland material has not been isolated but is put into a regional context by the examination of other finds from northern East Anglia.

Although mainly using metalwork this study is principally concerned with the meaning of the metalwork assemblage rather than individual artifact analysis. Central to the work is the collation of important information on items reported earlier, together with a wealth of hitherto unrecorded material. Closely related is a detailed analysis of the locations of finds. An attempt is also made to resolve some of the problems that are basic to artifact research, such as the reasons for the distribution of finds and their interpretation.

Several problems are highlighted by these studies, such as the need to research other contemporary material and analyse the effects of both depositional and post-depositional processes. In East Anglia the most

important of these, which has probably caused enormous variation in the distribution of finds has been arable agriculture, some of the effects of which are examined and analysed.

Whereas previous studies have been dependent on material not necessarily representative, accurately provenanced or numerically significant, this work provides, for the first time, a relatively sound basis, allowing some significant re-evaluations of the practices, organisation and settlement patterns of society in bronze age East Anglia.

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catalogue compendium
hoards
axes
tracers/awls
knives, daggers, dirks, rapiers and swords
spearheads
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gouges, chisels and leather-working knives
ornaments
miscellaneous

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Norfolk
Suffolk

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Cambridgeshire
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CHAPTER 1

INTRODUCTION

The importance of metalwork to studies of the bronze age is undeniable. Over recent years this emphasis has lessened, due to a growing, yet still very insubstantial knowledge of other aspects of the archaeological record. Nevertheless it is still the metalwork which is commonly used in establishing the main frameworks for interpretation of the period, especially with regard to chronology, regionality and social analysis.

This reliance on the metalwork evidence, together with a natural fascination with these readily recognisable and identifiable artifacts since the time of the earlier antiquarians of the 19th century, has resulted in a wealth of written works and studies. In view of this long history of research it is all the more amazing that many of the basic major questions concerning bronze age metalwork, although frequently postulated or hypothesized upon, remain unanswered. For example we cannot usually identify the function of the majority of the items, despite giving them convenient labels, for instance, axes, which may have served a variety of uses either as tools, weapons or both as is supported by the range of, often contemporary, forms and sizes (see chapter 6.9b).

Similarly, the lack of accurate studies of distributions of different implement forms and dates must be seen as a real gap in our knowledge

and a severe limitation to our understanding of the period.

Unfortunately this problem is not easily surmountable, for two main reasons: firstly the lack of knowledge of the original frequency of objects (due to bronze age re-smelting etc) and secondly, more alarmingly, the poor quality and selectivity of records relating to those objects that have survived into historic times, together with understanding the reasons why this survival occurred.

Clearly related to distributions and the factors affecting them is a knowledge of the frequency of objects, their value, and, consequently, their likely status and role in society. Although these fundamental issues have been the subject of general discussion, very little detailed work has attempted to examine either the known, or potential, number of metal articles in circulation in the bronze age.

This study aims to examine some of these issues. In view of their basic nature they should reasonably be assumed to be preliminary rather than subsequent, to other research and interpretations which will need to be based upon the results. It is suggested that as a consequence, many earlier works, without such foundations, may, indeed are likely to, need drastic revision.

The area chosen for this research (see chapter 2) has been limited to the three counties of northern East Anglia: Cambridgeshire, Norfolk and Suffolk. Numbered finds referred to in the text relate to the county computer record numbers used in the catalogues and are prefixed by a C, N or S for each county, or by a 1 relating to finds from north-west

Suffolk listed in catalogue 1 but not yet having a county computer record number.

There were several reasons for the choice of these three counties, particularly my personal knowledge of the area and its peoples, its wealth of artifacts, its geographical position and the diversity of the surviving archaeological evidence and environments.

Having grown up in the fen edge area of Cambridgeshire, Norfolk and Suffolk I had the advantage of local, although limited, knowledge of the local terrain, soils and agricultural practices and, probably most significantly, was able to gain the confidence of individual farmers, land workers and local collectors with relative ease. This was of major importance during the main accumulation of data which was based on field and personal observations rather than published accounts.

The seeds of this work were sown in 1980 when I carried out an intensive survey of the bronze age metalwork from the village of West Row, in the parish of Mildenhall, in north-west Suffolk (details available from the author or from the Suffolk Archaeological Unit, Shire Hall, Bury St. Edmunds, Suffolk). By interviewing local farmworkers and the finders of the metalwork very encouraging results were achieved, some 43 separate items being listed, of which 44% (19) were unpublished and 26% (11) in private possession. It was possible to record a precise findspot for 51% (22) of the artifacts, an approximate findspot for 7% (3) and only in the case of 42% (18) of the items was it not possible to give more than a general location. The relative success of the study was due to

the intensity of research. However, it was felt the true value of the work could not be realised unless a larger physical area was examined. It was hoped that this would allow recognition of any wider implications that could be demonstrated by the distribution and nature of the metalwork. This was likely to be particularly applicable in the East Anglian area where the abundance of bronze age artifacts has been obvious for well over a century (cf Evans 1872 and 1881, Fox 1923 and 1933 and Ashbee 1984). Indeed in the late 19th century Henry Prigg wrote *'There is probably no part of the kingdom, for its extent, more prolific in antiquities than the north-west district of Suffolk'*, a view recently endorsed by West (1985, 3).

Despite this wealth of material remains East Anglia has, in recent years, been very much in the background in the study of the bronze age in Britain and in terms of research has been treated somewhat as a parochial backwater. Unfortunately this is probably due more to its lack of surviving standing monuments, its geography and history than to its relative importance. Indeed it is, arguably, the single most important area of Britain in this period. Certainly no other area of comparable size can boast over 11,000 recorded bronzes. The realisation that Eastern England is devoid of raw material magnifies the significance of this.

The main concentration of artifacts occurs along the fen edges which are recognised as one of the primary centres for metalwork in Britain. It is part of this fen edge zone that has been studied in detail in this work (chapters 6 and 7) and emphasises the importance of intensive, as

opposed to extensive, survey methods. The results allow, for the first time, a soundly based evaluation of the reasons for such a wealth of metalwork and important re-assessments of bronze age ritual, settlement and society result. Based on this it would appear that the majority of earlier works have relied on an inadequate factual base and have exaggerated the results of, usually small scale and limited, initial research, often through no fault of the originators.

A classic example is presented by two paragraphs in Bridget Trump's paper 'Fenland Rapiers' (Trump 1968, 225) in which she suggested a ritual explanation for the preservation of so many rapiers (and palstaves and looped spearheads) in the East Anglian fens. Resulting from this superficially convincing but strictly limited observation, popular concepts of water based ritual depositions of prestige metalwork have developed and continue to be expounded by a variety of authors, without an adequate research basis. A few of the more influential examples of these are noted in chapter 12. The prominence placed on these assumptions of bronze age ritual practices over the last twenty years have dominated models of bronze age society and economy. It is suggested that as a result of some of the detailed research in this work (chapters 6, 7, 10 and 12) these now need re-examination.

The record of over 11,000 objects in the three counties raises a number of important issues. For instance, it became clear, from the small study of 1980 (above), that only a small amount of the metalwork was actually recorded and the existing documentation was usually of a very poor standard. Since 1980 the massive increase of metal detecting and a

plethora of commercial outlets for the finds has increased the problem significantly. The problems encountered with documentation (see chapter 6.5d), and more specifically in specifying precise finds-spots, are partially a result of the finders' difficulty in relating field observations to maps, often of a small scale. Usually personal interviews, frequently extending to field visits, are the only relatively reliable way of checking the accuracy of the records.

On occasions original documentation can be found which transforms the evidence presented in museum catalogues and published sources. For example the late Rowley Edwardson, curator of Moysey Hall museum, Bury St. Edmunds, Suffolk, mapped many of the more important finds obtained by the museum on a set of pre-grid system six inches to the mile Ordnance survey maps. These included many of the bronzes which he was particularly keen on. The items were also catalogued and published in the Proceedings of the Suffolk Institute of Archaeology and the Council for British Archaeology Group 7 Annual Bulletins. Checking the detailed mapping revealed that none of the cited grid references were correct. Despite usually being quite close, often between 50-200 metres (or 2-3 fields) out, this difference is quite critical in the localised topography of the fens and fen edges where most of the items originated. The discrepancies are probably not surprising in view of the pre-grid large scale maps in use in Moysey Hall. What is surprising, and alarming, is the fact that this main regional museum, one of only two in the county, did not have working maps over a 1:50000 scale (1 inch to the mile metric equivalent) until 1991. As a result any grid references cited by Moysey Hall are likely to be, at best, approximations.

Personal knowledge has also played an important role in verifying the reliability of the information. Although today this might appropriately be applied to some metal-detector users whose complete honesty may be suspect, and it is important to know how genuine information is likely to be, this is by no means a problem limited to the present. The citing of false provenances and the faking of objects is clearly illustrated amongst earlier collections in East Anglia by, for example, the Clouston collection (see chapter 6.5c and appendix 2a); various items from the Arreton hoard (Needham 1986) and a flat axe from Exning (S6420; Needham 1983, 338). Unfortunately it is impossible to know how much of the 19th and earlier 20th century material falls into these categories, although it is suspected that many more artifacts in museum collections are falsely documented than is at present recognised, especially if originating from a purchase.

The problem presented by museum records again highlights the need, when possible to personally check details with the finders (who are frequently not recorded). The large amount of material in private possession also necessitates the seeking out of likely individuals, including farmers, farm workers, private collectors and metal detector users, though clearly it is not possible to visit each and every one. The rewards of this kind of research are illustrated well by the following account. I had been informed of a man working in a carrot washing plant who had found a bronze axe. Upon visiting him it transpired that two had been found on separate occasions, both of which were rare flanged forms (catalogue 1.27 and 1.32). Before leaving I asked, as I always did, whether he had found any other objects. He

responded by showing me a small collection of flint axes and arrowheads and a stone pestle-shaped object. On examining this last item I was told, as an after-thought, how he had found what he thought was a brass loop, on the same field, when clearing weeds off his plough share. It was kept for cleaning and mounting on a wall. Since it didn't polish very well he hadn't bothered with it any further and had relegated it to the shed. He retrieved the item for my inspection. It was a unique late middle bronze age bronze torc, the first from Suffolk and the only cast example from East Anglia (Pendleton 1986). Other similar accounts can be related personally and by many other field workers who, in addition to researching the documentary evidence, take the trouble to talk to people.

How representative the surviving metalwork is of contemporary bronze age assemblages is another key, although not completely answerable, issue. It is felt that the preservation of bronze age horizons has occurred in the fens due to their blanketing by peat. The comparatively recent drainage and subsequent arable agriculture has disturbed, and offered the means of recording, a representative sample of artifacts. This has also identified the area as one needing detailed research.

Clearly there are difficulties in relating a sample from the fens and fen edges to other landscapes, although the implications of such comparisons are, again, significant. Attempts to study this problem have recently been aided by the recognition of a new source of artifactual evidence that has only become available over the last 20 years, namely small items of bronze age metalwork located by metal

detecting. The evidence presented by these finds is drastically altering the nature and patterns presented by former, largely unrepresentative, finds (see chapter 9). The recent renewal of field walking surveys has also helped in assessing the problems of bronze age territorial and settlement patterns and are seen as an important, and necessary, addition towards understanding the distribution of bronze age metalwork and the social implications (chapters 9 and 11).

One of the more obvious, yet major, considerations is the contemporary value of bronze. Metal has usually been seen to be a valuable commodity in its own right in bronze age times. This would appear to be valid in the case of gold items (see chapter 12.5b and chapter 8.5 1) and, to an extent, of early bronze age metalwork. However, the 11,000 bronzes and more of later bronze age date, representing an unknown but probably quite minor proportion of the true number of objects, rather suggests that this popularly held belief is incorrect for the later bronze age. Most of the objects need not be viewed as material wealth of high prestige, but should perhaps now be seen more as rubbish, discarded like pottery or stone artifacts. In view of the considerable lengths, both physical and geographical, that the bronze age population must have gone to in winning and importing the metal into the region the organisational and economic implications are considerable. We are not left with a view of a simple agricultural peasant society at a basic level of subsistence, but with one able to consistently produce, control and exploit enough surplus to result in such a mass of recorded finds.

On the other hand the change in objectivity resulting from bronze being common and of low relative value has implications regarding its association with status and elites. A consideration, but not one I wish to answer here is: do hierarchies still need to exist or could the material be more representative of a egalitarian society, especially when considering the observable differences seen in the Wessex area where such elites would appear to have been present?

A more down to earth consideration concerning this vast amount of metalwork was how could I deal with it. Bronze age metalwork was originally chosen as the subject matter as it had generally been better recorded and more easily recognised than other prehistoric artifacts and its frequency was thought to be at a level so as to allow it to be worked upon without being overwhelmed by a welter of information. I admit I was wrong on that count! In view of the amount of material and the need to carry out detailed survey work it became necessary to concentrate on an area within the three counties small enough to allow the work not to be too confined by physical and financial constraints. The area chosen, the district of Forest Heath in north-west Suffolk, covered an area of approximately 144 square miles (37,398 hectares) and is discussed in detail in chapter 6. Having grown up in the district I had the advantage, not only in knowing the area and people relatively well, but also of having carried out a considerable amount of field work, mostly field-walking, on the north-west Suffolk fen edges between circa 1965 and 1982. I was also one of the two fieldworkers for the Fenland Survey of Suffolk in 1986 and 1987 and worked on various local excavations, for example the round-barrows at Chamberlain's Farm,

Eriswell (Dymond 1973) and Pin Farm, Gazeley (Petersen 1973); burnt flint patches at Chairfen and Cooks Doves, Mildenhall (Murphy 1979 a and b) and early bronze age settlement sites at Mildenhall (MNL 130 and 165, Martin and Murphy 1988). In addition to this I had catalogued the entire archaeological collection of the district's main museum at Mildenhall, where I obtained an insight into the problems pertaining to museum collections, and which in most instances appear to be proportionately magnified the greater the size of the museum.

Being situated in the north-west corner of Suffolk the intensive survey adjoined the principal fen edge zones of Cambridgeshire and Norfolk. Following the fieldwork in north-west Suffolk it was hoped to carry out a general background study of the three counties and follow this up with further detailed work, perhaps of a slightly different nature, in two similar areas of Cambridgeshire and Norfolk. The background study was intended to be based on the bronze age metalwork recorded in the County Sites and Monuments Records.

As Suffolk County Sites and Monuments Record Officer I am, to a certain extent, familiar with the practices and methods employed in compiling these records and hoped that the information available would be relatively consistent in quality and content. Unfortunately this proved not to be the case (see chapter 8.1 and 8.2). The limitations imposed by the poor quality of information within the Cambridgeshire Sites and Monuments Record and the appalling records in the Cambridge University Museum of Archaeology and Anthropology (both in 1986) caused the rapid abandonment of any practical possibility of further work in

Cambridgeshire. The recognition of the variability of information (County Sites and Monuments Records) is an important issue for researchers. It is particularly relevant for those studying artifacts rather than 'sites', the latter tending to be more frequently and thoroughly recorded.

Several other limitations need to be pointed out. Probably the most personally restrictive was the difficulty in finding time to carry out the essential detailed research, and also the time consuming listing, analysing and mapping, especially as a part time student in full time work. This is not to mention the other duties expected of a husband and father. For these reasons the research had to be locally based, which as I illustrated above, was undoubtably advantageous, possibly vital, to many aspects of the detailed research. One disadvantage of this situation was the lack of good local library facilities (it might be added that the majority of Sites and Monuments Records have the same problem). Although theoretically available at Cambridge (35 miles away), in practice most of the documentation unavailable in the county record offices had to be studied at Nottingham (135 miles away). Therefore I have not attempted to find an array of comparisons, either for examples of specific items of metalwork, or of a range of ideas, claims, assumptions, theories or hypotheses regarding bronze age life in most of the rest of England or continental Europe.

Indeed it is felt that attempts to correlate local evidence with that from outside the region could in many instances be misleading. It is clear from any reasonably detailed studies that during later prehistory

England should be seen as a number of discrete territories. This is not to disregard the obvious contact and influences evident with other regions, as witnessed in, for example, several of the items or traits seen in the metalwork, including the source metal itself. Some obvious examples of long distance contact already highlighted by various authors can be cited, for example, the stone axe and jet trades; beaker pottery; the Wessex connection (note the two 'gold' barrows at Little Cressingham and Bircham in Norfolk, see Taylor 1980, 45-7); the Arretton tradition; an enormous range of other metal types up to the end of the bronze age, eg Hallstatt C bronzes and even late iron age coinage. The range of contacts, and reasons for them, are mostly unknown, as is the economic basis for it - livestock, perishable foodstuffs, clothing, slaves, who can say? However the variability in artifacts, in burial practices and in other recognisable archaeological features clearly indicate that regionality is a significant aspect, although, admittedly, it is difficult in reality to identify East Anglia as a separate region, especially when land boundaries are likely to change periodically. Nonetheless its seaward eastern boundary and restricted access to other parts of England probably make the area one of the more interesting for studying territories and their 'external' relationships.

Being restricted to East Anglia, such comparisons are largely beyond the scope of this work although the postulated late iron age 'reduced contact zone' or tribal boundary claimed to separate the Iceni from the Trinovantes (cf Lawson 1984, 167-171; Martin 1988 b and d), is briefly examined in relation to the bronze age in chapter 9.

Despite primarily being intended as a study concerning the metalwork of northern East Anglia, very little attention has been paid towards studying individual items, apart from in the north-west Suffolk intensive research area (chapter 6), where each artifact is detailed and where possible, drawn. Typological, chronological and metallurgical analysis have, through necessity with such a body of material, been only superficially examined. It is recognised that these important fields have much to offer (see chapter 8.3), especially with recent results of metallographic and lead isotope analysis becoming available. In the future they will help to provide answers as to the geographical movement of artifacts and potentially the extent of territories, if not to the nature of them.

Although still pitifully small, the number of radio-carbon (and dendrochronological) dates available that can be related to metalwork finds are increasing year by year, especially with the excavation of an increasing amount of later bronze age sites in East Anglia. In due course these might be related to typological sequences in the area and a sound chronology built up. Throughout this work the bronze age has been divided into early, middle and late in conventional terms, with the middle and late bronze age being collectively termed the later bronze age, although this division is mainly for terminological convenience rather than relating to any true chronological or cultural divisions (see chapter 6.11). It is my belief that all analysis must be developed from a sound basis, and it is to the identification of this basis that this work is directed rather than to studies which, as suggested above, are secondary to the main aim and may be better left to the future.

As well as being linked to chronological and metallurgical backgrounds the interpretation of the metalwork should, ideally, also be viewed in relation to other factors such as the physical and environmental settings, especially in the fen and fen edge situations. However it was recognised at an early stage that the information available was limited and open to a number of interpretations. The mass of detailed study needed to gain a valid overview of the landscapes and usage of them is far beyond my resources. Indeed one of the major findings of environmental research in the now relatively well studied fenland zone (Waller forthcoming) was the extent of localisation and poor dating of the horizons evident in the results. It is clear that great care is needed in extrapolating results from one location to any other, despite their having a superficial similarity. In the same way the effects of coastal change and hillwash are likely to be extremely important locally as well as regionally.

The extent of erosion of potentially important coastal sites is unlikely to be established although it is clear that changes of the East Anglian coastline are an ongoing process (Prof Brian Fennell, paper presented at conference 'coastal change and erosion in East Anglia, October 1991).

Hillwash has probably been under-emphasised in the region. Recent pipeline work has demonstrated how influential a masking factor this can be, particularly in river valley situations where the principal bronze age settlements can be expected. The high proportion of hoards found during ditching and sub-surface workings in the valleys, in relation to stray finds, may be a reflection both of the importance of river valleys

and of a potential for a wealth of, as yet undiscovered, metalwork and settlements.

The same variety of evidence may be true of other archaeological remains. There are two main reasons and causes for this. Firstly the survival of the evidence will be determined by a number of factors, some bronze age in date, most more recent. The most dramatic of these is probably seen in the preservation of prehistoric material by peat deposits in the fens as compared to the loss of comparable information in areas of longstanding arable agriculture (see chapter 9). Similar relationships exist between soil types and crop marks; PH levels and bone survival; finds distributions in relation to the search zones of metal detector users; the catchment areas of museums; archaeological research centres; public houses (where artifacts were sold to visiting collectors!); roads; railway lines etc.

The second reason is genuine archaeological variation, for example in the settlement pattern and its intensity, ritual or agriculture. The factors identified above make identification of the original archaeology extremely difficult, in some instances impossible. It is for this reason that this problem has been considered in some detail in this work by examining what I consider to be the most influential of the determinants in East Anglia, the effects of arable agriculture (chapters 9 and 11).

On a small scale it is likely that variation existed, for example in the bronze age agricultural practices of the brecklands and the boulder

clays. Differences may represent discrete communities or merely parts of one, or more, overall unified system/s which may be identified following detailed analyses of an array of available evidence. One suspects the differences seen in the agricultural practices and the artifactual material from the eastern and western fens may be due to territorial differences rather than just local variation although care should be taken. For example north-west Suffolk and south-east Suffolk have been seen as representing distinct areas in the early bronze age, mainly on the basis of differing pottery evidence and burial practices (Martin 1981, 77-8); and supported by the relative frequencies of Group 1 stone axes in the areas (Bradley, Flatland and Wetland conference, 1989 using Cummins 1979, fig 7a). However an examination of this hypothesis notes that the separation based on ceramic and burial practices is biased and is not well supported by the evidence from the adjoining area of north-east Essex (Priddy 1981, 96-7). Similarly the methods and lack of detail used for the stone axe example are also highly subjective and capable of being completely reversed by using the same data in a different way. This is not to say the original hypothesis was necessarily wrong, but it does suggest further analyses are needed to substantiate it.

Another instance, more pertinent to bronze age metalwork, is the group of studies relating to finds from the East Anglian wetlands, such as peat and river deposits (see above p.5). The intensive research carried out here (chapters 6 and 12) suggests that only a very few of the finds actually claimed to be from these situations were originally deposited in them.

These examples, amongst many, are used to illustrate how important it can be to examine even the most basic of statements carefully.

It is hoped that some of the detailed research undertaken here will allow a few of the more important problems relating to the bronze age in East Anglia, and some of the hypotheses relating to them, to be usefully assessed or re-assessed and, for the first time, based on a valid research framework.

CHAPTER 2

THE AREA

1. Boundaries and extent

The area discussed in this study and termed 'Northern East Anglia' consists of the present counties of Cambridgeshire, Norfolk and Suffolk (map 1) amounting to some 4,857 square miles (1,258,057 hectares or 3,108,659 acres) in total.

The existing local government hierarchy divides the region into, respectively, counties, districts and parishes. The boundaries of these are by no means permanent, indeed appear likely to change in the near future, and care must be taken relating reported finds from any one of these locations to the boundaries extant at the time of the original account. Notwithstanding this the units used throughout this work relate to those in use at present unless otherwise stated. The finds of bronze age metalwork from the region, listed in catalogues 2, 3, 7, 8 and 9 have been divided into county and parish locations respectively. District allocations have not been used due to the infrequency of their use relative to reported archaeological findspots. References to pieces of bronze age metalwork listed in the catalogue cite the first letter of the county (C, N or S) followed by the County Sites and Monuments Record (SMR) number, eg, the Downham Fen hoard (N4231). It should be noted that several well known hoards and individual finds are known by place names other than that of the parish in which they were found, for example, the Eriswell hoard (S8896) comes from Mildenhall parish, the Grunty Fen hoard (C5785) from Wilburton parish and the first Gorleston

hoard (N10556) from Great Yarmouth parish. Grid references, where known, have been omitted from the catalogue, in order to protect the sites from subsequent looting, but are obtainable from the county SMRs or the author. They are replaced in the catalogue by the abbreviations 'C', for correct (eight figure) grid reference known. 'A' for approximate (six figure) grid references and by 'N' when an exact or approximate position is not available.

The size of some of the parishes, especially in the fens and brecklands, means that items plotted from only a parish location have a large potential for inaccuracy (see chapter 6.8) even when plotted on small scale maps. As a large proportion of the artifactual evidence is only located to its parish this factor needs due consideration. For this reason metalwork with no known findspot has not been plotted on the small scale maps of northern East Anglia with the exception of hoards (maps 2, 4, 5, 26-42), although an attempt has been made to map the material with only generalised locations from the north-west Suffolk survey area (chapter 6.7, maps 8, 10-17).

2. Population and modern settlement pattern

At the time of the Domesday Survey in 1086, East Anglia was the most heavily populated area in England (Falkus and Gillingham 1981, 166). However, with the exception of Cambridgeshire, the rate of population growth in the region after this time, in comparison to much of the rest of the country, was much slower, and between 1841 and 1911, decreased. By 1961 East Anglia, together with the south-west, Lincolnshire, Cumberland

and parts of Yorkshire were the least densely populated parts of England. (Reader's Digest Association 1965, 114).

Since 1961, and especially over the last ten years, the region has seen the highest population and housing growth in the country and at the same time a major change in employment away from agriculture. Although early industrialisation made little impact on East Anglia's agriculture predominance much of the recent population movement has been as a direct result of its late development in the area. Nonetheless two of the most important of the mainly 19th century industrial archaeology landscapes were both of considerable interest and impact in relation to the regions prehistoric archaeology, but for different reasons.

The first of these was the development of the gun flint industry. Apart from its imputed relationship with neolithic flint working (cf Skertchley 1879), and the possible masking of potential neolithic mining sites at Brandon by the late 18th to earlier 20th century workings, the area of disturbance created by mining in the area is considerable, perhaps as much as 500 acres at Brandon alone. More relevant to bronze age studies however, is the frequency of fakers amongst the gun-flint knappers who often took full advantage of the lucrative trade in antiquities, the most notable being 'Flint Jack' (cf Forrest 1983, 114-6). Their ability to produce fakes in stone and bronze as well as flint is well attested (see chapters 3.3, 6.5c and R R Clark 1935, 56) and, one suspects, frequently undetected or undetectable.

The second industry, involving the mining and processing of coprolites, was of limited duration but was, appropriately, related to agriculture, being for the production of phosphate fertiliser (chapter 12.3b).

The method of extraction was by massive open cast mines. Significantly the largest area where this activity took place was on the archaeologically rich fen edges, between Cambridge and Fordham, Cambridgeshire (Grove 1976). Although a few finds are recorded (eg from Hauxton, C4979 and the Reach Fen hoard, C6397) it must be presumed that the majority of pieces of bronze age metalwork were either sold unrecorded or, probably in the majority of instances, redeposited, possibly at some considerable depth and distance from their original position. This mining activity may be one of the reasons for the comparative dearth of mapped material from this part of the otherwise rich south-eastern fen edges (eg, maps 4 and 26).

The effects of the more recent industrialisation and population increases in the region are likely to have been equally destructive especially if we include pipelines, roads and mineral extraction. A small proportion of the archaeological disturbance has been partially recorded, for example the Flag Fen Power Station site (Malim 1989; Wainwright 1990 and Prior 1992a) and the major late Iron Age site at Gallows Hill, Thetford (Gregory 1992).

Despite the prominence the effects of these developments, and the resulting excavations, receive, the most archaeologically destructive activity associated with man in East Anglia is unquestionably arable

agriculture. Although the proportion of the population employed on the land is probably lower now than in any earlier historical period the increased mechanisation and changed practices have caused an increase, rather than a decrease, in the resulting destruction of archaeological deposits. Due to the importance of agriculture in relation to archaeology this topic is examined more closely in subsequent chapters (particularly chapter 9).

East Anglia has, now as in the past, a variety of urban centres. Their size and nature has changed considerably, some towns have disappeared, others have been created. The principal county urban centres at present are Cambridge, Norwich and Ipswich (map 1). Although this is not the place to discuss the history of urbanisation, it is clear that relatively large populations are likely to influence the survival of the archaeological record, especially over the more recent past. Some of the more obvious ways in which this happens in relation to population centres are, for example, the presence of academic centres (principally the University of Cambridge and the University of East Anglia, Norwich); museums (appendix 3 lists the majority of the region's main museums); archaeologically and historically interested societies and groups and not least by the large number of individuals within these towns and cities. The frequency of finds in relation to towns is commonly portrayed by distribution maps and can most clearly be seen in relation to bronze age metalwork by the concentration in the Ipswich area (map 26), mainly as a result of finds reported to the museum and, more recently, by the Ipswich metal detectors' club. The relationship

between metal detecting and finds of bronze age metalwork (maps 43 and 44) is a vivid demonstration of this point.

Another factor that should not be over looked is the size of urban centres and the depth of deposits within them. It is reasonable to suppose that the river valley situations which they occupy would always have been focal points and that these may well have included some major bronze age occupation sites or centres which are now largely masked by later deposits and buildings. Occasional finds of metalwork are recorded from all of the principal cities and towns and the concentration of hoards in (and around) Norwich (map 42) is particularly suggestive.

For a brief discussion of some of the other modern factors affecting the distribution and recording of finds also see chapter 6.5.

3. The landscape and soils

In general terms the landscape of northern East Anglia is markedly lowland and suitably described as flat over much of the fenland zone. In other areas the topography is varied, rising to 128m (420 ft) at Depden in south-west Suffolk, and might be described as gently undulating and interspersed with frequent river valleys.

The principal landscape and soil regions are varied and have been loosely defined by a number of authors, including Fox (1933, 149-152); R.R. Clarke (1960, 14-19, fig 1); Lawson, Martin and Taylor (Lawson,

Martin and Priddy 1981, 41-9, 75-8, 118-120, figs 7, 26 and 47); Murphy (1984, 13-18, fig 2.1) and by the 1:250.000 Soil Survey of England and Wales (1983) which has also recorded the soils of some localities in more detail (eg Hodge and Seale 1966; Seale 1975 a and b; Corbett 1973).

The detailed surveys, at 1:25,000, despite being more accurate than those of a smaller scale are still generalisations, which, if used in relation to specific finds locations, can be misleading (see chapter 12.2). The majority of definitions used by these sources are based primarily on the agricultural properties of the soils, which have been simplified, into five basic (plus non-agricultural) categories by the Ministry of Agriculture, Fisheries and Foods land classifications (Agricultural Land Classification of England and Wales 1974).

Despite probably being one of the principal concerns amongst agriculturally based communities, and therefore most useful for separating the region in relation to potential prehistoric settlement patterns, these modern land divisions need to be used with caution. Agricultural practices and equipment today, on which the soil gradings are partially based, bear almost no comparison to those of a hundred years ago and probably none to prehistoric methods and equipment. The changes apparent in farming are commonly overlooked.

Much of the change has been due to varying needs, markets and fashions, for example at the beginning of the 19th century beef was not commonly eaten, cattle being principally bred for manure and milk. The extinction of many breeds of livestock since the last century is a

demonstration of the rapidity of some of these changes. Similarly the development of mechanically powered equipment has made obsolete most of the horse (which had replaced oxen) powered and manual practices of the period prior to the second world war. The use of land categorisation based on modern farming practice should therefore only be used with considerable care if related to the bronze age. Nonetheless in general terms, although differences in detail might be found, these do not detract from the quality of the East Anglian soils, in bronze age as well as modern times.

The use of soil maps in this work has varied according to availability and the area and subject of research. Further discussion follows in the relevant chapters.

Despite doubts over the way the soil types are divided and concern over the presumed usage of them during the bronze age, in particular the claim that the heavier soils were thickly wooded up until the medieval period (see for example, Clarke 1960, 24 and Martin 1981, 78), there is no doubting the huge variation evident in East Anglia (maps 4 and 5) and that bronze age communities are likely to have utilized them in different ways. Whether the population relying on these soils was unified or a number of disparate units is altogether a more difficult issue to resolve at this time.

With such a body of surviving metalwork there is not time to study the local landscapes and soils in relation to even a reasonable proportion of the finds. However the need for such detail, especially with regard

to finds which can be interpreted in a number of different ways, is made clear by the work on the fenland zone material (chapters 6, 11 and 12).

The landscape features of major concern in relation to interpretation of bronze age activity can be seen to include coastline changes (chapter 1, p. 15), peat, rivers and alluvium deposits, and topography. Little can be said regarding coastal change that is not obvious or has not already been voiced. It is clear that, in most instances, the present coast is an eroded (to an unknown extent) version of that extant in the bronze age although in some locations the eroded material has been redeposited making new land form. A good example of, though probably mainly as a result of silting, is the present Wash coastline where attempts have been made to establish the limits in Iron Age and Roman (eg Phillips 1970, 3 and 42, map K; Simmons 1980), though not bronze age, times.

As outlined in the introduction the areas likely to offer the best preservation of bronze age landscapes, together with the associated artifacts and structures, are probably those preserved by later deposits. Apart from urban masking (above) these are most likely to be found in four situations, namely under marine or river alluvium, hillwash or peat/lake deposits.

No finds are positively recorded from under marine alluvium and it would seem unlikely that many would ever have occurred in these low-lying localities. However the relative stability of silt soils together with their depth could conceal a wealth of archaeological evidence, for

instance it is notable how the survival of log boats correlates closely with the silt, rather than the peat, fens.

East Anglia has a network of major and minor rivers (map 2). The survival of river alluvium is likely to be very patchy, having been seriously affected by dredging and canalisation work.

The deposition of dredged and banking material however may, in some instances, have helped preserve some of the riverside locations where major settlements might be expected. Some of the fenland roddons and even minor buried channels are also likely to contain important, frequently waterlogged material, for example as at the Flag Fen Power Station site (eg French 1992). The importance of the rivers and the river valleys is demonstrated by the distribution of finds (maps 2, 4 and 5). The claimed frequency of 'high status' finds in some rivers, for example the Little Ouse, is examined in more detail in chapter 10.

The potential presented for organic and environmental survival by alluvial deposits in some of the major rivers has recently been assessed in parts of Essex. A bronze age paddle was located in the Blackwater Estuary, Essex (Wilkinson et al 1983) and elsewhere prehistoric horizons with organic survival have been observed, and partially recorded, in the intertidal zone both on the coast and in estuarine rivers (P Murphy pers comm 1991).

Also relevant to river valleys, together with 'dry' valleys, is the build up of hillwash deposits. Again these are likely to occur in the

areas where major settlements might be expected and for this reason are likely to be of fundamental importance in future studies of the region. Unfortunately no detailed, comprehensive research has yet been undertaken to assess the amount and extent of hillwash in East Anglia although, partially as a result of this work this is now being given priority in Suffolk. Being seen as one of the flattest areas of Britain has disguised the extent of hillwash in East Anglia. Although the driest part of the country, in terms of rainfall, the region does suffer major summer storms which can result in substantial soil movement (see chapter 8.2).

The areas which have preserved the best and largest available sample of bronze age metalwork (although how representative this may be is debateable, see chapters 6, 11 and 12) are the fen edges. The survival until recent times of so many artifacts is obviously a result of their covering by peat subsequent to the bronze age. Much of the material, as well as the area, has seen, and is continuing to see, considerable comment and research. Although I suggest above that the more important settlement areas may still await discovery under hillwash or alluvial deposits away from the fens, the imputed significance placed on the fenland finds has caused them to be one of the main concerns of this work and they are discussed in more detail in part 5 (below) and chapters 6, 7, 11 and 12.

Similar in some respects to the peat fen situation are some of the former meres and lakes of the region. Although a few remained wet, many had, over the centuries, become engulfed, at least partially, by peat

growth. Some of the more famous are the Broads, significantly created as a result of early medieval peat extraction. Unfortunately most of the former peat in the meres has now been removed, although tantalising accounts of some of the discoveries made during the destruction of the deposits survive. Several descriptions included details of finds of bronze age metalwork (see chapter 12.4a) in association with timber 'structures' suggestive of 'crannogs' or lake dwellings, although unfortunately the early records are not detailed enough to substantiate this. Nevertheless other mere sites survive undisturbed in East Anglia, several in the otherwise dry Breckland soils, and offer another potential archaeologically under-examined resource.

4. Land Use

Land use in East Anglia has never remained static other than for short periods. Although recent years have seen a massive increase in the amount of new housing and diversification of land usage, for example as golf courses, arable agriculture still predominates. I do not intend to discuss present land usage, as this is available in mapped form in a variety of atlases and in more detail from the Ministry of Agriculture, Fisheries and Food, but rather to look briefly at some of the major influences these have on archaeological interpretation.

Land use is undoubtedly the most important factor concerning the known distribution of bronze age metalwork. The great majority of surviving finds have been discovered as a result of chance following soil disturbance, usually as a result of arable agriculture, and detailed plotting of the finds clearly reflects this fact (map 11). It is felt

that some areas are relatively sparsely represented in metalwork terms due to recovery bias caused by differential land usage rather than reflecting bronze age distributions. The masking effects of deep deposits of soils over relatively large areas of East Anglia is outlined above. Other locations, such as forests, heath and pasture lands are also bound to be under-represented artifactually. Despite the main reason for the wealth of discoveries made in some locations in East Anglia being the intensity of arable agriculture, it is hypothesised, conversely, also to be the cause of the lack of finds in other heavily cultivated parts of the region. The implications of this are of major significance and are discussed more fully in chapter 9.

5. Extensive and intensive research areas

Most studies dealing with bronze age metalwork over geographically large areas have been concerned either with specific implement types or restricted periods. With such an abundance of material the reasons for this are obvious. This work had hoped to cross some of the barriers created by this approach by being limited to East Anglia, but has been similarly confined by the sheer quantity of material. In addition to this, other, more significant restrictions (see above eg. p. 12 and chapters 5.3c, 8.1 and 8.2), have meant that a unified research base could not be reasonably achieved across the three counties. This was in addition to the archaeological variation of evidence outlined above. Nonetheless the area (see above part 1) of intended research was retained, although the methods of achieving the original aims (chapter 5) had to be somewhat modified, mainly by choosing sample areas and

topics within East Anglia for detailed analysis. It was felt that a general study of the region as a whole still had value for use as an extensive background study which could put the more detailed research into a reasonably valid context.

Intensive research was intended to answer a number of questions, including: 1. Why was the apparent distribution so variable? 2. Was the surviving distribution a representative reflection of that occurring in bronze age times? 3. What are the reasons for its survival? 4. How much extra information could be obtained by intensive survey methods and what implications would this have? 5. What is the significance of the metalwork?

Some of these problems are inter-related and, it was felt, might be solved by a detailed examination of the area richest in surviving metalwork, and most discussed in existing publications, the south-eastern fen edges.

For the reasons outlined above this work necessitated the choice of relatively small physical areas. Although it had been hoped to choose representative samples from the fen edges of each of the three counties the relatively poor records for the Cambridgeshire section (see chapter 8.2) resulted in only two areas being selected, north-west Suffolk and south-west Norfolk.

Although the Suffolk area is the larger (see below), both were considered limited enough in extent to be practically workable, yet

large enough to show a representative sample of artifacts and diverse surface soil types of the south-eastern fens and their adjoining areas.

The limits of the north-west Suffolk area (chapter 6, maps 6 and 7) equate with the modern political boundary of Forest Heath District, an area of approximately 144 square miles (37,000 hectares) bounded on two sides by two major rivers, the Lark to the south-west and the Little Ouse to the north. The deep peat and lake marl in the north-west corner give way to fen skirt soils with sandy breck further to the north-east and chalk based soils to the south-east.

Despite covering a large area and necessitating considerable personal research the north-west Suffolk survey had the advantage of having been partially examined by the author for a number of years prior to this study. The earlier works had included two significant examinations of metalwork. First, in 1980, the initial listing of the bronzes from the village of West Row, in Mildenhall parish (p. 3 and Pendleton 1980). This was followed, in 1984-1985, by some preliminary research of the north-west Suffolk region, which was submitted as a BA dissertation (Nottingham 1985), much of which is now incorporated within chapter 6.

The south-west Norfolk area (chapter 7, map 18) adjoins the above on its north side and consists of the area between the rivers Little Ouse to the south and south-west and the Wissey to the north. It corresponds with the 'Wissey Embayment' portion of the Norfolk Fenland Survey which was partially fieldwalked by Bob Silvester and researched for earlier records of finds by Dr Frances Healy. Its area amounts to circa 66

square miles (17,000) hectares) consisting principally of deep peat, skirt and sandy breck soils.

Some of the other problems, for example those relating to the interpretation of finds, or the lack of them, from other parts of northern East Anglia, such as the claylands, together with the effects of arable agriculture over the varying soil types, could not be practically answered by the fen edge study alone. For these purposes a different approach was taken which related the metal to the non-metal finds distributions. The areas chosen for this were dictated by those where either field walking surveys had been undertaken or where the results of metal detecting were available. Due to the restricted accessibility of records detailing these activities this study was confined to relevant localities in Suffolk (chapter 9, appendix 9. catalogue 5 maps 43 and 44).

The final major topics of research were related to examining the evidence regarding ritual deposition of bronzes, in rivers (chapter 10) or other wet localities (chapter 12), and the evidence for fen edge settlement (chapter 11). The latter was largely restricted to the area of the north-west Suffolk survey. However the studies relating to ritual deposition necessitated a detailed examination of both the rivers (map 2) and fens (maps 47 and 48) of northern East Anglia, and were able to draw upon much of the work undertaken in the original extensive as well as the intensive surveys.

CHAPTER 3

EARLIER RESEARCH AND OPINIONS

1. Introduction

By far the greatest proportion of research, both locally and nationally, remains unpublished. Much has been on a small scale with localised or personal interests or problems in mind, and unfortunately much potentially significant work of this nature is totally unrecorded. Although some of these earlier studies, the excavations in particular, may now be seen as a destructive form of looting (and a few undoubtedly were exactly this), in their day most excavations and collecting activities had respectable intellectual aims.

Many of the surviving accounts are tantalising. For example, in 1848 the Reverend A Suckling (1796-1856) published his 'History and Antiquities of Suffolk' which was partially based on the manuscripts of Robert Reeve, (died 1840) a collector and antiquarian of Lowestoft, whose knowledge of antiquities was said by Suckling *'to have been extensive, varied and refined'* (1848, volume II, 107). Reeve's manuscripts are now lost. Similarly, in his 1935 note, on the sites at Mildenhall Fen, T.C. Lethbridge mentions a *'field-by-field survey'* plotted on six inches to the mile scale maps by C.S. Leaf (T.C. Lethbridge in Leaf 1935a, 126). The value of these maps for comparison to more recent fieldwalking and the fenland survey work would be considerable. Unfortunately they are also now lost.

Many other similar instances of lost research could be quoted. However it is the potential frequency of other studies, of which we have absolutely no knowledge, that are more worrying. Some of the opinions and imaginative conclusions drawn from published accounts, for example Lethbridge's assertion that 'beyond any doubt they were cannibals' (ibid), are today viewed with some amusement. Much was based on the comparatively limited evidence available at the time. However I would suggest that the same comment will be equally applicable in a few years time regarding several publications of this decade. Indeed examination of the early works shows that many of the modern hypothesis actually originated in the writings of earlier generations. Similarly, in view of the contemporary state of knowledge, it is surprising how frequently the early claims have subsequently been shown to be correct.

As discussed in the introduction (p.12) this work does not intend to carry out a detailed documentary search. An attempt to study the history of surviving records would, in its own right, form a basis for a valuable thesis. Nonetheless it is felt that some of the topics examined in this work are heavily reliant on earlier researchers and opinions and occasionally are directed to answering some of the issues raised by them. For this reason a brief summary is here given of some of the most relevant, and/or important studies relating to the subjects examined in this thesis.

2. The Nineteenth century

Documentary accounts of archaeological studies in East Anglia survive from at least the 17th century (Ashbee 1984, 2-4) and include those of

some of the most important prehistoric scholars of their time, such as John Frere (1740-1807), the first to identify the stratigraphic antiquity of man in a letter of 1797 (Archaeologia, 13, 1800, 204-5). The 'examination' of some of the district's barrows had begun even earlier, from at least the fifteenth century in Norfolk (Lawson 1981, 36) and various accounts and maps detail these activities and finds and locate many of the otherwise lost, principally early bronze age, monuments.

However it is the 19th century that saw the main development of scientific interpretation, especially the use of stratigraphy and typology, and their application to studies of bronze age metalwork. This same period saw the formation of the local societies and with them regular accounts of research in East Anglia in the Proceedings of the Norfolk and Norwich Archaeological Society (from 1847), the Suffolk Institute of Archaeology and Natural History (from 1853), the Cambridge Antiquarian Society (from 1859) and the Transactions of the Cambridgeshire and Huntingdonshire Archaeological Society (from 1904). Many of the other East Anglian Institutions, particularly the museums, were also established during the 19th century and formed natural repositories for many of the more important finds, although, sadly, little detail or original documentation usually survives.

It was artifacts that were seen as the main means of interpreting prehistory. As a consequence immense effort was directed towards obtaining and studying them, often by private collectors. The most influential and important of these was Sir John Evans whose

publications; The ancient stone implements, weapons and ornaments of Great Britain (1872 and 1897) and 'The ancient bronze implements, weapons and ornaments of Great Britain and Ireland' (1881) formed the basis for most subsequent research, especially with regard to Bronze Age metalwork. We are fortunate that much of the East Anglian bronze work obtained by Evans, and forming a substantial portion of the material discussed in his 1881 publication, is relatively well documented, both by Evans, and in slightly more detail by Joseph Warren (1792-1876), a clockmaker from Ixworth, Suffolk, whose collection, together with his valuable records of acquisitions, was sold to Evans in 1866. This manuscript (Warren 1866) is now held by the Ashmolean Museum, Oxford along with the Evans collection.

The importance of original accounts relating to some of the 19th and earlier 20th century finds cannot be overstated. Several examples are cited in the following chapters which demonstrate how subsequent authors have occasionally omitted potentially crucial factors allowing invalid interpretations. I will not cite those cases which are outlined later in this work but choose another example, amongst many, to illustrate the point. This is regarding the discovery, in 1812, of a gold (iron age?) torc at Mildenhall. In his discussions of votive deposition of prestigious metalwork from watery places Wait (1985, fig 2.12 and appendix IE 32) records this find as coming from a bog context. In the original, 1834 account, Bunbury (1834, 609-610) clearly states how the torc was found with a burial of a human skeleton, two horses, an iron sword and an axe *'while levelling skirt-lands (by cutting down hillocks of sand, and throwing them into the moor-pits)'*.

This failure to pay attention to the details relating to individual finds is reflected in broader considerations where generalisations are made without attention to some of the major issues, for example discussions of 'prestigious objects' commonly fail to consider either the large amount of surviving metalwork already recorded in earlier research, and the effects of this on any purported prestige value, or the gold items (eg Bradley 1990, 142).

The 19th century was particularly important regarding details of finds from the fens. By the 20th century many fenland locations had suffered severe, frequently total, peat loss. The chance to determine the stratigraphical relationship of finds to the peat deposits in these areas is thus totally dependent on the surviving records. The consideration of this historical documentation has important implications and is further discussed in chapter 12.

3. The Earlier Twentieth century

One of the unfortunate side effects of the interest in artifacts during the 19th century was the creation of an antiquities trade. The monetary value of finds caused a range of disreputable activities ranging from dishonesty to downright criminal offences. The former often took the form of citing false provenances for finds to collectors who were academically motivated and required find spots for their acquisitions or to other, locally based, collections, especially museums (see chapter 1, pg. 7 and chapter 6.5c). Somewhere in between dishonesty and criminality lies the production of 'copies', or 'replicas'. Some were clearly fakes (see chapter 1, pg. 7) and others genuine facsimiles of

objects for local collectors and museums. An interesting example was recently located in a small museum at Clare, Suffolk where a tanged copper dagger, apparently genuine, was seen, examined and photographed by Brian Charge, the chairman of the Haverhill and District Archaeological Group. On examination of the photograph it was clear that the dagger was the Hundon dagger (S5967), published in 1972 (Moore) and supposedly in the British Museum. Upon hearing this Mr Charge re-examined the Clare Museum dagger (for which no documentation exists) and could find no indication that the dagger was not the original. I contacted the British Museum who confirmed the genuine article was in their possession and that, to their knowledge, no copy had ever been made. Either an unrecorded copy was made for retention by the local museum prior to donation of the Hundon dagger to the British Museum or the Clare museum dagger, and perhaps the Hundon dagger itself, represent identical fakes.

Clearly into the criminal category fall instances where items can be shown to have been stolen, for example the Clouston collection (chapter 1, pg. 7 and 6.5c). Unfortunately without detailed research most of the material that falls within the groups listed above cannot be separated from genuine and correctly recorded items. The need to know the originator of the artifacts, the mode of collection and the individuals concerned, ie the history of the finds, is therefore a vital consideration.

This is particularly relevant with respect to at least two of the principal dealers in antiquities in the area of in the late 19th and

early 20th centuries, both of whom obtained a considerable amount of bronze age metalwork. The first of these was Simeon Fenton, who was recorded in local trades directories as a watchmaker and 'dealer in antiquities' in 1868 and a 'dealer in curios' in 1892. As well as purchasing items, Fenton actively collected and excavated material. Five to six thousand flints were acquired from Fenton by William Sturge and now form part of the Sturge collection in the British Museum. Some of Fenton's bronze age metalwork was purchased by Ipswich Museum in the 1920s, and other pieces by Toronto Museum in 1917. Recorded details relating to the Fenton collection appear, as far as can be told, to be correct.

The other notable character was George Pryke Gathercole (c1868-1950), of Lakenheath, who was responsible for selling a large collection of stolen and falsely provenanced bronzes to Dr Clouston (see above). Alarminglly Gathercole also acted on behalf of Cambridge University Museum in the purchase of 'locally' found antiquities for their collections towards the close of the 19th and beginning of the 20th centuries. Again some objects have been shown to have 'incorrect' provenances (see chapter 1, pg. 7) or to be forgeries (cf Jacobi 1984, 64), and other artifacts from the University Museum of Archaeology and Ethnology collections of this phase (1898-1903?) must be viewed with extreme caution.

Other pieces, apparently genuine finds, when viewed against the above facts, also need re-examination. An example of this is the important Montelius II pegged and socketed axe (catalogue 1.85) said to have been found by Mr E.G. Beckett in Wangford in circa 1930 (Briscoe 1954). The

axe is the earliest (Montelius II) socketed axe known from Britain and is considered as a likely direct import from central Germany/Bavaria (ibid; Gerloff 1975, 59; Needham 1979c, 277 and 1983, 359-60; O'Connor 1980, 58). Its supposed find date was about nine years earlier than the conviction of the thief who stole the Gathercole/Clouston bronzes yet it was not reported until 1954, some 15 years after the conviction and about four years after Gathercole's death. The north German/Bavarian origin correlates exactly with items in the Clouston collection which originated in the mid 18th century Zimmerman collection stolen from Devizes Museum. Beckett (the finder) and Gathercole lived in adjoining villages, Gathercole in fact being Beckett's barber. On the basis of this, admittedly circumstantial evidence, it would seem reasonable to suppose that this important British axe may not, in fact, be a British find at all.

The 20th century saw two major developments evolving from the 19th century obsession with artifacts; the birth of the first specialist society concerned with prehistory, the Prehistoric Society of East Anglia in 1908, and the evolution of 'regionality'. Indeed this had already partially taken place with the formation of the Prehistoric Society of East Anglia, although it is Fox's Archaeology of the Cambridge Region (1923) and his presidential address to the Prehistoric Society of East Anglia (Fox 1933) that is probably better known in this respect. His consideration of bronze age man in East Anglia has probably been most influential in the recognition of the rich fen edge concentration of finds and especially in his relatively detailed mapping of the finds. Many recent works still cite Fox, since no overall

comparable detailed presentation of the whole region's bronze age metalwork has been made since.

For the first time considerations of bronze age artifacts and communities were being put into a wider, yet specifically regional context. The establishment of the Prehistoric Society in 1935 saw the complete breakdown of artificial delineation in Britain although, it might be claimed, the formation of the present system of county archaeological units is a reversion to the original county organisations and as a consequence suffers from some similar problems to those of the 19th century.

Despite noting some of the more important changes the interest in artifacts still predominated in most amateur and professional research and publications. The detail given to flintwork was prevalent in East Anglia up until the 1930s. Various other works, concerned with the bronze age, either concentrated on specific types, for example, Greenwell and Brewis's study of spearheads (1909), or on artifact-based typologies for their breakdown of the period, eg, Montelius's 'The Chronology of the British Bronze Age' (1908). However this is not the place to consider these general and nationally based discussions.

Within East Anglia important work on the bronze age was being carried out by some notable individuals. Particularly prominent was R. Rainbird Clarke, who like his father (W.G Clarke, joint founder of the Prehistoric Society of East Anglia and author of 'In Breckland Wilds', 1925), led research into the area's archaeology. From the 1930s to the

1960s he was one of the few people recording and collecting information on contemporary and earlier finds from East Anglia, the results of which, substantially, formed the Norwich Castle Museum card index of finds and the basis of the present Norfolk Sites and Monuments Record.

Others, such as C. Fox and C.S. Leaf, have already been mentioned (above and part 1) although other less eminent workers were, in many respects, no less important. To illustrate the relative profusion of activity I shall briefly note a few of the individuals working between the 1930s and the 1960s. Unfortunately the majority made no records themselves nor reported their finds to local museums, who, all too frequently kept no documentation either. Many of those records that were made, for instance by Mr Sidney Ford of West Row, Suffolk, an astute collector and, apparently, mapper of finds from the fen edges of Cambridgeshire, Norfolk and Suffolk during this period, and by C.S. Leaf (as above part 1), have (commonly) not survived.

Despite the substantial losses, a reasonable body of information survives from the earlier 20th century and forms an invaluable insight into the nature of the evidence then available.

Amongst some of the individuals whose documentation still exists was Lady Grace M Briscoe (c1890-1973), responsible for recording, mapping and excavating some of the more important sites and finds in north-west Suffolk from her retirement to the area in the 1940s until the mid 1960s. Another eminent archaeologist in East Anglia was Basil J.W. Brown (c1888 - 1977) who recorded, but never published, a wealth of detail for most of the rest of Suffolk and parts of south Norfolk. He

was probably the most active of the area's archaeologists and should, justifiably, be remembered for his discovery and exemplary excavation of the Sutton Hoo ship burial and his discovery of the Anglo-Saxon village at West Stow. His journals and copious notes are now stored by the Suffolk Archaeological Unit.

In south-west Norfolk Frank Curtiss (c1900-1972), was probably more typical of the majority of smaller scale collectors in that he was based in agricultural employment. As well as making detailed records of finds, he undertook fieldwalking and excavations in the disappearing landscapes of the fen edges between c1948 and 1972. His work has recently been examined by Frances Healy (Healy 1988 and forthcoming). Despite, for the most part, being more prolific these worthies typify the work being undertaken by their contemporaries, the great majority of whom were amateurs, in the region.

The importance of their work partly lies in the changes that occurred in agricultural practice as a result of the adoption of petrol driven agricultural machinery. The effects were particularly drastic in the fens and fen edges where, for the first time, intensive arable agriculture became standard. The slow wastage of the peat due to drainage, accelerated by the use of diesel powered pumps, was doubled as a result of the agricultural changes and the fragile occupation horizons were mostly destroyed as a result.

It is no coincidence that many of the most important fen edge sites, such as Plantation and Peacocks Farms (G. Clark 1933, J.G.D. Clark et al

1935); Mildenhall Fen (J.G.D. Clark 1936); Hayland House (Leaf 1935a); Fifty Farm (ibid); Hurst Fen (Briscoe 1954b; J.G.D. Clark et al 1960); Methwold Fen (Godwin and Clark 1934); Southery (Lethbridge and Fowler 1931) and Wilde Street (Kelly 1967), to list some from the south-eastern fen edges, were found only shortly prior to their imminent destruction by agriculture, mainly before the onset of intensive mechanisation.

Important discoveries and discussions relating to them are too numerous to mention individually, but the Isleham hoard merits special attention since after its initial discovery it was dealt with by professional archaeologists. Ploughed up in 1959, this hoard, the largest in Western Europe, has still only been summarily reported (eg Britton 1960; Edwardson 1968; Northover 1982a; O'Connor 1980, 365-9), due mainly to the size of the task and to a lack of funding. Despite the importance of this hoard the site, which has been ploughed continuously since the discovery, has not been properly examined by detailed fieldwalking, metal detector survey, geophysical methods or modern excavation, though worked and burnt flint and bronze age pottery scatters have been identified (Malim 1990, 68-71).

4. From the 1960s until today

The 1960s saw the modernisation of archaeology with the widespread adoption of a multi-disciplinary approach utilising the advances (mainly of the 1950s) made in the sciences (eg radio-carbon dating, metal analysis, environmental archaeology, aerial photography). It was also the beginning of the period of professionalism which, in terms of county-based archaeology, culminated in the establishment of the county

units, and in consequence, the county Sites and Monuments Records (SMRs).

The result has been a much improved preservation of the archaeology, both in landscape and record terms, although being essentially based on development control, the units and SMRs have not fully realised their potential for research (see above p. 11 and chapter 8.1 and 8.2). This need is mostly still being undertaken by individuals, although changes in the approach taken to bronze age studies are very apparent. Despite the continuation of papers concerned with individual artifact types (eg Trump 1962, and Burgess and Gerloff 1981 on rapiers; Coles 1962 on shields; Cowen 1967 on Hallstatt swords; Eogan 1969 on lock-rings; Gerloff 1975 on early bronze age daggers; Coombs 1975 on weapon hoards; Ehrenberg 1977 on spearheads and 1981 on anvils and Needham 1983 on early bronze age axeheads) the inclination has moved towards a broader approach with distinct sociological, theoretical and interpretive biases, the artifacts themselves frequently only representing a background to the central theme. Although in many respects this should be seen as the correct approach, and interpretation must be seen as vital to any study of prehistory, on occasions it appears to have taken precedence over objectivity.

This development can be seen with the change in emphasis in some of the research. For instance, most of the classifications and listings of the 1960s offered little in the way of interpretation of the objects - a little over one page in Trump's influential paper on Fenland Rapiers in 1968 (above chapter 1, pg. 5). During the 1970s, the adoption of what

can generally be termed theoretical archaeology is apparent, for example in Burgess's account of 'The end of the early bronze and a hiatus' (1974, 194-8) he invokes a catastrophe theory as the cause with a change to a water based religion as a consequence. His 'deepening social stratification' (ibid, 197) is reflected in warrior aristocracies or other models involving social organisation (cf Coombs 1975, Rowlands 1976 and Gardiner 1980). In most of these studies the metalwork itself continues to be central to discussion (eg Davey 1973, Coombs 1975, Rowland 1976, O'Connor 1980 and Needham and Burgess 1980) despite the social implications.

However by the 1980s such reasoned suggestions and hypothesis are occasionally being integrated within a mass of subjective supposition which, in its own right, has little basis in actual artifact studies or detailed research and yet is, nonetheless, still highly influential (cf Bradley 1984 and 1990, Pryor 1992b).

The distance travelled from the practical groundwork undertaken in earlier periods is immense, and is partially a side effect of the 'professionalisation' of archaeology and the submergence of the previously important works of amateurs. Perhaps most alarming is the fact that the non-professionals, and the information they can, and are generally only too willing to supply, have been too frequently ignored, with a few notable exceptions, such as the commendable and valuable liaison between the late Tony Gregory and the metal detecting fraternity.

This work in part attempts to show the importance of independent individuals, such as the land workers, small collectors and metal detector users, and how an ignorance of the ground information they are able to offer, that is the basic research, prevents accurate analysis of the bronze age.

The majority of this chapter has been in the form of an overview of the reasons for the research and opinions related to East Anglia rather than a specific discussion of separate examples. To do this would be impractical in terms of the time needed to locate and record unpublished sources, which, as indicated above, proliferate, and would otherwise merely pull together a large body of existing publications, many of which are now outdated or already referred to in other sections of this work.

The same applies to excavations, which are now referenced in the index of archaeological excavations available from the National Archaeological Record of the Royal Commission on the Historical monuments of England. Despite the improvement in techniques and a definite increase in excavations on bronze age sites modern excavations do not necessarily achieve all that they might. For example I have personally observed the excavation of 16 bronze age sites in north-west Suffolk and on the fen edges over the last 25 years, and I have never seen wet-sieving undertaken. In addition to this, Prior admits, despite the importance of the site, that this was not practised on the Flag Fen Power Station site and, more alarmingly, the published details suggest that the great

majority of the bronze age metalwork located was, due to the methods of excavation, effectively unstratified.

5. Contemporary research

Several pieces of current academic research (a full list of ongoing theses in progress, 'British reports, translations and theses' is available from the British Library) have much to offer towards interpretation of the bronze age in East Anglia in the near future, such as the lead isotope analysis mentioned above (p. 14) and ongoing work on bronze hoards in Essex by Paul Sealey. However, perhaps as important, is understanding the background 'cultural' setting within which the metalwork is found. Two theoretically similar, but in practice diverse, methods are being employed that help to answer this need, namely fieldwalking surveys and metal detecting.

It is the recent adaption of systematic fieldwalking that has seen the greatest change and advance offered by the collecting of artifacts in East Anglia. Where such surveys have taken place, a reasonably balanced analysis of past land use and settlement patterns can be undertaken (for discussion see chapter 9 and 11). Fieldwalking is by no means new, indeed it had been the main method employed for the discovery of the material found throughout the 20th century. However the earlier collecting strategies were usually not recorded or systematic (excepting that of C.S. Leaf, part 1 above) and very biased towards the 'richer' sites. Although much of the recent and present fieldwalking lacks methodological consistency and, just as relevantly, has considerable variability in the qualities of participants, we are, for the first

time, gaining an insight into the intensity of material away from the Breckland/fen edge and Ipswich zones formerly seen as the '*two main areas of settlement in Northern East Anglia ... from Neolithic until Early Saxon times*' (R R Clarke 1960, 24).

Metal detecting has differed, in that the methods have been far less systematic, 'surveys' in general being very haphazard and poorly recorded, although there are exceptions. Although effectively practised since about 1970, a very small proportion of finds have been recorded. Despite a number of sites, mainly of Roman and Earlier Medieval date, being stripped of metal finds since the 1970s and a consequent decline in interest by some of the 'professional' detectorists and 'dealers', a surprising upsurge in usage has been observed over the last two years, probably as a direct result of the present economic depression and lack of employment. An upshot of this has been a marked increase in reported finds of, usually small, items of bronze age metalwork. These finds have, again, offered a completely new form of evidence now available for further analysis (chapter 9).

It is interesting that the process of collecting, sale and exchange that is enacted in some quarters as part of the metal detecting scene today, closely reflects that of the 19th and earlier 20th centuries. The finders (often agricultural labourers) then forwarded, usually through sale, their finds to intermediaries (such as G.P. Gathercole, above part 3) or directly to collectors whose material ultimately ended up in the local, national and international museums. Let us hope that the opportunity to record the present finds is taken before they too end up

becoming as archaeologically worthless as the majority of contextually
unrecorded finds in the existing museum collections.

CHAPTER 4

KNOWLEDGE, VOIDS, QUESTIONS AND RESEARCH PRIORITIES

1. The depth of knowledge

Despite a wealth of artifactual remains, mainly in the form of worked stone and pottery in the early bronze age, and a proportional increase of bronzes matching the decline of the lithics, in the later bronze age (cf Ford et al 1984 and see chapter 9.4 and 5 and chapter 11.2-5), our knowledge of most major aspects of contemporary society is remarkably poor. Even artifact usage is not definitely known in most instances.

A brief examination of some of the primary issues follows, outlining some of these voids and asking which questions would be most easily or best resolved.

2. Settlement

From the recent work by English Heritage on the Monuments Protection Programme, some might believe that the only bronze age sites of national importance are upstanding monuments, of which, apart from round barrows there are, not surprisingly, very few. This posture appears to show more respect for tourism than for archaeology. In terms of importance, whilst admitting human remains should be one of the priorities, the preservation of round barrows does not necessarily correlate with skeletal survival and disregards the majority of cadaveral evidence of the populations of the later bronze age which were not generally inhumed in large barrows.

This is particularly true of East Anglia, where agriculture has resulted in the destruction of earthworks on a massive scale. However, by the same means, evidence for settlement has become relatively prolific although it also has suffered as a result. Unfortunately most of the settlement evidence takes the form of surface find scatters on arable field surfaces, which, perhaps significantly, occasionally include human remains. Despite the obvious importance of occupation sites very few have been properly excavated. Those producing evidence of actual house plans are even fewer. This is undoubtedly a result of the lack of open area excavation techniques before the 1960s/1970s, rather than a result of nomadic pastoralists living principally in tents or very flimsy structures, as had previously been suggested (cf Lethbridge in Leaf 1935a, 125-7; R.R. Clarke 1960, 62 and 77).

Indeed despite many small scale excavations on the sand hillocks, so prolifically covered in settlement debris, along the south-eastern fen edges, the first clear example of a 'house' within such a scatter was not found until 1982 (Martin 1983). Although other, often dubious, houses, for example, at Chippenham, Cambridgeshire (Leaf 1935b and Gibson 1980) and Honington, Suffolk (Fell 1951), had been identified earlier, since the 1960s a comparative proliferation has been examined in East Anglia.

Unfortunately few of these 'settlements' have had reasonable representative proportions of their areas examined, some of the most complete being the Fengate complex near Peterborough, Cambridgeshire (cf Pryor 1980a); The Lofts Farm enclosure, Essex (Brown 1988); the Mucking

North and South Rings Enclosures, Essex' (Jones and Bond 1980; Bond 1988), and the Mildenhall 165 site (Martin 1983 and Martin and Murphy 1988). It was suggested that only 40% of the settlement area of the Mildenhall 165 site had been examined (ibid, 134). In addition to this most of these sites were either excavated in adverse 'rescue' conditions and had previously suffered from various agricultural activities.

Considerable variation is apparent in the nature of the occupation. Differences are particularly obvious regarding the practices on the western fen edges at Fengate and those in evidence on the eastern fen edges (cf Healy 1984; 118 and 1991, 36). How typical any of the excavated settlements are is questionable. Indeed one of the common features of the East Anglian evidence to date, namely the small size of the settlements, is by no means necessarily characteristic of the true settlement pattern in East Anglia, especially during the later bronze age. The small sites may merely be subsidiary to major centres, which, as suggested above (chapter 1, p.15 and chapter 2.3), seem likely to be buried under hillwash deposits or undiscovered for other reasons (chapter 9).

Although our knowledge of occupation sites has improved, major biases still exist in an overall understanding of settlement pattern in prehistoric East Anglia. The most obvious gaps are related to the two most diverse regions, namely the claylands, where very little research has been undertaken, and the fen edges, which, although clearly shown to be occupied in early bronze age times, have lacked firm evidence for the

later bronze age. These two regions are examined in more detail in chapters 9 and 11.

3. Agriculture, economy and wealth

Bronze age society was clearly agriculturally based. How much uniformity in method and practice existed across East Anglia is unknown, although as suggested above (p.26) variation is apparent. Whether the differences were localised or regional cannot, at present, be demonstrated. This lack of basic knowledge is clearly related to the limited extent of modern excavations and the dearth, and limitations, of environmental evidence (chapter 8.4).

Although we can identify some of the practices which took place on individual sites, from the residues that may be observable in surface scatters (such as leather working tools, quern stones, loom weights and bone remains) or the excavated features (such as the flax retting pit on the Mildenhall 165 site, Martin and Murphy 1988, 355; carbonised remains and animal bones) few general observations can be made other than that there was a clear reliance on domestic stock and cultivated crops (although hazlenuts and antlers suggest that foraging was not uncommon) even on the presumably game-rich fen edges.

The primary importance of cattle to the economy of the bronze age (cf Coombs 1975, 76) and the suggestion that they, as in the late iron age Britain described by Ceasar (de Bello Gallico 5.12), represented a measure of wealth, is controversial. Admittedly the comparatively large proportion of cattle bones present in most domestic assemblages supports

their importance. However the Grimes Graves evidence shows that of the 52.5% of the fauna made up of cattle nearly 50% of these were culled when only a few weeks or months of age, which is characteristic of dairy farming (Legge 1981, 85-9 and 1984, 170-2). However this does not necessarily disprove the importance of cattle but merely changes the emphasis with which they might be viewed.

Significant to the relative importance of stock, but less easy to demonstrate, is the value of crops to the economy. Cereals appear to be present, in one form or another, on most bronze age sites in East Anglia. It has been proposed that many of the major defensive structures of the earlier neolithic (the interrupted ditch systems) and the late bronze age/iron age (the hillforts) were principally centralised stores of seed grain (Gent 1983), which, if true, considerably elevates the importance of cereals.

What is not in doubt is the wealth produced by the region. The amount of imported artifacts (stone axes in the neolithic, stone and metal objects in the bronze age) affirm this. Whether the economic support was based on a surplus of stock, arable produce, cloth or salt production (for which there is, as yet, no existing evidence in bronze age East Anglia), slave trading, or some other commodity is unfortunately unprovable, although on this last count, it may be significant that the known high incidence of bronze age occupation sites and metalwork correlates with a marked concentration of burnt flint patches along the south-eastern fen edges (see chapter 7).

4. Industry and technology

As outlined in the previous section the basis of the economic output and wealth of the bronze age in East Anglia is not clear, even contentious. As a result the same must be said of much of the industry, indeed even the term should be used with some care in most respects. Fortunately the one exception we can speak of with relative confidence is the bronze industry itself.

Initially, during most of the early bronze age, production was limited, although, as time progressed, the use of bronze implements would appear to have become more commonplace and less prestigious. Elsewhere finds of certain early bronze age metal types, such as daggers, are mostly limited to barrow burials. In East Anglia, however, this is not necessarily the case. For example, of the four early copper tanged daggers identified from Suffolk, (S0845, S5967, S9585 and one other not yet numbered) one comes from the fen edge settlement zone, and another from a river. None can definitely be shown to come from barrow burials. Although some prestige items, (notably the early bronze age gold) are associated with burials, at least as many are not. Whether this suggests that the production of bronzes was aimed more towards utilization than ceremony or prestige, or that the area had greater wealth, or different politics, is largely postulation although from the evidence it appears that significant regional variation existed in lowland Britain.

It might be assumed that the comparative infrequency of early metalwork (see chapter 8.5) supports a case for the importation of metalwork from

production areas elsewhere. However the presence of at least one stone mould, from 'the Fens', Suffolk (Tylecote 1962; Britton 1963, 320, fig 7), together with other evidence for local production in the form of localised forms (cf Needham 1983) show that, whilst the metal had to be imported, the trading networks existed, as they had during the neolithic, to support local production.

The first evidence of production on a larger scale comes at the end of the early bronze age with hoards of axes characteristic of the 'Arreton' tradition. Although still small, the largest being the Poslingford hoard (S5985) of only 19 axes, these hoards mark the onset of the change from a primarily flint based technology to one of bronze. The increased usage (and disposal) of bronze objects and the specialisation involved in processing the ore as well as producing the finished objects, implies considerable 'industrialisation' at this stage, even if the raw materials are derived from the British rather than the European metal sources.

A consideration of the nature of the later bronze age industry, its extent and implications are considered in more detail in chapter 8. The extent of specialised production in East Anglia is debateable. The small size of hoards during the middle bronze age suggests limited localised output, although still, in regional terms, on a considerable scale, yet the extent of technological and artifactual innovation suggests the area was one of the metalworking centres of Britain, at least from the end of the early bronze age (Fox 1943, plate VIII), 'and was certainly one of the earliest producers of middle bronze age metal-

work' (Rowlands 1976, 119). How much of the innovation results from internal or external stimulus is, without better dating evidence, difficult to determine. Imported artifacts are certainly found, and it is clear that new metal supplies came from outside the region. Rowlands (ibid, 121) suggests that the middle bronze age development was probably indigenous up until the final stages of the period. Interestingly the concentration of ornaments in late middle bronze age East Anglia does not correlate particularly well with the produce of other ornament zones in Britain (for example the quoit-headed pins). This, together with the large number of experimental and early sword types in the region (cf Lawson 1979a), suggest that the development of new forms, whilst undoubtedly partially resulting from outside contact, was largely a result of local inventiveness. The amount of metalwork in the later bronze age, together with clear evidence for local production, suggest the continued importance of the East Anglian bronze industry. This is supported by a marked rarity of common continental forms in the repertoire (for example bangles, brooches, sickles, winged axes and Breton form axes).

5. Social structure

As outlined above, certain problems exist in attempting to determine the nature of society in bronze age East Anglia. The most important of these is the lack of clear evidence. The same can be said of prehistory as a whole. Secondly it would appear that comparisons with other regions are largely invalid, since regionality is apparent. This is particularly well illustrated by the variation in sepulchral deposits during the early bronze age (chapter 6.12f), and by the considerable

differences in comparative frequency of bronze objects recorded in the regions' (chapter 6.8). This may well partly be a result of the survival of the evidence but it is unreasonable to argue that this is the only reason.

During the early bronze age, East Anglia shows a wealth of artifacts of all types and materials. These include finds which have been deemed to be of 'high status'. Where records exist, the majority of these 'high status' goods do not come from barrow burials but from settlement sites. Indeed the infrequency of their association with burials is a notable feature of the region. Of the 375 'investigations' of barrows and ring ditches recorded (up to 1979) only 17 produced bronze age metalwork, a total of 23 pieces, seven of which were awls/pins (Lawson et al 1981). The meaning of this is contentious (see above part 4). Whether we have chieftain based society, for which there is little indication, which chooses not to display its wealth consumptiously in funerary ritual, or a more egalitarian society is a problem for others to solve.

Perhaps some of the answers lie in the way we use labels such as 'high status' and 'prestige'. It is argued (above p.9 and chapter 12.5) that the frequency of these objects in East Anglia (and probably elsewhere) renders obsolete the usage of these terms in relation to them. This is particularly applicable to bronze implements, especially objects such as rapiers, swords and large spearheads which no longer have rarity or metallic value as factors in their purported value. The evidence put forward later in this work indicates that these objects are merely part

of the high background incidence of all bronze types (especially see chapters 6, 8, 9, 10 and 12).

Although the presence of so many weapons might suggest a strong martial element and support a warrior aristocracy this need not necessarily be the case (chapter 5.12), especially as the artifact usage still has to be demonstrated in the majority of instances.

6. Death, burial and religion

Much has been said regarding burial practices in the bronze age which I do not intend to repeat here (cf Ashbee 1960; Lawson et al 1981; Wait 1985; Turner and Briggs 1986, 144-161; Healy and Housley in prep).

In broad terms the period can be subdivided into the early bronze age, when round barrows were probably a dominant feature of some landscapes, and the later bronze age when, despite the construction of some smaller barrows (eg Salthouse, Norfolk, Great Bromley and Ardleigh, Essex) barrow burial appears to have largely become outdated. This is undoubtedly an over-simplification since human remains of early bronze age date are a feature of several settlement sites (chapter 6.12f) and are also recorded from field ditches at Fengate (Pryor 1980a, 175-5) and the late neolithic deposits at Grimes Graves (eg Peake 1914) and from wet peat in the Norfolk fens (eg chapter 6.12f and 12.4a; Healy and Housley in prep). These informal methods may be a forerunner of later bronze age practices, certainly a similar situation is encountered in some iron age contexts. However the most common form of human disposal was likely to have been an increase in the already established practice

of cremation. Urned cremation cemeteries are known, for example Witton, Salthouse and Shouldham, Norfolk; Honington, Suffolk and Ardleigh, Essex, although, as far as we can tell, these tend to be the exception rather than the rule. It may be that agriculture, quarrying and other activities have resulted in the destruction of the fragile pottery (if the cremations were buried in pots) and the dispersal of any surviving, and difficult to identify, cremated remains. Equally possible is a practice of scattering the ashes, as commonly occurs in modern crematoriums. This could account for the lack of human remains dated to the later bronze age in the region and also possibly for some of the metalwork finds (cf West Buckland Hoard, Somerset, Taylor 1982, and below, chapter 7.8 and 7.9).

Closely related to burial is religion. Rites of passage cannot, unless exceptional circumstances exist, be established in any detail. It is clear that much of the evidence associated with barrow burial is ritual in nature and that any form of burial is by definition, a ritual act.

However it is not sepulchral practices that are the major concern of this work. Rather it is the much discussed area of ritual associated with artifact deposition. The understanding of this issue is vital to the interpretation of bronze age society and for this reason much of the detailed research in this work has been directed towards examining the problem. Most of the earlier comments have been dependent on generalised research of an extensive nature and the resultant hypotheses have consequently been inconclusive, despite their occasionally

assertive tone. For a discussion of the results of the detailed studies see chapters 6, 7, 10 and 12.

7. Chronology

The chronology of the bronze age was formerly based on typology, and a matter of great interest and discussion to earlier writers. Although still important, typology is not an issue discussed in this work in any detail, but is used only to give a broad dating basis to some implement types. The typological schemes are now given much more chronological significance by association with radiocarbon and dendrochronological dating. Unfortunately, as yet, too few samples exist in close association with metalwork or other artifactual evidence to offer as much detail as we would wish for. This is especially true in East Anglia where the majority of metal finds, being stray and out of their original context, have no directly dateable associations. Those dates that exist are particularly important, such as the series from the later bronze age horizon excavated at Grimes Graves, although unfortunately the bronzes were not particularly diagnostic. It is hoped that the dendrochronological and radiocarbon dates from Flag Fen and the adjoining Power Station site can be matched with the large group of metalwork; although, from the existing publications, it would appear that most of the finds are not securely stratified (Prior 1992a, 451-2; Coombs 1992, 504).

An additional problem with a large proportion of the East Anglian metalwork, even if its deposition date was to be firmly established, is the amount of wear and uncertain age of the objects when disposed of.

Indeed it is argued that a sizeable proportion of the finds away from the preserved fenland horizons were redeposited in post bronze age times (chapter 9).

Detailed dating is clearly crucial to the understanding of the origins of metalworking traditions and critical to East Anglia, where, as suggested in the previous section, the stimulus for the adoption of some major artifact types may have originated.

Fortunately the dating of ceramics is somewhat better, especially with regard to the early bronze age. A series of radiocarbon dates exist from East Anglia for both burials and settlements (eg Hunstanton, Norfolk; Mildenhall 130; Mildenhall 165) but large gaps still exist, both geographically and for some pottery forms. As yet the later bronze age is not as well provided (see chapters 9.4 and 11.4) although it is hoped a number of sites recently excavated in Suffolk, and especially in Essex, may go some way towards filling our understanding of the pottery sequence in bronze age East Anglia.

The general chronology used throughout this work is described in appendix 7. Radiocarbon determinations are cited in years 'bc' or calibrated calendar years 'BC'. Calibrated dates have been based on those in the cited sources and have not been standardised. A single standard deviation and laboratory sample number is usually cited after the date, for example the date of the radiocarbon sample from the settlement at Hunstanton, Norfolk was 1736±63 bc (BM 704). The general

usage of 'early', 'middle', 'late' and 'later' bronze age is explained in the introduction (p.14).

8. Research priorities

The general discussion in the earlier part of this chapter relates to some of the major issues of the bronze age and draws attention to the poor state of our understanding of the period. It is clear the gaps need filling, and it is felt that in several instances this is a feasible undertaking, especially with recent scientific advances and barring financial and physical constraints.

An absolute priority must be the creation of a sound research basis and an understanding of significant factors related to it. This is seen as the principal research priority on which the main emphasis of this work is founded. Two different methods are used. Firstly, intensive research of a sample area to examine the amount and nature of the evidence, and secondly a critical survey of the reasons for the varied survival of artifacts in East Anglia.

Specific questions are seen as secondary but, based on the primary design, are far more likely to be answered reasonably objectively. Amongst these secondary priorities some of the greatest needs are personally seen to be in identifying the following:

1. The area and nature of settlement;
2. The economic basis of the region's relative prosperity;
3. The nature, attitudes and practices of society;
4. The causes and chronology of change.

Clearly it is beyond the scope of this work to answer all of these questions, or indeed any one of them, fully - but nonetheless it is hoped a fuller understanding of some of these issues will result. A discussion of the main aims, and the methods used, follows in chapter 5.

CHAPTER 5

AIMS AND METHODS

1. General aims

In simple terms the main aim of this work is to examine the causes of the distribution of metalwork in bronze age East Anglia. Unfortunately simple questions are often not easily answered and require considerable examination of the evidence. The importance of a sound research basis for this is undeniable and the only reliable way to advance an understanding of the period using existing information. Previous extensive studies had failed to utilise or provide such a foundation. It seems likely that this failure to pay attention to details attained by such sound research will, at best, lead to misleading results.

In order to provide such a detailed basis I had originally hoped to examine parts of each of the three counties of northern East Anglia. However the enormous variation in the recorded evidence led to two changes in direction. Firstly the abandonment of one of the sample areas, in Cambridgeshire, due to the relatively poor state of the available records (chapters 2.5, 8.1 and 8.2). Secondly, and more significantly, it was decided to put more emphasis on the actual causes of the variability as it became obvious that modern factors were as likely to be as significant as ancient ones regarding the presence, or absence, of bronze age metalwork (chapters 2, 8 and 9).

As a result of the change in emphasis two main themes were developed under the principal aim of finding the reasons for distribution

patterns, that is: 1. the examination of contemporary bronze age events causing the deposition of bronze and other artifacts; and 2. the examination of the evidence of the main post-bronze age activities likely to affect the bronze age deposits mentioned in 1. By this means it is hoped that a valid base might be obtained for pursuing specific questions regarding the relationship of the metalwork to society, settlement, ritual and chronology. The aims, methods and significance of the findings are briefly outlined below and discussed in more detail in the subsequent individual chapters (6, 7, 9 - 12).

2. Specific aims

Many of the problems concerning the bronze age (chapter 4) are vast. The detailed research necessary to elucidate most aspects of these problems needs a great deal of both time and funding which puts them beyond the scope of this work. Using the methods cited below, however, some important and currently dominant issues can be carefully considered and evaluated. These include:

1. the amount and value of bronze age metalwork;
2. the survival and recognition of bronze age artifacts and settlements;
3. the relationship of surviving artifact distributions to those of the bronze age;
4. settlement pattern and structure in bronze age East Anglia;
5. the interpretation of the metalwork distribution;
6. chronological implications in terms of change or continuity;
7. ritual and religion;
8. social boundaries;

9. the importance of intensive research.

3. Methods

A satisfactory examination of the above clearly requires consideration of a range of relevant and influential factors. Inevitably a variety of methods are needed. A detailed discussion of these follows in chapters six to twelve. They can be summarised as follows:

a. The extensive survey (chapter 8)

Finds of bronze age metalwork from northern East Anglia have generally been recorded using the Sites and Monuments Records for Cambridgeshire, Norfolk and Suffolk. These have, where necessary, been amended (catalogues 2 and 3). The plotting of the finds with recorded findspots (maps 1, 2, 4, 5 and 26-42) shows a generalised background distribution of metalwork. The mapping differs from other region-wide examples (cf Chitty and Fox 1933; Chitty in Fox 1943 and Rowlands 1976) in that items without known findspots have been excluded, for a number of reasons (see chapter 2.1), not least being the frequency of the citing of false generalised provenances (see chapter 3.3). The results also show, for the first time, some significant changes in both the nature of the metalwork and in distribution patterns, due mainly to the impact of recorded metal detected finds (chapters 3.4 and 9.7).

In view of the amount of evidence and material, no attempt has been made to examine or verify the locations of finds or the finds themselves during this extensive survey although a few obvious errors and omissions have been corrected. This is in marked contrast to the main intensive

survey of north-west Suffolk (see below and chapter 6) where the deficiencies of extensive survey methods were particularly notable. As a result the value of the extensive survey was felt to be limited but nonetheless helped provide an indication of the present state of knowledge of finds and some of the reasons for localised variability.

b. The intensive surveys (chapters 6 and 7)

In order to assess the reliability of the extensive survey and earlier research two sample areas, in north-west Suffolk and south-west Norfolk, were chosen for more intensive survey (chapters 6 and 7). These areas were also examined in order to study specific problems related to the concentration of finds on the south-eastern fen edges, where evidence crucial to further interpretation was considered likely to occur. Although the areas adjoin, they have been separated on the grounds of the different nature of research carried out within them.

In north-west Suffolk study (chapter 6) has concentrated on recording as much of the bronze age metalwork as possible in some detail given financial and time restrictions. Due to the late onset of arable agriculture in some parts, particularly the former fenlands, it seems justifiable to presume that the surviving evidence for artifacts will be much greater and will result in a far better reflection of true bronze age distributions that can be recovered from the great majority of lowland Britain. The methods employed (chapter 6.6) included tracing as many likely sources of information as possible, especially individuals likely to have made personal discoveries. When possible, details recorded elsewhere (eg publications and museums) were checked with the

finders. Particular attention was given to determining the findspots and, where practicable, these were visited and incorporated within wider fieldwalking surveys. In view of the localised variability of the soils and subsoils on the crucial fen edge zone this factor was particularly important.

In south-west Norfolk a separate approach was taken (chapter 7). Due to the work of Dr Frances Healy the metalwork has, partially, already been studied (although the concentration is still much slighter than disclosed by the intensive research in north-west Suffolk). As part of the area had, conveniently, been fieldwalked for the Norfolk Fenland Survey, an ideal opportunity was presented for relating the independent pieces of research, ie, the metalwork distribution and other find scatters, to each other. The intention was mainly to appraise the findings made in the north-west Suffolk survey which suggested that the metalwork distribution was directly related to settlement pattern. Comparing the results of the plotted metalwork distribution to those of the Norfolk Fenland Survey fieldwalking was followed by a closer examination of apparent anomalies, including, when necessary, further field visits.

c. Factors affecting distributions

The significance of modern as well as ancient factors for both the bronze age and the surviving distributions of artifacts is enormous and was a major concern of all parts of this work. Of particular importance was the difficulty in interpreting the evidence when it could not be shown how representative this evidence was. The intensive survey of

north-west Suffolk demonstrated the poor state of recording, even in one of the areas of East Anglia which had been relatively well studied in comparison to other parts, and where a reasonable proportion of the evidence could be expected to survive. This prompted a more detailed examination of the other factors likely to affect distributions (chapters 6.5, 8.2 and 12.3), especially with regard to areas where such a representative survival might not be expected (chapter 9).

Agriculture was considered the most influential of these. Initial support for this mostly took the form of negative evidence, ie, finds proliferated in areas of short-standing arable agriculture, such as the fens and fen edges, but were only present at a very low frequency in areas of long-standing arable agriculture.

To establish that farming practice really was of major significance to the areas low in finds entailed a more detailed examination of the metalwork together with other recognisable artifactual evidence, namely pottery and lithics (chapter 9). It was predicted that the low frequency of metalwork on the historically rich soils (as shown by the extensive survey distributions) was due to the earlier disturbance and removal of larger items. The means of testing this was offered by metal detecting, which enabled the small and fragmentary objects, missed or ignored by earlier generations, to be discovered and recorded (chapter 9).

It was further suggested that other, potentially associated, materials, in the form of pottery and worked flints, should also reflect the extent of agricultural destruction of the evidence. Bronze age pottery, being

friable, has been demonstrated to have a restricted life span (in terms of visibility) in ploughsoil, whereas flint is virtually indestructible. An examination of field walking results in different soil regions was used to examine the relative survival of these materials and relate these, as far as was practicable, to the intensity of agricultural practice in these regions (chapter 9.1 - 5).

d. River and wetland deposits

The emphasis given to the so called 'ritual' deposits in wetland locations has been much to the fore in considerations of the bronze age over the last twenty years. Although I originally (in 1976, see appendix 5) supported a votive theory, it became apparent during the intensive research in north-west Suffolk (chapter 6) that this former interpretation of the evidence lacked a sound research base.

The importance of this issue warranted further study which was undertaken in three ways. Firstly the intensive survey work of north-west Suffolk (chapter 6) provided a detailed examination of finds from potential wetland sites as well as a comparable sample from other situations in the area. Secondly records of all finds claimed to be from rivers were examined and the results analysed and itemised (chapter 10, tables 17 and 18 and catalogue 7).

Finally records of all finds mapped or listed as from the fens were examined in more detail. Particular attention was given to the findspots and their relationship to 'dry' or 'wet' locations; to the surviving, especially original accounts, of discovery and to the contexts of the

finds (chapter 12). In addition to this, finds of purported 'high status' were studied to examine the possibility of their having a correlation with the 'wetlands' (chapter 12.5c, catalogue 8).

e. The evidence for settlement

The study of artifacts is just one, limited, means of gaining an understanding of bronze age society. Apart from the analyses of human remains one of the most important means of further interpretation is offered by the examination of settlements. Unfortunately the most difficult problem related to this is their identification. The reasons for this are varied but include possible masking by peat, silt or hillwash deposits (chapter 2.3); the small size of many of the sites; their insubstantial nature; and the difficulty in identifying the physical remains of occupation. Although some enclosure cropmarks are likely to represent bronze age settlement boundaries/defences, too few have been excavated in northern East Anglia to substantiate this, and it is likely that the majority of occupation sites lacked substantial enclosures. Difficulties pertain to the identification of crop marks of actual bronze age house sites, most excavated houses being circular in plan and similar (although usually slightly smaller) to the prolific ring ditches surrounding former ploughed-out barrows.

The majority of house sites that have been identified were excavated as a result of the examination of surrounding enclosure cropmarks, eg, Springfield Lyons, (Buckley and Hedges 1987) and Mucking North and South Rings (Jones and Bond 1980) in Essex, or earthworks eg, West Harling, Norfolk, (Clark and Fell 1953), or the presence of surface scatters, eg

Mildenhall 165, (Martin and Murphy 1988, 354); The Phillips site, (Kelly 1967). Whilst scatters of the early bronze age are comparatively common the identification of those of the later bronze age is more problematic due to the similarity in surface artifact remains (chapter 9.3 - 5 and chapter 11). The only exception is the metalwork, the presence of which may be an indication of settlement, especially if in association with other 'occupation debitage'.

In order to examine the evidence for settlement, it therefore became necessary to study the metalwork, flintwork and pottery evidence together. The identification of the problems presented by finds dispersal on the areas of longstanding arable agriculture, together with a need to identify the reasons for the concentration of fen edge metalwork, necessitated a detailed examination of the evidence for settlement to be limited to the fen edge study area (chapter 11).

Further detailed discussion of the aims, methods and results follows in the subsequent chapters.

CHAPTER 6

INTENSIVE: THE NORTH-WEST SUFFOLK SURVEY

1. Introduction

The widespread lack of intensive (as opposed to extensive) surveys relating to the distribution and abundance of the majority of prehistoric artifacts studied is clear. In view of the fact that the artifacts form much of the basic data around which studies of prehistory revolve, this state of affairs is alarming.

The south-eastern fen margin is one of the primary centres for finds of later bronze age metalwork and represents the only concentration of moor finds in Britain outside Ireland (Trump 1968, 222) and yet in the whole of the fens and fen surrounds the only relatively detailed survey on bronze age metalwork has been that of Davey on Lincolnshire (1971 and 1973).

The need for intensive survey, in the south-eastern fen edge area in particular, had been identified with a small scale survey completed in the village of West Row in 1980 (Pendleton 1980; above p.3). During the earlier work it had been recognised that almost half (44%) of the metalwork was not published, and much of the detail that was recorded was incorrect. It was therefore clear that many of generalised and even the more detailed conclusions based on analysis of the published records were in danger of being seriously flawed.

2. Aims

In order to evaluate the validity of earlier works and form a basis for revised or new research it was decided to expand the area of the 1980 intensive survey to include an area large enough to be representative of the south-eastern fen edges and an adjoining area of different soil types. One of the primary intentions has been to list and map as much material as possible, given the financial, physical and time restrictions imposed by this thesis and other natural factors.

Bronze age metalwork was chosen as the subject matter due in part to its infrequency compared to stone artifacts, in part to its relatively common recognition and in part to its having been generally better recorded than other prehistoric materials. I decided not to confine the work to specific implement types or to restricted periods within 'the bronze age' (limits for which are defined on varying basis such as industrial, typological and regional, and are therefore difficult to isolate in toto). Many of the interpretations will rely on direct comparisons between different metalwork types, and the existence of chronological divisions will also be largely dependent on comparisons between the content of postulated periods.

Extensive arable agriculture has caused widespread damage to archaeological horizons as is evident from the recognition of the abundance of artifacts noted above. The growth in destructive agricultural techniques (such as subsoiling) and continuing erosion of the peat and humic soil contents, due mainly to drainage, adds to the problems of archaeological site survival (see chapter 9 for fuller discussion of the

affects of arable agriculture). In view of this and continued destruction and loss of artifacts due to increased mechanization it is wise to record the data before the validity of any such work becomes so diminished as to be fairly meaningless. By this means a relatively accurate assessment of an area's archaeological value and potential for future research priorities can be offered. Having recorded the distribution and abundance of the metalwork it will be possible to test earlier unproven hypotheses that are often accepted without validation, and to put forward, where necessary, revised hypotheses. Particularly relevant are statements regarding the concentration of fen edge finds (eg Rowlands 1976, 118-121; Lawson 1979, 53 and 56). How real is this apparent fen edge distribution when set in its wider surroundings? Similarly the derivation of certain bronze types from 'wet' locations (e.g. Trump 1968, 22; Burgess 1974, 196), although claimed elsewhere (cf Ehrenberg 1977; Needham and Burgess 1980), needs to be tested in the Central East Anglian situation (also see chapters 10 and 12).

It is hoped that as a result of this work it will be possible to draw some inferences, not only as to the importance of intensive surveying, but to the practices of bronze age populations in the area of study, as implied by the distribution of metalwork.

3. Area of Study

The nature of this intensive study has necessitated the choice of geographical area that is limited, but large enough to show a representative sample of the artifacts and diverse surface geology of the south-eastern fens and its adjoining terrain. In view of this, and

the advantage of working within the boundaries of one county, north-west Suffolk has been chosen as the study area (map 6). The physical limits chosen coincide with the political boundaries of Forest Heath District, an area of approximately 144 square miles or 92,410 acres (37,398 hectares) with varying surface soils (map 10) and land usage (map 11).

The district has three main towns, Brandon, Mildenhall and Newmarket and a total population of approximately 56,000. However the area is primarily agricultural, based on fenland, breckland and chalk soil types. Two major rivers are located in the area, the Lark, dividing the north from the south, and the Little Ouse which delineates the northern boundary. All finds from the Little Ouse have been included in this study although strictly some may have been found in Norfolk (eg list nos. H17, 258 and 282) as a result of dredging operations.

4. Previous Studies

The proliferation of prehistoric material from the south-eastern fen margins and the brecklands has long been recognised by both amateur and professional archaeologists alike. Some of the earlier works are discussed in chapter 3. In the later 19th and first half of the 20th century the area represented a focus for visiting collectors, as many museum collections now bear witness. Most of these items were not recorded, although occasional artifacts were published in the two main local journals, the Proceedings of the Suffolk Institute of Archaeology and the Proceedings of the Cambridge Antiquarian Society and some of the national ones such as the Archaeological Journal and the Proceedings of the Society of Antiquaries of London.

The first major listing of local prehistoric metalwork did not appear until 1881 with Sir John Evans's The ancient bronze implements, weapons and ornaments of Great Britain and Ireland and it was not until Sir Cyril Fox's Archaeology of the Cambridge Region in 1923 that any relatively detailed mapping of material from the area was achieved. Since that time recorded samples of discoveries of metalwork from north-west Suffolk have become more commonplace in various publications, but until recently the only major attempt to map relevant finds appears to have been that of R.R. Clarke at Norwich Castle Museum, mainly in the 1950s, which was largely based on information from the National Bronze Implements Catalogue (now at the British Museum) and earlier published sources. Other studies dealing with local material, including the most recent, have been based almost totally on objects either published or in the larger museums and have concentrated on particular periods (eg Rowlands 1976 and Lawson 1979) or implement types (eg Fox 1939; Trump 1968; Gerloff 1975 and Ehrenberg 1981).

Excavations have taken place in various forms and with varying degrees of competence since the 19th century. Only five have produced bronze age metalwork, two items with burials (catalogue 1.162, Cawdor and Fox 1925; catalogue 1.182, Fox 1923, 33 and 326), three within contemporary settlements (catalogue 1.205, Kelly 1967; and catalogue 1.175 and 176) and two items from later settlements (catalogue 1.220 and 1.324).

Evidence has also been found for the use of metal on bone (and wood) work on adjoining settlement sites at Hayland Drove, Mildenhall Fen (Clark 1936 and Martin and Murphy 1988) dating to circa 1500 and 1200

b.c. Evidence of a similar nature is relatively common in local collections of surface found material.

5. Modern factors affecting distribution and recording

The known distribution of artifacts is clearly related to their recognition, their recording and to various factors affecting these, the main ones of which may be listed as follows:-

- a. Surface geology and survival
- b. Land use
- c. Finders, collectors and recognition
- d. The records and their validity

- a. Due to the relatively flat landscape (see map 4) hillwash is not felt to be a major factor, although it may be significant locally (see chapter 8.2). However, with the great majority of finds coming from the ploughsoil surface the area's mixed modern soils are likely to be particularly influential in determining the chances of discovery (map 10, for a detailed description see Corbett 1973 and Seale 1975). For instance, the areas of mostly post-bronze age peat of 90cm depth and lake marl to the north-west of the area are mostly devoid of finds. Whether this distribution represents a true distribution or one that merely reflects the submergence of material under peat and lake marl is unknown. The apparent concentration on fen skirt and shallow peat soils is in part due to the light sandy and relatively stoneless soils allowing easy recognition of finds. The converse is true in the chalk and particularly boulder clay soils where discovery by eye is bound to

be relatively fortuitous. Of the two finds definitely located on soils with chalk as the principal component one (catalogue 1.162) was found during excavation and the other (catalogue 1.16) was found with a metal detector. No evidence for differing survival rate due to variable soil acidity was located and although some of the breck drift soils are as a whole probably the most acidic, the presence of bronzes in good condition suggests that it had no effect on material preservation.

- b. Land use (map 11) is felt to have been the most influential factor relating to the known distribution of bronze age metalwork. This is clearly reflected by the complete lack of material from any location other than arable land and river dredging, excepting those pieces excavated (see above) and a hoard (catalogue 1.H12) which was found in a warren prior to forestation while digging for rabbits, and an awl (catalogue 1.177) found in 'a rabbit scrapping'. Finds shown as occurring in a present airfield (eg catalogue 1.85) and built up location (eg catalogue 1.107) were also originally found in arable fields. Whilst the great predominance of finds can be shown to be restricted to the areas of arable agriculture, it must be pointed out that the bulk of forestation and heathland and the larger of the two airfields (Lakenheath) are confined to the sand and chalk/sand drift soils of the breckland, and that the areas of breckland under the plough have produced a much small proportion of finds than the fen edges. It can also be noted, however, that the nature of arable agriculture varies in these two principal soil types with the breckland concerned predominantly with cereals and the fens and fen

edges with root crops. In archaeological terms the importance of this is that cereals can be controlled and cropped almost totally mechanically, while root crops are far more labour intensive (especially in the past), which leads to a much greater chance discovery rate than can be expected with the growth of cereals. The use of metal detectors on Forestry Commission land (the forested Breckland areas north of the river Lark) has not hitherto been permitted. However the frequency of finds on arable soils may also have caused their scarcity in areas of longstanding arable usage. The implications of this are particularly significant and are discussed at greater length in chapter 9.

- c. As already noted the area has attracted collectors for at least a century. The majority of these do not seem to have personally taken an active part in the discovery of the objects but usually followed the practice of purchasing items from agricultural labourers in local pubs. Those who did practise field walking largely confined themselves to the brecklands, fen edges and river dredgings. The amount of metalwork actually found by these collectors is extremely small, with the great proportion of material being found by the farmers and agricultural labourers who actually worked the land. This has caused a number of problems, the most obvious being that many bronze implements have simply not been recognised in the agricultural scene, and those discovered were commonly thrown away, whether immediately (especially if broken or damaged) or after serving some secondary use, or after being retained for curiosity's sake. Those objects which have survived this kind of treatment have

usually done so because of knowledge (however slight) of the artifact's archaeological, ornamental or monetary value. This last aspect in particular has caused, and still does, cause another major area of concern and must cast severe doubts over the validity of some of the bronzes (see part 7 'findspots and mapping' below and catalogue 1.18 and 257) and more especially the alleged provenances of earlier finds. This is particularly well demonstrated by items given various locations but almost definitely from the Stibbard hoard, Norfolk (see catalogue 1.H3; catalogue 3.N7147; and Inv Arch GB 50) and by items given local findspots in the Clouston collection (cf Lawson 1979, appendix III) which can now be shown to have been stolen from Devizes and Winchester Museums between 1906 and 1933 and to have originated mainly in south-west England and north Germany (personal communication Dr C.A. Shell). Similarly, two other items (Cambridge University Museum of Archaeology and Anthropology 1906.71 and 1906.72) given a Lakenheath location in 1906 by G.P. Gathercole have been shown to be part of the Coomassie Plantation Hoard, Cranwich (N15915), by Andrew Lawson. One of these, a palstave, is illustrated in fig. 30.

In recent times several bronze implements have begun to be discovered with the aid of metal detectors, largely as a by-product of the quest for Roman and post-Roman material. Once again, the problem of recognition/rejection arises, as does the illicit finding (and selling) of material from non-permitted locations. This being so, it must be realised that the objects recorded as having been found with a metal detector represent only those either reported

or made known to myself, and probably represents only a small proportion of those items actually found.

- d. It is also clear that especially in the past, many collectors, including museums, were not primarily concerned with the recording of findspots, even of a vague nature. In the majority of cases this has persisted until quite recently. Whilst this is of concern it is perhaps more worrying that many of the map references actually recorded in the museum catalogues, and quite often subsequently in publications, are incorrect when checked (eg catalogue 1.54, 55, 123, 203, 260 and 322), and plainly it is not always possible to discover the finder of items, let alone verify the findspot. This is probably due in part to the fairly recent introduction of a formalised and accepted grid system on maps, in part to incompetence and human error, and in part to the great difficulty many of the finders have in relating real life rural situations to maps. A major hindrance has also been the almost complete failure to record the finders.

It must therefore be recognised that any distribution based on available information, even with intensive research, must be unreliable, and need not be, in fact almost certainly is not, a representative sample (note the lack of small items from proven settlement areas such as West Row). The actual number of bronze artifacts present in the district, even excluding those items recast or destroyed in antiquity, cannot be estimated, but probably at least four times, and more likely nearer ten times the

listed sample would be correct.

6. Method of Study and Recording

Whilst the principal aim of this study was to record as much of the bronze age metalwork as possible, it was necessary to confine documentary research to those sources likely to be most productive, and therefore occasional items may have escaped attention. All published sources are listed in section 1 of each catalogue entry and in the bibliography. The journals researched are listed in Appendix 1. Amongst the documentary sources two sets of notebooks, the 'Warren Journal' and the diaries and records of Lady Grace Briscoe, were invaluable. Copies of the Warren Journal are held by the Suffolk Archaeological Unit, Shire Hall, Bury St. Edmunds, and the Briscoe notebooks are held by the Suffolk Archaeological Unit and by Mildenhall Museum. The Sites and Monuments Records of Suffolk and Norfolk also proved to be extremely useful. These records list material under parish headings (map 7 and appendix 6). This method seems to have been employed in the earliest records and will be further discussed below. The catalogue compendium (part 1 of catalogue 1) lists the parish in which each item was found.

Research in museums was also confined to those thought to contain relevant material (appendix 3). In view of the widespread collection and dispersal of material from the area (eg catalogue 1.H1.4 in Limerick, Ireland and catalogue 1.200 in Quebec, Canada), it is likely that occasional items may exist in various museums and institutions not included. The great majority of material, however, appears to have been deposited in only six of these museums: in order of numerical frequency,

Cambridge University Museum of Archaeology and Anthropology (at least 100 items), Moyses Hall Museum, Bury St. Edmunds (41 items), Mildenhall Museum (32 items), Elveden Museum (24 items), Ashmolean Museum, Oxford (22 items) and Ipswich Museum (20 items). Severe difficulties were encountered in some instances with inadequate museum records and catalogues, the earlier of which were often very limited. The failure to match records with material and even to locate records or specific items was commonplace in the two museums holding the bulk of relevant material. It is likely that further material exists in some of the museums researched, especially in Cambridge University Museum, where both records and storage were, at the time of research, disorderly and unworkable.

Probably the most worthwhile research was that involving both contacting those people who were responsible for the discovery of many of the items now in museums and any others who may have found or collected material. Whilst it was clearly impossible to talk to all relevant persons, those involved with agriculture and the older portions of the local population were selected as being of most value, together with people known as collectors, metal detector users or salesmen of artifacts. By following this practice, a relatively large amount of material evidence was amassed on items both in private hands and in museums. It is primarily this evidence that forms the basis of this study.

However, in certain areas, particularly Dalham, Gazeley and Higham (see map 7) it proved impossible to locate more than a few older, originally local residents for the area (being of a 'model village' nature

dwellings are now predominantly owned by non-local residents). Although the presence of landowning cartels (as opposed to local farmers and established estates using local farm employees) presents a slight problem in the north-western area this also has presented a far greater problem around Dalham, Gazeley and Higham and may contribute to the lack of recorded finds from this area.

As such a large amount of metalwork has been recorded from north-west Suffolk, the method of recording each item has been given a regular format (see beginning of catalogue 1). The idea has been to give the necessary basic information, but description, comparisons and dating have been kept to a minimum and are by no means exhaustive. This format is similar to Inventaria Archaeologica and to that proposed for recording bronze age hoards by Andrew Lawson in November 1981 (details from Norfolk Archaeological Unit). Although differing slightly from these (for the purposes of this dissertation), and not being presented on individual cards or having drawings on the reverse, an adaptation to this system can be achieved with a minimum of effort. Most effort has been directed towards recording those items either not fully published or not in museums.

Most items actually located have been drawn, together with the majority of the items already figured or published (for catalogue figure numbers see catalogue compendium, part 1 of catalogue 1). Hoards and associated metalwork have been listed at the beginning of the catalogue and have been given an 'H' prefix. Although, strictly, a hoard consists of objects deposited purposefully, which includes single objects (Levy

1982), in this work it has been used in a broader sense to denote the deposition of an associated group of two or more objects (or deliberately separated parts of a single artifact, ie, H20), which can have been deposited for a variety of purposes (cf Megaw and Simpson 1979, 297). Unfortunately the manner of discovery of most of these hoards does not allow an accurate assessment of their nature. Indeed some may not be truly associated at all, for instance the three elements of the Eriswell hoard (H2(a), H2(b) and H2(c)), although often accepted as representing a single hoard may consist of at least two separate groups (Briscoe and Furness 1955 and see O'Connor 1980, 358).

Circumstantial evidence has been used as the criterion for the separation of hoards from stray finds and the association of many of the objects must remain questionable. Other objects found close to one another may represent hoards (see appendix 4) but have been treated as separate stray finds.

All other items listed have been treated as individual finds. Seven of these were found during excavations (catalogue 1.162, 175, 176, 182, 205, 220 and 324), two of which have the contexts relatively well recorded (nos. 162 and 205)). All other listed items are casual finds from unknown archaeological contexts and whose causal reason for deposition is unknown.

Catalogue 1 lists the bronze age metalwork in the following order; hoards and associations (H1-H20), flat axes (1-27), flanged and haft flanged axes (28-37), palstaves (38-84), socketed axes (85-138),

tracer/awls (139-177), knives, daggers, dirks and rapiers (178-220), swords (221-234), spearheads (235-278), ferrules (279-280), gouges (281-284), chisels and leather working knives (285-301), ornaments (302-315), and miscellaneous objects (316-337).

All percentages cited in the north-west Suffolk study have been rounded to the nearest %.

7. Findspots and Mapping

Findspots cited in section 2 (site) of the catalogue are either 6 or 8 figure map references when known, and are accurate unless otherwise recorded (eg catalogue 1.243, 254 and 297). Map references have not been cited for items for which an imprecise location is recorded, ie, farms (eg Cupola Farm, Undley, also known as Copelow (319), Coplow (H16), Copalow (266) and Copolow (69), has always farmed a large area of land and cannot, at a local level, be located with any degree of accuracy) and towns and villages (eg catalogue 1.3 from Mildenhall, catalogue 1.5 from Mildenhall Fen, catalogue 1.78 from Icklingham etc.). Accurate single find locations have been denoted on maps 8-17 with an infilled circle, approximate findspots with an open circle and hoards with a square (with a dot if accurate, open if approximate). The larger proportion of finds, however, are without a precise location. I have, for this material, adopted the use of a sequence of 33 numbers (Appendix 6) for the mapping of finds having only a 'general' location recorded. The siting of these locations has been centralised on the named village, town or area and can be seen to be a necessary complement to the mapping of findspots (all positions are shown on map 8). The validity of the

designated locations for the general localities cited is further discussed below.

8. Results

A total of at least 447 entries for finds of bronze age metalwork were listed from north-west Suffolk. This consisted of 338 individual finds (catalogue 1.328, 329 and 334 although consisting of finds of 2, 4 and 3 items respectively have been treated as individual finds for the purpose of discussion) plus 109(+) items from 19 'hoards' (which excludes the 7 palstaves (H3) possibly from the Stibbard hoard, see discussion in part 9 below. As the 'ferrule' from Undley (catalogue 1.280) is probably the same item as the bronze ribbed ring (302) from Undley this can be excluded from further consideration as can the flat axe (18) which on analysis was shown to be a (19th century?) forgery (Needham 1983, 338) and the decorated knife (180) which is now known to come from the Norfolk rather than the Suffolk fen edges. Of the remaining 335 individual finds, 208 (62%) are (or were) located in museums and 127 (38%), either in private possession (73, 22%), or lost/unknown (53, 16%). It should be noted that of the 208 items listed in museums, many could not be located and only by extensive research with the public and through journals and old museum records was it possible to record their former existence. Many museums in the past did not follow the recommended practice of cataloguing items that were lost, exchanged, misplaced or stolen.

Some 68 objects from nine hoards were located in museums, another 28 from seven hoards were unlocated and 13 items from four hoards were

recorded in private possession. From the 335 single finds (including the seven excavated items, see above parts 4 and 6); 148 (44%) were referred to in publications prior to this research. Ten of the hoards containing 49 (46%) items of metalwork appear in publications. Since these include references to material from 1852 (Archaeological Journal IX, catalogue 1.H13) to today, considerable variation in the standard and extent of discussion and illustration is to be found. These often consist of a brief reference to an object (eg catalogue 1.1, 2 and 323), or objects (eg catalogue 1.H13), and in several instances do not allow accurate identification for typological or museum recognition purposes, (such as catalogue 1.86, a 'bronze celt'). Nevertheless many of these references contain information on items that would be totally unknown otherwise, and for this purpose alone remain valuable. They also illustrate the long history of the discovery and recognition of antiquities in the area (catalogue 1.226 was reputedly found in 1780) and could probably be used to record the extent of modern agricultural expansion and peat erosion on the fen margins, but this is outside the scope of this work (although see chapters 9 and 11).

Crucial to the interpretation of any distribution pattern recorded is the amount of listed material for which it is possible to denote a findspot. The exclusion of material with locations of a generalised nature only (see 'Findspots and Mapping', part 7 above) contrasts with many works that have either plotted finds (eg Rowlands 1976) or cited map references (eg Davey 1973) for material of this nature. Whilst this may be acceptable when extensive mapping is involved, in a study of this kind their inclusion would probably result in a misleading distribution

pattern. This is best demonstrated by the denotation of Mildenhall (1 on maps), which has the greatest number of finds representative of any one location (see appendix 6), as the site of discovery. It is no coincidence that Mildenhall Parish (map 7) is the largest in the area (and indeed one of the largest in the country) and has 155 individual finds and eight hoards listed. Lakenheath (19 on maps) has the second highest number of items listed, 83 single finds and four hoards, and is the second largest parish in the area.

It can also be seen (map 8) that Mildenhall is actually sited in an area totally devoid of finds with a known or approximated findspot and that the greatest mapped concentration of material, namely the West Row, West Row Fen, Mildenhall Fen, Kenny Hill and Wilde Street locations is also sited in Mildenhall parish. It is therefore clear that plotting of the material listed as from Mildenhall on the site of the town would be almost totally erroneous, with the fen edge locations suggested above being the most likely siting for the majority of the material. This is the reason for the positioning of the near Mildenhall location (location 6). Nevertheless the siting of position 1 on the site of Mildenhall has been adopted due to the widespread area of possible finds within the parish, and should not be accepted as anything more than conjectural. Although the same can be said of all other locations given by numbers, the diversity from the true findspots is probably not as marked as for Mildenhall and probably reflects the general distributions of material relatively well.

The common practice of denoting a parish as a findspot in preference to the nearest settlement in earlier records is an important recognition, especially when dealing with large parishes and 'antique' collections. In this context it should be noted that some items are given a more localised siting for discovery within larger parishes, eg Gravel Drove, West Row (location 3); West Row (location 2, for which the majority should, in my opinion, probably read West Row Fen); Mildenhall Fen (location 5) and near Mildenhall (location 6). The reasons for this are generally either a relatively recent discovery (eg catalogue 1.102, 185 and 272), a local collector/recorder (eg catalogue 1.245 and 273 of S.G. Fenton of Mildenhall), or comparatively competent cataloguing, and combinations of these. Bearing the above factors in mind, in relation to single finds, it has been possible to record a total of 137 accurate and approximate findspots, a further 192 having only a general location and only in the case of six items was it impossible to record a location of any sort. The accurate and approximate findspots therefore represent a total of 41% of finds listed, with 56% (77) of these having an accurate location. Of the 19 hoards eight (42%) were given an accurate or approximate findspot, seven (88%) of these with an accurate location.

The plotted distribution revealed by this work has confirmed the fen edge concentration of bronze age metalwork suggested by, for instance, Fox (1923), Rowlands (1976) and Lawson (1979a). This is well supported by the comparative lack of material recorded from south of the river Lark and to the east of the fen edge villages and parishes, even when including items with only generalised locations (see appendix 6). The only exceptions are Icklingham (and between Icklingham and Cavenham) and

to a lesser degree Lakenheath Warren. However, despite accepting that this fen edge distribution is likely to be a reflection of a genuine bronze age concentration of finds this should not be overstressed. It is suggested that the wealth of artifacts on the fen edges is due to its protection by later peat deposition. Elsewhere the bronzes have either not been recognised due to differential land use and collecting strategies (see below), or have not survived in the soil because of the longevity of agriculture (for a fuller discussion see chapter 9). Indeed parts of the high Breckland, despite being in areas which appear to be inhospitably dry, and unlikely to produce artifacts or evidence of occupation have, during excavations on a pipeline corridor at Barnham, adjoining Elveden, produced a quantity of features, including a round house and two small bronze finds, all of later bronze age date. These finds accord with a prediction of only small items surviving in areas of longstanding arable agriculture (see chapter 9).

The high proportion in the Icklingham area may be due to a number of factors. It is once again a large parish, but probably more relevant is its position on the river Lark, where easy fording could recently be achieved, as it probably could in the bronze age. The next parish over the river Lark, significantly Lackford, is the fording place of the Lark, has also produced a quantity of bronze implements. The Icklingham area also attracted occupation in later periods, and is in particular well known for its Roman (cf West and Plouviez 1976) and Anglo-Saxon settlements (West Stow Anglo-Saxon village is about 500 metres to the west of Icklingham parish: West 1985) and cemeteries (cf Briscoe 1979). This has led to Icklingham being one of the central foci for collectors

in the last and earlier part of this century, which naturally led to an increased chance of recovery and more relevantly recognition/sale rate. It may also be relevant that Icklingham was the known location of lithic fakers and a possibility of false provenances exists if not actual faking of bronzes (eg see catalogue 1.18 and 257) given this situation. This has also been suggested for the Lakenheath Warren and Lakenheath provenances given for many items in Cambridge University Museum of Archaeology and Anthropology (personal communication Dr C.A. Shell who believes there are too many of these Lakenheath provenances in the Cambridge collections) which is to a degree supported by the recognition of material given false Lakenheath provenances (see part 5c above). However, whilst this may in part be correct, the amount of material listed from the Lakenheath area is not at all out of keeping with the general distribution recorded for the south-eastern fen margins (see above p.94, map 8 and appendix 6). Indeed the majority of the purported Lakenheath material would conveniently fill a gap which otherwise has few precise or approximate findspots.

Whilst admitting that the majority of the surviving finds concentrate in the fen edge situation this is not the same as accepting a derivation from watery contexts as has been done in other locations and by others for the south-eastern fens (see above part 2 and chapter 12). Although some pieces may appear to have been found in a 'wet' deposit (eg catalogue 1.H18, H20, 186, 190 and 307), the great majority were not. The implications of this are further discussed below and in chapter 12.

The 335 individual and 109 'hoard' items listed confirm the metallic wealth of north-west Suffolk. This compares very favourably when matched with the only other fenland area for which the metalwork has been relatively well catalogued, namely Lincolnshire (Davey 1971 and 1973). The comparative areas are 92,410 acres for north-west Suffolk to the 1,705,293 acres of Lincolnshire, which produced a total count of 446 bronzes, consisting of 242 stray finds and 204 associated finds. In terms of average acreage per find comparative frequency between Suffolk and Lincolnshire reveals a ratio of 209:3824 or 1:18. Relatively stray finds are even more proportioned in favour of north-west Suffolk giving a 277:7047 or a 1:25 ratio. It can be seen from this that further comparisons between the two areas would be relatively pointless as fundamental differences exist between the two localities.

9. The Finds

a. Hoards and associated metalwork (figs 1-16)

For a general discussion of hoards see chapter 8. The 19/20 hoards from north-west Suffolk are discussed here in their local rather than their regional context. No description of the individual components of each hoard is intended although the items are detailed separately in Catalogue 1.

Hoards are here taken to consist of two or more separate (or formerly deliberately separated parts of the same item) objects purposely deposited together (above part 6). This excludes finds, such as pins/awls numbers 175 and 176, which may be loosely associated, in that they derive from the same occupation site or horizon, but are unlikely

to have been associated deliberately. Also excluded are items that, although found close to one another, cannot be positively identified as having once been hoarded (see appendix 4) and single finds that may have formed components of otherwise lost/dispersed hoards, for example, hammer-broken sword fragment no. 222, and various fragments of copper or bronze cake, waste or sprue cap wasters (nos. 327-331, 334-7).

No evidence survives, other than as single finds, (above part 4), for items of associated metalwork interred with human remains in north-west Suffolk despite several round barrows and ring ditches of early bronze age date having been excavated (cf Martin 1981). The frequency of contemporary metal stray finds on settlement sites suggests that this general lack of metalwork associations with formal burials may have been part of a deliberate sepulchral practice, reflected in the region in a general paucity of other grave goods.

Hoards first appear as a significant element in metalwork assemblages in the area at the end of the early bronze age and are of Arreton form. They appear to represent a tradesman's class of hoard, for example the Holywell Row hoard (H1).

It may be significant that the date of this tradition coincides with some marked changes in monument construction, burial and technological practices. In general these changes are probably more gradual than was formerly suggested by, for example, Burgess (1974, 194). This can be illustrated locally by gradual development in pottery traditions (see chapter 11) and by possible alternative methods of disposal of the dead

during both the early bronze age, on sites such as Hayland House and Fifty Farm, Mildenhall (both Leaf 1935), and the late early bronze age, Mildenhall 165 (Martin and Murphy, 1988). Stray human bones are an element on these occupation sites and in the deep fens of Norfolk and Suffolk early bronze age skeletons are recorded (Healy and Housely in prep.). It would appear, however, that the increased 'commercial' output suggested by the Arreton hoards mirrors the abandonment of the stone axe trade and is likely to mark the onset of a traditional 'later bronze age' technology boom, and artifact changes associated with it. Nonetheless the lack of Arreton hoards, and general Arreton tradition material in burials, has also been noted in areas where traditional burial practices continued, particularly in Wessex (cf Gerloff 1975, 128 and 155-7), and suggests that a socio/economic and/or sepulchral factor should also be considered.

Despite some finds of the earlier MBA occurring as components of hoards these are usually of late MBA date (eg H19 and the associated(?) items 186 and 190). The disappearance of 'traders' hoards, particularly of axes, similar to those of the late EBA in the earlier MBA may be an indication of the onset of localised insular metalwork production, where items were made as required rather than as stock for exchange.

It is during the late middle bronze age that hoarding reappeared, with a larger proportion of the total metalwork than occurred in the late EBA. Rowlands comments on the relative infrequency of hoards in comparison to single finds in East Anglia during the middle bronze age (1976, 106). However several small hoards found recently transform the proportions in

north-west Suffolk, and probably account for over 20% of the total late middle bronze age items.

In addition to this there are the miniature unfinished palstaves of Stibbard form claimed to be from Eriswell (see H3). Although it is suggested (part 8 above and Edwardson 1968) that these are falsely provenanced axes which actually originated in the Stibbard hoard, Norfolk (N7147 see INV. ARCH GB50) an alternative interpretation is possible. The purported findspots are listed variously, as 'from a barrow' at Icklingham (no. H3.7), 'from a tumulus now destroyed' at Eriswell (nos. H3.3, 4 and 5) or 'in a Roman mound at Eriswell' (nos. H3.1, 3, 5 and 6). Palstave number H3.2 is merely recorded as from Eriswell. Icklingham and Eriswell parishes adjoin each other at a location marked by an existing barrow, How Hill, and the likely location of adjoining barrow/s (as suggested by excavation by Briscoe 1955). The evidence is therefore remarkably consistent for the seven items formerly located and recorded separately in museums at Colchester (no. 1), Taunton (no. 2), Bury St. Edmunds (nos. 3, 4, and 5) and the British Museum (nos. 6 and 7). The hoard H19 also appears likely to be from this location and may be part of H3. Interestingly it includes another possible Stibbard type axe together with a 'haft flanged axe' (Rowlands 1976, 288) and a narrow bladed palstave. Although the 'haft flanged axe' is probably an early MBA form Rowlands does note their reappearance in the late MBA (1976, 26). Like hoard H3 the provenance of H19 is also open to question. The labelling on at least one of the pieces - 'found in a Roman mound at Eriswell, near Mildenhall, 1857', together with the admixture of axe types, all possibly of late MBA form, suggests that H3

and H19 are not part of the Stibbard hoard. This evidence is further substantiated by the recent discovery, on an area that is otherwise devoid of bronze finds, of a contemporary LMBA palstave form (catalogue 1.67) about 100m from How Hill.

The difficulty in separating the Eriswell and Stibbard hoards lies in the marked similarity of their atypically small and unfinished axes. It has been presumed that axes of a similar type, from various cited locations (see Catalogue 3, N7147), are Stibbard axes which were re-provenanced in the 19th century. A recently discovered LMBA hoard (catalogue 1.H17, fig 15), from the river Little Ouse at Brandon, has produced a palstave of Stibbard form. From this it is fair to conclude that some of the palstaves thought to have been re-provenanced Stibbard axes actually derive from their documented findspots.

Significantly the palstave from hoard H17, despite having had its casting flashes removed, is also unfinished. This raises the problem of the function of these axes. They are all very small for palstaves and, despite occasionally having their casting flashes removed, none seem to have been used. Another common feature is their presence in hoards and their relatively standardised weight. Bearing these factors in mind it seems likely that these objects represent bronze 'currency' or ingot axes used in a similar way to the lead 'Armorican' or 'Breton-type' axes of the French final bronze age (cf Briard 1979, 206-8 and O'Connor 1980, 304). The presence of loops on some of the palstaves may suggest a utilitarian purpose, but it should be noted that the majority of the 'Armorican' axes also have loops. Some of the Stibbard hoard axes have

been analysed, giving higher bismuth readings than otherwise occur in Brown and Blin-Stoyle's (1959) group 1 (MBA, below 1% lead), a feature shared by other implements such as the Coveney Shields, two palstaves in the Grunty Fen hoard, Ballintober swords and straight based basal looped spearheads, suggesting a very late MBA date (Brown and Blin-Stoyle 1959, 199; Rowlands 1976, 8).

Another late MBA hoard is the Eriswell hoard which includes a transitional sword type (H2(a).1). Although this has been seen as part of a founder's hoard (Trump 1968, 221) it seems more likely that at least two hoards are represented (see above part 6 and Rowlands 1976, 261), the main LMBA hoard representing another small personal type deposit, interestingly associated with one of the burnt flint patches common to the area.

Only two spearheads (catalogue 1.H9), and possibly the second part of the Eriswell hoard (H2(b)) represent associations that may belong to the Wilburton phase or late bronze age 2 (after O'Connor 1980), although other associations/hoards may well date to this period (eg H11, H12 and H14). Of particular relevance to this is likely to be the occurrence of the Isleham hoard, consisting of at least 6,500 bronze fragments, representing the largest hoard from western or northern Europe (O'Connor 1980, 365) only two kilometres (just over one mile) to the west of the study area (see map 8). The Isleham hoard may not be as influential (see appendix 7 and tables 1-3) to this area's metalwork frequency as might be expected.

The Wilburton phase sees a major change in the nature of hoarding with the general introduction of 'founders' hoards mainly of scrap metal. No ingots are present in Wilburton hoards although they may be represented by the ribbed bronze plate scrap as found in the Isleham hoard, Guilsfield and Co. Roscommon, Ireland hoards (O'Connor 1980, 367 and 369; Burgess 1969, 13). It seems likely that the collection of scrap, presumably for re-smelting, had become necessary as increased needs were causing demand to outstrip supply and the large amount of worn or damaged bronzes made their collection viable. However the large number of finds in the Isleham hoard that are either very rare or non-existent in the East Anglian stray find repertoire, does suggest that the hoard consists mainly, or wholly, of imported scrap (cf Northover 1982b, 59-65; Northover and Gale 1982, 285). For further discussion see chapter 8.7.

The majority of the hoards can be dated to late bronze age 3 or late bronze age 4 and consist of both 'founders' hoards (eg H5, H6, H7, H8 and H13) and possible 'personal' hoards (eg H10, H11 and H16). Of particular relevance regarding the place of hoards in bronze age society is the matching of a decline in stray finds with the increase of 'hoards' (tables 2 and 3) which, when grouped together, reveal a consistent trend in terms of frequency (table 1). This suggests that no major change in the use of metalwork occurred, merely a response to general increases in metal waste, coupled with possible insurance against problems with supply. The overall numerical trends, and possibly the social organisation, remained unchanged. This is well demonstrated by the proportional similarity of artifact types seen in

both stray finds and hoards (table 4), when divided into tool, weapon and ornament categories (on hypothetical, rather than actual, grounds). Although certain types, eg, axes, may in fact have been used as weapons and others such as rapiers may have been partly prestigious (see below), they have, for the purposes of consistency, been accepted as, respectively, tools and weapons.

These figures demonstrate that the scrap element in the hoards from LBA 3 represents local material, often associated with imported plano-convex ingots of almost pure copper. Whether these ingots come from the British highland zone (O'Connor 1980, 300-306), Ireland or mainland Europe is debateable, but they demonstrate both widespread connections, reflected in the typology of many of the bronze artifacts, and the complexity necessary for the maintenance of the flourishing bronze industry in the East Anglian later bronze age.

The rarity of bronze hoards clearly belonging to LBA4/EIA1 is probably merely a reflection of the change to an iron-based industry. Indeed many of the LBA3 hoards may represent stored or dumped material deposited during the period of this change. The massive hoards of 'Armorican' ingot' (usually with a high proportion of lead) axes found in north-western France do not occur in Britain, with the exception of a few stray finds (e.g. from Wicken, Cambs: fig 34) and small hoards. This may suggest that much of the source material in use in East Anglia during this period was derived from British rather than European sources (eg The Great Orme Mine: Hammond 1992) or that iron was adopted in Britain earlier than in north-western France. Perhaps of more

importance is the sheer quantity of Armorican axes produced at the end of the bronze age in north-western Europe. The possibility that this huge surplus survived merely because of the change to an iron based technology (and hence the obsolescence of bronze) has massive implications with regard to the amount of material that has not survived from earlier in the bronze age.

b. Axes (figs 17-41 and map 12)

Axes form the largest proportion of separate implement types and amount to 138 (41%) of the 335 stray finds listed. They include items which can be given an alternative term, chisel, but which typologically are difficult to differentiate from axes. Indeed it must be recognised that their function may range from prestigious (especially in the early bronze age) to weaponry (eg the winged axes illustrated on the Certosa situata and the Vace clasp; Kastelic 1965, pl. 23, 65 and 66), hoes (see Harding 1976), woodworking tools, ingots (above) and finally axes. A remarkably good typological sequence can be demonstrated, from plain flat axes (figs 17, 18 and 19) to the development of low flanges (fig. 20.17) and cross ridges (figs. 21 and 23) to haft flanged axes (figs. 22 and 23) including the beginnings of decorative features below the stop ridge (figs. 22.34). Developing from this is a large palstave sequence (figs. 24-33). Contemporary to this we see the development of the socketed axe series from the earliest British example from Wangford (fig. 34.85), although its early date, uniqueness and form suggest this does not necessarily cause subsequent development (and note pgs 41 and 42 above) to axes of the Taunton-Hademarschen form (fig. 34.89 and 91), to plain socketed forms (figs 35-37). The eventual use of decorated, as

well as plain socketed forms (figs. 37.121, 38.134 and fig 39) and finally Sompting type axes (figs. 40 and 41), show the chronological range of bronze age axe forms in the region. This sequence not only demonstrates a variety of function for the axes (hence the contemporary use of two vastly different types - the palstave and socketed axe) but also emphasises the pattern of continuation and development suggested above, as opposed to a scene invoking any radical changes to the social, industrial and economic organisation of the area within the bronze age.

c. Tracer/Awls (figs. 39 and 40)

Unfortunately the tracer/awls are one of the most difficult items of bronze age metalwork to date and a possibility for a non-bronze age date must be considered in some instances (eg 145 and 146). Nonetheless the 39 items listed (plus one in the Eriswell hoard H2(a)) represent the largest body of its type listed for any one county in Britain. Rowlands (1976) lists only 17 (stray finds) from southern Britain which he considers to be of middle bronze age date. A number of small, pointed awls are known from early bronze age burials, the nearest of which is from Risby, Suffolk (Martin 1976). One from Barton Mills (no. 162) was also located in a barrow, although in this instance with a secondary undated cremation. Two more awls were associated with late EBA occupation at West Row Fen, Mildenhall (list nos. 175 and 176).

The continuation of use of a relatively unchanged form (Mercer 1981. 74) throughout the bronze age (for instance with the middle bronze age settlement debris at Grimes Graves) and into the earlier iron age is likely. This is supported by the apparent association of an iron.

square-sectioned, pointed-ended awl with circular-sectioned handle tang (note this is opposite to the normal suggested mounting pattern and is only recognised due to the preservation of binding impressions) amongst a late bronze age hoard believed to be from Chippenham, Cambridgeshire (Author, unpublished). The variety in size and form also indicates a variety of functions. They are normally considered as domestic although Coles suggests they may be metal working tools for producing pointillé decoration (Coles 1966, 117). This is supported by evidence on some bronze anvils (Ehrenberg 1981, 20-1) and on some scrapped items in the Levington hoard, Suffolk (S3832). The two lugged tools (fig. 43.139 and 140) would suggest block mounting, probably in a wooden 'anvil', although these two appear to have opposing functional ends. Certainly many of the tools could have been double ended, whilst others, such as the chisel ended 'punch' (fig. 43.170) were only single ended. This class of implement will probably become much more commonplace with the growth of the use of metal detectors and it may be noticed that at least eight of the listed examples were discovered by this means.

In this context it is interesting to note that neither of the two 'pins/awls' (nos. 175 and 176) from the excavations at West Row Fen (Martin and Murphy 1988) were identified during actual excavation, despite this being by hand. One was later found amongst the bone finds and the other was located within an environmental sample. This demonstrates the difficulty in identifying these items during normal agricultural activities or fieldwalking or, it would seem, even during excavation.

d. Halberd, Knives, Daggers, Dirks, Rapiers and Swords
(figs. 43-56 and map 13)

The classification of implements as either knives, daggers, dirks or rapiers in this study is wholly arbitrary and is used merely as a useful descriptive device.

One of the most impressive and chronologically the earliest item located in this survey was the tanged copper dagger from Kenny Hill (fig. 44.181) dated from approx. 1950 to 1850 bc (see appendix 7). It is the largest British tanged copper dagger. Although tanged daggers are usually associated with barrow burials in the Wessex area (Gerloff 1975), the location of this find (map 13) was within an area of domestic occupation debris extending, like the bronze age metalwork, along the south-eastern fen edges.

Another important and rare East Anglian find of the early bronze age is the halberd from West Row Fen (fig. 44, 321). Like the tanged copper dagger, this was located in an area recognised for its domestic occupation debris and not for barrows and burials. On the other hand the much smaller blade from 'the Cardle' (fig. 44.182) was apparently found with a contracted skeleton 'in a stone kist' and must, in this instance, represent grave goods although the exact siting of 'the Cardle' and the form of the burial monument remain obscure.

Unfortunately the small knife/dagger from Lakenheath (fig. 44.178) is also unprovenanced, although in Wessex they are again normally associated with barrow burials. These early bronze age bladed

implements, and probably the larger middle bronze age implements, are likely to be partially prestigious.

The classification of knives (in the catalogue all are of a double edged form), daggers, dirks and rapiers is a complex study and all major recent schemes (Trump 1962 and 1968; Burgess 1968; Rowlands 1976; Burgess and Gerloff 1981) have differed in some respect. Clearly none would seem to be wholly satisfactory and perhaps too much emphasis is being placed on typological development when a scheme adopting different typological forms for different whims or functions contemporaneously may be more acceptable in some instances. Certainly the knives illustrated (figs. 48.207; 49, 210 and 211; 51 and 52) show variation in the extreme in hafting arrangements, with virtually no wholly similar butt forms occurring. Although Burgess and Gerloff (ibid) classify middle bronze age knives as dirks or rapiers, claiming that the majority are reworked fragments of the larger artifacts, this approach is misleading. Knives were relatively common in early and late bronze age contexts and there is no reason to doubt their manufacture during the middle bronze age, as is shown by some of the knives which are clearly too small to have ever served as dirks or rapiers. Notwithstanding this even those which are from reworked weapon blades ended their life as knives, not dirks or rapiers, and should be classified accordingly.

The high proportion of broken rivet holes from the south eastern fen edges (eg figs 16.H20.2; 45.190; 46.193; 47.198 and 199; 48.194 and 207; 51.180, 204, 205 and 206; 52, 214; 53.196) and possibly the notch butt rapiers (fig. 49; see Rowlands 1976, 72) can probably be seen as

reflecting their extensive use. This can be paralleled by evidence for wear and regrinding on the palstaves (eg figs 24.39 and 54; 25.52, 55 and 63 and Rowlands 1976, 121). The evidence of extensive use can also be seen on the earlier bronze age material (eg figs 18.13; 23.27 and 44.178) and on the late bronze age axes (eg figs 13, H10.1 and 2; 35.92 and 94; 36.101, 104 and 105; and 37.107). Despite this, evidence for repair is remarkably rare. It appears that worn or broken items were easily replaced, often with no regard being given to the original, causing the frequent deposition of obsolete metalwork.

Both Trump (1968, 214) and Rowlands (1976) consider the West Row Fen dagger (fig. 48.187) to be early middle bronze age and accept a probable early bronze age origin for the form. A similar early bronze age tradition is accepted for the decorated dagger/knife of Irish type from Undley (fig. 48.207 and Rowlands 1976, 67). Comparisons can be drawn between these implements and the developed forms seen in fig 45. The probable association (see appendix 5) of these rapier/daggers (fig. 45.190) with a notch butt, flat midrib rapier (fig 46.186) illustrates the difficulties of dating varying typological forms.

Trump (1968, 213) considers a local manufacturing centre of these notch butt flat midrib rapiers in the West Row area on the grounds of three examples from West Row and one from Mildenhall. One of the West Row rapiers, however, was incorrectly provenanced (no. 191, fig. 47), in fact coming from Beck Row and the Mildenhall provenance is also probably misleading (see above part 8) with the general distribution of knives, daggers, dirks and rapiers (map.13) indicating a fairly uniform spread

of all types along the south-eastern fen edge. The late bronze age knife and sword types (figs 5, 10, 53-56) can also be seen to develop from early forms locally, for example the experimental(?) rapier-sword from the river Little Ouse (no. 200, fig. 50). The Eriswell hoard sword (no. H2(a).1, fig 2) which is also considered as a local experimental product, as is the sword from Methwold, Norfolk (O'Connor 1980, 114). Like these swords the knife from West Row (fig. 53.212) appears to be unique, and probably experimental.

The overall impression, then, is one of similarly mixed assemblages of both tool and weapon blade forms, often showing evidence of extensive use over the whole of the bronze age and is consistent with local settlement. This is largely confirmed by the distribution (map 13) with the possible exception of an apparent concentration of weapons in or near the Little Ouse. However this will be further discussed below (part 12d and chapter 10).

e. Spearheads (figs. 57-65 and map 14) and Ferrule (fig. 70.279)

Once again the area shows the early introduction of a major implement type, namely the socketed spearhead as represented by the pegged example from West Row Fen (fig. 58.239). This dates to the late early bronze age and is contemporary with the Arreton tradition although it is probably of Irish manufacture or derivation (Needham 1979b, 9).

Although pegging is not retained into the early middle bronze age the Irish contact is (eg the decorated knife no. 207 and the kite-shaped spearhead fig. 54.240) and the local side looped forms probably develop

as a direct result of this (cf Rowlands 1976, 51). Again a large variation in size and form is to be found in the side looped spearheads (eg figs. 58, 59 and 60) and mainly late bronze age pegged forms (figs 12, 13, 64 and 65). Although normally considered as weapons, this variation suggests that their utilization, if as weapons, was multifunctional, for instance as thrusting and throwing spears (cf Coombs 1975, 74-5). However it should be noted that the evidence for extensive use noted above (parts 9b and 9d) for knives, daggers, rapiers and axes is also found on the spearheads (eg fig 13.H14.1; 58.240 and 244-258; 65.268 and 269) and is neither likely nor particularly conducive to their use as weapons. Other suggestions for use have been made, for example, larger spearheads may have been used as harpoons notably for sturgeon (Ehrenberg 1977, 23) and prestigious considerations must be taken into account. The survival of the brown bear, the wolf and the wild boar together with the relatively wild nature of domesticated stock should also be noted.

Worthy of note is the presence of one of the few listed examples of pegged spearheads with surviving bronze pegs (no. 270). Four others are listed (see Greenwell and Brewis 1909, and Ehrenberg 1977) and another (see appendix 2(e)) was found at Thetford, Suffolk (now Norfolk), which adjoins the study area. Bronze pegs are also found in the leather-working knife from Lakenheath (fig 66.286) and one of the winged chapes from Undley (fig 14, H16.2). This local concentration of bronze pegs is rather unusual although no adequate explanation for their presence can be suggested.

The distribution of spearheads (map 14), like that of other objects is fairly uniformly dispersed along the fen edges location. The only definite ferrule (see above, part 8) listed (fig 70.279), apparently found near an unidentified spearhead, also had some evidence of wear. (Leaf in Lethbridge, O'Reilly and Leaf 1935, 146).

f. Gouges, Chisels and Leather working knives (figs 66 and 67)

Of the four gouges (plus one in hoard H13) the example from Undley (fig 66.281) is unusually long. The more normal sized Wilton Bridge example (fig 66.282) can be seen to be extremely worn despite its relatively poor condition. Similarly the socketed leather working knife from Icklingham (fig. 62.287) is severely worn. The term 'leather working knife' is used in preference to the traditional 'tanged chisel' usage previously adopted and follows O'Connor (1980, 137-8) as being a more likely description in functional terms. However, the descriptive terms of chisel and leather working knife must remain ambiguous especially in view of the wide variety of size and form (figs 66 and 67).

The distribution is similar to that of the other implement types described above.

g. Ornaments (figs 68 and 69 and maps 16 and 17)

Of the fourteen ornaments, the earliest dated examples would appear to belong to the Taunton phase of the 14th and 13th centuries B.C. (after Burgess 1974, 203-4). This group of ornaments (fig 68.302; and possibly nos. 306; fig. 68.307; fig. 69.312 and 314; and fig. 68.315) extends the suggested west Norfolk concentration (Rowlands 1976, 121-2) southwards,

although there is a change in emphasis from hoards in west Norfolk to stray finds in north-west Suffolk (also see chapter 8.51). The material also supports an extended dating for the production of this group of ornaments, as suggested by Lawson (1979a, 63-4) for quoit-headed pins and Rowlands (1976, 85) and Lawson (1979a, 49-50) for disc-headed pins (eg fig 69.312) and by the Kenny Hill torc (fig. 68.307) into the Penard phase of around the late 12th century B.C. The condition of the ornaments appears overall to be very good with only one object, the incised ribbon bracelet from Icklingham, having a small part of one end missing. The distribution of ornaments although again relatively dispersed, does appear to have two minor clusters at Icklingham (nos. 303, 306, 314 and 315) and Lakenheath (nos. 310-3) but little emphasis should be placed on this due to the suspect or unknown dating noted for most of these items (303, 306, 308, 309, 310, 311, 313-5) and the lack of many precise locations of discovery. Unfortunately, a number of objects were not located, so dating of objects into the late bronze age was not possible except in the case of the penannular bronze and gold examples of 'ring money' (nos. 304 and 305) and although probably the commonest form of prehistoric gold ornament in Britain these are, unfortunately, very poorly dated (cf Taylor 1980, 64-5).

h. Miscellaneous (figs 69 and 70)

The majority of the miscellaneous items consist of fragments of copper or alloy cake or sprue cap wasters all concerned with metalwork manufacture (15 fragments, nos. 327-331 and 334-337). Unfortunately no metallographic analyses have been carried out on these samples to establish whether they represent melted down scrap items or imported

refined copper (ie fragments of plano-convex ingots), for the initial production process (see Charles 1975) as is supported by one of the rare occurrences of lead in a British bronze age hoard (no. H14.2). The lack of dated associations for these stray finds, as opposed to those in the listed hoards (eg H5, H6, H7, H8 and H13) also gives good reason to doubt the possible bronze age date. However other stray finds such as the anvils (fig 70.325 and no. 326), the socketed 'hammer' (fig 70.319), the lugged 'tracer/awls' (fig 44.139 and 140, interpreted as metalworkers' stakes: Maryon 1938), some of the 'tracer/awls' (see above part 9c) and possibly the rivets (fig. 70, 332 and 333) all lend support to a localised small scale production based on immediate demand, as does the narrow bladed palstave (H18.3) in the hoard from Eriswell. This would explain the proliferation of worn, heavily utilised objects and the apparent pattern of use and loss/discard of much of the material and the relative lack of local founders' and traders' hoards.

The increase in hoard material in the late bronze age appears to follow a similar localised production pattern which represents part of the pool of local metalwork. This is demonstrated by the reflection, in the hoarded material, of the same proportions of metalwork types (table 4) apparent in the stray finds and also in the fact that a consistent flow in metalwork frequency can only be achieved by including this hoarded material (tables 1-3). The reasons for the occurrence of founders' hoards during the late bronze age (late bronze age 3 particularly) is discussed in part 9a above and in chapter 8.7.

A stone mould from 'the Fens', Suffolk (Tylecote 1962 and Britton 1963, 320-321, fig 7) also acts to support evidence of a local bronze industry although the products available from the shallow mould matrices form a curious group. One side has a 'ring' the other has a bar, a 'flat axe' and a trapezoidal knife (?) matrix. Although probably early bronze age (copper, tin and lead were revealed from scrapings by optical emission spectroscopy) the implement types are far too atypical to be certain.

Another unusual feature in the material from north-west Suffolk is the occurrence of three bronze arrowheads (list nos. 322-4). Although one is unlocated the other two probably represent reworked rapier and spearhead tips, which would suggest a possible local continuation of archery into the middle bronze age at least. This is supported locally by a leaf shaped form from Hockwold, Norfolk (adjoining north-west Suffolk; N16863) and nationally by a few others such as the Penard hoard example which firmly gives a late middle bronze age/late bronze age 1 usage (note also the arrowhead in hoard H13 (H13.6)).

10. Insularity and external contact/influence

The discussion above illustrates an overall model of structural continuity throughout the course of the bronze age, despite inevitable change in metal types and techniques. This continuity will be further considered below. It is clear, however, from the sheer variety of implement forms and from recognisable instances of external imports/influences (eg list nos. H18.1, 43, 48, 66, 85, 181, 183, 207, 208, 239, 240, 254-263, 304, 307 and 321) that external contact was a vital element in the local industry. Nevertheless the proliferation and

quality of the objects illustrate the strength and nature of local metalworking.

The widespread extent of this contact is illustrated by the presence of a large Irish element, (eg nos. 48, 207, 239, 240, 254-263 and 321; and see Rowlands 1976, 143-5), continental artifacts (eg nos. H18.1 and 85) and influence, and by a wide range of British contact as demonstrated in the extensive variety of artifacts. However, the existence of local metalwork and a local bronze industry in an area with no metallic resources made external contacts and influences inevitable. The existence of such contacts outside the region had already become established by the neolithic/early bronze age and can be vividly demonstrated (see appendix 10) by the presence in the study area of imported stone axes, representing 23% of the total axe count, and also by the importation of at least 81% of the flint axes to an area naturally rich in flint (with 'flint' being separated from 'stone').

11. Chronological Implications

Although traditional chronologies have been used throughout (see appendix 7), one of the purposes of this study was to test the validity of the chronological divisions within the East Anglian fen edge situation during the bronze age. Although, as already stated, it is possible to detect changes in metalwork types and production techniques these changes merely reflect an inevitable typological and industrial development, especially in an area necessarily influenced by external changes with the adoption of metalwork. However, despite the effect of these external changes the local industrial, and presumably social (see

parts 9a and 12g and tables 1-5) organisation would appear, on the evidence of the metalwork distribution and numerical seriation, to remain remarkably unchanged. Whilst it is perhaps difficult to be clear as to the early bronze age beginnings of this continuation due to the relative scarcity of metalwork, by the late early bronze age the local pattern of distribution and industrial organisation encountered in the later bronze age is already established. I would therefore put forward the hypothesis that, on the grounds of the metalwork, no basis can be detected for suggesting any major sociological or organisational divisions within the bronze age chronology, at least in the East Anglian situation of north-west Suffolk.

12. The distribution and its depositional significance

As already demonstrated (part 8 above and maps 8, 10-17) the distribution can be accurately described as predominantly fen edge (for a discussion of the likely main reason for this concentration see chapter 9). Clearly the position of the finds and the reason for their deposition is highly significant in terms of understanding the nature of the material and the practices and organisation of the bronze age population. A number of reasons can be suggested for the distribution of finds of which the most important will be discussed in the following order:

- a. Hoarding
- b. Loss
- c. Dumping
- d. Ritual
- e. Warfare

- f. Sepulchral
- g. Settlement

a. Approximately a quarter of the recorded finds represent 'hoards' or associated items of metalwork. Although a number of theories have been put forward (see above, part 9a) to suggest reasons for the collection and deposition of hoards the local finds would appear to be best explained as representing founder's or metalworker's hoards (nos. H5, H6, H7, H8, H12 and H13, and possibly H3), trader's hoards (H1, and possibly H19), and 'personal' hoards (H2a, H9, H10, H11, H15 and H16, and possibly H18). The reasons for the collection and deposition of metalworker's hoards is debatable, but probably represents either safe storage of material (which was never recovered for a variety of possible reasons); a shortage in raw materials or supply (see part 9b), insurance in case of shortages; or storage/dumping of surplus material at a time when demand had declined (part 9a). The nature of the hoarded metalwork, ie, mainly scrap, would indicate that this was not always solely safe storage of metallic wealth due to external threat, although the presence of ingot material within some of the larger hoards does suggest more than local collection or waste disposal. The possible trader's hoard (H1) probably represents an unrecovered storage point. Both the trader's and the founder's hoards were located (where a findspot is known) in definite dry land locations away (although usually not very far) from the fen edge and river valley (Icklingham) situations recognised for the stray finds. However the 'personal' hoards (where provenanced) all reflect the

distribution of stray finds and probably are more closely related to it (Hoard H10 is an exception, but see below part 12c)..

Although these items may represent unrecovered storage of personal items an alternative explanation is possible. In view of the lack of recognised burial (see below) these items may represent sepulchral objects. It may not be coincidental that the Eriswell hoard was located in a burnt flint patch and that cremation was the main rite of disposal during the middle bronze age (for which we have no local physical evidence for either cremation method or deposition). Possibly the Eriswell hoard represents the deposition of an individual's possessions on the site of his funerary pyre? Further support for a lack of intended recovery is to be seen in another possible personal hoard from Gravel Drove, West Row (see appendix 5) which may have been deposited in peat (but note discussion in chapter 12.2) and may represent sepulchral goods deposited with a cremated individual in a 'wet' mortuary rite. Despite the consideration that founder's hoards may also be cenotaph deposits (see O'Connor 1980, 307), in this area I believe they can be considered separately from other material and are industrial.

An interesting factor common to the five possible small middle bronze age personal hoards (H2a, H17, H18, H19 and H20, possibly inclusive of the items in appendix 5) is the general lack of mixture of tool and weapon types, with the exception of the tracer/awl in The Eriswell Hoard (H2a). The same is true of the possible hoard of the Stibbard type axes from Eriswell (H3)

although the atypical Stibbard hoard in Norfolk did apparently have an admixture. In view of the generally mixed distribution of stray finds of tools and weapons this feature is all the more curious, especially when two, presumably contemporary hoards. The Eriswell hoard (H2a), from Mildenhall parish, consisting of an early experimental sword, a rapier, a dirk/dagger and an awl, was found only 600 metres from the hoard of four palstaves (H18) from Eriswell. This suggests that this separation was deliberate, although unfortunately no evidence survives to indicate the reasons for it.

- b. Whilst it must be accepted that casual loss of any type of object will occur, it seems highly improbable that this can apply to the vast amount of material located in this study. This can be said to be especially true of the larger items. The loss of metalwork in boating and fording accidents can be suggested for finds from rivers (cf Needham and Burgess 1980, 442) or wet fen locations. However, no material can be clearly demonstrated to be from definite wet fen locations. Even if accepting that some items do derive from these contexts they would seem to represent both complete and incomplete material (eg see appendix 5 and no. 261) as indeed can be found with the riverine material (eg nos. 195, 233 and 279). It would seem unlikely that broken metalwork would be lost in boating or fording accidents. If, as might be expected, some of the plotted material does represent casual loss, for example the pins/awls (nos. 175 and 176) excavated from the Mildenhall 165 site, this would suggest its distribution was

related to those places most often occupied by the owners, ie the settlements and work places.

- c. The worn and broken nature of much of the material (realising the natural tendency for broken artifacts not to have been collected recently) would suggest that a good proportion may well represent discard/abandonment. This is also suggested by the re-use of objects for purposes for which they were not intended (eg several of the rapier or sword blades re-used as knives) and the worn out condition obtained in their subsequent use (eg hoard H10). If, as I believe it probably does, the occurrence of so much worn and broken material suggests casual disposal of the objects it is likely that this disposal/deposition would occur most frequently at sites of occupation. This is well demonstrated by the one excavated later bronze age occupation site at Wilde Street, Beck Row (Kelly 1967) where a knife with a broken rivet hole (no. 205) was evidently abandoned. Nonetheless although a large number of the stray finds are very worn one would expect many of these could, if metal was in short supply, have either continued to be used or have been re-cast. As they were not it seems likely, especially in view of the general rarity of signs of repair and re-use of tools in hoards (cf Burgess 1979, 297) or as stray finds, that metalwork was more easily available and/or plentiful than has formerly been accepted.
- d. According to Trump, the concentration of rapiers found in the fens and rivers such as the Ouse and Thames is a result of offerings to

water deities from men travelling considerable distance to reach the ritual water sites (1968, 222). This votive deposition theory has been supported by Burgess, Coombs and Davies (1972, 228) and again by Burgess (1974, 196-7) and partially by O'Connor (1980, 307-9) and Ehrenberg (1977) and by Needham and Burgess (1980, 442-449) and others (see chapters 10 and 12 for more detailed discussion). However, as has been pointed out by Rowlands (1976, 119) Trump's explanation is hardly an adequate one with regard to rapiers as the distribution of all types of metalwork equates with that of rapiers. It is also extremely unlikely that broken fragments of metalwork (eg no. 261) together with flint and bone debris occurring in the same 'wet fen' contexts (see appendix 5) would represent offerings to this same deity. The actual dispersed distribution of material is also incompatible with offerings made into pools and rivers by folk from afar, whom one would expect to arrive in the area along established routes and to deposit their offerings on either recognised or obvious sites.

The major flaw in the argument, however, is the fact that the majority of the material does not even derive from rivers or wet fen deposits. Many of the items close to or even within the rivers, do not definitely originate in them (cf Needham and Burgess 1980, 442-7). Of the 335 listed stray finds only two were probably dredged from the river Lark (189 and 226) and only 13 from the Little Ouse (110, 195, 197, 198, 199, 200, 221, 232, 233, 238, 250, 258 and 279).

Even if accepting the unlikely deliberate deposition of all of these items in rivers (noting that sword 233 is incomplete and bent and rapier 195 is only a tip) one is looking at only a very small proportion, 4% of stray finds or 3% of the total available metalwork. Needham and Burgess (1980) and Ehrenberg (1977 and 1980) put particular emphasis on the high proportion of prestige objects (ie large spears, rapiers and swords). However, whilst this is to some extent evident in our material (1 rapier/dagger, 5 rapiers, 4 swords, 1 socketed axe, 3 spearheads and 1 ferrule), it must be realised that the recovery of these objects was largely due to the observations of digger operators, on wet muddy surfaces, which would lead to a natural recovery only of the large, recognisable objects. The two incomplete objects (233 and 195) were both found with the aid of metal detectors. Of particular relevance to the Needham, Burgess and Ehrenberg distributions, where the preponderance of prestige goods occurred in rivers and not on land, is the fact that in this north-west Suffolk study area a larger proportion of these 'prestige' items occur in non-riverine contexts. We may be seeing evidence for different regional organisation or practices. Alternatively the late onset of agriculture in the fen edge situations is revealing a distribution largely lost in the other study areas (for further discussion see chapter 9).

The fallacy of the wet fen derivation is probably largely a result of a few of the items actually appearing to have been found in wet deposits. In fact only five such instances (list nos. H18, 186, 190, 261 and 307) occur in this study area despite the vast number

of finds, and all are probably cases of post medieval re-deposition from former dry horizons (see chapter 12.2). The majority of the other finds are all found close to, or in present or former, fenland. However, the fact that peat once overlaid the material, as it certainly did in many cases, does not mean that they came from within the peat, much of which is probably iron age in date.

Probably the most remarkable aspect of the distribution is its agreement with a mass of recognised domestic occupation sites (also formerly covered in peat), most of which appear to be of early bronze age date (eg Leaf 1935a, J G D Clark 1936, Briscoe 1949, Murphy 1979a and b and Martin and Murphy 1988). Although not yet studied in detail, the pottery from the surface scatters common to the area (see chapter 11, map 46) suggests a later bronze age content as well as the recognised early bronze age material. This has been confirmed to an extent by excavations at Wilde Street (Kelly 1967) where a small later bronze age settlement (producing knife no.205) was located.

Although evidence for increasing wetness has been found on some of these sites in post early bronze age contexts (see Murphy 1979 a and b 1983 and Martin and Murphy 1988) the evidence for this is at present confined to the low lying areas only (the hollows in areas of hummock and hollow micro-relief) and is as yet undated. It is certain that many of the bronze items were actually found on the ridges of the fen edge locality (eg nos. H2, H20, 175, 176, 220, 236, 237, 240, 324 and 338) and that the nature of this material

does not constitute ritual offerings into meres, merely the remains of local occupation and settlement.

- e. The possibility that some (clearly not all) of the material may be a result of warfare or mere localised violence should be considered (cf Coombs 1975, 70 for hoards). The presence of weapons is clearly attested, even if one excludes the axeheads, and can be seen to be proportionately greater in the middle bronze age (see Table 5). However, the evidence of weaponry in the early bronze age is heavily attested locally in the form of arrowheads (and again axeheads?) and although bronze examples are known (part 9h above and chapter 11.3) in the middle bronze age, rapiers and spearheads appear to represent a change in weaponry rather than a reduction in it. The reduction in the late bronze age is relatively slight and may not have any significance, especially in view of the alternative interpretations for some of the 'weapons', such as dirks and spearheads, and the introduction of resmelting larger later bronze age items such as swords. Unfortunately, evidence of actual warfare will be difficult to locate, especially as no physical remains of the later bronze age population have been studied in the area in modern times. Violence is attested in bronze age populations, eg, the Stonehenge inhumation (Evans, Atkinson, O'Connor and Green 1984, 13-21) and the Dorchester inhumation (Ehrenberg 1977, 37 and plate 1) the latter of which contained the tip of a basal looped spearhead in a human pelvis. It is possible that the broken rapier tips (eg nos. 192, 195, 215 and 219) and spearhead tips (eg nos. 236, 237, 261, 262, 263, 264, 273, 277 and 278), as well as the damage on many

of the more complete rapiers (especially H20.2) and swords, may reflect violence but clearly this is impossible to determine at present.

- f. The distribution of burial mounds (map 9) and ring ditches is not closely related to the metalwork distribution, or indeed to the known concentration of early bronze age occupation. It is also clear that the local sepulchral practice was not related to that apparently prevalent in, for instance, Wessex, where rich grave goods are a recognised feature. Only two metal objects in the survey area were located with burials (nos. 162 and 182) and only one of these (182) can be fairly confidently dated to the early bronze age. This is despite a recognised material wealth of both metallic and non-metallic objects in the area, such as the copper tanged dagger, which in Wiltshire can be paralleled with that in the Roundway burial. A similar dearth of other prestige objects, with the single exception of gold (see chapter 8.5 1), is to be encountered in the burials of the region, where again their presence is plain on settlement sites. For instance, in the study area, at least 15 jet (or jet related) 'prestige' objects are known from occupation sites yet none have been located with a burial, a situation which is reflected with other prestige objects. The realisation of this does of course make comparisons of material wealth between various districts/cultures of Britain a very precarious business, and foreshadows the differences in social/political and/or sepulchral organisation that were to be experienced in later prehistoric Britain.

Whether or not the owners of the metalwork were being interred in the burial mounds is unknown, but it is clear the most common rite encountered in the excavated barrows was cremation. Whilst it is feasible that all of the early bronze age population could have been interred in barrows, this is patently not the case. Such a situation is hardly surprising in view of the distance of the occupation sites from the barrows. The most common means of disposal is not known. It could have been either a less ritualised form, as suggested on both of Leaf's sites (Leaf 1935a) and on the Mildenhall 165 site (Martin and Murphy 1988, 356), or a completely different mortuary practice. A set of radio-carbon dates for skeletal remains from the Norfolk fens would appear to confirm such alternative modes of disposal (Healey and Housely in prep). In the later bronze age burial in large barrows seems to have been replaced by cremation in flat cemeteries, eg, at Witton and Shouldham, Norfolk (Lawson 1980a and 1984, 160) or smaller barrow cremation cemeteries, eg Ardleigh, Essex (Erith and Longworth 1960), Long Bennington, Lincolnshire (Allen et al 1987). However evidence for the south-eastern fen edges, despite its obvious importance in material remains, is totally lacking. This appears to reflect the implications for the early bronze age and probably represents a development of the earlier, presumably non-prestigious and largely unrecognised burial fashions. It seems likely to have been cremation, although if urned, one might have expected some to have been recognized. Whilst it must be seen as a possibility that all buried cremations may have been unurned this seems unlikely. However, the possibility of a practice of scattered ashes may be the

simplest explanation. If deliberately in 'wet' situations and including the deposition of sepulchral objects, i.e. bronzes, this could adequately explain genuine cases of 'wet fen' and riverine finds of metalwork and their clear relationships to the occupation pattern indicated by the other bronzes.

It would here seem relevant to look at the only other major area of 'wet fen' finds, ie, in Ireland. Significantly, Eogan's consideration of the cause of deposition of metalwork there (specifically ornament hoards of the late middle bronze age), was similar, ie, they represented *'grave goods so to speak without a grave'* (1964, 285). This argument has come to the fore recently with regard to river finds in locations such as the Thames (eg Bradley and Gordon 1988).

- g. It has already been demonstrated that the distribution of bronze age metalwork reflects the bronze age settlement pattern of north-west Suffolk. Whilst this can be clearly shown in the early bronze age, when the lithic and pottery evidence is easily recognisable, and resultant excavations have substantiated the settlement (the most recent excavations yielding radio-carbon dates of between circa 1470 and 1240 bc: Martin and Murphy 1988, 355), it is less easily detectable in the later bronze age when lithics are less frequently used and inevitably remain indistinct in form from the earlier assemblages (eg Kelly 1967 and chapter 11.3). The pottery too, unless well preserved, is relatively similar in form to the earlier material, especially as the majority is in the form of very

fragmentary sherds found in ploughsoil (see chapter 11.4). However a brief examination of material personally gathered while field walking suggests later bronze age pottery is represented. It is probably no coincidence that one of the few lowland later bronze age occupation sites excavated in this country prior to this work, at Wilde Street (Kelly 1967), is situated in this very fen edge and produced a bronze artifact amongst the debris.

Also worth noting is the large, undated, circular 'enclosure', Undley ring work (Fowler 1950), comparable to Mucking North and South Rings, Essex (Jones and Bond 1980); Springfield Lyons, Essex, (Buckley and Hedges 1987); Thwing, Yorkshire (Manby 1980, 321-3); West Harling 2 and 3, Norfolk (J G D Clark and Fell 1953), which is also situated within this fen edge distribution. It seems likely that, in the bronze age, settlement was centred on the fen edge location throughout. However this does not necessarily imply that any great emphasis should be placed on this occupation for it need not have been intensive (see appendix 11). Indeed recent fieldwork by the author and the Suffolk Archaeological Unit has also established the existence of later bronze age settlements on the Brecklands to the east of the fens, the nature of which suggest that the comparative richness of settlement debris on the fen edges is related more to survival than to definite patterning (see chapters 9 and 11). Nonetheless the metallic evidence still suggests that the occupation of the fen edges was greater than elsewhere, although to what degree it cannot be said.

One striking aspect of the metalwork distribution is the admixture of 'tool', 'weapon' and 'ornament' types (maps 15, 16 and 17). If truly representative of occupation, then any social stratification, on the grounds of 'prestigious' metalwork, was clearly integrated within the local population. This, together with the general scatter and frequency of distribution, may suggest no such stratification existed, which would to an extent be supported by the sepulchral evidence (above part 12f). For further discussion of the evidence for settlement of the fen edges see chapter 11.

13. Summary

As a result of intensive study it has proved possible to establish a relatively realistic understanding of the bronze age metalwork distribution in north-west Suffolk. This has enabled an accurate assessment, at least in terms of metalwork, of social, political, ritual and sepulchral organisation during the bronze age in the area and has allowed chronological trends to be interpreted at a local level.

Previous studies were dependent on material not necessarily representative or generally accurately provenanced and were therefore based on poorly substantiated hypotheses.

In comparison to earlier works which discuss the local metalwork, a far more accurate data base has been provided by this research and has allowed the following hypotheses, based on the distribution and contexts of the material:

1. The main surviving concentration of metalwork from all phases of the

bronze age in north-west Suffolk is consistently fen edge based. It is likely that the balance of metalwork was not as markedly inclined towards the fen edges during the bronze age.

2. The distribution of metalwork shows no evidence of political or social divisions during the bronze age.
3. Despite the changes apparent in technological/industrial development, especially in the organisation of hoarding and raw material supplies, and the implication these have for widespread trading(?) networks across Britain and Western Europe, the evidence presented by the metalwork frequencies and proportions from north-west Suffolk suggests local continuity. None of the external industrial developments can be shown to have had any marked effects on the nature or frequency of an evolving metalwork assemblage, or, by implication the political or social developments behind it, with the emphasis on continuity.
4. Most of the finds are closely related to settlement pattern.
5. The imputed ritual/votive significance of the fens is illusory. I
6. Sepulchral monuments do not appear to represent the main mode of deposition of the dead, even during the earlier bronze age, and either casual disposal or scattered cremation is probably the main disposal method.
7. The deposition of 'prestigious' artifacts, which are common in the north-west Suffolk assemblages, with burials of the earlier bronze age, as witnessed elsewhere, was not generally practised.
8. Those finds that may be representative of wet deposition, which are not as common as has previously been suggested, are probably related to sepulchral, as distinct from votive, practices.

9. The incidence of weaponry appears to have remained relatively stable during the bronze age in north-west Suffolk.
10. The major Isleham hoard, only 2 km to the west, does not seem to have had any significant impact on the frequency of metalwork in the study area.
11. The fen edge concentration probably represents only a fraction of the true bronze age frequency. Nonetheless this is likely to be a fairly accurate reflection of the original metalwork that has survived due to protection by post bronze age peat deposition. Elsewhere such evidence has usually long since disappeared.

It has only been possible to make these suggestions due to the intensive survey methods employed on this study. The importance of this is emphatic, with a minimum of 38% of the metalwork being either lost or in private possession, in addition to further unlocatable items formerly recorded as in museum collections, and a maximum of only 44% of finds being published. The abundance of private collectors/farmers and more recently metal detector users is bound to increase the proportion of unpublished finds in private possession. The implications of these findings reveal the importance of the intensive survey, and have caused the reversal of some earlier conclusions based on more shallow or extensive, and potentially unsatisfactory, study methods. These are certainly of local and probably of national significance.

CHAPTER 7

SOUTH-WEST NORFOLK: PREHISTORIC SCATTERS AND METALWORK

1. Introduction

The intensive study of north-west Suffolk, discussed in chapter 6, identified a concentration of bronze age metalwork along the edges of the south-eastern fenland basin. It was suggested, contrary to the generally accepted assumption of a ritual/votive cause, that this concentration was directly related to contemporary settlement and consisted largely of abandoned and discarded items of, usually, worn or damaged equipment. However the main problem in substantiating this claim, lay with a lack of identified occupation debris and sites associated with the metalwork.

Beyond an analysis of the frequency of finds from a sample of sites located, mainly by the writer, during the Suffolk fenland survey (appendix 9) and a study limited to one parish to show the relationship of metalwork finds and sites producing pottery with flint fillers (chapter 11.5 and map 46), no other details of the restricted fenland survey work that took place in Suffolk were, at the time of writing, available to make more extensive comparisons of the relationship between metalwork finds and prehistoric scatters.

If the hypothesis relating metalwork to occupation sites is to be studied critically, detailed distributions of metalwork and other prehistoric material must be examined jointly. The evidence elsewhere (see chapter 9) suggests that meaningful prehistoric scatters are

generally unlikely to remain identifiable in ploughsoil in East Anglia away from the fen and fen-edge locations, where peat deposition has, or at least had, preserved the remains of the pre iron-age(?) sites relatively undisturbed.

Fortunately work in one such fen edge area, adjoining the north-west Suffolk study, in south-west Norfolk, has recently been completed. The results have been made available allowing comparison of the prehistoric scatter and metalwork distributions.

Two forms of work were undertaken in Norfolk. Firstly fieldwalking, and subsequent research of the Wissey Embayment, as part of the Norfolk Fenland Survey (Silvester 1991). Secondly, as a necessary addition to the fenland survey, a study of former finds and fieldwork in the region, mainly that of the late Frank Curtiss of Feltwell, was undertaken by Dr Frances Healy (Healy forthcoming). This included a gazetteer of the metalwork from the Wissey Embayment.

2. The Area of the Wissey Embayment

The Wissey Embayment is the term used by Silvester (1991) to include the area delimited by the rivers Little Ouse to the south and south-west, the Great Ouse to the west and the Wissey to the north. The east side is defined more loosely on a irregular north-south line running just west of the villages of Methwold and Feltwell. Its total area is some 109 Km² (ibid, fig 3, p.5). Healy, for her listing and mapping of the metalwork, has used the same limits except along the eastern side, where the boundaries, although not identical, are generally similar.

3. The Fenland Survey of the Wissey Embayment: Limitations

Despite an undoubted increase in knowledge resulting from the work of the Fenland Survey a number of limitations need highlighting to put the results into perspective.

The first of these concerns the nature of the fieldwalking itself. Its intensity was, by admission, variable (Silvester 1991, 8-9). Some fields were not walked at all and others unsatisfactorily. Within areas considered to have been walked to an acceptable standard, and for which Silvester claims he was 'satisfied that no site had been overlooked' the transect interval is stated to have varied, usually being 30m apart (ibid 9). Doubts concerning Silvester's assertion are confirmed by his statement that some 'pot-boiler' spreads, 'because of their size, may have been overlooked during transect walking' (ibid. 35).

This shortcoming is amplified by one of the main limitations in methodology, namely that the fieldwalking was restricted to a once-over, single phase, assessment. This deficiency has been recognised by Healy (1991, 136). The inconclusiveness of evidence produced by such restricted methods can be demonstrated by the markedly differing results obtained during the fenland survey in north-west Suffolk in comparison to personal fieldwalking of the same area over a much longer period. A sample illustration (also see chapter 11.2) was the failure to identify a site during the fenland survey fieldwalking, despite visibility and field surface conditions being good and transects being limited to 20m intervals, where earlier, repeated survey, had defined the second (after Hurst Fen) most prolific early neolithic site located in Mildenhall

parish (Suffolk Sites and Monuments Record MNL 225 and C F Pendleton, unpublished research archive). In addition to this, and not to be overlooked, are the variations in weather, light, health and mood that affect, probably quite markedly, the results of fieldwalking even when only one individual is involved. This can be confirmed by any experienced fieldwalker.

The next main problem lies in the definition of 'sites'. Silvester was clearly aware of this problem on the fen edges where the proliferation of artifacts had caused him to refer to the Norfolk skirtland as a single site, nine kilometres long and one kilometre wide (1991, 9), and yet it is then separated into over 500 defined sites (including over 300 'pot boiler' sites) on the basis of 'a combination of experience and intuition' (1991, 9). The inability to recognise some sites, especially of bronze age date is also suggested by Healy (1991, 139 and Silvester 1991, 87). In view of the profusion of bronze age pottery personally identified in the adjoining north-west Suffolk fen edges there is little reason to doubt this theory. Indeed the difficulty in differentiating flintwork and pottery of later bronze age date from early (and later) prehistoric material, as discussed in chapter 11, is propounded by the shortage of 'pre-Iron Age' pottery recovered in the Wissey Embayment Survey; only 390 sherds. Of these only 17 (4.4%) were identified as of 'early bronze age' date, although 150 (38.5%) were of indeterminated grogged or flint and/or sand-tempered (Healy 1991, table 5). This factor is particularly relevant to the present research where these bronze age sites which appear, from the above evidence, to have become

integrated within the general background scatter were, ideally, those very sites that needed identifying.

The problem is further intensified by the lack of valid scientific sampling procedures. Despite Healy going to some lengths to breakdown the flintwork (1991, 116-39) this appears to have been based on a collection strategy where 'no attempt was made to retain every worked flint that was recognised in the background scatter of material' when 'a strategy of total collection was rejected' (Silvester 1991, 9). The value of Healy's examination of the flintwork must therefore be considerably reduced, especially in consideration of later bronze age flintwork, which, by its relatively crude nature, would naturally be more likely to have been excluded by such a subjective collection strategy.

A more minor criticism of the Wissey Embayment Survey report is the lack of discussion of the so called 'iron age' pottery. The basis for the dating of this pottery (and indeed for much of the other pottery and flintwork) needs to be called into question as it would appear, from the report, to rely mainly on personal viewpoints, with little or no independently substantiated dating evidence.

Finally another key issue relates to the plotting of soil boundaries in various phases. Again this appears to be highly subjectively based - 'largely on intuition ... and guesswork, coupled with fortuitiously located archaeological material' (Silvester 1991, 11). For this reason I have, in this study, relied mainly on the general 1:100,000 plotting

of Flandrian deposits illustrated by Silvester (ibid, fig 4). This approach is not entirely satisfactory as it is clear that this is not an accurate reflection of true bronze age geophysical boundaries, but lacking more precise information, this seems likely to be a more reliable approach. Silvester also uses 1:10,000 plottings which offer more detailed information on the complex arrangement of sand ridges on the fen edges (ibid, figs 8-16). However these also need to be used with care regarding the peat/skirtland boundaries as some (mainly 'pot-boiler') sites, probably of bronze age date, are shown within peat when it is obvious that, originally, these would have been situated on dry land. If these 'pot boiler' sites are of bronze age date (as implied by Silvester 1991, 86-7) it would suggest that the contemporary horizon is still partially buried under later peat deposits.

The date of the onset of wet conditions over the earlier (and later?) bronze age horizons which resulted in the subsequent blanketing by peat and the partial conservation of the massive concentration of artifactual evidence, until recent times, is unknown. Indeed it is unlikely to result from a single event and is more likely to be a combination of successive, localised phases of variable peat growth, the main stages of which may have occurred at any time from the later bronze age onwards.

4. The Fenland Survey of the Wissey Embayment: The prehistoric scatters

In view of the severe limitations noted above, it has been necessary to abandon any hopes of separating bronze age, especially later bronze age, occupation scatters from those of other prehistoric material.

Occasional finds of characteristic pottery indicate the presence of

Occasional finds of characteristic pottery indicate the presence of bronze age settlement but it would appear, for a variety of possible reasons, to have become inextricably intermixed and/or dissipated within the profusion of prehistoric material. Nonetheless this is not necessarily as great a setback as it may at first appear as the distribution of finds located during the fenland survey is remarkably consistent, despite varying in intensity, in all of the pre-Roman phases. That it changes by Roman times is itself probably pertinent and is suggestive of the advance of peat growth onto the fen edges by the Roman period.

As mentioned above the nature of the archaeological evidence took the form of a scatter of artifacts of varying intensity, mainly along the hummocks and hollows of the skirtland of the fen edges and 'islands'. The majority of the prehistoric finds were of burnt and worked flints. A smaller amount of bone and stone (other than flint) remains were found together with a comparatively small number of potsherds. Dating of the prehistoric material ranged from Mesolithic to Iron Age with the great majority of the finds being undeterminable prehistoric.

Although Silvester (1991) has separated 'sites' (often using debateable criteria, see above part 3) into specific periods both he and Healy make it clear that considerable admixture occurs. In view of this and the presence of so much undiagnostic material I have conflated all of Silvester's prehistoric 'sites' onto maps based on the 1:100,000 plot of Flandrian deposits and on the detailed 1:10,000 plots of the fen edges (maps 19-25; Silvester 1991, figs. 4, 46-50).

5. The Vissey Embayment Metalwork: Limitations

As no bronze age metalwork was located during the fenland survey the mapping of metalwork was based entirely on finds listed previously. These were items recorded mainly by Mr Frank Curtis in the 1950s and 1960s and in the Norfolk Sites and Monuments Record and subsequently listed by Frances Healy (forthcoming). Although we are fortunate that such a record of finds had been made since the 1950s, it would appear, from comparing the significantly larger number of finds resulting from the intensive research in the adjoining area of north-west Suffolk (chapter 6), that the record of metalwork in the Vissey Embayment is not as complete as it could be.

In addition to the numerical limitations the lack of detail evident in many of the records presents a further constraint on the value of the information. For example the failure to examine physically or illustrate the artifacts has caused problems in accurately dating and describing the objects and clarifying what proportion are damaged or worn. Similarly the cited locations are frequently uncorrelated and occasionally clearly misprovenanced. In north-west Suffolk a large proportion of the formerly cited and published findspots, when checked with the finders, were incorrect. This factor may be important in relation to some material which, from the grid references, appear to be from peat or other 'wet' deposits.

However, despite the above problems, the material from south-west Norfolk, as a result of this work, is probably better researched than in

any other similarly sized area in northern East Anglia apart from that detailed in the north-west Suffolk survey.

6. The Metalwork: Distribution

Of the 176 pieces of bronze age metalwork from south-west Norfolk recorded by Healy (this total excludes items listed by Healy that were either falsely or incorrectly provenanced and other objects of iron age or indeterminate date; see catalogue 4), 125 are single finds and 51 are from four late bronze age hoards. Sixty-six findspots are recorded for 64 single finds and two hoards. Additionally seven finds from within the Norfolk survey area or from the river Little Ouse, which forms the county boundary with Suffolk, which were recorded by the author, have been included. These include the only complete gold object (the incomplete remains of a gold 'lock-ring' were amongst the items in the hoard from Feltwell, N5295) from the survey area, an example of banded 'ring-money', of the late bronze age.

Most of the finds are distributed along the edges of the 'uplands' and peat fens. A few appear to derive either from within, or very close to, peaty fenland or from rivers. An examination of these potentially 'wet' findspots (see chapter 10 for discussion of the river finds) within the peat-based soils (also see chapter 12) shows that some items, for example the awls (N2542 and N2586) were probably associated with early bronze age burials (Healy and Housley in prep). Further burials, possibly of middle bronze age date, are suggested by the proximity of a palstave (N2567) and an unfinished rapier (N2540) to human remains. Other finds would appear to be re-depositions either from former or

extant water courses (eg palstave and sword N11949, awl N2586, palstaves N4727, N4451 and 16590) or from subsoils underlying later peat deposits (eg Cauldron N5191, bronze fragment N5324 and spearhead N2533). A detailed examination of the contexts of the other metalwork is pursued further below (part 8 and 9).

In general the metalwork can be seen to be similarly distributed in the 'early', 'middle' and 'late' phases of the bronze age and restricted mainly to the peat fen and upland interface. The proportion of occasional finds that may be related to the wetter peaty based soils (note above and below part 8) also remains relatively constant in all phases. There would appear to be no major changes evident in dispersal patterns, even though sepulchral (eg associations of metalwork with inhumation burials) or industrial (eg, the onset of hoarding of scrap bronze) changes did take place during the bronze age.

7. Comparative distributions: Find scatters and metalwork

The consistency in the pattern of scatters located during the fenland survey in all pre-Roman phases has already been noted and is striking, especially in view of the narrowness of the band where intense activity/settlement was actually indentified.

Finds of metalwork were similarly restricted in extent and, significantly, concentrated in the very same 'occupation zone' identified by the results of the fieldwalking survey (maps 19-25). Nonetheless in view of the importance of relating the finds scatters and the metalwork, of which the majority were single unstratified surface

finds, a detailed examination of some of the findspots is necessary.

Clearly, being surface finds, no direct association between the finds of metalwork and the other artifacts can be demonstrated, even if the material was recognised as being contemporary, which for the reasons cited above (part 3) it rarely can be. In view of this, little can be gained from examining the metalwork or other artifacts from the locations where both are found, potentially originally in association.

However the findspots which would repay closer inspection are those lying outside this 'settlement zone' especially those from within the peat soils.

8. Metalwork from the peat

The items which would appear to be those most easily demonstrated to be separate from settlement and on which any argument for alternative deposition theories is most likely to be based are those from the 'wet' peat fenland soils.

Of the total of 73 cited findspots 14 are mapped as from peat soils and a further nine lie on the edges of peat and skirtland soils (map 21) as based on the 1:100,000 mapping (cf Silvester 1991, fig 4) which, because of the difficulties experienced in clarifying these boundaries, will also need to be examined (catalogue 4). Three of the peat finds are early bronze age, two 'awls' and a flat axe. One of the awls (N2586) was associated with the 'Southery Fen female', or 'Nancy' as she is perhaps better known, and may represent either a drowning (as suggested by Lethbridge; Lethbridge, Fowler and Sayce, 1931) or a fenland

inhumation (see Healy, and Housley in prep). The same may be the case with the second 'awl' (N2542) which was found, though not demonstratably associated, with disturbed multiple burials. However the findspot also adjoins a scatter of worked flints, pottery and animal bone indicating this was not necessarily a find from within a wet deposit.

The flat axe (N2593) was said to have been 'from the bed of the old run', a 19th(?) century main pumping engine drain. The findspot is immediately opposite a group of buildings, suggesting that this represents a modern find thrown into the drain some time prior to its discovery in 1937.

Seven middle bronze age finds are listed from apparent peat fen locations, an unfinished rapier, a basal looped spearhead and five palstaves. Interestingly the rapier (N2540, found as a result of ploughing/subsoiling to 18 inches) and two further palstaves, without findspots, from Southery (N2567), were all said to have been found near human remains.

The five palstaves may all have derived from ditching operations, two (N4461 and N17968) being situated besides ditches whilst another (N16590) was actually dredged from a ditch. Unfortunately no evidence was available from the fenland fieldwalking survey for any of the palstave findspots but personal examination of the locations of the two looped palstaves (N5248 and N17713), although confirming peat (very woody) as the predominant soil type, did record slight rises on both of the field surfaces in the areas of the finds, suggesting hummocks

underlying the thin surface peat, as well as the presence of subsoil remains, probably resulting from spread ditch upcast, over the surface of the one field where crop growth had not obscured visibility.

Significantly the findspot of the palstave that was found during dredging (N16590) adjoins a visible sand hummock, emerging from the wasting overlying peat, together with a prehistoric burnt flint patch. This relationship with peat finds and ditching/dredging operations indicates that the finds are likely to derive from subsoil horizons rather than from within the peat itself, although, without direct observation this possibility cannot be proved.

The basal looped spearhead (N5250) is probably one of the most important finds recorded from wet fenland deposits, being one of the few objects having detailed records relating to its apparent findspot. It was found peat digging 'some years' previous to an examination of the findspot in 1933 by Godwin, Clark and Clifford (1934). From their work it was concluded that the spearhead was found, in peat, at a depth of about 70 cm beneath the field surface and circa 1.55 m above the natural chalky boulder clay. From this it is reasonable to conclude that we are discussing a genuine 'wet fen' find. Nevertheless this does need to be tempered by three points. Firstly a considerable variability in peat depth was noted, and whilst the shallowest occurrence of the subsoil recorded was still 80 cm deeper than the spearhead, only three trial borings were made. It is not inconceivable that the spearhead may have lain at a level equal to, or only slightly above, one of the subsoil ridges so characteristic of the region. Nonetheless from the account of

the finder the spearhead does appear to have derived from within peat. Secondly the spearhead is recorded as being found on, or slightly above, 'a layer indicative of drier conditions' (J G D Clark and Godwin 1940, 71) as demonstrated on the site by a prostrate yew tree. Unfortunately no analyses could be carried out on the finds horizon, which had been destroyed by peat digging, and pollen samples, taken for this purpose some 18m away were too few to allow valid conclusions. It is therefore possible that the contemporary fenland surface was dry enough for human passage at the time of the deposition of the spearhead.

Finally it should be noted that the cited findspot is within 10 metres of a substantial field drain. Whilst it is unlikely that the find would have derived from ditching operations and ended circa 70 cm below the field surface it is possible that it was re-deposited following the construction of 'sock-grip' drains (see chapter 12.3c), 'bush-drains' (ibid) or other small drains connected to the main, surviving field boundary ditch, or from an earlier system (note the main drain forming the southern field boundary was present in the 17th century and may pre-date the mid 17th to 18th century fenland drainage: Silvester 1991, fig. 75). Any of these is likely to have cut into the subsoil underlying the peat. This may also explain the sudden rise in beech pollen, which is usually considered not to have become widespread in the downland until the Iron Age (Evans 1975, 82; Dimbleby 1978, fig. 6), recorded in the level underlying the spearhead, if this sample actually derived from a surviving fragment of the same drain in which the spearhead was redeposited. It should be noted that the reconstructed depth of the beech horizon corresponds closely to that of the segmented bush drains

encountered on the excavations at site Mildenhall. 165 in Suffolk (E A. Martin, pers comm), the peat fill of which also produced bronze age artifacts.

Only three late bronze age finds are listed from peat soils, a 'sword' and two socketed axes. The socketed axes (N13459 and N13461) both lie off the end of a spur jutting into the peat south of Catsholm. Again no evidence was available from the fenland survey to indicate whether or not these represent the position of further hummocks masked by peat beyond the defined limit of the spur as marked (map 21). A personal examination of the findspot of the 'sword' (N5267, now sold) revealed surface indications of sandy subsoil and stones, probably from spread ditch upcast, although the bulk of the soil consisted of very woody peat.

The final object, a 'bronze axe' (N21426), when plotted on the detailed map (map 25) is seen to lie on one of the complexes of sand islands to the west of the main fen edges. Finds listed from this field surface include a general scatter of burnt flints, a bone spatula and a beaker sherd.

Turning to the items marked as from the fen edges, and therefore potentially from peat horizons, only one early bronze age artifact, a flat axe (N15766) is recorded, with only an approximate findspot.

However despite appearing to lie at least 100 metres to the west of the fen edges off the 'island' at Hilgay/Southery (north-west corner of map 21), surface finds of a flint axe (NSMR 15798) and saddle quern (NSMR

14499) from the same field suggest this is a skirtland rather than a fenland location.

The three middle bronze age objects are all palstaves. The record relating to one of the findspots (NSMR 5185) also mentions a sword although, curiously, does not list it in the main artifact index. A second palstave (N13891) comes from the same findspot as that cited for a small late bronze age hoard of two socketed axes, although the phasing of the palstave form suggests it is unlikely to be associated. The cited locations for the three palstaves are only approximate but all lie on the edges of skirt islands (maps 21, 24 and 25). Fenland survey details were not available for the findspots of two of the palstaves (N13891 and 15742) although one (N13891) lay between the sites of a burnt flint patch (NSMR 24315) and worked flint (NSMR 24116) located in adjoining fields. A general scatter of worked flints and two bronze age sherds is recorded from the field where the final palstave (N5185) was found.

A total of four findspots for objects of late bronze age date are from a fen edge situation, consisting of a small hoard (N13891) of two socketed axes, a single socketed axe (N2569) and 2 spearheads (N2533 and N13890). Only one of these finds (N13890) is recorded with an eight figure grid reference which locates it just off the end of a small spur to the south of Southery island. The socketed axe findspot is similarly positioned although the edge of the island is less clearly defined at this point (Silvester 1991, fig. 41). The small hoard was found as a result of recutting a ditch, in a similar location to the palstave (N13891) listed

above, that is between two prehistoric sites. The second spearhead (N2533) was also found during ditching operations and came from a field described as having a sparse to moderate scatter of worked and burnt flints over its surface.

The only undated bronze find from a fen or skirland location is a 'bronze axehead' (N5260) sited to the edge of a further skirt 'island'. Examination of this field, in 1992, with poor to medium surface conditions, identified a thin scatter of worked and burnt flints over the surface. This was not restricted to the island alone.

9. Conclusions

This chapter has attempted to see whether the recorded distribution of bronze age metalwork could, or could not, be correlated with contemporary settlement evidence in the fen and fen edge area of south-west Norfolk.

From the outset it became clear that the evidence used, as based on the fieldwalking for the fenland survey, was inadequate for accurately locating settlements of bronze age date. After considering the factors affecting sites of this date, and the nature of them, it is suggested that they have become submerged within a background scatter of overwhelmingly undated prehistoric artifacts. However the area of this background scatter is very limited in extent, covering a narrow band, usually under 1 kilometre in width, along the edges of the fens. The correlation of distribution for the majority of the bronzes (59, 81%,

out of 73 cited findspots) and the settlement zone is marked (maps 19-21) and includes nine findspots which originally appeared, potentially, to be peat finds (above part 8). Further bronzes, although from predominantly peat-based soils, were usually found just off the edges of the skirt soils (8 finds), often as a result of ditching operations (two definite and two probable instances). This indicated that some of the bronze age horizons witnessed on the skirt soils are still in some areas buried underneath later peat deposits. This is supported by examples of the frequent, probably bronze age, burnt flint patches, the tops of which were just being disturbed at the time of the fenland survey, and which are clearly shown in otherwise peat fen fields, (Silvester 1991 fig 11: 89, 96 and 97). The bases of these scatters, and the subsoil cut features with which they are usually associated (cf. Martin 1988a, 358) must be presumed still to lay undisturbed beneath the peat cover.

The remaining six finds (8% of the 73 findspots) all appear to be further away from the scatters on the skirtland soils although the variability of depth and drainage of the hummocks and hollow sand micro-relief cause this supposition to be unverified without more detailed fieldwork. The possibility that two of these objects (N4461 and N17968) also came from ditch upcast supports the case for buried bronze age soils pre-dating localised peat deposition although the evidence for association with human remains with two more of the finds (N2586 and N2540; also see N2542) could indicate an alternative, possibly sepulchral, cause.

Only two other artifacts remain from peat soils. The flat axe (N2593) seems to be a case of recent re-deposition in a 19th century drain and it is suggested above (part 8) that the basal looped spearhead (N5250) may also have been redeposited as a result of drainage works.

An examination of the precise location of bronze finds in relation to sites designated as scatters (Silvester 1991, figs 46-50) on the detailed plottings (maps 22-25) shows that only two of the 28 finds (N2530), both fragments of rapiers, were actually situated within a marked scatter. This is not surprising, for two main reasons. Firstly larger bronze artifacts are not normally found in house sites (a few exceptions can be cited, eg, Chalton: Cunliffe 1970; Black Patch: Drewett 1980; Thorny Down: Stone 1941;) but are more likely to be found within the overall settlement complex. There are probably two main reasons for this; the clearance of domestic rubbish into middens, some of which may then have been spread as fertilizer or disposed of in waste areas (such as damp hollows as at Mildenhall 165, Martin and Murphy 1988 356-7 fig. 1) or the deliberate disposal of objects likely to endanger the younger elements of family groups (especially spearheads, swords and axeheads?). The frequency of small bronze objects on settlements (note the two objects mentioned above, apparently found within a scatter, were both fragments) suggests the latter explanation as the more likely although it may be misleading to use non-East Anglian examples to support this supposition. It would probably be revealing to undertake a metal detector survey of the fen edges to see if distributions varied between small and large bronze objects. Secondly, as stated above (part 3) the definition of 'sites' in the area has been highly subjective and,

in my view, should not be taken to be definitive, or even particularly meaningful in view of Silvester's statement that the Norfolk skirtland should be considered as a single site (1988, 327; 1991, 9). This can be illustrated at a few of the cited findspots of bronzes, for example a 'bronze axe' (N21426) is 60 metres from the nearest site, a 'pot-boiler' concentration, as mapped by Silvester (1991, fig. 14G, 130) yet is recorded as being within the area of a general scatter of burnt flints, a beaker sherd and a bone spatula in the Norfolk Sites and Monuments Record. Similarly another 'bronze axehead' (N5260), was located 170 metres from the nearest marked 'site' (a prehistoric flint and late neolithic/early bronze age pottery scatter; *ibid.* fig. 13F, 132), which when personally fieldwalked, revealed a thin scatter of worked and burnt flint surrounding the axe findspot. As the model expected from occupation sites, especially of the later bronze age when the pottery rarely survives in ploughsoil and the amount of lithics was relatively restricted, would only be a thin scatter of worked and burnt flint, this attempt to define 'sites' can be seen to be particularly pointless with regard to bronze age surface scatters.

The only positively identified house sites, of the late early bronze age, on the south-eastern fen edges at Mildenhall (Mildenhall 165, Martin and Murphy 1988) were located by excavation following the discovery of freshly disturbed bone and pottery evidence on the field surface, not because of any observed artifact concentration in the ploughsoil. Indeed the surface scatter experienced on the site was thin in comparison to others in the immediate locality, and may well not have been rated as a site using Silvester's classification methods.

The final illustration is provided by the spearhead tip (N5367) mapped 90 metres from the nearest fenland survey site, a 'pot-boiler' concentration. As the spearhead was excavated, in 1962, from a Romano-British temple site, which was not, apparently, located during the fenland survey, the validity of site identifications needs to be seriously questioned.

In conclusion, the distribution pattern illustrated in south-west Norfolk, when studied in detail, is, in the majority of instances convincingly based within a contemporary bronze age settlement zone. It should be noted that survey work in the parish of Mildenhall in north-west Suffolk also demonstrated a remarkable correlation of bronzes and other prehistoric finds; all of the recorded findspots of bronzes also produced prehistoric artifact scatters within the same field, despite the greatest proportion of the fenland fields being totally devoid of finds.

Apart from a few objects, of early and middle bronze age date, which are likely to be associated with human, probably sepulchral, remains, and a few late bronze age 'industrial' hoards, no evidence has been found to support a non-secular reason for the distribution of finds in the south-west Norfolk study area.

CHAPTER 8.

THE EXTENSIVE SURVEY OF NORTHERN EAST ANGLIA: THE BACKGROUND DISTRIBUTION

1. Introduction

The frequency of metalwork found in East Anglia is rivalled in Britain only by finds from the Thames Valley. This high incidence continues throughout the bronze age in these two regions. In order to put the concentration of finds apparent along the south-eastern fen edges into a regional setting, a study of the background distribution is necessary. This should also allow recognition of local variations in metalwork finds patterns and may help to offer explanations for them.

Originally the intention was to list and map all finds of bronze age metalwork listed in the county Sites and Monuments Records (SMRs) for Cambridgeshire, Norfolk and Suffolk (above p.11 and chapter 5). These records have the benefit of being multi-period, computerised and, theoretically, standardized. East Anglia has an added advantage, not occurring elsewhere, in that a regional SMR users group exists using a common wordlist. Unfortunately the potential for compatibility presented by computerization has, for a variety of reasons, not been realised. The diversity and variability of content, even in East Anglia where the counties Sites and Monuments Records are probably more standardised than in other districts, is so great that even basic comparisons between individual counties are seriously biased.

The standard and variability of SMRs has implications of national as well as local importance, especially now that the National Monuments

Record is beginning to standardise a nationwide record partially for ease of use for research purposes. In view of this some factors likely to cause variation in the archaeological record are examined here more closely.

2. Modern factors affecting distributions

The basis for availability of information in the three counties is in some respects similar, namely they are all areas with a predominance of arable agriculture. However the deeper peat and silt fens are liable to act as a masking element to greater degrees in Cambridgeshire, Norfolk and Suffolk respectively. Similarly hillwash and river silts, not obvious factors in East Anglia, are probably locally significant. This has been vividly demonstrated recently (1991) by depositions of deep layers of hillwash (30cm plus) following a single thunderstorm in areas with very slight slopes in the Suffolk Brecklands and by a deep gorge cut about one metre deep and redeposited, by two days of heavy rainfall, in the Sandlings at Bromeswell, Suffolk (J. Newman, pers. comm. 1992).

The light Breckland and Sandling soils are also prone to massive sand storms. An account, by Thomas Wright in 1668, relates how a great 'land flood' had, over a period of years, advanced across the parishes of Lakenheath, Wangford, Brandon and Santon Downham where 'tis now got into the Body of this little Town where it hath buried and destroyed diverse Tenements and other Houses'. Mr Wright goes on to describe how the sand 'had so possessed all our Avenues as there was no passage to us but over two walls that were 8 or 9 foot high'. The river Little Ouse between Brandon and Thetford 'for 3 miles together so filled with sand that now

a vessel of two load weight passes with as much difficulty as before with a Ton'. In 1769, William Gilpin, a contemporary of the antiquarian the Rev. Dr Stukeley, described the landscape between Brandon and Mildenhall thus: 'Nothing was to be seen on either side but sand and scattered gravel without the least vegetation; a mere African desert. In some places this sandy waste occupied the whole scope of the eye; in other places, at a distance we could see a skirting of green with a few straggling bushes which, being surrounded by sand, appear'd like a stretch of low land shooting into the sea. The whole country indeed had the appearance of a beaten sea-coast, but without the beauties which adorn that species of landscape. In many places we saw the sand even driven into ridges; and the road totally covered, which indeed was everywhere so deep and heavy, that four horses which we were obliged to take could scarce in the slowest pace drag us through it. It was a little surprising to find such a piece of absolute desert almost in the heart of England' (R.R. Clarke 1937, 95-6).

The result of these massive soil movements has been the burial of earlier historic and prehistoric horizons on a vast scale as typified by, for example, the mesolithic sites at Wangford and Lakenheath Warrens (summarised in Jacobi 1984, 57-63); a recently excavated Roman site at Eriswell (Tester in prep) and the West Stow Anglo-Saxon village (West 1985, 9).

The importance of soil variation is also potentially a highly influential consideration affecting the artifact distribution, dispersal and subsequent discovery. For example the chances of observing objects

during farming activities in heavy clay soils are clearly much slighter than on weathered, stone free, sandy soils, especially in view of the different crops and management activities characteristic of these soils.

The longevity of agriculture and resultant discovery and distribution of finds and sites have created a major problem in attempting to identify the extent and intensity of early occupation in some soils. The significance of this is examined in chapter nine.

Many of the more recent factors affecting the distribution of finds such as the antiquities trade, museums and population centres have already been outlined (chapters 2.2, 3.3-3.5, 5.3c and 6.5). All are causes for concern regarding an accurate portrayal of bronze age distributions. To this must be added the lack of uniformity in the methods, processes and practices in the formation of the main existing general source of information relating to artifacts in the three counties, namely the Sites and Monuments Records (for a discussion of practices in museums see chapter 6.5 c and d). There is no cohesive policy regarding the content of the County Sites and Monuments Records. At present in East Anglia only Suffolk has a specialist prehistorian on its staff. Each county has a different computer system; none is compatible. However most disconcerting is the quality, quantity and variation in the records. I would argue, based on the north-west Suffolk survey, that none has carried out the basic research to allow the reasonably comprehensive recording of existing finds from their regions; for example no deliberate attempt has been made to contact farmers and

record their finds. This is particularly vividly demonstrated by comparisons of north-west Suffolk and south-east Cambridgeshire.

The incorporation of information available from local museums is probably better in Norfolk than in Cambridgeshire or Suffolk, as the Archaeological Unit is part of the Norfolk Museums Service, but few of the potentially important private collections have been adequately surveyed, and it is not clear to what extent other national and international museums have been searched. At the time of compilation, in November 1986, only Norfolk had included information from the National Bronze Implements Catalogue (now in the British Museum) in its SMR, due to the works of Rainbird Clarke and Andrew Lawson rather than as a matter of policy.

The research of publications is no better. Although the principal local journals, namely the Proceedings of the Prehistoric Society of East Anglia, the Proceedings of the Cambridge Antiquarian Society, Norfolk Archaeology and the Proceedings of the Suffolk Institute of Archaeology have been searched even this has not been systematic. Added to this are problems with editing. Former Sites and Monuments Records officers and processors in all three counties, although being computer literate, were not always archaeologists, let alone prehistorians. This has caused a large proportion of the information contained within the SMRs to be worthless prior to careful editing, which in many instances still needs to be carried out. For example, a single ogival dagger (C7508) from Cambridgeshire appears in at least three sources and now appears as three separate daggers in the SMR (C7508, C7619 and C7765) whilst the

Isleham hoard, the largest hoard of bronze age metalwork from Western Europe, found in 1959, was not listed at the time of my initial research in 1986. The information extracted from publications, although sourced, occasionally incorrectly, frequently lacks the details necessary for archaeological analyses despite this information being available within the sources.

The point does not need to be laboured further. In practical terms the information available from the three counties is incompatible for all but the most general of comments (although see hoards, part 7 below). The information available in the Cambridgeshire SMR (and in the Cambridge University Museum of Archaeology and Anthropology) was, in 1986, so poor that further detailed examination, as undertaken in Suffolk and Norfolk (chapters 6 and 7) of bronze age records and finds from Cambridgeshire would need a complete re-assessment of the SMR, and has therefore been abandoned.

It is suspected that, even today, the situation is little better. The present work loads are so great that, without further funding, the SMR officers are struggling to record the new finds that are reported. Suffolk has a three year backlog and cannot hope to record earlier finds or carry out the necessary 'in the field' research without lengthening this backlog.

3. The finds: general

The corpus of finds listed in catalogue 2 and mapped on maps 2, 4, 5, 26-42 is based on information extracted from the Cambridgeshire and Norfolk Sites and Monuments Records in November 1986. As information from the three counties is so different, the information extracted from the Suffolk Sites and Monuments Record was extended up until December 1991, as there remained no possibility of using comparable data bases. The items listed include all metal objects of 'bronze age' date. This includes material that may be said to be of a 'copper age' but excludes items traditionally assigned to the 'iron age', although it is accepted that a clear distinction between the 'bronze' and 'iron' ages cannot be defined realistically.

Over 11,000 items of bronze age metalwork are recorded. Clearly with such a huge amount of material it has not been possible to examine the majority or to give more than brief details. This restriction prevents an accurate breakdown of the condition, completeness, typology and regional variation of the surviving finds although it does still allow some generalisations to be made. The most obvious of these is that the raw material for this mass of objects all had to be imported, indeed the dependency on supply of exotic metal may have been one of the main causes for a change to an iron based technology at the end of the bronze age in much of Europe (O'Connor 1980, 306-7). The nearest copper sources were central Europe (mainly the Austrian Tyrol and Swiss Alps) and the 'Highland' region of western and northern Britain (Devon, Wales, Cheshire, The Lake District and Scotland) and southern Ireland. Tin sources occurred in central Europe, central France, Brittany and Cornwall

(cf O'Connor 1980, 299-301; Bradley 1990, fig 31). Despite clear evidence of cross-channel links, especially during the middle and late bronze ages, O'Connor suggested that most of the source metal in use in south-eastern England came from the British Highland zone (1980, 304-5). Support for his suggestion has recently been provided by the dating of the copper mines at Great Orme, North Wales (Hammond 1992). The evidence presented by the Isleham hoard (Chapter 6.9a and 6.13.10, appendix 7 and part 7 below) and the river based distribution of other scrap metal hoards also indicates that imported material, via the eastern seaboard, in the form of ingots or scrap, may have been an important factor in East Anglia (see part 7 below). In the first century BC, Julius Caesar stated that tin was found inland but bronze was imported to Britain (de Bello Gallico 5.12). Lead (additions of which are characteristic of some of the British earlier middle bronze age and late bronze age bronze industries) and gold are also found in the British highland zone although most prehistoric gold probably derived from alluvial sources.

Metal analysis has been carried out on a number of objects from northern East Anglia, using various methods, since the 19th century. The results and the interpretation of the earlier samples are often contentious, and are further complicated by the progressive re-use and admixture of metal through the bronze age. Advances have been made with the increased use of metallographic, as opposed to chemical, analysis methods and the results of early lead isotope analysis also look encouraging. As yet however, comparatively few samples from East Anglia have been examined, and detailed discussion of these will be more rewarding at a later date

and is not pursued here. For a discussion of an extensive series of determinations of early bronze age axeheads see Needham (1983) and for British bronze age gold analyses see Taylor (1980).

The need to unify metallurgical with typological studies is clear, but is beyond the scope of this work. Some earlier research, notably by Rowlands (1976, 121-5, 167-8) and O'Connor (1980, 303-6), highlights the difference between localised production of tool types and the widespread uniformity of some weapons, mainly rapiers, swords and large spearheads. They suggest that a 'two-tier' system for the production and distribution existed, possibly due to centralised political control by a 'warrior class'. However care needs to be taken. Whilst tool forms tend to be regionalised, 'non-local' types feature commonly in East Anglia. Similarly whilst weapon types are mostly similar to those found in other regions, localised experiments are clearly an element in their production, for example with the Eriswell (S8896), Methwold (N4875) (O'Connor 1980, 114), Little Ouse (S9719, catalogue 1.200) and Coveney (C6020) swords (for these and other local transitional swords see Lawson 1979, 53-5).

Significantly, smaller tools of the widespread 'weapon' form, notably knives, are a common, and under-discussed, type that crosses this 'two-tier' division. It therefore seems likely that the differences that appear to occur in tool and weapon distributions are likely to be due to other factors. Some of these are likely to be: 1. the lack of decorative motifs on most weapons (and knives) that are a significant feature in identifying localised typological variation on tools; 2. the

different methods of production. Northover (1982b, 70) suggests that tools needing cold working, eg, axes and chisels, would not be manufactured from clay moulds (although this is contradicted by the rarity of metal or stone moulds in East Anglia) whereas larger weapons invariably were;

3. different uses, especially localised use of tools and potential long distance use of weapons, particularly in trading networks. It is probably relevant that the areas shown by Rowlands to have specialised in weapon production, northern East Anglia, the Thames Valley and for example, south-east Devon (1969, 167-8) are all likely to have been particularly active in coastal trading of raw materials, in the former cases to obtain metal and in the latter to supply it.

4. The geographical and environmental setting

The area and characteristics of northern East Anglia are outlined in chapter 2. A variety of factors were, and are, likely to affect the distribution of bronze age metalwork. In terms of plots of surviving finds distributions, it is the modern, rather than the ancient, causes that are likely to be more significant (eg chapters 6.5, 7.4 and part 2 above), and it is argued that agriculture is probably the most influential of these. In areas such as East Anglia, the impact of arable farming is likely to be critical to interpretation and has therefore been studied in more detail in chapter 9.

Although the survival of the evidence will be heavily biased by these modern factors, which should always be borne in mind, contemporary prehistoric landscapes must also have been particularly crucial. For

this reason the general plot of finds, map 26, has been overlain by two of the most critical elements of these early landscapes, namely the surface soils, maps 4 and 5 and rivers, map 2. Problems exist, for example the high quality loessic soils, now found in areas such as the Shotley Peninsula, may have been far more extensive in the bronze age. The courses of ancient rivers are also likely to have changed considerably, especially in the fens, where in some cases roddons marking the former routes can be recognised. In other areas canalisation and major dredging operations may have significantly changed drainage patterns, with the result that former stream or river courses may now have disappeared.

Unfortunately, indicators of bronze age environments are limited, mainly to either pollen or faunal remains, and scientific analysis in the region have been extremely restricted, especially in some areas where soil conditions have not been conducive to the preservation of environmental evidence. Additionally the methods give results which are likely to be either too localised (for example molluscan and micro-faunal samples from barrow ditches) or too dispersed (for example with pollen analysis) to offer information that is more than of very limited value.

As a consequence some of the more important questions regarding the use of the bronze age landscape in East Anglia remain unanswered. For example the nature, extent, and date, of agriculture intensification on the heavier chalk and clayland soils, on the present evidence, cannot be ascertained with any degree of confidence. Similarly in areas where

sampling has been relatively frequent, such as the fenlands (Waller forthcoming). drainage and topography appears to have been so localised that extreme caution needs to be taken in extending the environmental implications. It is not, for example, possible to support the earlier claims (cf. Burgess 1974, 195 and 310) of climatic deterioration in the middle, or even late, bronze age, over the whole of the fens.

Similarly, care is needed over extrapolating evidence from relatively well studied sites, such as Fengate (Pryor 1974, 1980a and 1984) or Grimes Graves (Legge 1981), as indicating a predominantly cattle based economy during the bronze age, as evidence of cereals and other arable crops are also a common feature on contemporary sites.

The evidence for such a cattle based economy is supported, in relation to the iron age, by Martin (1988b, 68) but is to some extent contradicted by recent work on the high brecklands where evidence of later bronze age settlement occurs in the 'dry' areas above the limit of lactation as mapped (ibid, fig 59).

In view of the restricted availability of environmental evidence at present there would seem to be little to be gained from taking this topic further than identifying the need for research designed to resolve some of these problems. A general discussion of the environmental evidence for East Anglia can be found in Murphy (1984) and for the fens in Waller (forthcoming).

5. The Finds: details

Of the excess of 11,168 pieces of bronze age metalwork 1,439, or 12.9%, are single finds. The proportion of items hoarded (see part 7 below and catalogue 3) changes markedly through time, from only circa 2.8% in the early bronze age to circa 80% in the late bronze age, although considerable variations are also to be found within these phases (see part 7 below for further discussion).

Although the region is probably better known for the fine condition of some of the discoveries, most of the metalwork is either worn, damaged or incomplete. This is becoming all the more apparent now that metal detecting is correcting the original bias in favour of large and complete finds with a more balanced proportion of small and/or fragmentary objects (see chapter 9.7 and tables 11 to 13). The changes being caused by this development mean that the proportions of artifact types listed here are likely to be rapidly superseded by some of the previously under-represented metal types, such as awls and ornaments. Despite this, a comparison of the finds recorded from north-west Suffolk, which has a noted high proportion of awls (chapter 6.9c), and those metal detected from the rest of Suffolk up to December 1991, has demonstrated remarkable consistency (chapter 9.7, table 20). This supports the belief that the surviving sample of metalwork from the preserved landscapes of the fen edges is representative of the bronze age (cf chapter 6.13). As a result of the changes brought about by metal detecting, even if the proportions of types remain similar, the mostly fragmentary nature of the finds is likely to have a dramatic affect on the interpretation of these survivals. Other important

differences can be expected, especially with regards to the frequency of objects, their distribution patterns (chapter 9.7a) and the reasons for their loss/disposal.

593(+) single finds are recorded from Norfolk, 582(+) from Suffolk and 265(+) from Cambridgeshire. However, as noted above, the standards and methods used for recording these have varied in each county and therefore these figures do not represent a sound base for comparison. Of these finds 660 or 45.9%, have accurate or approximate findspots (Cambridgeshire 49.4%; Norfolk 45.0% and Suffolk 45.0%). These objects are plotted on maps 2, 4, 5 and 26 to 42. Their distribution, which can generally, and significantly, be described as widespread, is discussed more fully below (parts 8, 9 and 10).

Despite neither being able to provide an accurate portrayal of bronze age distributions or a detailed 'periodic' breakdown of finds (see above, part 2) it is possible to make approximate comparisons of the pattern of modern finds of specific implement types that are, in the main, characteristic of their period or of varying functions (and potentially, status). By this means it may be possible to relate the distributions evident in one period to those of another, or compare separate implement types, and see if significant changes occur. This is attempted in two ways; by using two discrete artifact types, axes and bladed 'weapons'; and by using a general standard tripartite division into tools, weapons and ornaments.

Axes have been separated into flat axes, being representative of the early bronze age; flanged axes of the late early bronze age and early middle bronze age; palstaves of the middle bronze age and socketed axes of the late bronze age. Other rare types, such as winged axes, have been excluded. Although without detailed examination of the individual artifacts, this generalised division is not perfect, some palstaves being late bronze age in date and some socketed axes being middle bronze age, it is felt the overall pattern is probably acceptable in general terms although a notable constraint is that axes undoubtedly did not serve a single function (chapter 6.9b). With regards to the problems presented by the dating of some of the axes, particularly late palstaves, two points should be emphasised. Firstly, although palstaves form the main axe type in use in the late bronze age in north-west England (cf Burgess 1969, 21), in East Anglia their use rapidly becomes infrequent after the middle bronze age (or after LBA 1 following O'Connor 1980). Despite no general figures being available, an examination of the region's late bronze age hoards (excluding Isleham - see below for reasons) shows a total of 1,223 axes, only 2.7% (or 33) of which are palstaves. This compares well with the likely error for socketed axes which, based on the middle bronze age forms amongst those from north-west Suffolk (catalogue 1) amounts to 2.2% (2) of the sample of 90 datable examples.

The resulting mapped distributions (maps 30-33) reflect, as might be expected, a numerical chronological increase from flat axes through flanged axes to palstaves although, mainly as a result of increased hoarding, a slight decrease in stray finds occurs with socketed axes.

The distribution patterns compare remarkable well. Although flat and flanged axes are relatively sparsely represented and both are particularly rare in Cambridgeshire, due primarily to the state of the SMR, their recorded findspots are, like those for palstaves and socketed axes, well dispersed over the whole landscape of East Anglia. The expected concentration of axes along the south-eastern fen edges is surprisingly slight.

It has been less easy to extract bladed 'weapons' as no early bronze age forms are as easily labelled under a martial category as the rapiers and swords typical of the middle and late bronze ages. As it seems likely that these types were, at least partially, prestigious, comparison has been made with the tanged daggers and halberds of the early bronze age. This does present a slight potential bias in that tanged daggers occasionally occur as grave goods, although fortunately not as frequently in East Anglia as would appear to be the case in other areas of Britain (chapters 4.4, 4.6 and 6.12f). Again restrictions occur in that without examination it has not been possible to identify many of the 'tanged knives' or 'tanged daggers' as early bronze age with forms of tanged knives also occurring in middle and late bronze age contexts. For this reason they are likely to be under-represented.

With only eight early bronze age daggers and halberds plotted, no significance can be placed on their distribution. Problems also relate to the distributions of daggers/dirks, rapiers and swords, which, being both large and generally re-usable, are only likely to survive in restricted locations where they are likely to be preserved. As a

result, the plots (maps 36 and 37) reveal a comparatively dense fen and fen edge concentration of stray finds. Other finds, however, particularly of swords in late bronze age hoards, reflect the wider dispersal of items as seen with the axes (above) and support the case for a biased distribution as a result of post bronze age agricultural practices (chapter 9.6 and 7.9d).

The division of artifacts into tools, weapons and ornaments is more difficult to subdivide into periods in all instances, and for this reason comparisons are between functional rather than chronological divisions. This pre-supposes the use of objects, which is in its own right unsatisfactory, but bearing this in mind, does allow some generalised comparisons of the three main artifact groups.

The distribution patterns of tools (map 27), weapons (map 28) and ornaments (map 29) compare well. All are widespread. Stray finds of weapons are more marked on the south-western fen edges although this is likely to be mainly as a result of variable land usage subsequent to the bronze age (see above and sections 5f, and 1 below). Ornaments are the only type which may show some variation in that no obvious concentrations occur either in the fen edges or in south-east Suffolk to compare with those of tools and weapons. As only 35 ornament findspots are plotted however, this is likely to be of little significance.

A brief examination of individual artifact types follows.

5 a Axes

The most common bronze implement type represented amongst single finds, as might be expected, are the axeheads, with a total of at least 805.

This represents 36.3% of the total of 2,215(+) axes (including those from 151 hoards) and 55.9% of all single finds. Only 14.5% of hoarded items are axes, due to the low count (6) in the massive Isleham hoard (Cambridgeshire, unnumbered), although if this is excluded, axes consist of 50.4% of hoarded finds, which is numerically consistent with the proportion of single finds, 55.9%. It should be noted that axes represent a markedly higher proportion of the stray finds listed in the background catalogue for northern East Anglia than in the intensive survey area of north-west Suffolk, where only 41% of the total are axes (chapter 6.9b). No close examination of individual implements has been attempted in the majority of cases. Nonetheless a wide and comprehensive range of axes has been identified (cf chapter 6.9b), from some of the earliest broad butted copper (eg catalogue 1.12 or N8446) to late 'Sompting' (eg catalogue 1.125) types.

Whilst no detailed analysis is possible here, some features of the overall assemblage are notable, for example the scarcity of winged (4 single, 8 hoarded) and 'Armorican' (11 single axes, a few others are known but not identified/listed in the SMRs) forms suggests that insular metalworking continues to dominate during the late bronze age, following the tradition established by the late early bronze age ('Arreton tradition') and middle bronze age (cf Rowlands 1976, 39-40, 119 and 137) East Anglian industries. The increased importance of hoarding is clearly shown by the decreasing proportion of axes occurring as stray

finds during the bronze age; 95.9% of flat axes, 72.0% of flanged axes, 63.4% of palstaves and only 19.9% of socketed axes.

The distributions (also see part 5 above) of flat axes (map 30), flanged axes (map 31), palstaves (map 32), and socketed axes (map 33, including socketed adzes), although differing in frequency of findspots, show a general consistency in patterning. The relative lack of flat axes, and to a lesser extent flanged axes, from most of Cambridgeshire and central Suffolk, is possibly a reflection more of poor recording and their general scarcity than their genuine distribution (note unmapped finds are recorded from these areas - catalogue 2). Axes of all types tend to cluster along the south-eastern fen edges, however the concentration is again (see above) remarkably slight. Only flat axes appear to be concentrated along the fen edges (circa 40% of plotted findspots) to a significant enough degree to suggest a possible deliberate location based settlement pattern.

5 b Tracers/awls

Fifty four tracers/awls have been recorded as stray finds and a further seven in hoards. This group of implements is, for various reasons, one of the more difficult to discuss. Their function and date are usually uncertain (see chapter 6.9c) and the small size of the majority make the finds the most likely to be heavily under-represented. This has been amply demonstrated both by the failure to observe them during hand excavation of a bronze age settlement site (chapter 9.7) and by the high proportion of tracers/awls (12.2% of stray finds), recorded from the north-west Suffolk intensive survey area (chapter 6). They are,

potentially, one of the more common artifact types and the relatively large number of finds of these small objects reflects this. The number in hoards, 7 (or 11.5%), is remarkably low, flat axes (4.1% hoarded) and, curiously, side looped spearheads (only 2.9% hoarded) being the only other common tool types with proportionately less in hoards.

It is clear that some of the tracers/awls are early bronze age. Contextually dated examples confirm this, and the possibility of deliberate separation (such as with side looped spearheads?) may have been a further reason for their exclusion from hoards. In this respect the inclusion of an awl amongst a group of other rarely hoarded items, namely a complete sword, rapier and dirk (S8896) may be significant. However the most likely reason is bound to be their small size and low re-smelting value. Nonetheless the lack of awls in the Isleham hoard, noted for its high proportion of small items (circa 7000 items of 13 grammes average weight) is surprising. Their use is occasionally evident on some already scrapped items, such as a sword blade fragment and socketed axe fragments in the Levington hoard, Suffolk (S03832) although, again, no actual tracers/awls were found in the hoard.

Although beset with these problems, tracers/awls are some of the more interesting objects in that they are, due to their small size, most likely to have been lost or left on settlement or workshop sites. The general lack of interest in them, together with identification difficulties, compounds their promise as indicators to key sites. Now, for the first time, the tracers/awls are beginning to be located by the use of metal detectors. Although amounting to only 3.75% of all listed

single finds, about 10% of the bronze age finds metal detected from Suffolk since 1970 (catalogue 5, chapter 9.7d) have been tracers/awls, a figure which compares well with the 12.2% in the intensive survey area.

The distribution of tracers/awls (map 34) is, due to their under-representation, very biased towards the north-west Suffolk survey area where 53.6% (15) of the 28 recorded findspots occur. The other 13 findspots are probably too few to make useful comment although the pattern appears to be dispersed similarly to that of the axes and other artifact types listed below.

5 c Gouges

Of the 56 gouges recorded, only ten (17.9%) are listed as stray finds, four with a known findspot. Although 12 fragments are present in the Isleham hoard, they are not otherwise generally a feature of Wilburton phase hoards. They occur relatively commonly in post Wilburton hoards of the late bronze age, being components in 22 separate instances.

Nonetheless their absence from some of the larger hoards supports a case for specialised use. All hoards including gouges also include socketed axes. Similarly all hoards with sickles, and all except one with hammers and razors, include gouges. An interesting feature of the distribution of gouge hoards is their distance apart. In the majority of instances they are separated by a 18-22 km or 36-44 km gap (map 34). Again this supports specialist production networks, the examination of which should prove worthy of further research.

5 d Chisels/Leather working knives

Sixty-eight items are categorised as chisels/leather working knives, 40 stray finds and 28 from 20 hoards. Some of the broad bladed tanged or socketed forms (eg figs 66 and 67) are more appropriately termed leather working knives (O'Connor 1980, 137-8) although it has only been possible to differentiate those items examined (catalogue 1.285-301), most other pieces being loosely described as 'chisels'. The wide variety of forms and sizes is a clear indication of the varied usage of this large group of tools. Some of the 'chisels' take the form of narrow palstaves (eg fig 67.297). Others that fall into this group are probably listed as palstaves whilst small flat or flanged (fig 23.19 and 23) and socketed axes (figs 34.91 and 35.94-6) might also be more aptly described as 'chisels', although they have usually been categorised, loosely, as axes. In view of the lack of accurate descriptions and the variety of form no detailed analyses of these tools or their distribution (map 34) is attempted.

5 e Halberds

Of the four halberds recorded from East Anglia only one (S8802) is accurately provenanced. All are stray finds excepting the example dredged from the Wissey and considered to be part of the late bronze age Stoke Ferry hoard (N4725).

5 f Knives, daggers, dirks and rapiers

Some of the earliest pieces of metalwork in East Anglia are the unriveted tanged copper daggers from Lakenheath (S9585), Hundon/Clare (S5967) and Rickinghall Inferior (S11744), a 'knife-dagger' from Stuston

(S0845) and possibly a small example from Icklingham (S10343). An example from a barrow at Barnack (C0036) was associated with a beaker as was a later riveted example from Barton Bendish (details not listed in SMR but N4492 according to Lawson 1984, 153). Other rivetted examples are recorded from Grimston Heath (N2334), Cranwich (N4972, decorated knife/dagger) and Littlington (C8129).

Triangular bronze knives/daggers supersede the tanged forms in the early bronze age. Four are reported from Norfolk (Lawson 1984, 153), three from barrows, at Cockley Clay (N2688) and Little Cressingham (2) (N5051), and the forth as a surface find from Methwold (N5245).

Later ogival daggers and knife-daggers occur, one in a barrow burial from Chippenham (C7508) and others from Methwold (N4879), Lakenheath (S9728) and Undley (S, Catalogue 1.207, decorated). At the end of the early bronze age 'Arreton' form daggers are found, such as those from Southery (N4458) and near Cambridge (C number unknown, Lawson 1984, 154). This tradition is soon submerged by a flourishing metalworking industry in the traditional middle bronze age, when knives, dirks/daggers and rapiers became relatively common. The development from the early bronze age traditions is demonstrated by the difficulty in categorising some of the items as of late early bronze age or early middle bronze age date, for example the daggers from West Row Fen (catalogue 1.187 and 188; cf Trump 1968, 214) which are reminiscent of some of the ogival daggers described above.

The subdivision of knives (mostly double edged), daggers, dirks and rapiers is problematic and subjective (see chapter 6.9d). It is dependent on a number of factors, particularly completeness and accurate identification. The sites and monuments records and surviving accounts frequently describe items as daggers which in fact are knives (eg S8869, S8941). Indeed the knives listed by Rowlands (1976, 355-358) are totally absent from the Cambridgeshire SMR, and in Norfolk they are described as daggers. The problem is compounded by the frequency of incomplete finds; blade and butt fragments are often identical in knife, dirk and rapier fragments.

Despite occasional examples of knives and daggers being manufactured from the remains of swords (eg N1955, S2614, S3028) and rapiers (eg N2530, N19143, N16398) most knives were originally manufactured in their surviving form. Examples occur of early, middle and late bronze age date. Knives are clearly an important, and under-discussed, tool type. Their frequency is heavily under estimated for the reasons cited above. Ninety-four are listed in late bronze age hoards yet only 25 definite examples, spanning the bronze age, are listed as stray finds. Although a major factor, the causes are unlikely to be due to mis-identification alone. It is suggested below (chapter 9.6 and 9.7) that knives (and complete spearheads) are more likely to have been re-utilised by post bronze age communities than any other artifact types. They are also amongst the least likely of items to be discarded by contemporary communities, as is testified by the extremely worn and damaged condition of those that have survived. The dearth of knives away from the fen edges, apart from within hoards, where objects were deliberately

concealed and buried, is marked. On the fen edges, where the metalwork is considered to be relatively representative of the bronze age assemblages, the concentration of knives is particularly noticeable (map 35) and strongly supports this suggestion.

Knives are a common tool type, only axes being more numerous. They are particularly important as they transpose the supposed model of inter-regional weapon producing specialists (cf Rowlands 1976, 121-2, 137-142, 167-8; Northover 1977, 64 and 1982b, 51) and regionalised tool production (above, part 3). Consequentially more detailed analysis of the existing metalwork is needed before metalworking organisation can be adequately explained. This also raises the problem of defining 'daggers' and 'dirks' (chapter 6.9d and cf Rowlands 1976, 65) as either 'tools' or 'weapons' as many lie between knives and rapiers or swords. Some of the shorter examples only differ from knives in being ogival rather than having rounded blade tips. A pointed tip would usually be more useful in a tool and there seems little reason to identify the shorter ogival daggers as weapons. Indeed, no clear division is, or ever was, likely to have existed.

Due to the difficulty in separating knives, daggers, dirks and rapiers it has not been possible to isolate counts accurately although a minimum of 119 (25 stray finds, 94 hoarded) knives, 51 (46 stray finds and 5 hoarded) daggers/dirks and 87 (68 stray finds and 19 hoarded) rapiers are recorded within a total of 277, 158 (57%) of which were stray finds. From this body of information an insight into the development of local metalworking can be gained. Despite the apparent occurrence of Irish and

continentally inspired objects (cf Rowlands 1976, 67) actual imports are difficult to identify, and most claimed instances turn out to be cases of false provenances or discarded or lost collectors' items.

The difficulty in classifying many of the transitional bladed weapons, particularly daggers and swords, exacerbates the problem of identifying the extent and origins of the influences. Despite accepting external contact the East Anglian evidence does show a remarkable consistent development. The early bronze age beginnings are outlined above. The typological transition to typical middle bronze age forms of daggers and rapiers is clearly attested (compare figs 48.207 and 187 and figs 45.183 and 189) in the region, as is the development of experimental knives and swords (chapter 6.9d; part 3 above and Lawson 1979a, 53-5). Without accurate dating it is impossible to clarify whether some of these early swords (eg the Eriswell hoard sword, catalogue 1.H2a, fig 2, and the Methwold sword, N4875, claimed as either Rixheim, rod-tanged, Monza or Rixheim-Monza experimental types; cf O'Connor 1980, 114 and 357) originated locally or were inspired by continental examples. The evidence certainly indicates local production of a variety of forms with a confusing range of influences across Europe (cf O'Connor 1980, 114-5).

The distribution of daggers, dirks and rapiers (map 36) shows a marked concentration, due to the intensive survey of north-west Suffolk, on the south-eastern fen edges. Disregarding this group, due to the obvious bias it creates, no marked concentrations occur, other than might be expected in view of the better preservation of finds of this nature in the fenland situation (chapter 9.1 and 9.6). Some sizable voids occur

for example in north-west Norfolk and across most of the Suffolk and south Norfolk claylands although these may not be significant, especially in view of the likely results of long term arable agriculture, particularly in the latter region (ibid).

5 g Swords

Although, like rapiers, sword fragments can be difficult to identify accurately their distinct hilts and generally broader blade forms are usually (although see S9823, catalogue 1.227, 228 and 234, figs 53 and 54) sufficiently informative to overcome this problem. Despite only 39 swords being recorded as stray finds, 426 (mostly fragmentary) more are from hoards. This highlights two problems. Firstly, being mostly of Wilburton phase or later date (although note the relatively large proportion of LMBA/LBA 1 transitional swords) the hoarded items are frequently part of 'founders hoards' and deliberately broken. Depending on the size of the sword they are usually fragmented into between six and ten pieces. This results in a misleadingly high count. Despite this, if the 296 fragments from the atypical Isleham hoard (see hoards below) were excluded, the remaining count of 169 would accord well with expected numerical trends (parts 7 and 10 below).

The second problem concerns the proportion of sword remains in hoards, 91.6% of the total of 465. Again, if the Isleham material is excluded, the proportion of swords in hoards, 76.9%, is consistent with the 77.3% for gouges, the 80.1% for socketed axes and the 82.5% for pegged spearheads (below). This correlation of major artifact types suggests the proportions of swords to gouges, spearheads and socketed axes, as

represented in both hoards and stray finds, should lie at about a 1 : 0.3 : 1.7 : 8.7 ratio. Thus these four principal artifact types which are identifiable as being late bronze age in date can be considered to consist of 74.7% socketed axes, 14.5% pegged spearheads, 8.6% swords and 2.2% gouges in East Anglia. This also raises the issue of disposal practices. It would appear from the above figures that all of the principal implement types, both tools and weapons were collected and hoarded in similar, between 76.9% and 82.5%, proportions. Therefore swords do not appear to have been given special status, at least in terms of their disposal.

Another factor, not usually considered but highly relevant to swords, as well as large spearheads and rapiers, is the difficulty presented in abandoning the objects. Disregarding any metallic value (chapter 12.5b and 13.3a and note an average sword weighs less than two average palstaves or three average socketed axes) these items could not, like the smaller and less dangerous items, be left laying on settlement sites or thrown onto middens without presenting a considerable danger to groups likely to have substantial juvenile populations. The evidence for removal of hilts from swords and rapiers (cf Coombs 1992, 504) and shafts from many of the spearheads (cf Bradley 1990, 24) may be a result of this concern.

Deliberate burial, deposition or destruction would have been necessary.

In the late bronze age this could normally be achieved by entering the network of founders hoards. Interestingly, sword fragments are now becoming relatively common amongst stray finds and support the theory of

deliberate destruction. This could also account for the rare finds from meres, rivers and other wet places, where recovery might not be expected, and for the damage, such as hilt removal, which objects in these locations have often received.

The late bronze age model differs from that of the middle bronze age. No scrap metal trade existed in the earlier period, but other differences also occur. The consistent proportions of hoarded items in the late bronze age are not apparent in the earlier assemblages. Although the proportion of palstaves hoarded (32.4% excluding the Isleham hoard, 20.2% if also excluding the equally atypical Stibbard hoard) is high this is liable to be a result of the number (61+) of late bronze age palstaves in late bronze age hoards (28 in the Isleham hoard alone). Together with this are differences between middle and late bronze age production practices, which will cause statistical variation in different implement types that will not occur in the same way in hoards of scrap. However the extremely low count of hoarded side looped spearheads, only 2.9%, and the low proportion of daggers/dirks (as well as middle bronze age knives), circa 9.7% compared to the 14.3% (or 36.8% including the Stibbard hoard) of hoarded basal looped spearheads, and circa 20% of rapiers, suggest other factors might be considered. Although there may be a chronological element, the most likely cause, suggested by the personal nature of many of the middle bronze age hoards, is that they were either hidden (presumably for security and/or to remove the larger, dangerous items from circulation, as suggested for swords above) or are a form of grave goods. The relationship of the Eriswell hoard to a burnt flint patch (Briscoe and Furness 1955) is

suggestive in respect of the latter and the presumed usual practice of cremation during the later bronze age. Another possibility is that some of these small hoards represent personal caches of objects that might not have been in regular use which were deposited in shallow features/containers within individual houses. Such a model would, again, accord well with an association with a burnt flint patch/hearth.

The distribution of the 22 plotted stray finds of swords and those in 31 plotted hoards is discussed above (part five).

5 h Chapes

Only two chapes (N7734 and catalogue 1.318), neither of which have accurate findspots, are recorded as stray finds. 1,781 are listed in hoards, 1764 fragments coming from the Isleham hoard alone. Again it is the Isleham hoard that is clearly alien to the region in which only 19 chapes are otherwise known. The hoarded proportion of this smaller sample, 89.5%, is not too far removed from the average 80% figure for other late bronze age finds listed above, especially in view of the small sample and likely difficulty in identifying and dating chapes amongst localised collections of stray finds.

5 i Spearheads

The total of 216 stray finds of spearheads represents 43.4% of the 498 recorded (including those from hoards, but only 23.5% of the 918(+) spearheads inclusive of the Isleham hoard). 15% of stray finds, 10.3% of hoarded finds (excluding Isleham) and 11.9% of all finds (excluding Isleham) are spearheads. However within these figures a wide variation

in form and deposition practice separates the different types. Although a few examples of tanged or socketed and pegged spearheads of late early bronze age Arretton form occur (cf Needham 1979b, 20-21, 31), the great majority are of middle and late bronze age date, with at least 95 others being unclassified. As expected most, 82.5% (excluding the Isleham hoard), of the late bronze age pegged spearheads occur in hoards. Both barbed (5) and lunate spearheads are uncommon (though note Coombs 1974) in the region (several lunate spearhead fragments occur in the Isleham and Wilburton hoards), although the fragmentary nature of many of the unclassified and pegged forms may be parts from these types.

However, as stated above (parts 5b and 5g), the most significant variation is to be found in the dispersal of the middle bronze age spearheads. The four hoarded basal looped spearheads, representing 14.3% of the total of 28 (excluding the ten spearheads in the atypical Stibbard hoard) contrasts markedly with only two, possible, hoarded side looped spearheads which amount to only 2.9% of the 68 listed. Both hoards are somewhat dubious, the spearhead from Carbrooke (N8763) is not a definite association (with a palstave) and the 'hoard' from Grunty Fen, Cambridgeshire (listed as a side looped spearhead, two palstaves and 'other items' by Rowlands 1976, 54 and 226), found prior to 1880, is merely listed as two flanged axes in the Cambridgeshire Sites and Monuments Record (C6196). Whether or not these two examples were from hoards, it is apparent that major differences occur in hoarding practices for side looped and basal looped spearheads. The rarity of hoards prior to the late middle bronze age in East Anglia may be the cause if we accept that side looped spearheads predate this phase.

Rowlands, however, considers it unlikely that side looped spearheads were produced in southern England prior to the middle phase of the middle bronze age, the only early examples being kite shaped spearheads derived from the Irish industry, and suggests that side looped forms may have continued in use into the late bronze age (1976, 51-5). Nonetheless the lack of side looped spearheads in late bronze age hoards suggests this is unlikely in East Anglia. If Rowlands is correct in assuming their use in the late middle bronze age, as occasional associations with ornament horizon material in southern Britain would suggest, and if this also applies to East Anglia, then their exclusion from hoards must have been deliberate, though the reason is unknown. Certainly no other implement type current in the middle and late bronze age is excluded from hoards to such an extent, although, interestingly, other contemporary middle bronze age types likely to be in common use, namely knives, daggers and dirks, are also relatively rarely hoarded.

Alongside spearheads should be a consideration of arrowheads. Although these are discussed elsewhere (chapters 6.9h and 11.3) it can be questioned as to whether some of the small 'spearheads' that feature in some hoards would be more accurately described as arrowheads.

The distribution of spearheads (map 38) displays a notable concentration, especially of complete (?) specimens, along the south-eastern fen edges. As noted above (part 5f) this concurs with the pattern of bladed implements, particularly knives. The localisation is likely to be a result of recent agricultural history and is discussed in

more detail in chapter nine. Otherwise the distribution, as indicated by fragmentary stray finds and hoards, appears to be widespread.

5 j Ferrules

Ferrules are another rare type in East Anglia. Only one, of pegged tubular dished form (S8452, fig 70.279) is recorded as a stray find. Although another 57 are listed in hoards, 46 of these are from the Isleham hoard. The remaining 11 hoarded ferrules form 91.7% of the total, an abnormally high proportion, although the low count reduces the significance of this. The removal of the six ferrules in the Wilburton hoard would effectively reduce the hoarded percentage to 83.3%, and to within the range of proportions shown by other late bronze age artifact types in East Anglia.

In view of the comparative frequency of spearheads it is clear that in East Anglia ferrules either were not normally used or served some function other than butts for spear shafts.

5 k Sickles

Of the 17 (or 18) sickles reported from northern East Anglia six (or seven, C8218 is described as an artifact with a curved blade) are recorded as stray finds. One of these (N9569) is thought to be a collectors import from Ireland. The 11 hoarded sickles consist of seven from the Isleham hoard and four from three other hoards, including the well known late middle bronze age Downham Fen hoard sickle (N4231). Excluding the presumed modern import and the Isleham hoard finds 44.4%

of the remaining 9 sickles are hoarded, a proportion reflecting a mixture of late bronze age and earlier specimens, although in view of the limited numbers involved little weight need be attached to this observation.

5 1 Ornaments

Although not numerically significant, the 82 (excluding 25 in the Isleham hoard) ornaments listed, representing only 2% of the bronze age metalwork, are in some respects one of the more important classes of metal finds (note some items, eg N3961 and catalogue 1.314 and 315 need not necessarily be bronze age). This is particularly true of gold work which, with the exception of its use for decorative fittings or artifacts, such as the dagger hilt mounting and associated boxes from Little Cressingham (N5051) and the 18 sheet gold wrist guard caps from Barnack (C0036) is totally restricted to ornaments. It should be noted that not all gold ornaments are listed in the SMRs, and therefore are not discussed here. These include some important finds such as the Granta Fen hoard (Taylor 1980, 57 and 78), and the Ickleton hoard (ibid. 78), both from Cambridgeshire (for Norfolk see Lawson 1984, 165). It is clear that gold items, and consequently ornaments, were amongst the most highly valued objects of the bronze age. Because of its continued value gold was usually re-circulated and only a small proportion would be likely to survive in the archaeological record. Several of the 'stray finds', such as the foil covered beads from Bircham (N1705) and the Little Cressingham items listed above, were actually deliberately deposited grave goods, and therefore would probably be more aptly included amongst the hoarded material. Of the 31 gold items listed, the

beads from Bircham and wrist guard caps from Barnack, being composite parts of single objects are counted as one item each, 24 (77.4%) are ornaments, although as stated above the gold items in the Little Cressingham (5) and Barnack (1) barrow burials are also primarily decorative. Only one object, an 'ingot' of possible bronze age date, falls outside the ornamental nature of the finds.

All of the seven early bronze age items, amounting to 22.6% of the total, derived from (three) barrow burials. The dating of the two decorated strips from Geldeston is problematic but the other 22 pieces are all of middle or late bronze age date. Thirteen (59.1%) come from six hoards, the remaining nine (29.0%) apparently being stray finds (no details exist for three of these finds, two ribbon torcs C6399 and N11150, and a bar twisted ring S10352). It is noticeable that a higher proportion, 87.5%, of the middle bronze age gold was hoarded than the 55.6% of the late bronze age. However it is felt this is likely to be partially a result of the recent increase in single finds of small pieces of metalwork, for example late bronze age ring-money and lock rings, occurring as a result of metal detecting.

This also raises the issue of the proportion of gold finds that are actually reported. From early accounts, hunting 'for gold and treasure' by looting barrows has taken place in East Anglia from at least late medieval times (cf Martin 1981, 67). That the finds included gold has been amply demonstrated by the recent Sutton Hoo excavations (eg Carver 1989 and 1991, 2), though, in this instance, they were not bronze age. It is also clear from surviving accounts that gold discoveries were

likely to have been melted down (eg Bunbury 1834). Despite the law of treasure trove existing today in order to protect this heritage it is, to my personal knowledge, both inappropriate and failing miserably in its task. Indeed this has probably always been the case, and although today material is not being destroyed (melted down) to the same extent but merely sold, without provenances, in the international antiquities market, the problem is all the greater. Deliberate looting is no longer restricted to barrows and the mass of information lost through the relatively frequent discovery and illicit disposal (ie, without being declared to the Coroner) of small stray finds, which would not generally be protected by treasure trove law anyway, is a major problem concerning all post neolithic periods of archaeology, especially bronze age studies. The situation is amply demonstrated by recent discoveries of bronze age gold work in East Anglia (chapter 13.1). It is, therefore, sadly the case that any statistical examination of gold work, and ornaments, will be seriously affected by these activities and, as a consequence, reported finds are unlikely to offer a valid representative sample.

Other important gold finds, not listed in the SMRs at the time of this research, for example a 'lock-ring' from Wimblington, Cambridgeshire (Pendleton 1987b), a late middle bronze age hoard including a torc from Thetford, Norfolk (Ron Morley, pers comm, 1991) and a bracelet terminal from south-east Suffolk or north-east Essex (Paul Sealey, pers comm, 1992) are also known but are not discussed further here. The same is true of a major hoard including armlets, a waist torc and two 'lock-rings' (S8842) which probably originate in Essex, despite the 'lock-

rings' having been published as coming from the south of Suffolk (Edwardson 1968, plate VI).

Most earlier gold finds are discussed and analysed in Taylor (1980) and do not need to be further examined in this work. Similarly detailed discussion of individual bronze ornaments is not intended although a useful discussion of the middle bronze age evidence is found in Lawson (1979) and of the middle and late bronze age metalwork by Lawson in 1984. Further research is now in progress on bronze age ornaments by Mrs Sophia Hankinson at Nottingham University.

The distribution of ornaments (map 29) has been seen to centre in west Norfolk during the later middle bronze age (Rowlands 1976, 121-2; Lawson 1984, 162-3). However this may well be an over-simplification.

Although the majority of hoarded finds still derive from the four (or five if the Thetford hoard noted above is included) Norfolk hoards, four late middle bronze age hoards containing ornaments are now also known from Suffolk, from Boyton (S2641, not part of the early bronze age hoard from Poslingford as stated by Lawson 1984, 167), Bury St Edmunds (S6735); Great Barton (S6873) and Thurston (S6891) as well as the Grunty Fen (C9785), and Granta Fen, Stretham (not in SMR) hoards from Cambridgeshire.

Only nine single finds of ornaments of middle bronze age date are reasonably provenanced. Their general distribution is therefore not discussed although gold finds are examined in more detail in chapter

12.5c. At least two later contexts contain middle bronze age ornaments, torcs, from a late bronze age hoard (C5452) and a Roman pit (C1751).

Fewer securely dated late bronze age ornaments are recorded. Only eight findspots are recorded, for four hoards (including Isleham) and four single finds. Three of the hoards came from within 20 kilometres in west Norfolk and the four stray finds were found within a small area on the edges of the fens in south-west Norfolk and north-west Suffolk (map 29). Despite these apparent groupings the evidence of ornaments without detailed provenances (catalogue 2) demonstrates a wider scatter similar to that of other implement types.

Unfortunately, for the reasons cited above and due to the difficulty finding (they are frequently small), identifying and dating some of the less obvious bronze ornaments, they are likely to be seriously under represented proportionately amongst collections consisting largely of unstratified stray finds.

5 ■ Cauldrons/buckets

Another rare group, cauldrons and buckets occur mostly in hoards. The single stray find consists of a rivetted sheet fragment, from amongst a surface scatter of worked and burnt flints, from Feltwell (N5191). The only association of a 'hoard' containing an almost complete cauldron, also from Feltwell (N5191) was with a flesh hook. Associations of cauldrons/sheet metalwork with flesh hooks are comparatively common (also Isleham, Eaton N9550 and Eriswell S8896). The cauldrons from Feltwell (N5191), the Isleham hoard, and the Eriswell hoard (S8896) are

all Class A cauldrons. They have recently been more fully discussed, listed and illustrated by Gerloff (1986).

A total of 28 cauldron and sheet metal fragments are listed from six hoards in northern East Anglia, including the Feltwell cauldron and flesh hook, although if the 19 from the Isleham hoard are excluded only ten cauldrons and sheet metal vessels are known. It is likely that the fine structure of sheet metalwork will render its rapid destruction in ploughsoil, and probably accounts for its rarity amongst stray finds in East Anglia. Dating problems are also posed by the discovery of fragments of sheet metal. Most, even if collected and recorded, will be unidentified and undated and therefore will not normally be located in searches specifying 'bronze age', 'cauldron' or 'bucket' as key words. Nonetheless, if the association of flesh hooks and cauldrons is accepted, given the comparable rarity of the more hardy flesh hooks, we must accept the rarity as genuine.

The value and contexts of cauldrons are discussed later in this work (chapter 12.5c).

5 n Shields

Bronze shields, along with some of the larger weapon forms and sheet vessels, are often grouped together as representing a distinct class of 'prestige' implements. This is partially due to the difficulty and time taken in their manufacture, their rarity and the experimental work of Coles (1962, 184-5) which appeared to substantiate the belief that these were primarily items of display. The latter of these points is now

slightly more disputable with the discovery of bronze shields with clear spearhead damage and the fact that Coles used a copper, rather than bronze, shield in his experiment. This topic, together with the whole concept of prestige implements, is discussed more fully in chapters 10 and 12.

It is certainly true that metal shields are rare in East Anglia. Being principally of sheet metal, like cauldrons, it is likely that few will survive in the agricultural landscape of East Anglia unless buried or protected by subsequent masking such as peat growth or river silts. The single stray find from Sutton (N8318) was protected by seven feet of peat. Significantly the shield came from within the underlying white sand rather than the peat.

A possible 15 other shields are recorded from three other contexts, all hoards, although the principal of these, from Sutton Staithe (N8217) is reported as about a dozen 'bronze dishes' found beneath a riverside slipway and their identification as shields must remain dubious. The remaining three shields, two from Coveney Fen (C6020) and one, possibly associated with a basal looped spearhead, from Langwood Fen, Chatteris (C3697), were protected by peat deposits and were said to have been found lying on the underlying clay. The contexts of these shields is more fully discussed in chapter 12.5c and catalogue 8.

5 o Rings

A variety of miscellaneous annular loops are represented in a number of late bronze age hoards. They do not appear to be decorative finger

rings, or particularly ornamental, and several are probably scabbard (cf Coombs 1975, 66) or harness fittings although their function is usually unknown.

Being small, they are difficult to identify, and date as bronze age, and only five stray finds are listed, some of these somewhat tentatively. The single stray find listed from Cambridgeshire (C6987) is important in that it was excavated from the bronze age causeway at Little Thetford in 1935 (Lethbridge 1935), a location which has also produced several other stray finds of bronze age metalwork on the field surface. A further bronze 'ring' was excavated by Basil Brown in about 1946, from a 'pit' at Fakenham Magna (S2492) and was apparently in association with beaker pottery, a flint dagger and other worked flints. Fourteen hoards are known to contain 31 or 32 'rings' (78% of the total) and an additional unknown number are present in the Isleham hoard.

Their distribution is widespread. Without detailed assessment of these artifacts their significance can not be determined.

5 p Hammers

Hammers are known from both middle and, more commonly, late bronze age contexts. Nineteen are known from northern East Anglia (map 39), four stray finds and 15 (78.9%) from hoards. Ten of these, however, are from the Isleham hoard. The remaining hoarded proportion, 55.6%, if corresponding to the hoarded proportions of other artifacts, suggests that the sample is a mixture of middle and late bronze age hammers. Hammers are likely to be metalworkers' tools, and in late bronze age

contexts would be expected in hoards. The 44.4%, occurring as stray finds, accords well with a high proportion being of MBA date when, despite East Anglia being a production centre, metalworking appears to be largely demand led, and of a localised nature (cf Rowlands 1976) and the sites difficult to identify. The tanged, rather than socketed, example from Beechamwell (N4533) would tend to confirm such a middle bronze age date.

5 q 'Ingots'

Imported ingot material was clearly of importance in a metal-using society in an area without resources such as East Anglia. The recognition of ore-material is notoriously difficult (cf Charles 1975) and only when in the form of ingots is it generally identifiable, although a possible fragment of ore has been identified in the Thorndon hoard II (S4061) along with possible evidence for smelting or remelting/refining of ingot material in the form of quantities of variable quality 'cake' or dross.

Some ingots may have taken the form of artifacts, for example the lead Armorican 'ingot axes' of the final bronze age. Indeed it is also possible that bronze itself, rather than its constituent elements, was imported into the region, as may be the case with the untooled, small and relatively uniformly weighted Stibbard type axes (see section 7 below and chapter 6.9a), and the ribbed plate scrap in the Isleham hoard.

By the late bronze age the need for source material, together with increased demand, was being met partially by the careful collection of obsolete and scrapped stock. However with continued demand and a loss of a minimum of 20% of the bronze (the proportion of metal not hoarded and surviving as stray finds) through loss and use the need to import further scrap or ingots remained. Although it appears that imported scrap was utilised in the Wilburton period, from the following Ewart Park phase, ingots of traditional, usually plano-convex or bun-shaped forms, were used. The copper ingots probably also helped maintain, where necessary, the standard of the metal which frequently included large additions of lead in southern England. Most ingots, on analysis, are of pure copper although lead is also known from at least three hoards (N12872, N17472 and S unnumbered catalogue 1.H14), 'some small pieces of pewter' from another (S6909) and a (bronze age?) gold ingot from the Horning hoard (N8446).

Unfortunately copper ingots are difficult to identify from written or verbal accounts only, especially when they usually form elements of hoards in which scrapped material was frequently melted down. In addition to obvious residues of casting, such as sprue cap wasters/jets, quantities of 'rough metal', 'cake', 'irregular lumps of bronze or copper', 'fused metal' or 'ingots' are usually described. It has not been possible to examine the majority of this material, much less to analyse it, and the identification of ingot material must, therefore, remain ambiguous. Bearing this in mind 'ingots' appear to be reasonably common and widespread (map 39). Although only 18 are identified as stray finds, this is largely due to the difficulty in giving a date to

the, usually fragmented, remains and the rarity with which they are collected. Unfortunately a common practice amongst dealers in the metal detecting trade is to amass quantities of such finds and other low valued metal for their scrap value alone and, one suspects, occasionally for their use in utilizing 'repair/reconstruction' of damaged finds. The latter is certainly practised with higher valued finds made of gold and silver.

Complete ingots occasionally occur, for example the plano-convex example from Barnham (S7067) and the possible example, described as a 'pot shaped bronze slag' from Icklingham (S10284). Unfortunately, most accounts do not give detailed descriptions and it is often difficult to identify whether the 'cake' is complete or only a fragmented portion of the whole. At least 323 (mainly fragmented) 'ingots' are listed from 61 hoards, representing 94.7% of the total. In addition to this 2,624 fragments of ribbed plate metal are recorded from the Isleham hoard (O'Connor 1980, 367). 'Ingots' form 1.3% of all stray finds, 11.8% of hoarded items and 8.2% of the total (all excluding the Isleham hoard).

Without being accurately identified as ingots the significance of their distribution (map 39) cannot be recognised, although, if the listed items are all true ingots, they are probably best considered along with hoards, to which they constitute an element in over 40% of cases.

5 r Miscellaneous

A number of rare or difficult to classify types are included within a miscellaneous category. Three rarer types that have not been examined

above are briefly discussed here, razors, anvils and moulds. Of these razors are the most frequent, nine to ten (plus three in the Isleham hoard) being listed, four from separate late bronze age hoards (excluding Isleham) and five to six as stray finds. The low percentage of hoarded finds, between 40 and 44.4%, probably confirms the longevity of razors with dated early, middle and late bronze age examples known. A Class Ib (Butler and Smith 1956, 28-9) razor found amongst a surface scatter of worked flints and beaker pottery (N5368) may confirm the early date of some of the examples as may the fragments from within an urn in the barrow burial at Hevingham (N7500). Two Hallstatt C type razors, from Martlesham (S1519) and the probably important late bronze age settlement site at Wimblington (C6057), demonstrate the use of razors up until the end of the bronze age in East Anglia.

Two bronze age anvils have been identified within the area, both from the north-west Suffolk fen edges, at West Row (catalogue 1.325) and Lakenheath (catalogue 1.326). Only nine others are recorded from Britain, and only two from England (Ehrenberg 1981), one of which is probably a casting residue rather than an anvil and the other is a fake or modern copy (ibid, 24). Their presence confirms the importance of the area and the specialisation in metalworking that took place in East Anglia. For a fuller discussion of anvils see Ehrenberg (1981).

Despite the wealth of evidence for metalworking in East Anglia mould remains are very rare. At least one stone, multi-implement, mould is recorded (chapter 4.4 and 6.9 h), probably of the early bronze age. However the major period of production, the later bronze age, sees only

five (7 valves) bronze moulds from the whole region (excluding an example of thick bronze from Bardwell (S7369) which is not positively identifiable as from a mould). All are from two part moulds for axes, and only two have both valves and are complete, being for a shield pattern palstave from Harling (N21469; Wymer 1987) and for a plain socketed axe from the late bronze age Unthank Road hoard, Norwich (N0500). Apart from the Harling mould all are from late bronze age hoards. The three single valves are for a palstave in the Isleham hoard, a facettèd socketed axe in the Beeston Regis hoard (N15534) and a (plain?) socketed axe in the Levington hoard (S3832), the last of which is only a fragment.

Despite Northover's comments regarding the problems of cold working bronze from clay moulds (1982, 70), the rarity of stone and bronze moulds in the region leads to the conclusion that moulds were primarily made of refractory clay. This would appear to be confirmed by the evidence from elsewhere in Britain, where clay mould fragments are becoming increasingly common on excavated later bronze age settlements. Stone moulds are relatively scarce in Britain, even in the Highland zone where suitable stone was more readily available than in East Anglia.

6. Associations with burials

It has already been noted that the deposition of prestigious grave goods was not common practice in East Anglia (chapter 6.12 f). Although all of the early bronze age gold listed here comes from barrows only a small proportion, 8%, of the other early bronze age metalwork (excluding awls and other undated finds) appears to have been sepulchral in nature

(chapter 4.4 and 4.5). . Indeed some finds associated with burials may have been functional, rather than ceremonial, as is suggested in cases where unburnt 'awls' are found with unurned cremations implying their use as fasteners for (fabric?) containers.

The case is not so clear regarding possible non-barrow burials which, in an agricultural or acidic area, may disappear with the exception of their associations. On the basis of the East Anglian evidence (chapter 4.6 and chapter 6.12 f), barrow burial would appear to be the exception, certainly in the later bronze age and possibly the early bronze age as well.

For further discussion of possible associations of metalwork with alternative sepulchral practices see Chapters 4.6, 6.12 f, 10.3 and 12.4.

7. Hoards

For a general discussion of hoards see chapter 4.4, 6.9 a, 6.12 a and the introduction to catalogue 2. By definition a hoard consists of anything buried purposefully, which can include single objects (Levy 1982). However in this work it has been used to denote two or more metal items deposited in association but excluding grave goods which are discussed above (part 6).

Hoards have been examined in slightly more detail (catalogue 3) than stray finds as they are generally more likely to have been recorded (especially in the SMRs) and are therefore relatively well represented.

Detailed records and drawings of most Norfolk and Suffolk hoards, in a format similar to *Inventaria Archaeologica* (as outlined by Andrew Lawson in November 1981, details from Norfolk Archaeological Unit) is presently being compiled by the Archaeological Units. Hoards were of major significance, in the later bronze age in particular, when demand for metal began to cause supply problems. The use of hoards as a response to these problems makes them particularly useful as a measure of regional organisation.

At the onset of the bronze age, hoards are rare. Only one, containing two flat axes and a tanged dagger (or spearhead?), from Rickinghall Inferior (S11744), is recorded in the SMRs. Another, containing flat axes, from Mile Cross, is recorded by Lawson (1984, 151). Of the finds identifiable as of early bronze age date (excluding items of the late early bronze age Arreton tradition) this represents only 2.8% of the material. By the end of the early bronze age production begins on a larger scale as is witnessed with the distinctive artifacts and hoards of the Arreton tradition. Stray finds still predominate although at least five hoards (C6438, C7216, N2243, S5985 and S9302, but excluding C5606 which is probably the same as a hoard of two palstaves C6196) are likely to belong to this phase, containing at least 30 flanged axes and a tanged spearhead. Most of these hoards are relatively small, the largest being the Poslingford hoard (S5985) of 19 flanged axes, and consist of complete items. The majority are likely to be 'traders hoards'. The hoard of an unknown number of axes from Wighenhall St Mary Magdalen (N2243) is particularly interesting as it includes at least one imported 'Medocain' axe (Lawson 1984, 154). The 112 artifacts

identifiable to this period consist of 107 flanged axes, some which may be slightly later, 3 spearheads (four others are noted by Needham 1979b, 20-21, 31) and 2 tanged daggers. The hoarded proportion is equal to 27.7%, although it should be noted that other metal objects, such as the awls from the Mildenhall 165 site (S9027), which also belong to this period, are not included in the statistics due to the difficulty dating other awls (above, section 5b), though none occur in hoards of this phase.

Despite increased local production, no further hoards occur until the final stages of the middle bronze age in East Anglia. This accords with a model of small scale production to meet immediate, local, demand (cf Rowlands 1976, 121). Nonetheless it is clear the area was one of the primary and major metalworking centres, influencing a wide geographical area of lowland Britain during the middle bronze age (ibid), and that the produce, typologically, was regionally unified in nature.

The late middle bronze age hoards are mostly small and consist mainly of what may be termed 'personal' hoards, although some, particularly the Stibbard (N7147) and Bramfield (S1949) hoards, are probably 'traders' or 'metalworkers' hoards. A total of at least 31 hoards likely to be of this period are listed (catalogue 3).

The Stibbard hoard is particularly interesting in that the standardised palstave form axes are all unfinished and unusually small. They are paralleled in a hoard claimed to be from a mound at Eriswell (catalogue 1.H3) and by numerous stray finds from elsewhere (see catalogue 3,

N7147). Although it has been postulated that most of these derive from the dispersed Stibbard hoard, the possibility of their representing genuine separate finds has recently been substantiated by the discovery of another unfinished axe of similar form in a hoard(?) dredged from the river Little Ouse at Brandon (S10218, also see chapter 6.9a). In view of the general rarity of unfinished palstaves and the small and standardised size of the Stibbard type axes it is suggested that the common occurrence of these unfinished axes represents the survival of imported bronze 'ingot axes' (cf O'Connor 1980, 304) into the area.

Ornaments found in the 'personal' hoards of the late middle bronze age are briefly discussed above (section 5 1).

The proportions and importance of middle bronze age metalwork in hoards is difficult to ascertain without examination of the individual artifacts, due to the use of some of the more frequent middle bronze age implement types, particularly palstaves, into the late bronze age. For this reason it has not been possible to include two major types, the knives/daggers/dirks and the awls, into the figures. However, using a count of the palstaves, rapiers, side and basal looped spearheads and the ornaments demonstrates that approximately 30% of these principally middle bronze age finds, including the Stibbard hoard, are from hoards. If the Stibbard hoard is excluded, the figure is reduced to about 21%. Although partially as a result of the nature of the hoarding, the hoarded proportion of individual artifact types varies enormously, from only 2.9% of the 68 side looped spearheads to circa 65% of the 41 to 44 ornaments (the other figures are: 14.3% of the 28 basal looped

spearheads, excluding the Stibbard hoard; 20.6% of the 389 palstaves, excluding the Stibbard hoard; circa 20% of the 87 to 103 rapiers; 32.7% of the 459 palstaves, including the Stibbard hoard and 36.8% of the 38 basal looped spearheads, including the Stibbard hoard).

This situation is completely transformed in the late bronze age. One of the most surprising, and significant, findings of the analyses of the material has been the proportional uniformity of principal artifact types represented in hoards within the late bronze age assemblages (see below).

A notable exception has been the Isleham hoard. Although it has been claimed that the Isleham hoard is local (P Northover, pers comm, July 1992), due largely to the presence of so many small items including apparent 'floor sweepings', the content of the hoard is so alien to the region that other explanations must be sought. For example the remains of ten hammers are recorded in the Isleham hoard yet elsewhere in the region only seven are known. Likewise a comparison of some other artifacts in Isleham and non Isleham contexts illustrate the point, for example: sickles 7 (Isleham hoard):10 (other); chapes 1764:19; ferrules 46:12 and gouges 12:44. Many artifact forms in the Isleham hoard are otherwise unknown locally, and other types, although occasionally found, are generally rare in the region, for example indented socketed axes, lunate spearheads, stepped blade spearheads, and decorated harness gear.

Indeed the Wilburton industrial phase is partially identified as a period represented by the widespread addition of lead and the

importation of scrap bronze (cf O'Connor 1980, 304-6 and Northover 1982a). This is supported by the metalographic analysis (Northover *ibid* and 1982b, 59-63; Northover and Gale 1982, 285-6; O'Connor 1980, 157) which suggest the bronze of the Wilburton phase consisted of central European and north French metal to which lead was added in Britain.

The non-local origin of the Isleham hoard material is further confirmed by an examination of artifact proportions, which are remarkably standardized in the late bronze age artifact groups, but only when the Isleham hoard is excluded. For example, if we exclude the Isleham material, 79.9% of all late bronze age implements are hoarded. The proportion of the principal individual artifact types, including socketed and winged axes (79.8%), swords and chapes (78.2%), pegged spearheads (82.5%), gouges (77.3%), and 'rings' (78.9%), a total of 2035 items, all lie within 2.6% of the 79.9% average. Only two late bronze age types lie outside these bounds; ferrules (91.7% hoarded), of which too few (12) examples exist to be numerically significant, and ornaments (64.7%) which again are only represented by a small sample (17 items), although even with these, if the gold finds (9 items) are excluded, a comparable figure (75%) is obtained. This outstanding consistency is totally transformed by including the figures for the Isleham hoard which cause a variation of 20% in the hoarded artifact proportions.

Taken together, this evidence substantiates the conclusion that the Isleham hoard was imported into northern East Anglia and does not represent locally collected scrap. The only other alternative that could be argued is that the Isleham hoard represents a total collection

of East Anglia's scrap, excepting the few other Wilburton period items known, and that the consistency in hoarded artifacts relates only to the post Wilburton phase. This is contradicted, however, by two important considerations. Firstly the marked rarity of late middle bronze age material (which must still have been a feature in the Wilburton phase assemblages and was common locally) in the Isleham hoard. Secondly the figures obtained from the adjoining north-west Suffolk survey area (tables 1 - 3) demonstrate a relatively uniform growth rate in metalwork frequency throughout the bronze age. From these figures it is clear that no significant contemporary collection of metalwork occurred in an area only two miles away from the findspot of the hoard. These findings therefore confirm the imported scrap hypothesis.

The significance of the consistency of hoarding in the late bronze age is discussed below (part 8).

The distribution of bronze age hoards are plotted (maps 40-42) using symbols to denote their comparative weight rather than their size in terms of the number of artifacts they contain. This was felt to be particularly relevant to hoards of the late bronze age which consist mainly of scrap bronze rather than artifacts in their own right.

The distribution is widespread. Too few hoards are known of early bronze age date to be significant geographically. The middle bronze age spread is very dispersed. The main gap occurs in Cambridgeshire, but this is likely to be a result of poor recording (for example the Granta Fen hoard is not included) rather than a true reflection of the

distribution. The late bronze age pattern, although still generally dispersed, shows some interesting developments. Two areas are possibly devoid of hoards (as they were in the middle bronze age), the till/clay soil block in the south-west of the study area (west of Cambridge) and part of the till belt of central Suffolk. The implications of this are discussed below (part 9).

A slight concentration, though not particularly marked, occurs along the south-eastern fen edges. However one of the potentially more significant aspects is the possible localised clustering of hoards in some locations together with an indication of patterning for the heavier, and therefore more important, hoards. Clusters of two hoards in close proximity (under 2 km) occur on 15 occasions, clusters of three hoards on four occasions, and clusters of four or more hoards on four occasions. Although individually some of these hoards are small when grouped within clusters they become of much greater significance. The evidence from some groups, such as those from around Cambridge (the Winship and Green End Road hoards, C5452); Butley (S2614); Norwich (N0500, N9550, N9551 and N9552); Thorndon (S4059, S4061, S3342, S4006); Felixstowe (S2927, S3028 and S3030); and Snettisham (N1504, N1670, N1671 and N1672) suggests that the sites represent either deliberately separated stocks of a single 'workshop' or re-used centre points of at least a semi-permanent nature.

Gaps between such 'centre points', including those of single major hoards, for example, the Levington (S3832), Stuntney (C7111), Wilburton (C5717), Foulsham (N3089) and Carleton Rode (N10022) hoards, tend to be

regular enough to suggest deliberate spacing, although in view of the varied topography, river patterns and length of the late bronze age more detailed examination will be necessary to determine the reality of this observation.

A final point considering the distribution of hoards is their relationship to stray finds. Too few early bronze age finds are recorded to make useful comment. Although precise findspots for stray finds are, in comparison to the potential, relatively few, it would appear that hoards of the middle bronze age correlate reasonably well with the distribution of stray finds. This contrasts with the late bronze age, when a notable lack of stray finds is usually apparent near the hoards. This is particularly noticeable in some areas, for example around the Felixstowe, Butley and Thorndon hoard groups. The separation of the fen edge concentration of stray finds from the hoards in north-west Suffolk has already been noted (chapter 6.12a). The simplest explanation for this is that scrap hoards occur where the obsolete material has been collected, resulting in their local absence, whereas where no such collection has occurred a proliferation of objects survive as stray finds. This, however, is likely to be an over-simplification, and does not explain the absence of non-obsolete material from the hoard localities. It is possible that localised industrial/social organisation occurred to account for the variation but without further intensive research around some of the key areas this problem cannot be resolved.

8. Chronology and organisation

The chronology of the bronze age, and metalwork in particular, in East Anglia is beyond the scope of this work (chapter 4.7). Nevertheless some generalisation have been made (eg chapter 6.11) especially concerning the organisational trends apparent from the metalwork. For example it would appear, based on the north-west Suffolk intensive survey, that the increase in metalwork in the region was relatively uniform and gradual throughout the bronze age (tables 1-3), and that the proportions of distinct artifact groups were also comparatively similar throughout the period (tables 4, 5). This indicates stability. There are no indications of major population or social upheaval, at least in terms of the metalwork evidence. Those changes that do occur may be more connected to the development of metalworking practices than to social change. Nonetheless the examination of the metalwork in the previous section, especially hoards, suggests some significant variation, especially between the late middle bronze age and late bronze ages. Whilst these changes, particularly the use of leaded bronze and importation of scrap that characterise the Wilburton period, may be a response to increased demand, it is as likely to be due to a breakdown of metal supply (from the British highland zone?), or to market led changes. The results may have been a diversion from bronze ingot suppliers (cf the Stibbard hoard axes, above part 7) to separate scrap and lead (ingot?) sources in the Wilburton phase, which, after a short period, were superseded by local supplies of scrap together with imported copper (and lead?) ingots.

Whether this is a reflection of social change is altogether more difficult, although this need not be the case. The region had, since neolithic times, been rich, and the evidence relating to, for instance, irregular burial practices, extensive exchange/trade networks and a continued settlement pattern, suggest that continuity rather than change was more characteristic of the region in prehistoric times.

Nonetheless, from the consistent 80% of hoarded bronze artifacts evident in the late bronze age, and the possible central based pattern of the hoards, it is extremely likely that the supply of metalwork, and society itself, was very carefully organised. This implies centralised control, though whether this was egalitarian or elitist in nature cannot be answered solely on the basis of the existing evidence.

9. Regionality

It has been made clear (chapter 4.5) that regionality was a particularly important factor in later prehistoric Britain. The existence of 'cultural' territories are not disputed, although their boundaries, and the social implications of them, often are. Boundaries, particularly of a political nature, are not static, a problem which is likely to confuse the evidence for a period that is over 1500 years long. Additionally, artifactual/cultural evidence for territorial division, in view of the lack of historical evidence and scarcity of excavated settlements and cemeteries, will need detailed typological research of the implement stock available for study. This has not been possible in this work.

Despite this, the evidence so far examined from northern East Anglia does support the area having considerable unity. This has been shown by various other studies, for example on neolithic pottery (cf Healy 1984, 100); beakers (eg D L Clark 1970; Lanting and Van der Waals 1972; Bamford 1982); middle bronze age metalwork (Rowlands 1976); bronze age gold work (J J Taylor 1980) and iron age coinage (Allen 1970; Cunliffe 1981 fig 67).

Within the overall study area, however, two postulated boundary regions exist between south-east Suffolk and north Suffolk/Norfolk/south-east Cambridgeshire, and between west Cambridgeshire and the rest of northern East Anglia (cf Lawson 1984, fig 6.10), and marking the iron age tribal territories of the Iceni, Trinovantes and Coritani. All lie on clay/till and fen (in north Cambridgeshire) soils which may, in part, have formed 'reduced contact zones'. Interestingly the boundary lines (as suggested by, for example, Lawson, *ibid*; and Martin, 1988b and 1988d) largely, though not exactly, correspond to areas devoid of late bronze age hoards (map 42), although not of stray finds (map 26). In view of the potential importance of these 'boundaries' that between northern Suffolk and south-eastern Suffolk has been examined in more detail in chapter 9.

10. Conclusions

In view of the initial belief that too little information was adequately recorded and that so many variables existed that only the broadest of generalisations could be made concerning the bronze age metalwork in East Anglia (sections 1 and 2 above), the results have been surprisingly

good. Although many reservations are still held concerning the quantity and quality of the available information (see chapter 6 in particular) and enormous potential for changes in the evidence exists, a number of key issues have been discussed and resolutions suggested (see above). I do not intend reiterating these here but merely wish to note some of the key points.

The first is the need to carry out further intensive research in order to resolve some of the problems highlighted above, such as that pertaining to social territories and the regional unity of the late bronze age assemblage. The former has been partially examined in chapter nine, but could be further considered by a study of geographically separated samples from areas such as south-east Suffolk, central Norfolk and north-west Cambridgeshire. The peculiarities witnessed within the Flag Fen power station site assemblages might then be put more accurately into their regional setting. On the basis of the present evidence the Fengate sites as a whole do not appear to fit very securely within the evidence from farther east in East Anglia.

The second finding is the dispersed nature of the metalwork. Earlier references had mostly highlighted the fen edge concentration of finds, and whilst this concentration still exists (for the reasons discussed elsewhere, eg chapter 11.2), it is no longer as prominent, and is rapidly being subsumed within a massive regional distribution that is being revealed by metal detected finds (chapter 9.7). That this distribution is apparently not affected by soil type boundaries is another significant divergence from earlier works.

Another aspect of the distribution is the uniform admixture of 'tools', 'weapons' and 'ornaments' (paralleled by proportions of separate artifact types occurring in hoards or as stray finds; above part 7) which show no evidence of geographically differentiated hierarchies. This, together with the evidence for chronological changes in the metalwork, which are probably technological and supply led rather than social in nature, infer a high degree of organisation and stability in bronze age East Anglia.

CHAPTER 9

DISTRIBUTIONS AND LAND USE: THE EFFECTS OF ARABLE AGRICULTURE

Towards clarifying the North-South schism

As stated in the introduction (p.4) the south-east fen edges have been recognised for their outstanding richness of bronze age artifacts for over a century. One of the aims of this work was to determine whether this fen edge concentration was a valid reflection of a bronze age distribution pattern or was biased by the collecting (and recording) methods of earlier generations (chapter 2 and chapter 6.5). The results, whilst showing that bias was indeed present, have not only confirmed the existence of the fen edge concentration but have shown that it was actually heavily under-represented in terms of the number of finds previously published or even recorded (eg chapter 6.5).

The initial plotting of the metalwork distribution in Suffolk confirmed a north-south divide and presented a convincing case for an early precursor of the postulated iron age tribal division between the Iceni and the Trinovantes (cf R R Clarke 1939, 89; Lawson 1984, 168-171, fig 6.10; Martin 1988, 68-72, figs 61, 62).

However, an examination of the other (smaller) concentrations that have been recognised, for instance in south-east Suffolk (map 26) have, to a degree, helped to establish that collecting methods (cf chapter 6.5c) are a major factor in their apparent existence. This is of some importance. If these concentrations are largely a result of biased collecting and/or reporting then, apart from being artificial foci, they

may indicate a much greater background of metalwork than has previously been suspected. This would lessen the relative variation between the fen edges and the other parts of northern East Anglia and may cause the perceived divide between north Suffolk/Norfolk and south Suffolk/Essex to be questioned, particularly with regard to the bronze age.

1. The effects of agriculture

To put the metalwork into perspective it was necessary to look at other types of artifact and compare them with the metalwork. It soon became apparent, however, that although scatters of material were present within the crucial 'reduced contact' area, the claylands of High Suffolk, they consisted of very dispersed, almost undefinable, spreads which rarely included pottery. In this there was a marked contrast with the fen edge material and, to a lesser extent, with the sites on the sandy soils of Suffolk. It was clear this was due to the effects of arable agriculture and as a result it was decided to examine this significant factor in more detail.

Over 80% of Norfolk and Suffolk and 90% of Cambridgeshire are under arable agriculture (Suffolk County Council 1976; Lawson 1977; Cambridgeshire County Council, pers comm 1990). Finds are bound to be more commonly brought to the surface and located as a result of arable agriculture than they would be otherwise. Distributions reflect this (eg chapter 6.5b, map 11). The results of recent archaeological work, however, when compared to surveys undertaken in the same areas in the past, are often different, presumably due to the effects of agricultural destruction and dispersal of once recognisable sites (cf Raymond and

Darvill 1988), and of over-collecting (eg chapter 11.2). Healy and Silvester, working on the south-west Norfolk fen edges in the 1980s, have both suggested that the lack of later bronze age pottery, present some 25 years earlier, is a joint result of agriculture, peat erosion and a short life expectancy for this material (Healy 1988, 26 and 1991, 139; Silvester 1985, 59 and 1991, 87). Scatters of worked flint, which cannot be said to have a short survival rate, and which were associated with the pottery, were also, significantly, considered to have been so dispersed by plough action as to be unrecognisable or indistinguishable from the background scatter of earlier flints (Silvester, *ibid*). Experimental work on artifact (sherd) movement in soil ploughed by an ard (see Butser Ancient Farm Year Books 1989 and 1990 for modern ploughing) at Butser shows a lateral shift averaging 54.6 cms per annum, with an additional 6% loss (Reynolds 1988, 137). Further work (R H Clark and Schofield 1991, 95-99), on a sandy-loam soil in Wiltshire over six agricultural episodes (three seasons), demonstrated mean lateral displacements of flakes of between 0.69m and 1.90m per episode, or between 2.26m and 2.59m per season. They make the point that *'disturbance under intensive agriculture will make the delimitation of sites as discrete units virtually impossible, at least in southern England.'* (*ibid* 103). Additionally, the increase in lateral displacement due to cultivation in heavier soils, such as the clays of south Cambridgeshire, central Suffolk and Norfolk, is likely to be greatly increased due to the effect of the 'drag factor'.

Computer simulations, based largely on Reynolds experimental studies, suggest gradual increases in the area of scatters which, over a hundred

year span, become unidentifiable (Yorston, Gaffney and Reynolds 1990). They conclude (ibid, 81) by stating 'Archaeologists are asking increasingly complex questions of their database at a time when the continuing implementation of large scale arable regimes appears to be eroding the ability of the archaeological record to answer such questions. The crisis is already upon some periods and types of site. For instance, the recent concern in the literature with the interpretation of lithic or sherd scatters in later prehistory may rapidly become an academic question, in the worst possible sense, as original patterns dissolve into an inscrutable tangle of archaeological and agricultural variation.'

It is certainly true that the distribution of well-defined 'settlement' scatters and large and complete bronzes in East Anglia is heavily concentrated in the south-east fen edge zone. It is also true that, since the onset of peat formation, probably in the earlier part of the iron age, this area has only been under arable agriculture, intermittently, since circa 1812 at the earliest (see below part 2 and chapter 11.5), and only relatively intensely for about the last 50 years.

Other areas, perhaps ploughed for millennia subsequent to the bronze age, are relatively devoid of both bronzes and definable prehistoric scatters. In fact one of the greatest dilemmas facing archaeologists in East Anglia, emphasised as a result of recent fieldwalking surveys, is how to define or interpret 'a site' when often all that is found is a loosely dispersed scatter of finds. This strongly suggests, much as

Clark and Schofield concluded (above), that the survival of a recognisable 'site' is largely dependent on its burial under later deposits, or restricted periods of arable agriculture.

It is probably no coincidence that many of the locations in East Anglia (outside the fen edges), where possible later prehistoric settlement debris and houses have been clearly observed, have been preserved under later earthworks; for example, under later ramparts at, for instance, Thornham, Norfolk (Bamford 1982, 33) and, more commonly, under barrows. Examples can be cited at Reffley Wood, Kings Lynn, Norfolk (ibid), Chippenham (3), (Gibson 1980; A Taylor 1981, 110 & 114), Barnack, Brampton, Peterborough, Snailwell, Thriplow and Wimblington, in Cambridgeshire (cf A Taylor 1981, 110 & 114), Eriswell (Dymond 1973), Pakenham (Brown et al 1954), Worlington (Briscoe 1956; Martin 1981, 69), Sutton Hoo (Copp 1989), Martlesham (Martin 1976) and Brightwell (Moir 1921) Heaths, in Suffolk. As Bamford says, talking of 'beaker' sites in the East Anglian Fen Edges, *'The known Beaker domestic sites in this group are all in such a position as to have been protected from ploughing, at least until recent years, and it is to this fact that we owe their preservation'* (Bamford 1982, 33).

To examine the suggestion that the lack of evidence for bronze age (and other later prehistoric) settlement in the central clayland area of Suffolk is a result of later agriculture rather than a 'cultural' or social divide, it is necessary to examine the available evidence in some detail. This has been done in two ways. First, by looking at the results presented by detailed and relatively intense field walking

surveys recently carried out in various areas and soil types in Suffolk. Secondly, by examining the possible causes of variation in survival rates of the main types of bronze age artifactual remains in these regions. The results obtained by the fieldwalking can then be evaluated with reference to predictions based on the varying agricultural practices and soil types that prevail.

2. The Soil Regions

For the purposes of comparing results from separate soil regions, Suffolk has been divided into four main areas coinciding with the principal soil types. These are the fens/fen edges; the light sandy soils of the Brecklands and Sandlings; the loam/chalk and loessic soils; and the heavier clay region. Although these are relatively broad generalisations and the boundaries are not always clear cut, they do, in practice, reflect agriculturally distinct soil areas comparatively well. For more detailed soil classification maps of East Anglia see, for example, the 1:250,000 Soil Survey of England and Wales (Soils of England and Wales: sheet 4 Eastern England 1983).

The fens and fen edges consist of an area of sand hummock and hollow micro-relief (cf Seale 1975a). They differ from the adjoining Brecklands only in that they are more low-lying, tend to be wetter, and as a consequence were, until recently, overlain with peat. Although partially drained in the 17th and 18th centuries, they were used mainly for stock. Arable cultivation, despite varying from area to area, has, in general terms, been a recent development. Land use may have been comparable to the Lincolnshire Fens, where *'it was not until the 1920s*

that much of the permanent pasture was broken up for the first time by ploughing', although by 1977, 'over 96% of all farmland is arable' (Simmons 1977). In Suffolk it was said that 'This county, at the beginning of the present [19th]. century, was well stocked with wildfowl. Though its chief extent consisted of well cultivated land, still it had immense tracts of waste and marsh, that occupied nearly all the county at its NW corner, and which extended from Newmarket, on the borders of Cambridgeshire, to the confines of Norfolk, near Thetford and Brandon' (Gallwey 1886). In his agricultural survey of 1804 Arthur Young had stated that no less than 100,000 acres of this fenland in the region of Lakenheath was uncultivated. This area of the north-west Suffolk fen edges was also mainly used for stock up until the 1940s. Significantly the first tractors were not used before then. A recollection of this area, by an ex-fenman, was 'that old land was nearly always flooded, would grow anything only grass' (Wells 1976, 40).

The sandy soils of 'The Brecklands' in north-west Suffolk and 'The Sandlings' in east Suffolk, classified as grade 4 soils by the Ministry of Agriculture, Fisheries and Food (1974), had still, by 1854, 'considerable acreages of "sheep walk"... (10,500 acres in Mildenhall Union in north-west Suffolk and 7,500 in Woodbridge Union in south-east Suffolk, Dymond 1988, 102). 'Significantly many of these "dry" areas were dominated, until the advent of modern farming, by sheep-walks and rabbit-warrens, being of very little value for any other type of farming' (Martin 1988d, 32). This area largely coincides with that where the highest proportion of round barrows survives as earthworks. For the Norfolk Breckland, Lawson (1981, 62) states: 'the detection of

ring ditches on better soils ... may indicate that the poor soil on which the surviving barrows stand is the factor governing survival rather than site selection. These poor soils were perhaps unprofitable to cultivate at later times, while the barrows on the better soils were destroyed due to the agricultural potential of their sites.'

Nonetheless, these sand-based soils have, in many locations, also witnessed long periods of ploughing. This can be seen by the obliteration of standing earthworks at, for instance, the iron age enclosures at Barnham (north-west Suffolk), Foxhall (south-east Suffolk) and Thetford (south-west Norfolk).

The loam/chalk and loessic soils vary considerably. All fall, however, within grade 2 of the Ministry of Agriculture, Fisheries and Food agricultural land classification (1974) and apart from the limited area of class 1 soils in the fens they are agriculturally the richest in the county. The bulk are glacially derived. In the major tract to the north-east of Haverhill they are relatively heavy and difficult to separate from other, class 3, till soils. Within the main class 3 till area itself, outcrops of class 2 soils are usually related to river valleys. The only area of true chalk soils occurs between the fen edges and the Brecklands of north-west Suffolk and is comparatively small in area. The class 2 soils are likely to have been more intensely farmed than any of the other soils in Suffolk, although this should not be over-emphasised in view of the similarity of some of the class 2 and 3 till soils. Also noteworthy is the lack of evidence for Saxon settlement on, apparently, good quality loess soils in the Shotley peninsula south of Ipswich.

The clay soils (M.A.F.F. grade 3, *ibid*) of 'High Suffolk' separate the sandy soils of the Breckland in the north-west from those of the Sandlings in the south-east. Interspersed within the mixed clay soil area are river valleys with a higher loam or gravel element. For the purposes of this general comparative survey, however, these have been included within the area defined as being clay based. Some of these river valleys, which were likely to have been the focus for settlements, show evidence of considerable numbers of ring ditches (*cf* Martin 1988c, maps 4 and 12). In spite of this, it has been suggested that the area is virtually devoid of barrows/ring ditches because it was still heavily wooded in the early (and later) bronze age (*ibid*, 30).

However, any ploughed out barrows on the clay soils away from the river valleys will be invisible due to the lack of crop mark evidence. Rackham (1988, 50) estimates that by about AD 1300 under 5% of Suffolk was woodland. The view that the soils of this region were too heavy or wet for successful arable agriculture is to some extent belied by the distribution of Roman agricultural settlements (Plouviez 1988, map 14) and by Williamson's (1988, 40) claim that the planned, '*co-axial patterns of land-division*' of '*the boulder-clay plateau*' are '*probably late Iron Age...Romano-British and Post-Roman*'. This is confirmed by the environmental evidence from Springfield Lyons, Essex which suggests an extension of cultivation onto heavy clay soils by iron age or Roman times (Murphy 1987).

Significantly, the tithe map records of land use for circa 1840 show that a minimum of 60% of land use was arable in the clayland parishes

(Holt and Kain 1982, fig 28). The first statistics of land use for the whole of Suffolk, in 1854, show that the main concentration of arable farming (with over 50% ploughed) was across the clay-lands of High Suffolk (Dymond 1988, 102, map 46).

One of the most telling statements made concerning fieldwalking on the clayland soils was made by Mike Hardy, who has systematically fieldwalked more Suffolk clayland parishes than anyone else. He maintains that the easiest way to ascertain whether any archaeological material survives on a field is merely to walk the headlands. Artifacts can be located there when, as a result of progressive plough-drag, none are necessarily to be found elsewhere on the field (M Hardy, pers comm, 1986 and 1991).

3. The Fieldwalking Evidence

Over the last decade, reasonably intensive field walking surveys have been carried out by various individuals and groups in the different geographical and soil regions of Suffolk. Results from the four main soil regions all emphasize the relationship between good survival of prehistoric scatters and areas that have been out of arable agriculture (appendix 9, tables 6-10).

The methods employed by fieldwalkers vary and some inconsistency can be expected in the detailed findings, due to a variety of factors. This is inevitable in any large scale fieldwalking programme. Overall, the results can be considered to be a representative sample (with the

possible exception of grade 2 soils, see below) for the soil types as defined above.

Fourteen parishes where systematic fieldwalking surveys have taken place were studied (details in appendix 9), one from the fen edges, one from grade 2 soils, two from grade 2/3 soils, six from grade 3 soils, one from grade 3/4 soils, and three from grade 4 soils. The mass of information available from the fen edge parishes made analysis of more than one parish unnecessary. In the cases of grades 2 and 3/4 soils, however, only one parish in the county had been systematically fieldwalked and the resultant figures, especially in the case of the grade 2 sample, may not be particularly representative. The number of scatters identified during the other surveys, for example in adjoining areas with related soils (grade 2/3 in the case of soil grade 2), are great enough to suggest a statistically significant sample has been analysed.

In each parish all scatters, with a 'scatter' being counted as any group of finds defined as a site in the county Sites and Monuments Record, were recorded and counted. The proportion of prehistoric sites was then calculated together with the percentage of these with prehistoric pottery (tables 6-9). The relative scarcity of recognisable prehistoric scatters in the non-fen edge situation was clearly demonstrated. Nonetheless, despite a higher percentage of total sites and a much greater amount of prehistoric pottery on the fen edges, comparison of post mesolithic scatters containing pottery (table 7) demonstrated that a higher proportion of those from the non-fen edge

soils included pottery (as well as lithics). This suggests two things. First domestic assemblages are likely to be represented within these soil areas. Secondly, due to the comparatively high proportion of prehistoric sites with pottery, which will only survive for a short period in ploughsoil, it is likely that the pottery finds from the non-fen locations had only been disturbed recently. Therefore, in these instances, the recognition of the sites is liable to have been due more to the recent, rather than the longerstanding, disturbance of subsoil features. Despite this the count of artifacts related to site area further strengthened the evidence for agricultural dispersal and destruction of recognisable prehistoric sites on the heavier, non-fen edge soils of Suffolk (tables 7-10).

The nature and proportions of the finds suggest two alternative explanations. There was either a dearth of prehistoric settlement on the 'claylands', although the presence of the dispersed lithics and 'scatters' discussed above suggest otherwise. Or there was a markedly longer period of ploughing than in the Sandling soils (see above) and a known short period of ploughing in the fens/fen edges (for details of the fieldwalking see tables 6-10 and appendix 9). In view of the proportionate relationship of the artifact dispersal to the amount of arable agriculture in the cases studied, it is reasonable to suppose that the survival of the rich lithic and pottery scatters of the south-east fen edge zone is, in part at least, a result of the relative lack of intensive arable agriculture until the last 50 years.

To examine the evidence for likely survival rates of bronze age artifactual remains in different conditions it is necessary to look briefly at the three principal types of artifact: pottery, flint and metalwork.

4. Pottery

The friability and short lived nature of all bronze age pottery, particularly that of the later bronze age, in East Anglia (excluding some of the Lincolnshire pottery, for example, that of the middle bronze age from Billingborough; Nottingham University Museum) is clear (above part 1 and chapter 11.4).

This has also been noted outside East Anglia. For example, on the Yorkshire Wolds *'a by-product of cultivation since the 1840s has been the vast quantities of flint and stone implements recovered from the surface of cultivated fields. These are the more durable residue of occupation sites, only under favourable circumstances are pottery and bone material recovered'* (Manby 1977, 6). Even on excavated sites with Iron Age hut circles (and Saxon structures) in the Upper Thames Valley the lack of pottery in the ploughsoil has been noteworthy (Miles 1977, 2).

In the sand/peat soils of the fen edges a survival of less than 25 years has been noted (above) for pottery in the ploughsoil (Healy 1988, 26, and Silvester 1985, 59). The loss of the pottery had already been recognised by Lawson by 1976 (1976, 2). In discussing the pottery scatters found earlier in the Hockwold region of the south-west Norfolk

fen edges he said *'These sites may well be destroyed as recent field-walking produced not a single sherd of prehistoric pottery'*.

No figures are available for other soil types, although Hall (1985, 48), discussing a Late Bronze Age site on a gravelly spur at Cottenham, has written *'finds of this period are rare in Cambridgeshire, since normally the pottery is of such poor quality that it does not long survive in ploughsoil'*.

Frost and weathering are probably the most destructive agents as far as pottery is concerned. In view of this, the proportion of pottery reaching the soil surface, and presumably just below the surface as well, where it is exposed to these elements, is likely to be the most significant factor. Field experiments at Butser from 1982 to 1986 demonstrated that between 11.1% and 14.7% (averaging 13.2%) of the pottery in the ploughsoil was reaching the surface after each cultivation (Reynolds 1987, 147). Therefore after 5 ploughings 50% of the pottery in the ploughsoil has surfaced; after 10 ploughings 75% has surfaced and after 25 ploughings about 97% has surfaced. The results following two full seasons of modern arable farming on sandy-loam soils in Wiltshire demonstrated 11.68% and 9.91% respectively of the artifacts (flint flakes) were surfacing each season (Clark and Schofield 1991, 96-100, table 8.2). Whilst there is likely to be variation due to soil types and cultivation methods, and the destruction rate of this surface material will vary according to the initial strength of the pottery and to the weather, it can be seen that after only a short time a large proportion of the prehistoric pottery in the ploughsoil will be

destroyed. Over much of East Anglia, up to 2500 years of agriculture have taken place since the end of the bronze age.

This hypothesis regarding the lack of prehistoric pottery in arable landscapes is supported by the evidence from systematic fieldwalking in Suffolk. A vivid demonstration, in 1991, was the fieldwalking, by double transects, of a 9 metre wide corridor across the sand soils of the Suffolk Brecklands between Euston and Kentford. Worked flint was common throughout but only six prehistoric sherds were located over the 15 kilometre length. In a sample parish, Barnham, four sites were revealed during the topsoil stripping of the corridor and subsequently excavated. Only one sherd, with flint fillers, was located during the initial fieldwalking on the surface of these four sites. Following the topsoil stripping a number of features, which had been truncated by ploughing, were excavated. These produced 1,140 sherds of later bronze age date.

Where statistics are available, details from fieldwalking elsewhere in Suffolk show approximately 1 sherd per 450 square metres of prehistoric (post mesolithic) scatter in the fen edge locations (appendix 9) compared to 1 sherd per 1,480 square metres on the sand based soils and 1 sherd per 10,134 square metres on the loam/chalk and clay soils.

5. Flint

Although surviving better than pottery, later bronze age flintwork is difficult to differentiate from earlier and later material (see chapter 11.3), especially when it is not found in closed groups. Many lithic

'sites' are loosely classified as 'neolithic' when 'prehistoric' is a more accurate label. However most of these scatters share the same problem, of interpretation, as 'sites' or as 'stray finds', when there is often no more than a thin spread of material over a relatively large area. The difference between the sites identified on the fen-edges and elsewhere is very marked. This is perhaps best illustrated by looking at the so called scatters that have been identified as prehistoric 'sites' during the non fen-edge surveys. Available figures show an average worked flint count of 1 per 363 square metres of 'sites' on sand based soils and 1 per 573 square metres on loam/chalk and clay soil types. This compares to a sample average of 1 per 44 square metres for sites identified during the fenland survey in Mildenhall.

An example of the destruction wrought by the plough elsewhere is illustrated on a bronze age undefended hilltop settlement on the Berkshire chalk disclosed by a gas feeder pipeline. Canham et al (1977) state *'perhaps more disturbing than the plough damage [to the features and stratigraphy], which was to have been expected, was the archaeological invisibility of the site prior to topsoil stripping. Fieldwalking prior to pipeline work had failed to reveal any occupation debris, and none was noted in walking the adjacent ploughed fields after discovery of the site'*. This appears to be another instance where the effects of agriculture have caused both the destruction of the pottery and the dispersal of the worked flint to such an extent that a known site became unrecognisable on the field surface.

Surprisingly, it appears that the destruction of lithic scatters by dispersal, as well as the physical loss of the pottery, has not been generally recognised or accepted. In fact, Bamford (1982, 33), for example, discussing the rarity of the pottery element in Beaker occupation sites due to plough action says '*It must be assumed that most domestic sites elsewhere [away from the fen edges and other protected horizons] are now marked only by surface scatters of worked flint, the most durable material from them*'. The fact that these flints are now so spread that it makes the definition of sites impossible points to a need for a major re-assessment of the presumed lack of occupation in High Suffolk (ibid, 38) in prehistory.

6. Metalwork

The survival of metalwork differs somewhat to pottery and flint in that whilst, like flint, the material (usually) survives physically, it was:

1. never as commonplace;
2. a higher status material and as a result may have been 'curated' (Binford 1979), ie, being of higher value or prestige these objects tended to be kept more carefully, (although note chapter 7.9, 12.5b and 13.3a), even beyond their 'functional' life, with the result that only the lower value/quality material would be likely to be discarded and consequently found alongside the flint and pottery (which can, presumably to a lesser degree, also undergo this process).

In this event finds are in inverse proportion to their contemporary importance; 3/ being metal and more obviously of 'antiquity' bronze objects are more likely to have been picked up and removed or re-used by later generations. Of these only the third point is of relevance to the effects of agriculture to finds distribution.

It is clear that discoveries of useful and/or unusual objects have attracted interest in the past, probably throughout time. The active collection of previously worked (and patinated) flint implements, probably during agricultural activities, for reworking and/or re-use can be clearly recognised in the south-eastern fen edge assemblages (Appendix 10) and demonstrably occurs, locally, from the beginning of the early bronze age. Recovery of obsolete metalwork, although not necessarily as a result of agriculture, can be witnessed with examples of early and middle bronze age metalwork in late bronze age hoards, eg, Stoke Ferry (N4725) and Green End Road (C5452).

It would appear that agricultural intensification had taken place in many regions by the Iron Age (cf Bradley 1990, 131). This can be witnessed by, for instance, the flattening of the Chitts Hill barrow cemetery at Colchester, Essex (Crummy 1977, 15) and the ploughing of the five mounds at Roxton, Bedfordshire (Taylor and Woodward 1981).

A further indication of the collection of bronze age metalwork, again probably as a result of arable farming, occurs in the Roman period. It is unlikely to be coincidental that such a large amount of bronze age metalwork is found on, and in rivers adjoining (see chapter 10.3) Roman sites. Some bronzes that have been shown, by excavation, to derive from Roman features are, for example, the spearhead tip from the Sawbench Temple site, Hockwold Cum Wilton (N5367), the spearhead blade fragment from Burgh (S10749) and the bronze torc from Peterborough (C1751B).

Although far fewer Saxon occupation sites have seen any detailed field research, excavations at the early Saxon site at West Stow produced a bronze awl, possibly of bronze age date, during the excavation of a sunken featured building (West, 1985, 36, fig 144). The middle Saxon site at Brandon has produced a later bronze age blade fragment and a spearhead tip remodelled into an arrowhead (S9823), which together with a barbed and tanged flint arrowhead in a sealed middle Saxon horizon, suggests that items such as these were retained as items of interest, if not use.

Several implements have signs of re-utilization, an inter-continental example being the British Gündlingen sword remodelled in the Medieval period into an Arabian scimitar (Cowen 1967, 453-4, plate 65). The two blunted and filed socketed axes from Lakenheath (S09715), the rivetted knife blade from Mendlesham (S11883) and the palstave with a pierced butt from Hilgay (N11405) were probably remodelled in medieval or more recent times.

The removal of items caught up in agricultural machinery, and as a result then thrown away or taken home for non-archaeological reasons, can be demonstrated, for example, by four artifacts from within a three mile radius in north-west Suffolk. These show how frequently both high status and standard types can be discarded in the modern setting, when it might have been expected that their historic interest or archaeological worth would have been recognised. These were a halberd from West Row (S8802), the copper tanged dagger from Kenny Hill (S9585), and the socketed axe from Beck Row (S8895), all of which were

disentangled from machinery, thrown away and, fortunately, picked up at a later date by third parties. Similarly the cast bronze torc from Kenny Hill (S0179) was removed from a ploughshare beam and kept to be polished as a household ornament (see chapter 12.2 and Pendleton 1986). There are also numerous examples of finds from sugar beet, potato and carrot harvesting machines, washing and processing plants.

These are only a few instances among many, where post depositional actions can be shown to have caused false distributions, at either a micro or macro level. In reality it seems likely that the majority of artifacts recovered from ploughsoils, unless they can be shown to have been masked under later deposits until a short time prior to their discovery, are probably a result of such secondary depositions and therefore are unlikely to present an accurate or valid reflection of true bronze age distributions at anything more than an approximate background level.

7. Arable regions and metal detecting: a more accurate means of reflecting distributions?

To summarise the outcome of the recognition of the effects of agriculture outlined above it can be stated that:

- a. There is a demonstrable loss of settlement scatters on land where there has been a long period of disturbance of bronze age horizons by arable agriculture;

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b. Even where prehistoric scatters survive, their attribution to the later bronze age is often uncertain. (see chapter 11);

c. The fen edge concentration of settlement scatters and metalwork survives as a result of the protection offered by later depositions of peat;

d. As a result the fen edge concentration, despite being real, is probably, proportionately, greatly exaggerated. Clearly settlement debris rarely survives in a form that may be recognised as forming part of a definable site away from the fen edges, and as a result it is possible that the density of settlements was almost as great in the other regions;

e. Metalwork rarely survives in its original location in arable situations due to long term collection, movement and clearance, especially with regard to the larger, easily recognisable objects and those objects that lend themselves readily to re-utilisation. This is likely to be a major cause of the rarity of these objects, eg, swords, knives and spearheads away from rivers or the fens.

However metal detecting has offered a potential means of partially clarifying this problem with regard to the relative distribution of bronze age metalwork, and, if accepting that this metalwork is representative of settlement (see above chapter 6.12g and 7.9), the contemporary occupation patterns of Suffolk. Over 90% of bronze age metalwork is now found as a result of metal-detecting (see table 11).

Although metal-detecting is not generally carried out in a scientific manner it does have some advantages over earlier 'research'. It has not been directed towards answering specific bronze age problems and in this respect represents a random sample, and it has taken place on all of the major soil types of Suffolk (map 45). The outstanding feature is that in over 42% of parishes where more than one site (of any age) has been detected bronze age metalwork has been found as a result of this activity (maps 43 and 44). This takes no account of un-reported or un-recognised material.

The majority of the finds consist of small or fragmentary objects. This is in marked contrast to the earlier record of metalwork finds (tables 12 and 13), which have consisted mainly of large and complete objects, and fills an obvious gap in our knowledge. The significance of these artifacts is that they have been missed, or ignored, by both contemporary and later populations and therefore will not have suffered the same fate as the larger bronzes. A vivid demonstration of this was the intensive fieldwalking and hand excavation of the late early bronze age/early middle bronze age site at Mildenhall Fen (MNL 165) which failed to produce any metalwork. Later post-excavation work, however, revealed two small bronze awls: one in a soil sample and one which had been mis-identified as being of bone.

Therefore, theoretically, these small objects should give a far more accurate representation of bronze age distributions than can be obtained through researching lithics, pottery, and/or large metalwork.

Metal detected finds now represent over 60% of bronze age metalwork from Suffolk recorded in the Sites and Monuments Record. Since circa 1970 a total of 103 single artifacts plus eight hoards, from 95 sites, have been listed as metal detected in Suffolk (catalogue 5). Whilst these probably yield a more valid reflection of bronze age distribution patterns than has been obtained by earlier non-detected finds, these recorded examples represent only a sample of the artifacts actually located by detecting. This is due both to failures to report/record finds and/or recognise them. It is also true that the resultant distributions will, like earlier ones, be heavily influenced by factors not related to research of bronze age artifacts, in this case usually the attraction to sites with rich (non-bronze age) metalwork scatters. This bias has been, however, county-wide, far more random, and therefore more useful, than was the case with earlier patterns of collecting. A number of factors have been examined regarding the metal detected material and compared to non-detected finds. These are:-

a. Distribution

b. Size

c. Completeness

d. Artifact types

a. Distribution

The general distribution pattern presented by these finds (map 44 and 45), contrasts, usually markedly, with those discussed or illustrated previously (eg Fox 1923 and 1933; R R Clarke 1960, 24; Rowlands 1976, map 27; Lawson 1984, 168-9; Martin 1988c, map 12). The concentration on

the fen edges is maintained, although not as strongly as before (and see 'size' below), with over 70% of the metal detected finds coming from the non-fen edge situation. It is this non fen-edge distribution where the most marked differences are seen.

The former secondary focus in south-east Suffolk is now largely submerged in a thin blanket coverage of metalwork over the rest of the county, despite a much greater frequency of metal detecting in south-east Suffolk (map 43). Gaps occur, for example in the south-west and between north-east and central Suffolk (map 44) although these are probably mainly due to a lack of metal detecting activity. The distribution of the metalwork in relation to soil types (catalogue 5, table 16, map 45) again shows a greater concentration (proportionate to area) on the fen edge soils. No finds were definitely recorded from the fens, although detecting there has been limited. A higher amount, and proportion (over 30%), of metalwork was found on the group three (mainly clay based soils) than on any other soil, although the finds were commonly on, or close to, the interface of group 2 soils (mainly loess, loam and chalk based) usually in river valley situations. This relationship to river valleys is to be expected and is consistent with settlement patterns in most periods. The distribution demonstrates that metalwork (and by inference settlement, see below) is not restricted to the lighter soils of the fen edges, Brecklands and Sandlings and in fact appears more common on the clays than on the agriculturally richer loess and loams. Objects from the group four, sandy soils, are again largely found close to the boundaries of other soil types, which is probably a

reflection of the lack of available water and poor quality of the sand based soils.

b. Size

As stated above, the majority of the detected metalwork tends to be smaller than previous finds and is beginning to balance the relative lack of this material in earlier published lists and collections. As smaller objects are usually the largest proportion of metalwork found on recently excavated bronze age settlement sites in this country, these finds are of considerable importance. A problem inherent with the smaller objects is, one suspects, the frequent failure to recognise them as being bronze age. This is in addition to the tendency, by some, to discard incomplete objects not thought to be of particular value. It must be said that these same problems, have, in the past (?and present) also been common to museums. With the wide diversity of objects present in the bronze age (eg. in the Isleham hoard) the failure of recognition is not surprising, especially with a lack of bronze age specialists in northern East Anglia (the Norfolk Unit, for example, at present, has no prehistorian). Indeed, the fen edge concentration, where the objects have mostly been identified by the author, is a partial demonstration of this, with, for example, five tracers/awls; one bronze and one gold 'ring-money'; two lugged, chisel edged, tools and a disc-headed pin which may not have been recognised as bronze age by non-specialists.

Of the 103 single finds listed (catalogue 5, table 14) 84 (82%) are below 10 cms (maximum dimension) and 57 (55%) below 6 cms. No large variations, in percentage terms, are to be found relating size to soil

types, although only 41% of the finds from grade 3 soils are below 6 cms in size. This could partially be a result of weaker metal detector signals occurring in clay soils, leading to a reduced recovery rate for small objects. Alternatively this may suggest that fewer objects below 6 cms occur on these clay soils although with the relatively high figure of 54% occurring on the fen edge soils, where a higher proportion of larger finds might have been expected, it is likely that the slight variation is not significant.

The relative uniformity of the size of artifacts from different soil types, at first glance, may appear surprising and a contradiction of the suggestion that small finds will form a greater proportion of the material surviving on the heavier clay (above part six). It must be remembered, however, that the loss of the larger material, which this work suggests has taken place over the last 2000 years on these soils, has also occurred, more recently, on the sandy and fen edge soils respectively, with the result that it is mainly the smaller objects that now survive in the ploughsoil in all soil areas. When the size of the finds discovered prior to metal detecting are considered, the figures change dramatically. For example, of the 51 objects listed (in the Suffolk Sites and Monuments Record) as being found between 1940 and 1970 (excluding hoards and excavated finds), only 7 (14%) are recorded as below 10 cm maximum dimension. Of the 22 items from the fen edges only 2 (9%) are smaller than 10 cm maximum dimension. This will immediately reduce the figure of 82% for these small (below 10 cms in length) metal detected finds from the fen edges to only 50%. Pre 1940 finds would reduce this figure even more whilst the small amount of metalwork

recovered from the clay-based soils does not significantly alter the 81% figure obtained from the metal detected material.

c. Completeness

Another factor likely to be an indication of the longevity of arable agriculture, and hence greater likelihood of later recovery, is the degree of completeness of artifacts. It is clear that incomplete objects, especially when not re-usable, are less likely to be subsequently removed from the surface than whole ones (also see below). The group 3 and 4 soils give markedly lower percentages of complete artifacts (22% and 29% respectively) than the 46% from the fen edges (table 14). These figures will, as with the percentages for size, deviate to an even greater extent if the statistics for non-metal detected finds are added. The 60% recorded from the group 2 soils, in view of the small size and number (6) of the artifacts involved is probably not statistically significant.

The completeness of artifacts (tables 12 and 15) is mainly related to size, but also to function (eg frequency of axe blade edge fragments, spearhead tips and rivet hole breakages in knives and rapiers). Only 35% of the listed metal detected finds are complete compared to 94% of the finds listed as found between 1940 and 1970, despite their being comparatively larger.

d. Artifact Types

The details of artifact types in relation to soils and completeness show (tables 14 and 16 and catalogue 5) a number of interesting details.

Particularly pertinent to the suggestion that items which were useful were often re-utilised at a later date, is the rarity of knives and the lack of complete spearheads away from the fen edges. It could be argued that knives were less common or less frequently broken and/or disposed of, although knives were slightly more frequent than swords on the fen edges whereas the reverse is true in the non-fen situation. The frequency of fragments of spearheads, however, which, when complete, are generally of similar size (and potential) proves their presence at least. This suggests that the rarity of relatively complete examples is due to other factors, such as re-use. It cannot be proven that this re-use was necessarily subsequent to the bronze age. Indeed the slightly greater frequency of later bronze age hoards away from the fen edges (chapter 6.12a) may indicate a greater contemporary recovery rate for larger bronzes in these areas. The evidence cited above, however, strongly suggests post bronze age causes.

The high proportion of rapiers/swords (circa 11%) is much higher than might be expected and further supports the hypothesis that these 'weapons' were not necessarily as 'high status' as has been presumed (cf chapters 8.5g and 12.5c). The proportion of 'weapons' (if taken as swords, rapiers and spearheads), circa 27%, exactly matches the figure obtained from the detailed fen edge survey area (chapter 6). Although possibly slightly elevated due to the frequency of fragments with no scrap or re-use value (knives being re-used [above] and ornaments being less likely to have been deliberately disposed of) this consistency supports a relatively high percentage of 'weapons' in the metalwork. This is discussed further below (eg chapter 13.3d).

It is the frequency of the smaller artifact types rather than the fragments of the larger ones that has been one of the most important features of metal detected finds. For example, four of the six arrowheads listed from Norfolk and Suffolk (chapter 11.3) were found metal detecting as were all three examples of 'ring-money' and the only definite quoit-headed pin from Suffolk. Small items, such as ornaments and tracer/awls are a feature of many of the assemblages from excavated bronze age occupation sites. Their presence on the clay soils lends support to the claim that the relatively high number of bronzes there is due to settlement rather than losses during tree-felling, hunting expeditions or warfare. The frequency of tracers/awls, circa 10% of the metal detected finds, is of interest in that very few have been found in bronze hoards in northern East Anglia (chapter 8.5b), despite some, such as the Isleham hoard, having large numbers of small items. Evidence for their haphazard use is recorded, however, on axe and sword remains in the Levington hoard, Suffolk (S03832), and the deliberate use of a tracer/awl is also noted on a semi-circular object in the Wilburton hoard (Evans 1884, 111). These factors demonstrate the limitations inherent in using hoards as a measure of metalwork proportions. No tracer/awls are recorded from south or east Suffolk, other than one from Baylham (S11413) which is more in the form of a punch than an awl. Whether this is a true reflection of distribution or a lack of recognition in south and east Suffolk has yet to be established.

e. Interpretation/conclusions

The research outlined above has made it clear that the evidence offered by earlier work, based mainly on distributions heavily biased by larger

items of metalwork, and 'collection centres', such as north-west Suffolk and Ipswich, has misrepresented true bronze age metalwork proportions and distributions. As a consequence potential settlement patterns are also likely to have been incorrectly interpreted. It would appear that the pottery and flintworking evidence for this settlement has been largely destroyed by arable agriculture away from preserved landscapes, such as the fen/fen edges, and even there the identification of later bronze age scatters is difficult (chapter 11.2). The destruction and dispersal of these materials has to a large extent necessitated a closer look at the metalwork evidence. Even with this the evidence suggests that larger collectable or useful objects, when they survive, have usually been removed from their original places of deposition. This is demonstrated by, for example, the fieldwalking survey at Mendlesham, on the clay soils of High Suffolk, where only three very widely dispersed prehistoric (flint) 'scatters' were identified (appendix 9). Three bronze artifacts were also discovered, away from these scatters, parts of two palstaves and a re-utilised bronze knife. All of these bronzes were found within separate medieval pottery scatters!

Metal detected material has offered the means of clarifying the poor quality of information available from these other sources, especially when amalgamated with this, largely circumstantial, evidence. From this it can be seen that no evidence exists for a 'reduced contact zone' on which to base any territorial/social boundaries, and their purported existence, although apparent in the late iron age and at the time of the Roman Conquest, needs to be questioned with regard to the bronze and, by implication, earlier iron ages. It may be that detailed typological

analysis of later bronze age metalwork will show, or conversely, may not show, evidence of cultural divides (cf Savory 1958, 49 and Burgess 1980, 249 for Wales) in East Anglia although the relationships of artifactual to cultural boundaries are themselves debatable.

CHAPTER 10

RIVER DEPOSITS

1. Introduction

Apart from grave goods, two main groups of finds have commonly been assumed to indicate ritual behaviour, namely items found in bogs, lakes or other bodies of water (see chapter 12) and those found in rivers. The evidence regarding ritual and riverine deposition in East Anglia is discussed here.

A general examination of river finds has already been carried out for some locations, eg. for continental Europe see Torbrügge (1971), Coles and Harding (1979) and Bradley (1990) and for England see Crawford (1921, 142), Fox (1943, 58), Burgess (1974, 196) and Bradley (1979 and 1990).

This topic has, up to now, relied too heavily on generalisations. Detailed research is now needed to solve some of the problems that have been discussed. Several relatively recently published works do, to some degree, fall into this category: that of Ehrenberg (1977) on the spearheads of Berkshire, Buckinghamshire and Oxfordshire; Davey (1971 and 1973) on Lincolnshire; Burgess, Coombs and Davies (1972), Rowlands (1976, 207-8), Needham and Burgess (1980b), Barrett and Bradley (1980b) and Thomas (1984) on finds from the Thames; and Bradley (1979 and 1990), Ehrenberg (1980) and Wait (1985) on, *inter alia*, finds from English rivers. Although considering alternatives, all except Rowlands and Ehrenberg (1980), favour a deliberate ritual and/or votive reason for the apparent deposition of the majority of these bronzes in rivers.

This section aims to look at the East Anglian evidence and examine the arguments concerning the nature of these bronze finds. Various factors must be taken into account before any conclusions can be considered.

Although not wishing to reiterate the means by which artifacts can come to be in rivers (cf Ehrenberg 1980, Bradley 1979, Needham and Burgess 1980), in view of the primary importance of this, some of these must be considered. Firstly it must be stated that not all finds claimed to be from rivers were truly found in them. The Gathercole/Clouston bronzes, for instance, were given false provenances (chapter 6.5). Because of the collecting techniques practised in the 19th and earlier 20th centuries (and to some extent today), the citing of false provenances was probably a far more common practice than has been realised, for example the dagger from 'Sproughton' (S4612), the tanged spearhead from 'Hintlesham' (S5218), and the flanged axe from 'Martlesham' (S3664) actually came from the Arreton Hoard, Isle of Wight (Needham 1986). Similarly the various locations cited for some pieces probably originating in the Stibbard hoard, Norfolk (catalogue 3.N7147), and two Italian flanged axes reputedly '*found in Suffolk*' (Ipswich Museum 1920.51.30, 33). Incorrect provenances, that is accidental mislocations, have also occurred, eg a basal looped spearhead from West Row (S8823), the sword from 'Lawshall' (S6011) and the palstave from Croxton (N 11253).

Other finds actually come from recent river courses, new cuts and canals rather than prehistoric river channels (catalogue 7), for example the sword from Cockfield (S6011), the 'dagger' from Littleport (N 7305) and

the palstave from Runcton Holme (N 22265). At least one find is known from a medieval turbary, the palstave from Hickling Broad (N 8387).

Many of the other finds said to be 'from rivers' actually come from dredgings and do not necessarily derive from the rivers. For example, the fenland rivers in particular were embanked with imported materials to prevent flooding. An instance of this practice in the fens is recorded in a manuscript of 1668 where, following floods, a contract was awarded to create new banks using imported earth at a rate of 22d per 'floss' (Cambridge Record Office R59.31.19.10). Where these loads of 'earth' came from is not known but it was not until a succession of cases of banks giving way and causing flooding that it was realised that clay had to be used for the flood prevention barriers to be effective. Clearly one of the results of this was the incorporation, and likely subsequent erosion, of amounts of imported soils which could have contained prehistoric material. Dredgings were usually dumped directly on top of these banks and subsequent erosion, agricultural and drainage practices have often mixed the deposits. Imprecise recovery methods and records have made the true origin impossible to identify in most instances, and the possibility of finds coming from the imported, rather than the dredged material should not be discounted. An example of this would appear to be a Saxon coin hoard from Barsham, Suffolk where it is suggested the hoard derived from the clay defences rather than the more recently dredged materials from the River Waveney overlying them (Carr in prep).

Most of the rivers also have ditches alongside. Dredgings from these ditches, and therefore deriving from non-riverine deposits, have also periodically been added to the existing embanked material.

Nonetheless a percentage of the finds can still be accepted as deriving from rivers. The next major consideration must be whether they were deliberate depositions or accidental losses, and if deliberate, was it bronze age in date and/or ritual in nature?

2. Accidental losses

These are summarised by, for instance, Ehrenberg (1980, 7-9) and include boating and fishing accidents, warfare and erosion from former dry land situations. The extent of the former can never be calculated although they clearly must have occurred. Finds of this nature are unlikely to be recognised as such in a true riverine situation, due to dredger action etc. The discovery of the Southery Fen female (N 2586), popularly known as 'Nancy', associated with metalwork in the Norfolk fens, does appear a likely, dramatic, instance of an actual drowning (Lethbridge and Fowler 1931), although a sepulchral cause may be an alternative (cf Healy and Housley in prep). It is also worth pointing out that the distribution of hoards (particularly of late bronze age date) appears to be river based (map 2). Most river traffic, especially where 'valuable' cargoes were concerned, would probably have been protected by an armed crew. This could have caused a relatively high proportion of any losses to have been weapons, especially if this were a result of fighting.

Much aggressive behaviour may well have been localised and small scale or of a personal nature. However, the distinction between this and warfare is very difficult to recognise from the archaeological evidence. That some weaponry was used aggressively is undeniable, for instance the skeletal evidence from Dorchester on Thames, Oxfordshire; Tormarton, Gloucestershire and La Grotte du Pas de Joulie, France (Rowlands 1976, 192-193; Knight, Brown and Grinsell 1972, 14 and 16), but the scale, nature, frequency and social effects of any violence are difficult to determine. Further indications of the use of weapons can be gained through examination of use damage (eg the shield from Long Wittenham, Needham 1979a, 113 and the sword from Watford, Savage 1979). Evidence from the north-west Suffolk sample area indicates the occurrence of 'weaponry' to have been relatively consistent throughout the bronze age (above chapter 6.12e and tables 4 and 5) although its actual role is undetermined.

However, it is perhaps here worth looking more closely at swords and comparing the bronze age with the only other period where they occur 'in the field' in similar proportions, that is in the Saxon period. Suffolk was chosen as the sample area. The remains of 65 bronze age swords are recorded. If we exclude the 40 definitely from founders' hoards we are left with 25 (21 if we also exclude four others that may also have come from founders hoards), 17 of which are complete or almost complete. Of these, five (20%, or 23.8% if we accept the total as 21) came from rivers or river dredgings (note no swords are recorded from rivers in Cambridgeshire and, excluding 3 from the Little Ouse that have been included in the Suffolk total, only 1 is recorded from Norfolk - see

tables 17 and 18). These five are also 29.4% of the complete/almost complete count. Although this appears to be a very large proportion of the swords there may be simple reasons for this that do not necessarily concern bronze age (see below) or ritual activities and for this reason the best correlation may be obtained by comparing the bronze age with the Saxon swords, the deposition of which is not generally considered to be ritual or votive in nature (though note Wilson 1965, 50-1, Margeson 1982, 211 and Bradley 1990, 3-4).

Eighteen Saxon swords are recorded from Suffolk, all of them fairly complete. Four (22.2%) came from rivers. Eight of these swords though were early Saxon grave goods with inhumation burials. As this practice did not take place in later bronze age East Anglia we should perhaps exclude these. In the middle and late Saxon periods, when Christianity precluded the inclusion of grave goods, we are left with ten swords. The four that were found in rivers now represents 40% of the count. Stanley West (pers comm) believes the most likely cause for their being found in rivers was warfare.

Nonetheless in view of the possibility remaining that these also may be votive offerings (per Wilson, Margeson and Bradley above) a comparison with medieval swords may be more valid. Interestingly a large proportion of post-medieval, 'obsolete' swords are, or were until relatively recently, held in armouries. However few of the medieval swords that survive come from armouries, most are either single finds or come from tombs. Frequently swords, and other armour, was either placed outside (usually above) or within monumental tombs in churches. Most of

those outside the tombs were given away, thrown away or destroyed in the 17th and 18th centuries. The number of swords within sealed burials is unknown but may well be considerable as burials of medieval date are rarely examined.

Medieval swords are not frequently found in the field although interestingly a high proportion of such finds is again from the fenland area. A few come from dry land situations, some from ditches and one, from Thrandeston, Suffolk, was found whilst cleaning out a moat. It is estimated, however, that between 75% and 80% of all medieval swords from England with a known provenance were found in rivers (pers comm Ewart Oakeshott, December 1991).

An interesting comparison between bronze age and medieval practices occurs with the finds from the river Witham in Lincolnshire where the finds of medieval date are generally more numerous and impressive than those of the bronze age (White 1979). Although the causes of these medieval depositions are unknown, ritual is not usually considered as one of the more likely reasons.

Erosion of material from river banks and terraces, especially from settlement sites and particularly on major rivers, has been one of the major alternatives to ritual as the reason for so much metalwork occurring in some rivers (eg Rowlands 1976, 207; Bradley 1979, 4-5; Pryor 1980b, 489; Ehrenberg 1980, 10-13), notably along the Thames. That erosion has occurred is clear, some published examples being Wallingford, Oxfordshire (eg see Collins 1948-9; Ehrenberg 1977, 60; Thomas et al

1986; Lambrick 1990, 15); Syon Park, Greater London (Needham and Burgess 1980, 445) and Runnymede Bridge (Needham and Longley 1980).

It is the extent and nature of the finds from rivers in comparison to those from known settlement sites that have caused the main criticisms of this hypothesis. In East Anglia, despite there being no definite instances of bronze age material eroding into rivers, examples of ?prehistoric and Roman date have been seen at, for instance, Santon Downham (into the Little Ouse) and Scole/Stuston (into the Waveney).

However, it is the detailed study of the north-west Suffolk and south-west Norfolk areas that illustrate the situation most clearly. It is surely no coincidence that the area showing the greatest incidence of bronze age metalwork found in rivers, and the only such concentration in East Anglia, from the Little Ouse, correlates exactly with the zone of bronze age fen edge settlement (cf chapter 6.12g and chapter 11) and the distribution of bronze age metalwork from a dry land situation (see maps 8-17 and 21). It is also noteworthy that a similar observation was made by Bradley [1979, 4] regarding the location of settlement sites and bronzes from the Thames. The Suffolk evidence is of some importance as Thomas (1984, 18), with regard to the Thames finds from Wallingford, points out that the known settlement and dredged metalwork are separated by 'over a kilometre' and are therefore unlikely to come from the same location.

3. Deliberate deposition.

Finally we are left with material that was deliberately thrown or placed in rivers. A variety of possible reasons exist for this occurrence. The generally accepted view is that these finds are a result of ritual or votive deposition (cf Ehrenberg 1977, 18; Burgess, Coombs and Davies 1972, 216; Wait 1985; Bradley 1990). The distinction is based mainly on whether the bronzes were part of a funerary ritual (note the association of cremations with rivers as in, for instance, the Ganges today) or were votive, usually in the form of an offering to a deity. It has also been argued that these practices were a means of maintaining the value of bronze in a status-controlled society or were an ostentatious display of wealth consumption (eg Bradley 1984, 101-5) as practised by, for instance, eskimo communities in recent times, although this presumes bronze to have been more highly valued than perhaps it actually was (chapters 7.9 and 13.3a).

In support of the sepulchral theory, later bronze age burials known from northern East Anglia are extremely scarce, and even earlier bronze age burials are rarely associated with metalwork and are disproportionately low in relation to the likely population (cf Atkinson 1972; Fowler 1978, 5-6). Also they are generally situated away from the fen edge area which shows the greatest concentration of settlements (above chapter 6.12f). Those later bronze age burials that are known (eg Lawson 1980a lists 19 sites in Norfolk), are cremations. Skeletal remains are, however, often encountered both in excavated earlier bronze age occupation sites and amongst surface scatters, and more significantly they are now recorded from both peat and riverine situations relatively

frequently. The early bronze age date of some of these skeletal remains has recently been confirmed by accelerator dating (Healy and Housley in prep).

Although it has been suggested that the Southery Fen female (N 2586) may have been an instance of drowning, the discovery of other human remains in the same general area, occasionally possibly associated with metalwork (see N2542, N2567, N5248 and N5267 and chapter 7.8), suggests that a form of burial in wet places may be involved. If 'grave goods' were also present and cremation the main rite of disposal of the human remains then archaeological recognition would be almost totally restricted to these 'grave goods', ie, the bronzes. Ehrenberg (1980, 10) lists 'river burials' as a possible explanation for the large amount of high quality weapons in the Thames, and Pryor (1991, 120) supports a funerary element for some of the Fengate Power Station 'causeway' finds. This would also explain the predominance of weapons in rivers - note the rarity of tools in, for instance, early bronze age or Saxon male graves and the lack of a common association between most items of bronze age metalwork and females.

Votive deposition is another instance of a theory that is difficult to prove archaeologically. It has been supported by the 'historical' evidence such as the passage from Posidonius (cf Wait 1985, 15) where European Iron Age tribes are reputed to have submerged vast treasures in pools in sacred precincts near Toulouse in the 2nd century BC, and that of Julius Caesar, relating to the customs of the Gauls, where many tribes piled battle spoils on consecrated ground (Gallic Wars, VI, 17),

These works have, however, been shown to lack historical accuracy and were clearly partially written as political propaganda. It has been argued on several occasions, on what seems weak and imprecise evidence, that finds such as those from Llyn Cerrig Bach (of iron age date) and the 'fens' demonstrate such votive practices in Britain.

In rivers the occurrence of bent or broken objects (mainly swords and rapiers) has also been cited to support their votive 'killing' (for example Anon 1859; Martin 1980; Thomas 1984, 18; and Pryor 1991, 120). It is difficult to prove that such damage occurred in the bronze age, especially as most are eventually discovered as a result of dredger action. At least 57%, probably 71% of the swords from rivers in Norfolk and Suffolk were found in dredgings (appendix 1). These may have been disturbed a number of times before their transference to the river bank and discovery.

Even if damage could be proved to be bronze age, it may be that the finds represent deliberate destruction and disposal of inferior or obsolete metal rather than votive practices or the visible destruction/consumption of wealth. For instance poor quality swords have been revealed by analysis. Particularly interesting is the attempt to finish, and by implication pass into circulation, swords from casts that *'would have been fit from the outset only for remelting'* (Savage 1979). Indeed, in relation to finds from the Fengate Power Station site, Pryor states that *'many of the metal objects were clearly very second-rate castings at least two of the swords had been broken across major casting flaws and one must ask whether they could ever have*

been used in actual battle' (Pryor 1991, 118). This would agree with the model proposed above (chapter 6.12c) that the great majority of the surviving bronze age metalwork in northern East Anglia results from the disposal of rubbish rather than ritual.

Only two of the six swords from East Anglian rivers show evidence of bending or other damage that could be related to any such ritual 'killing'. An interesting documentary account of sword breaking is contained in the 11th century epic poem 'The song of Roland', where Roland, mortally wounded, attempts to break his sword, not for ritual purposes, but to prevent another, unworthy, using it.

Another serious difficulty in accepting a votive theory concerns the nature of the river finds. It has been argued that these are usually weapons or of high status. For example it has been claimed that 75-80% of the dirks and rapiers of Britain and Ireland (Burgess and Gerloff in Needham and Burgess 1980, 445) and 89% of the 7th century BC swords from lowland Britain (Wait 1985, 19) are from rivers and bogs (but compare with above part 2). In some instances, eg shields, these are maintained to have been made specifically for votive/ritual practices (cf Coles 1962, 184-5; although note the spearhead holes in the shields from Long Wittenham, Oxfordshire and Bingen, West Germany, cf Needham 1979a).

In the north-west Suffolk area of intensive survey only six (17% or 24% depending on the scheme of classification used) of the rapiers and dirks come from rivers. None come from within definite bog or peat locations (see chapter 12) despite this being artifactually the richest part of

the fenland area in lowland Britain. If the river finds did represent votive practices, or an ostentatious display of wealth consumption, it is especially notable that the truly high status material, the gold, is missing, especially in view of the Strabo (Geographia 4, 11, 13) quote, relating to 1st century Gaul, *'The country came to have treasure in many places in Celtica; but it was the lakes most of all that afforded the treasures their inviolability, into which the people let down heavy masses of silver and gold'* (Ehrenberg 1980, 9). None of the bronze age gold artifacts from East Anglia have come from rivers (catalogue 8).

A further factor to be considered, almost too obvious to mention, is that although some artifacts were deliberately placed in rivers, this need not have occurred during the bronze age. Children and adults, including farmers, have all been responsible for throwing objects into rivers, especially if they were likely to foul their agricultural equipment. The bent condition of some of the larger finds, such as the swords (above) is paralleled by pieces known to have been bent as a direct result of being entangled with machinery, such as the halberd from West Row (S8802) and the copper tanged dagger from Lakenheath (S9585). A classic example of a recent deposit was the report of a palstave (catalogue 1.H17), found metal detecting and then thrown into the river Little Ouse. Its bright bronze colour (it was, as it happens, found in material dredged from the river) had led the original finder to believe it was modern, despite his interest in antiquities.

The practice of throwing junk into rivers is not necessarily only a 20th century phenomenon. It may be a curious coincidence but the areas where

bronze age metalwork occurs in rivers in Suffolk corresponds to the location of large Roman sites (and note that a large proportion of bronze age metalwork that is now found by metal detecting comes from Roman sites). The Little Ouse cluster in particular is adjacent to one of the few Suffolk sites where field systems of this date appear to exist. It may seem unlikely that the Romano-British population would dispose of this material in this way. However, four possibilities exist. First that these items were no more than a nuisance when ploughed up (?from the bronze age settlement sites of the fen edges). Secondly that they were left in the farmyard, perhaps used, then thrown into the river to prevent accidents occurring with children. Thirdly, they may have served a Roman ritual practice - a curse plaque has been found in the same dredgings and the area adjoins the site of the Hockwold ritual crowns. Finally it is not inconceivable that the bronze age swords served as weapons in later periods as amply demonstrated by the scimitar from Arabia adapted from a Gündlingen sword (Cowen 1967, 453-4, plate 65).

4. East Anglian statistics and conclusions

Although the results of the research of the East Anglian material can be compared with that carried out for other British rivers this is in many respects not a valid exercise, as fundamental differences exist. For example the relative proportions of river to dry land finds in these locations are bound to differ for a number of reasons, such as the differing present, as well as ancient, agricultural practices in each region. Indeed it is argued below that the heavy concentration of metalwork witnessed in the fen edges is a direct result of their

protection from 2000 years of agricultural activities by the unique preservation offered by the fen deposits. In addition to this one can mention soil types, regional topography, artifact recognition, collecting and research strategies and bronze age regional variation as a few of the more important reasons for these differences (eg chapters 6.5, 9.1 and 9.2).

In Cambridgeshire, Norfolk and Suffolk a total of 45 or 46 bronze finds are recorded from rivers, a minimum of 18 from meres, one from a medieval turbary, six from canals and five from beaches (catalogue 7, table 17). In relation to the number of finds of bronze age metalwork from the three counties, at least 11,168, the total of 74/5 finds is very minor, representing only 0.7%. The plot of finds in relation to the rivers (map 2 and see tables 17 and 18) shows only one concentration, in the Little Ouse, which, as stated above (part 2) coincides with the main concentration of finds on dry land.

A variety of implements is represented (tables 17 and 18). The majority of these, as might be expected for finds from river dredgings (see above), tend to be of the larger and more easily identified types, such as swords, rapiers and spearheads (24/25 finds) although smaller finds, from palstaves to gouges and a pin (19/21 finds), are also represented. An apparent late bronze age hoard, from the Wissey at Stoke Ferry (N4725), which includes an early bronze age halberd, is also listed. Indeed the unsharpened palstave/s and the socketed chisel (S10218), dredged from the Little Ouse at Brandon, may be another hoard. From the reported unpatinated condition of one of the palstave(s), upon

discovery, it seems likely that this is an instance of a bronze age loss or deposition in a river.

A significant predominance of weapons and other prestige-goods has been claimed to occur in rivers (eg Ehrenberg 1977, 18; Needham 1979a, 127-8; Wait 1985, 15-25; Bradley 1991), especially in the Thames (Barrett and Bradley 1980, 261-3; Ehrenberg 1977, 18-19 and 1980, 1-15). Although more weapons than tools are indeed recovered from East Anglian rivers, in view of the bias in recovery of large implements (cf Bradley 1979, 3; Ehrenberg 1980, 1-7), this is to be expected and the proportion is insignificant. A relatively low figure of 25/26 (54-58%) of the recorded river finds are classifiable as weapons. In comparison, weapons form about 27% of the finds from the north-west Suffolk intensive survey and 28% of the finds found metal detecting in Suffolk. Three (60%) of the five beach finds and two (33%) of the six finds listed from canals are also 'weapons'. If the torc (S0179) is amalgamated with the weapons as being 'high status' the total would increase to 43% of the canal finds. As a proportion of the total finds of weapons, even only complete ones, from the three counties those from rivers are insignificant.

It is demonstrable, by the discoveries from turbaries and canals, that deposition of bronzes has occurred, either accidentally or deliberately, in relatively recent times in such bodies of water. Other finds, for example the unpatinated palstave from Brandon (S10218) and possibly the palstave from (?) an extinct rodden course at Chatteris (C1517) indicate, as might be expected, that some items found their way into

rivers during the bronze age. However with the evidence for the relationship between rivers and hoards (map 2), together with actual boat and paddle remains, eg, the dug-out boats from near Chatteris (one with a rapier, Evans 1881, 250) and Warboys Fen (Noble 1910), and a paddle radio-carbon dated to 2900 ± 70 bc (BM 2339) from Canewdon, Essex (Wilkinson, Murphy and Austin 1983, 21-4), it is only reasonable to suppose that some of the losses of metalwork would occur normally in navigable rivers. The shared centre of riverine and dry land deposits in the area of the Little Ouse (maps 2 and 8) should be seen as further support for accidental, or at least profane, deposition (not necessarily during the bronze age) in East Anglian rivers.

In conclusion, the evidence strongly suggests that bronze age ritual or votive deposition of metalwork in rivers did not occur in East Anglia.

CHAPTER 11

LATER BRONZE AGE FEN EDGE SETTLEMENT: THE EVIDENCE

Probably the most significant feature with respect to the occurrence of later bronze age metalwork on the south-eastern fen edges is the apparent relative lack of associated settlement evidence. It is clear that occupation exists until the end of the early bronze age as is witnessed by the profusion of lithic and pottery scatters (cf Hall 1987, Silvester 1991, Martin and Murphy 1988, 354) and by excavations at Hayland House and Fifty Farm (both Leaf 1935a), Mildenhall Fen (J G D Clark 1936), Hurst Fen (Briscoe 1954b and J G D Clark et al 1960), Mildenhall 130 (Martin 1977), Mildenhall 165 (Martin 1983, 234-5; 1984, 328; 1986, 153; 1987a; Martin & Murphy 1988), Hockwold-cum-Wilton (Bamford 1982, 8-30); Feltwell (Healy 1988) and at Plantation and Peacocks Farms (Clark 1933, J G D Clark et al 1935; J G D Clark and Godwin 1962) and by dated examples of the prolific burnt flint patches at Mildenhall 124 (Murphy 1979a; Murphy in Keeley 1984, 25-7), Mildenhall 137 (Murphy in Keeley 1984, 25-7, and 1979b) and Mildenhall 204 (Martin 1987b; 1988a).

Although some works elsewhere suggest that lithic scatters need not necessarily be settlement sites (eg in the Derbyshire Peak District, D Garton, pers comm), in the fen skirtland those of neolithic and bronze age date commonly are. Hall (1987, 2) states '*Discussion has occurred amongst prehistorians for some years as to the significance of lithic scatters..... Having surveyed large areas of Cambridgeshire it is clear that lithic sites must be settlements*'.

The sites on the fen edges have the added advantage, not usually in evidence elsewhere, that prehistoric pottery, as well as animal bone, has survived relatively frequently as an element of these surface scatters (although see chapter 9.4).

The confirmation that these scatters represent settlements has been the excavations listed above. Although only one site, Mildenhall 165, has produced recognisable houses, this is probably due to the lack of area excavation on the pre-1970s sites and the extensive, and largely recent, erosion of the sand hummock surfaces on which these sites were situated. All of these scatters, however, have produced good settlement debris including worked flint, pottery, animal bone, burnt flint and usually quernstones and/or other evidence of cereal(?) processing.

The archaeological recognition of this evidence of settlement has been a relatively recent development. Before the 1930s its presence was generally suggested only by the known wealth of (collectable and saleable!) items such as flint arrowheads, stone and flint axeheads and early bronze age metalwork (eg Evans 1881 and 1897; Fox 1923) forming part of the collections of many of the local and national museums.

With such good evidence for neolithic and early bronze age occupation the apparent lack of comparable association of settlements with the later bronze age metalwork is all the more puzzling. In fact the presence or lack of later bronze age settlements must be seen as one of the crucial problems regarding the interpretation of the metalwork. Contemporary settlements, as found in the early bronze age, allow

secular causes for the metalwork distribution to be considered. Without settlements it seems hard to envisage any other interpretation than funerary/ritual or votive for its occurrence.

1. Excavations

Any consideration of the apparent scarcity of recognised later bronze age settlements on the fen edges must examine the likely causes for this in some detail. Later bronze age settlements have been located on only two occasions during excavation. One of these, The King Site, was accidental in that it resulted from the exploration of potential palaeolithic sites by an amateur archaeologist (Kelly 1967). The other site, Mildenhall Fen (J G D Clark 1936), was found following a deliberate search, although the pottery, which was dated to the late bronze age by Clark, is close in form to that from Mildenhall 165 (Martin in prep.) and probably somewhat earlier than he at first supposed (cf Lawson 1980a, 279). A further small excavation with possible later bronze age flintwork and pottery was also undertaken by the author (appendix 5).

The other prehistoric sites which have been examined on the fen edges were excavated only because of the possibility of their being burial mounds (Hayland House); to answer specific problems regarding the nature and dating of burnt flint patches (3 sites, see above) or, in the majority of cases, because of the rich nature of the pottery and lithics (for instance decorated pottery and finer flintwork such as arrowheads, axeheads etc) previously found fieldwalking on the sites. However this higher quality artifactual evidence influencing the choice of these

sites for excavation is consistently neolithic or early bronze age. As a consequence it was mainly sites of these periods which were excavated and/or published:

One reason for the relative lack of excavated sites of the later bronze age in comparison to those of the early bronze age may be that no one has been concerned with studying sites producing only 'unexciting' or 'undiagnostic' artifactual material (see below).

Many other excavations, carried out on the fen edges between the 1930s and the 1960s, were not reported, for example those by Frank Curtiss (Bamford 1982; Healy 1988 and forthcoming). For the majority of the sites excavated in this period, with a few exceptions such as the records made by Frank Curtiss (ibid), no documentary evidence now survives. It may be that, on some occasions, no reports of these works were made because the finds were of this undiagnostic nature, and on other occasions the records have subsequently been disposed of.

Therefore, due to the bias inherent in the practices previously employed, the examination of later bronze age settlement sites with a very basic and largely indistinguishable flint and pottery range (eg Mildenhall Fen, Grimes Graves and the King Site; see below) has, in the majority of instances, not taken place, or when it has, the records have rarely survived.

2. Surface Scatters

Having expressed one of the main reasons why such sites may not have been excavated does not, however, explain why they have not been identified, even if only as surface scatters, especially when so much apparently earlier material can be seen so clearly on the field surfaces. The causes may be much the same in that there is a distinct lack of artifacts (apart from the bronzes) that have been easily and readily identifiable as diagnostically later bronze age in date. The majority of early bronze age pottery from this area is plain and the flintwork indistinguishable (see below). It could be that the sites producing lithics and pottery already identified and generally categorised as 'neolithic', 'early bronze age' or 'iron age' are partially or even totally later bronze age in date.

To attempt to resolve this key issue, it was decided to carry out detailed assessments of some of the fen edge area. The main aim of this was to see how much material which could be considered as representative of settlement was present; and to establish the likely date and nature of this material and its possible relationship to finds of metalwork. Three principal methods were employed. First the recording of local collections, many of which were held by farmers and individual collectors as well as museums. This allowed the biases that occur in the random collecting strategies utilised by these various parties to be recognised and evaluated locally. It was clear from this that, as might be expected, only the finer or more exotic artifacts were generally saved. Alarminglly, this even occurred when groups of finds of mixed quality, which offered a truer representation of the surface

assemblages, were originally donated to some of the museums. Any finds of this nature which were retained, and many were not, consistently lacked findspots.

Secondly the material found during detailed and recurrent fieldwalking by the author, over a limited fen edge area (of about 500 hectares), where seven of the excavations listed above occurred, was examined in an attempt to evaluate and quantify the nature of the scatters in relation to the bronze age metalwork distribution and the possibility of later, as well as earlier, bronze age settlement scatters being present.

Finally the author also carried out some of the fieldwalking for the fenland survey in north-west Suffolk. This offered the opportunity, via a wider yet less detailed fieldwalking programme, of evaluating the more general artifact distribution patterns in the area already chosen for detailed research of the metalwork. It also allowed areas of true fen, fen skirt and non-fen to be examined and compared and the implications for settlement away from the rich fen edge occupation zone to be reassessed. The results are discussed further below.

The fieldwalking (details held by the author and the Suffolk Archaeological Unit) confirmed a heavy presence of neolithic and earlier bronze age material; usually represented by restricted concentrations of finds on sandy hillocks in areas of former 'hummock and hollow micro-relief'. Artifacts consisted predominantly of worked flint but also of pottery, worked and utilised stone, bone and burnt flint. Most of the bones were of domestic animals but some human skull fragments were also

recorded. This is consistent with the results from excavated sites in the area, eg, Fifty Farm and Hayland House (Leaf 1935a), and Mildenhall 165 (Martin and Murphy 1988, 356). For the most part definable scatters were restricted to the fen edges. None were recorded from the deeper fens and sites from the non-fen situation were very scarce although stray finds of worked flint there may have been representative of plough dispersed scatters.

In some instances neolithic or earlier bronze age finds (eg, Grimston/Lyles Hill ware, flint and stone axes, leaf and chisel arrowheads, jet buttons, beaker and collared urn pottery) were identifiable. In most cases, however, the assemblages were undiagnostic in character. Due to the local micro-topography described above even where concentrations of, for example, neolithic material, occurred, this was frequently mixed with subsequent settlement debris. The frequency of re-utilization of, for example, polished flint axes and flint quernstones for source material was notable (appendix 10). This is not the place for a detailed discussion of the results of the fieldwalking surveys, some of which will appear as part of the fenland survey series of monographs (Martin, in prep.). Amongst the relevant conclusions based on this work are:-

1. The concentration of 'settlement scatters' recognised on the fen edges did not, in general terms, appear to be present in the deeper fens in Mildenhall parish, even where the prehistoric horizon was not masked by peat.

2. Although prehistoric scatters were rare on the higher and drier soils to the south-east of the fen edges it is possible that recognisable traces of settlement in these areas have been dispersed by long term ploughing.

3. The frequency of neolithic and early bronze age artifact scatters, including 'high status' finds, was confirmed as was the likelihood of their being settlement sites as suggested by earlier excavations.

4. The presence of neolithic and early bronze age scatters was heavily masked by a mass of undiagnostic prehistoric material, some of which may be of later bronze age date.

Also demonstrated, jointly by the fieldwalking and the recording of local finds, was the effect of changes in artifact frequency on some sites caused by the collecting strategies outlined above. Two instances illustrate the point. One was a report of "over a thousand" arrowheads being found by a father and son during horse ploughing on one field, prior to the common use of the tractor. These arrowheads were sold. There is no reason to doubt the identification as arrowheads in this instance and even allowing for exaggeration, this record contrasts markedly with the evidence of the last 20 years when, despite being fieldwalked by a variety of persons, including the author, only one arrowhead has been found, together with a dispersed, pottery free, worked flint scatter on this same field.

The second example compares two areas, in Mildenhall and Feltwell Fens. Mildenhall Fen, where a profusion of implements has been recorded recently, has been noted for well over a century for the discovery of numerous complete flint, stone and bronze axes. This has not been matched by the better recorded finds of the last 20 years (author, unpublished manuscript) when some four flint, one stone and no bronze axes have been found.

A similar area in Feltwell Fen has been walked, infrequently, both in the past (with the exception of Frank Curtiss, see Healy 1988 and forthcoming; Bamford 1982; and above) and recently. However the recent walking, carried out by a local amateur, has produced an astonishing collection including 17 flint, 14 stone and 4 bronze axes. It is perhaps significant in this case that not only has the Feltwell Fen area been less heavily collected in the past but the loss of its protective covering of peat has been much more recent than that in the Mildenhall Fen area. Significantly, according to the fieldwalker, Mr M Young, the finds of complete axes '*have now run out*', with only smaller objects being recovered over the last three to four years (pers comm, 1991). For discussion of the pottery survival see chapter 9.4.

To assess the results of the fieldwalking surveys with regard to the possibility of the survival and recognition of later bronze age material remains, and hence settlement sites, it is first necessary to identify the artifact types which might commonly be expected on sites of this type.

3. Later bronze age flintwork

The use of worked flint continued throughout prehistory in Britain. Although the increase of metalwork caused a relative decline in the range of flint artifact types (cf Healy 1981; Ford et al 1984) flint and pottery are usually the most common (surviving) implement materials on settlement sites until the end of the bronze age. This is particularly true in areas, such as East Anglia, where flint is common, although elsewhere it has been argued that accessibility to metalwork was also a significant factor (cf Bradley et al 1980, 288-9, who show the percentage of flintwork increases with the distance from rivers in the Thames valley). However the frequency of flintwork on later bronze age settlement sites in East Anglia has, with a few exceptions, still to be established and although hoards appear to be mainly river based (chapter 8.7 and map 2), the factors that affected access to or availability of the other bronzes have yet to be demonstrated.

Indeed it has been argued (eg chapter 6.5d) that metalwork was far more common in East Anglia than has previously been accepted. This being the case there need be no variation in metalwork availability and as a consequence in flint assemblages either. The range and frequency of flintwork in use in the traditional early bronze age is well recognised and need not be expanded upon here. This range becomes more restricted in the later bronze age. Bradley (Ford et al 1984, 164-7) identifies five basic early bronze age types and four in the later bronze age, when the arrowhead goes out of use. However, this is not necessarily the case in East Anglia (see below). Indeed, despite Hawkes and Ford (ibid, 159-64) showing that differences are demonstrable between early and

later bronze age flake assemblages these are so slight that any attempt to separate them without independent means of dating would be of extremely dubious validity.

Some details of assemblages of later bronze age flintwork are published, using variable criteria, from a number of excavated sites in East Anglia. Amongst these are Barton Mere, Suffolk (Jones 1869); Phillips 1-4, Suffolk (Kelly 1967; Ford et al 1984), Mildenhall Fen, Suffolk (J G D Clark 1936); Stonea Grange, Cambridgeshire (Fenland Research 1 1983-4 27; Fenland Research 2 1984-5, 9); West Harling, Norfolk (J G D Clark and Fell 1953, 34-5); Fengate, Northants (Pryor 1980a), Haddenham, Cambridgeshire (Fenland Research 3, 1985-86, 32-5); Grimes Graves, Norfolk (Saville 1981), Springfield Lyons, Essex (Buckley and Hedges 1987, 5); Barham, Suffolk (Martin, Balkwill and Plouviez, forthcoming, 22-24) and Flag Fen, Cambridgeshire (Pryor 1991, 91-2). The flint assemblages from Barham and those from the Mucking South and North Rings are said to be small (Jones and Bond, 1980, 471, 475, 480 and for North Rings details see Bond 1988, 23-5).

Most of the flintwork from these sites consists of flakes, many of which may have been utilised, and scrapers, awls, rods/fabricators, hammerstones and knives. Amongst the large later bronze age assemblage excavated at Grimes Graves the material also included picks, burins, points and possibly tranchet axes and barbed and tanged arrowheads. The latter of these is of some interest in that barbed and tanged arrowheads are occasionally encountered on excavated sites of later bronze age date in East Anglia eg. Grimes Graves (Saville 1981, 50 and 67), Springfield

Lyons (Buckley and Hedges 1987, 3), and Mildenhall Fen (J G D Clark 1936, 43-6). Although often considered as residual there is usually no firm evidence to support this.

Despite later bronze age arrowheads, of both flint and bronze occurring on the continent (cf Piggott 1965, 183 and Mercer 1970), very few are known from Britain. Of those flint arrowheads listed by Green as having possible later bronze age associations, he considers the most recent of these, on grounds of association, to be the Kilmarnock class dating 'to earliest around 1000 bc' (1980, 131-141).

Bronze arrowheads are also rarely represented in Britain. O'Connor (1980, list 58) lists only four 'tanged' bronze examples, from the Penard hoard, Glamorgan; Bokerly Dyke, Dorset; Water Dean Bottom, Wiltshire and Eriswell, Suffolk (S0472). However, although still relatively scarce, at least six are now known, in a variety of forms, from Norfolk and Suffolk; from Hockwold (N, no SMR number, Bury St Edmunds Moyses Hall 1977-860), Eriswell (S0472), Lakenheath (S, no SMR number), Brandon (S9823), Hinderclay (S9833), Wetheringsett (S3342) and additionally possibly those in the hoard from Exning (S6419), from Methwold (N4884) and two from Norfolk (N11136). These demonstrate the continued usage of arrowheads in the later bronze age in East Anglia, and support the possibility that some of the flint arrowheads may also be of this date.

The evidence from Mildenhall 165, radio-carbon dated to between 1470 ± 70 bc and 1240 ± 70 bc (HAR-4269, 5634, 5635, 5638, 5639), with only three

barbed and tanged arrowheads may suggest that the use of arrowheads was declining towards the end of the traditional early bronze age (as dated, for example, to circa 1250 bc, Lawson 1984, 142; 1200-1300 bc, Needham 1979c, fig 14).

In conclusion the flint work in use on later bronze age sites in East Anglia is, in its own right, largely indistinguishable from that found on early bronze age settlement sites, notwithstanding that these traditional period sub-divisions are probably inconsistent with the evidence for bronze age continuity in the study area (above chapter 6.11).

4. Later bronze age pottery

A variety of early bronze age pottery styles is represented in East Anglia. Although individual finds (mainly from burials) have usually been separated according to traditional pottery typologies or classifications, for example beaker, food vessel, collared and biconical urns, the material from settlement sites cannot, and probably should not, always be so conveniently divided. In the majority of instances mixed assemblages are evident, and while some of the pottery types are usually recognisable, admixture and large variation in proportion and style is usual. However, the great majority of the pottery, particularly that found on the surface, consists of relatively small, plain, sherds. These early bronze age sherds are usually, but not exclusively, grog tempered.

The pottery in use, on radio-carbon evidence, up to circa 1240 \pm 70 bc (HAR-4269), on the Mildenhall 165 fen edge site shows a predominance, and variety, of mainly collared/biconical, urn forms, again mostly grog tempered. These can be seen to develop from the local, slightly earlier (c.1720-1440 bc, see above) bronze age pottery traditions and are, in turn, succeeded by the urn forms from the Mildenhall Fen site (J G D Clark 1936, 36-43). This material, in forms clearly developing from those from Mildenhall 165, is now principally flint-tempered. It is unfortunate that no radio-carbon dates exist for this assemblage but it demonstrates the continued local progression from that of early bronze age form and date as seen at Mildenhall 130, into a later bronze age, Deverel-Rimbury tradition, pottery series.

On East Anglian sites with later bronze age metalwork and/or moulds in association with the pottery, eg, Wilde Street (Kelly 1967); Grimes Graves (Mercer 1981); Flag Fen (Pryor 1988, 15-16) Springfield Lyons (Buckley and Hedges 1987); Mucking North and South Rings (Jones and Bond 1980) and Stonea Grange (Potter and Jackson, 1983-4, 27) the common fabric is predominantly flint tempered (although variable quantities of shell, grog, chalk and sand are also used and grog may still be commoner in Norfolk, cf Lawson 1980a, 275).

The Deverel-Rimbury tradition forms, although still variable, and with too few representative sites in East Anglia to do more than generalise, have become relatively restricted in range consisting mainly of simple bucket forms, of coarse fabric, poorly fired and largely devoid of decoration (cf Lawson 1984, 157). As Lawson states '*it is hardly*

surprising that little of this pottery survives among surface collections' (1980a, 273). Of the 2974 sherds excavated in the 1971-72 excavations at Grimes Graves only 202 (less than 7%) were decorated.

Longworth has noted, in relation to the Grimes Graves material (with a range of radio-carbon dates mainly between 1100 and 800 bc) that *'the virtual absence of fine wares and globular shapes in particular is striking'* (Longworth 1981, 41). Also noteworthy was the high percentage of plain rims, a recognisable characteristic of a large proportion of the rim sherds recovered field walking on the fen edges.

From about 1000 bc these simpler forms developed to include a wider variety including (slightly) decorated bowls and jars of both finer (but still mainly flint tempered) and coarser flint tempered fabrics (cf Barrett's 'Post-Deverel-Rimbury Tradition', 1980). The use of sandier fabrics appears to increase on some, but not all, sites as the bronze age progresses (cf Buckley and Hedges 1987, 8). However the finer wares still only occur as a small component of the pottery assemblage and in northern East Anglia they have usually only been recognised as single vessels (cf Lawson 1984, 161). A radiocarbon date of 690 \pm 70 bc (HAR-3160) exists for an example from Barham, Suffolk (Suffolk SMR BAR 015).

The excavations at Mucking and Springfield Lyons in Essex have offered far better sequences of later bronze age pottery than is at present available from northern East Anglia. Lawson (1984, 161) claims this Essex area is identifiable as a 'discreet style zone', also identifiable in the middle bronze age by Ardleigh urns, but in view of his admission

of a lack of research (ibid) in northern East Anglia this must be viewed with caution. Although the relative lack of pottery clearly identifiable as 'post Deverel-Rimbury' north of Essex may support a regional divide it is notable that even within the excavated assemblages from Mucking one of the major problems highlighted was differentiation of the local neolithic, beaker coarse ware and the middle and late bronze age flint-gritted fabrics common to the area (Jones and Bond 1980, 477). In the surface collections available on the East Anglian fen edges, which lack the large sherds and reconstructable vessels present on excavations, this problem is significantly greater. It is particularly pertinent that the pottery from the surviving ploughsoil (most was machined away) at the Mucking and Springfield Lyons sites (which were not fieldwalked beforehand) would not, without the subsequent excavation and resulting hindsight, have been recognised as of late bronze age date.

Development continued with the use of further decorative and stylistic forms into wares that have been traditionally regarded as characteristic of the early iron age in northern East Anglia (cf Cunliffe 1968), as at West Harling (J G D Clark and Fell 1953, 14-32). Champion (1976) suggested that Cunliffe's Fengate-Cromer style should, with the West Harling pottery, be considered as transitional and designated 'ultimate' bronze age (cf Lawson 1980a, 271). This bronze age designation is supported by the date of 690 ± 70 bc (calibrated to 845-795 BC) cited above for a West Harling type vessel from Barham, Suffolk. Martin, Balkwill and Plouviez (forthcoming, 18-22) have also highlighted the problems of precisely dating the pottery styles of the later bronze age

and iron age in East Anglia, even within closed excavated assemblages, and suggest that the Darmsden style group (Cunliffe 1978, 360) is also partly of the later bronze age. This has been supported by a radio-carbon date of 730 ± 70 bc (HAR-8514) from a layer overlying Darmsden type pottery at Lofts Farm, Essex (Brown 1988). Plain potsherds, mainly with flint fillers, are again the most frequently encountered element in assemblages from these sites.

In conclusion various factors and expectations should be taken into consideration regarding the identification, discovery and distribution of later bronze age pottery in northern East Anglia. These are:

1. The rate of survival is likely to be low in ploughsoil (chapter 9.4) and therefore in areas of long standing arable agriculture without buried bronze age soil horizons it is unlikely that later bronze age pottery will be found.
2. The pottery which does survive is likely to be predominantly 'flint gritted' and represented by relatively small sherds.
3. The great majority of this pottery, being plain and of similar fabric, is going to be indistinguishable from local ploughsoil finds of neolithic, beaker coarse-ware and iron age wares.

5. Flint tempered pottery scatters

As a result of these observations it became clear that later bronze age settlement, which is probably invisible in the majority of soils where

longstanding ploughing has taken place (chapter 9), could indeed be present in the south-eastern fen edges although its recognition would still be problematic. Clearly flintwork, for the most part being undiagnostic, could not be used. It was concluded that only 'flint gritted' pottery, being predominant in later bronze age pottery assemblages, was likely to provide reasonable evidence. As a consequence the results of the fieldwalking surveys by the author, together with material recorded in the sites and monuments record and the fenland survey were analysed and details of flint-tempered pottery finds were extracted for one parish, Mildenhall, in north-west Suffolk. The fenland survey fieldwalking results derive from extensive traversing of the landscape, much on 20m or 30m apart transects. Only where concentrations of finds were noted were the transects restricted to 10 or 5m centres. Some areas were not walked due to crop cover etc. As a result of this practice it is clear that the distribution can only be representative of a larger presence of artifacts. The information extracted from the SMR is also very limited although it includes the later bronze age 'Mildenhall Fen' (J G D Clark 1936) and 'King'/'Phillips' (Kelly 1967) occupation sites, both of which failed to produce any flint-gritted pottery during the fenland survey! The intensive fieldwalking by the author was also restricted in that it concentrated only on the south-western half of the fen-edges in Mildenhall parish. Nonetheless it is hoped, and felt, that the sum total of this research has led to a relatively accurate representation of the distribution of surviving flint gritted pottery in this parish.

During the analysis all sherds which were clearly neolithic or early bronze age in date were excluded. It was not possible to separate possible 'iron age' sherds but it should be noted that no evidence exists for any other 'iron age' artifacts from the south-western half of the parish. Those known from the north-eastern half consist only of 'late iron age' coins and in view of the fact that all were from predominantly Roman scatters it seems likely that they belong to the Roman rather than an iron age phase of occupation on these sites. The plot of the resultant distribution pattern was then compared to that for the known finds of bronze age metalwork (map 46). As can be seen the correlation is marked. Particularly noticable are the matched concentrations of metalwork and flint tempered pottery on the south-western and north-eastern areas of the fen edges. Even the single bronze torc found comparatively deep in the fen area to the north-west is seen to be within 100 metres of a flint tempered pottery sherd.

Also marked is the correlation of flint gritted pottery finds with areas of (historically) restricted arable usage, as designated by the line of fen edges marked on the 1812 enclosure map. Only five flint-tempered sherds occur in the area of presumed longstanding arable land (also see chapter 9.4 and above part 4). The only area where the finds patterns do not appear to match particularly well, the concentration of five findspots of metalwork in the north-central fen edge area, may well be due to the lack of survey in that area as four of the five findspots were not fieldwalked (Suffolk Archaeological Unit, Fenland Survey archive).

In conclusion, although it must be accepted that some of the flint tempered pottery scatters are not of the later bronze age, most probably are. However it should be noted that these scatters represent only the later stages of later bronze age occupation sites which are already known and accepted. As has been pointed out (chapter 6.11), there is continuity in the metalwork distributed along the fen edges from the beginning to the end of the bronze age, and in social terms there may be no valid subdivision of the bronze age in this part of East Anglia. In terms of industrial metalwork organisation, production and use, and by inference the settlement, the 'later bronze age' can be claimed to begin from the onset of the Arreton tradition in this area. Significantly this puts the Mildenhall 165 site, with its round houses, collared and biconical urns, barbed and tanged arrowheads and associated lithic and bone assemblages, with dates of between 1580 ± 60 bc and 1240 ± 70 bc (Martin and Murphy 1988, 355) into this later (or traditional 'middle') bronze age. The continuum demonstrated by the 'Mildenhall Fen' site assemblage (J G D Clark 1936), along with other scatters producing similar ranges of artifacts, further demonstrate the presence of later bronze age occupation on the south-eastern fen edges. These examples highlight the problems inherent in attempting to separate related continuing pottery traditions in areas such as this.

It can no longer be accepted that there is no evidence for later bronze age settlement in the fen edges and as a result the need for a ritual, sepulchral or votive cause for the deposition of the metalwork is considerably lessened and a secular cause now becomes acceptable.

CHAPTER 12

WET FEN FINDS

In 1968 Bridget Trump's paper, 'Fenland Rapiers' highlighted the large number of rapiers from the south-eastern peat fens of East Anglia (together with the River Thames) and suggested ritual as the most likely explanation for this concentration (Trump 1968, 225, fig 52). Trump's work rekindled national interest in the topic although she was not the first to voice votive or ritual reasons for finds from fenland regions. In 1882 John Evans, while reading a paper on the Wilburton hoard, Cambridgeshire, had stated that one possibility, regarding the peat fen location of the objects, was '*that they may have been thrown into the water as precious offerings to the gods*' (Evans 1884, 114). Similarly, Fox (1923, 51, 60, 63) stated, in relation to four hoards of the early and middle bronze age, that '*it is possible that in this secluded marsh [Grunty Fen, Cambridgeshire], environed by forest, votive offerings were deposited... . The Chatteris and Coveney Shields, also probably votive, were found in the fens not far away*'. (op. cit, 60). He was followed by J G D Clark (1938, 273, 278) and, relating to finds in Europe, by several continental authors, most notably by Glob (1965) whose work was translated into 'The Bog People' in 1969.

Prior to Trump's paper the first work in the 1960s mentioning ritual practices in relation to metalwork in Britain was that of Coles (1962, 185), again concerned with shields, in which he wrote that the British, and probably the north European examples, '*were designed as ceremonial or ritual objects, and deposited as such in bogs and rivers*'.

At the same time, environmental archaeology was taking a more prominent role in studies of British prehistory, and indicated a period of deteriorating weather conditions and increased wetness between the traditional early bronze age and prior to the Roman conquest. In 1974 Burgess (1974, 195-197) suggested this was the result of a catastrophic event, leading to climatic change and an early bronze age/middle bronze age hiatus (despite admitting there was scarcely any scientific evidence for such a climatic change in this period). He claimed a rise in new centres such as the Thames valley and the fens as 'the centres of the new water based religion' and stated 'the vast majority of the enormous quantities of metal finds from these regions, including much of the finest material ever found in Britain, has come from the rivers, streams, pools and marshes of these regions'. (op. cit. 311). He also mentions that 'up to 80% of the 1100 dirks and rapiers from the British Isles' came from 'wet' provenances (op. cit. 310).

Support for these ritual/votive deposition theories has continued to appear. Wait (1985) stated 'six regions [in Britain] contained positive evidence for votive deposition of swords, vessels or shields in watery contexts'. One of these regions was the East Anglian Fens. He concluded that 'these objects were deposited in rivers and bogs by elite individuals in rituals...' (op cit). In 1989 Bradley said, 'it is generally accepted among prehistorians that the metalwork from the south-eastern fens is votive in nature' (Flatlands and wetlands conference, University of East Anglia).

The case regarding riverine deposition is discussed above (chapter 10) and refutes the ritual/votive claims within East Anglia. The case for the fens has to some extent already been questioned by Rowlands (1976) who, in response to Trump's suggestion relating to rapiers, stated *'It can be seen that this is scarcely an adequate explanation in the light of the wider distribution of metalwork from East Anglia involving metalwork of all three implement categories and in both stray find and hoard associations'* (op. cit. 119). Pryor (1980b, 490), suggested *'that much of the metalwork from the fens was not deposited in watery meres during ritual observances..., but instead represents settlement material in its horizontal, but not its vertical context'*. Similarly Chowne (1980, 300), discussing the metalwork from Lincolnshire, states *'Davey (1971) suggested that some of these bronzes may have been votive deposits, but a more likely explanation is that they came from settlements buried by later peat growth'*

The evidence for the metalwork from the fens is examined here in more detail with the aim of clarifying this key issue.

1. Methods

All finds of bronze age metalwork recorded from the fen and fen edge areas, where details of the discoveries are recorded, have been listed (catalogue 9) and, where possible, mapped against the surface soil types (maps 47 and 48). Finds with no indication of a findspot or evidence to suggest a fenland location, other than the parish, have not been listed despite some parishes having the greater proportion of their area in the

fens. Those finds apparently from peat or alluvial soils are examined in more detail as are the 'prestige' items (parts 5b and 5c below).

The listing for Cambridgeshire and parts of Norfolk is based on items recorded in the county Sites and Monuments Records and is therefore of an extensive nature in those areas. Intensive research has centred on the metalwork distribution in the north-west Suffolk fen zone (a comparative distribution of flint gritted pottery from part of this area has been made, see chapter 11.5 and map 46). In the adjoining part of south-west Norfolk the metalwork (based on Healy forthcoming) has been plotted in relation to the sand 'islands' and 'uplands' and is plotted (maps 18-25) in relation to the prehistoric scatters mapped largely as a result of the Wissey Embayment survey (Silvester 1991).

The aims of these separate forms of research are to:

1. Determine the amount, nature and reasons for any 'wet fen' finds and their significance.
2. Establish, by intensive research, the extent of available evidence not readily identified by extensive research.
3. Determine the relationship between the metalwork and possible contemporary settlement patterns.

2. Soils

The soils of the fenland region have been mapped (maps 4, 5, 47 and 48) following the 1:250,000 soil survey of England and Wales (1983) and the 1:63,360 soil survey of the Cambridge and Ely district (Seale and Hodge 1976). Although giving an overall impression of soil type boundaries

they are only representative, even on the larger 1:63,360 scale, and inconsistencies, as well as inaccuracies, occur. A demonstration of this is the classification of an area in Mildenhall fen, centred on TL650773, as shallow peat of the Adventurers series up to 90cm deep. Field walking (author) has shown the main soil constituent to be sand, with humified peat representing an insignificant proportion of the matrix. Trial excavations over one of these fields, to determine the survival of prehistoric subsoil horizons, represented on the surface by concentrations of neolithic and bronze age artifacts, demonstrated a total lack of any subsoil below the 30cm deep ploughsoil other than natural sand (pers comm, E.A. Martin). Conversely, there are instances of soils shown as not being of fen type, that clearly once were; due to drainage, dessication and cultivation, the peat has now disappeared. Examples of this are illustrated by 19th and earlier 20th century finds from within or under peat at Grunty Fen (C5785, cf J G D Clark 1938, 273), Wilburton Fen (C5717) and Padnal Fen, Ely (C7209).

In view of this, it is unwise to place too much emphasis on individual cases of finds of metalwork which appear, merely on the evidence presented by plotting the finds against the modern soil maps, to be particularly significant. There can be no substitute for the detailed recording of the circumstances and exact findspot of each artifact.

Although Trump was correct in mapping many of the finds of rapiers as from 'the Fens' (Trump 1968, fig 52) the major factor, which was omitted, was that the peat deposits of these former fenlands (the majority of the peat has now disappeared) were probably of post bronze

age date. In fact it appears that the covering of peat was the very cause of the survival, and good condition, of most of the metalwork and for the apparent fenland concentration. Detailed plotting (eg maps 10, 21, 47 and 48) and research has demonstrated that the great majority of finds of bronze age metalwork came from 'skirt' soils, ie, from areas with a micro-relief of sandy hummocks and peat filled hollows, rather than pure peat soils. These same areas have been shown to have been heavily occupied during the mesolithic, neolithic, earlier and later (see chapter 11) bronze ages. By and large no evidence for iron age occupation exists. Although it is possible that some of the finds of metalwork were actually deposited within some of the contemporary wet hollows, the detailed research in north-west Suffolk has shown only four instances where finds initially appeared to have been deposited in areas of peat or peat filled 'hollows' rather than on 'hummocks'.

The first of these was the rapier with its hazel scabbard and a shorter dirk (S8901). Unfortunately they were surface finds following agricultural activity and their exact findspots cannot be determined. However an exploratory excavation (author, appendix 5) demonstrated that a pre-peat horizon, producing worked flint and flint-gritted pottery, existed at the reported findspot and that waste worked and burnt flint and animal bone, suggesting rubbish disposal, was to be found within the undisturbed peat.

The second example was the tip of a (basal-looped?) spearhead (S8972) found metal detecting by an amateur circa 80m from the above, which when lifted from the ploughsoil was reputed to have left its imprint in the

underlying peat. The fact that these finds were from ploughsoil in an area with an undulating, artifact rich subsoil, which at places appears on the surface, indicates a likely non-peat origin for these bronze objects. The alternative is that they were deposited alongside other objects more clearly in the nature of normal household waste.

The third instance relates to the discovery, hanging from a plough share beam, of a bronze torc (S0179) from a small field with soil of the Adventurer's series, which at this point is up to 90cm deep (Pendleton 1986). However a stone 'pestle', of prehistoric (cf Alvey 1967; Chitty 1964) or medieval date was also found on the surface and recent field walking has shown a heavy presence of material from the adjacent Baldwin's Lode and field drainage ditches. This suggests that the torc probably originated from this dredged material, which includes the sandy sub-soils underlying the peat and rubbish from the late 11th century (? - Abbot Baldwin of Bury AD 1065-1097) and later use of the Lode.

The final, and possibly most interesting case, concerns a probable hoard of four palstaves from Eriswell (S11868) found metal detecting in a ploughed low peaty area beside a slight sandy ridge. Although the four palstaves were close enough to the peat and sand ridge interface to have come from the sandy soil the fact that they clearly did not come from higher on the ridge makes the findspot particularly intriguing. However the true significance of these finds was only revealed by the observations of the detector users who were attracted to the area by the frequency of Roman, medieval and early post medieval coins and metalwork. They had noted, and found it curious, that these finds were

occurring in the damp peat areas and not on the presumably more hospitable sandy ridges. Could a case for Roman, medieval and post medieval votive deposition be made here? The answer, one suspects, comes in the account made by Sir Henry Bunbury (1834, 609-610) of the discovery of an iron age burial of a human skeleton, two horses, a gold torc, an iron sword and an axe on his land in the region of Mildenhall, *'along the borders of the sandy fen'*. He states that these finds were made in 1812 by some labourers *'while levelling skirt-lands (by cutting down hillocks of sand, and throwing them into the moor-pits)'*. The site in question was within the eastern bounds of Bunbury's estate and is probably evidence of this practice. It is unfortunate we do not know how extensive or commonplace this 'levelling' was in the south-eastern fen edges.

3. Modern re-deposition of finds

It is clear that bronze age metalwork distributions, in areas once covered by peat, are relatively accurately reflected by the distribution recorded in this survey. This is due to the protection and preservation of these finds and the associated prehistoric soil horizons caused by the overlying peat until relatively recently. With the drainage of the fens, however, a variety of uses began to cause occasional displacement/re-deposition of finds in the area. These can be divided into:

- a. agricultural practices;
- b. peat and mineral extraction;
- c. drainage operations.

In view of the importance imparted to the apparent findspots in relation to the causes of deposition this aspect needs to be examined in some detail.

3a. Agricultural practices:

The effects of modern agricultural machinery in the most intensive arable region in the country are for the most part fairly obvious. Although the discovery of the metalwork has, in most instances, been as a result of recent agricultural activity the findspots are usually probably not far removed from their original locations of deposition. Although the movement of larger objects is likely to be greater than that of smaller ones it is felt that, in most instances, the findspots are not going to be particularly far removed from the original location. There are, however, numerous exceptions to this, for instance when items are physically caught up in the machinery (eg socketed axe S8895, halberd S8802 and torc S0179) or in root processing equipment (eg palstaves N5186 and S9153, spearheads N19400 and S8785 and socketed axe S9196). Bearing in mind the size of some of the large fenland fields this factor needs to be taken into consideration. It would seem likely that the effects of this modern machinery will be greater than that used prior to the Second World War when, apart from steam ploughs, horse drawn equipment was normally employed and fields were usually much smaller. Nonetheless it is the practices of this earlier agricultural phase that have some of the most disturbing implications regarding re-deposition. One of these, 'levelling', has already been noted (above part 2).

Another practice, unfortunately not very well recorded, was the improvement of the fen soils by 'claying', as described by, for example, Raynbird (W and H, 1849, 5 and 120; and see Darby 1983, 187-8). This involved the excavation of underlying clay from trenches, eight (Caird 1852, 181) or '*about 15 yards*' (Lewis 1870, 99) apart, which was then spread and subsequently mixed with the peat soils. An example of a discovery made during this process, in about 1910, was the log boat in Warboys Fen (Noble 1910) and, apparently, a Roman pewter dish from Welney (Lewis 1870). During the description of the circumstances of this find it was said that '*rarely are these clay-pits opened without disclosing not only the vegetable and animal traces of ages past ... but also implements of flint, bronze and iron*' (ibid, 99). The excavations at Peacocks Farm, Cambridgeshire (J G D Clark, Godwin and Clifford 1935, 288-9) claimed to have found archaeological evidence of this practice in the fens. Unusually, the clay at Peacocks Farm is 'buttery clay', overlying the lower peat and sand. which suggests that these are 'bush' or 'hollow drains' (below part 3c) rather than claying pits.

The precise details of where and to what extent claying took place cannot, at present, be determined, although, in 1852, it was said to have been in '*universal operation*' in the fens during the preceeding 30 years (J A Clarke 1852, 244-51). Raynbird (1849, 120) cites a fen farm of 300 acres spreading circa 13,500 cubic feet per acre in a period of nine years, and the practice was said to have taken place '*every eight to ten years*' on the estate where the dagger from Welney (N 4432) was found (Lewis 1870, 98). The number of bronze age artifacts disturbed and redeposited by claying may have been relatively few and without

knowing whether the clay was transported into areas with non-clay subsoils it is not clear how important this factor is. Nonetheless, even if redeposition was to take place only in the immediate vicinity and did not affect the vertical location, the potential transference from the top or within the clay subsoil to deep peat soils could be critical in the interpretation of some of the fenland locations.

3b. Peat and mineral extraction:

The occasionally drastic effects of peat extraction are probably best demonstrated by the broads, a series of turbaries largely created in medieval times in south-east Norfolk and north-east Suffolk. Although landscape changes have not been as drastic in the fens, large amounts of peat were extracted for fuel up until the mid 20th century. Peat/turf digging for fuel has now died out although, to my knowledge, only within the last ten years. The threat of modern peat extraction for the horticultural market has, due to problems with weedseeds and the present environmental lobby, only materialised to a limited extent in Norfolk, Suffolk and Cambridgeshire. It is now restricted to an area of Methwold Fen in Norfolk (W Carlile pers comm) and a small area in Rickingham, Suffolk (see S11744).

Exactly how extensive former peat digging was is unknown: certainly some areas were heavily pitted by extraction, although they are usually now level and only visible from the air, for example the silt filled medieval turbaries in Upwell Fen (Darby 1983, fig 21). This may account for the lack of finds from some areas, where they might otherwise have been expected, for example at Lakenheath/Undley Turf Fen (see chapter

6.8 and map 8). Records of finds during peat digging are, as to be expected, limited to the 19th and 20th centuries (such as the Grunty Fen hoard, C5785; N2602; N5250 and N5297), and are rare. If finds were located earlier they are not documented. We therefore have no way of knowing if any were recognised or collected during the whole of the medieval and earlier periods.

It is not generally recognised that open cast mineral extraction was a boom industry in 19th century Cambridgeshire. Perhaps not surprisingly it was linked to agriculture, being for the extraction of coprolites, for grinding into phosphate rich artificial manure. This practice was largely confined to Cambridgeshire between 1851 and 1891. Coprolite digging was renewed, for a short period during the first world war, the phosphates being used for munitions manufacture. Between 1860 and 1890 over 1,383,000 tons of phosphates from coprolites were extracted, occasionally from workings over 20 feet in depth. This was usually followed by reconstitution, the land being worked by successive parallel trenches. They extended into the fenland areas between Cambridge and Soham, as at Wicken Fen, Burwell/Reach Fen, Swaffham Prior Fen and Stow Cum Quy Fen, which were clearly heavily disturbed by these practices (for details see Grove 1976). On occasions material was first identified during the actual mining/digging operations, for example the Reach Fen hoard (C6397) and the flat axe and palstave from Hauxton (C4979).

It must be expected that in the majority of instances finds were merely re-deposited prior to re-constitution of the land. Fortunately it

should be possible, by using the 19th century records, to identify where commercial coprolite digging has taken place and bear this factor in mind when considering items from these locations.

In addition to these large workings small scale extraction of, for instance, brickearth, gravel and sand has been carried out intermittently during the 19th and 20th centuries and accounts for at least one (N2382) of the finds from a deep fenland location.

3c. Drainage operations:

The derivation of some bronzes from river channels is discussed in chapter 10, where it is noted how frequently these come from dredging operations. Whilst it is debatable whether these finds were left deliberately within the rivers during the bronze age, or at a later date, or were accidental cases of loss, erosion etc it is clear that several have derived from modern canals and drainage channels and must represent modern re-deposition. As in the case of river finds they may either have been dredged directly from their original deposition place or have been dumped into water courses at a (much) later date. Recorded instances of this are few (for example see catalogue 7 and table 17).

It is likely that more items of metalwork have been moved by the minor drainage works although it is far less likely that they have been recognised as being re-deposited by these means. Known instances of artifacts deriving from ditch/dyke cutting/dredging operations are probably in a minority (eg C7209, C2769, C3587, N2533, N2586, N13891, N16590, N22265, N4883, N8318, S8869, S8960) compared to those objects

where this has occurred and are now merely recorded as miscellaneous finds from field surfaces. Usually such discoveries might be expected to occur close to present, or earlier ditches (eg, C2027, C6953A, C7018, S8816, S9701, and note discussion of the torc S0179 above).

However this apparently straightforward observation is in need of drastic revision with the recognition of the use of 'hollow' or 'bush drains' (Young 1804, 172-7) from the end of the 18th and into the 20th centuries. These are visible only on aerial photographs and during excavation. They usually consisted of segmented, or occasionally continuous, ditches that were excavated, infilled with bushes, straw or, in the fens, blocks of peat, then refilled. This improved surface water drainage. Examples found during excavations include those from two sites in Mildenhall Fen (Mildenhall 130, E Martin pers comm and Mildenhall 165, Martin 1983, 235) and probably the Peacocks Farm 'Claying pits' (above part 3a).

In the 20th century this method has been superseded by the automated laying of ceramic and plastic drainage pipes. Again it is the effect on the horizontal deposition rather than the lateral movement that can be expected to be more critical in these cases. The frequency of this practice makes the identification of finds horizons of any artifacts from the fenlands extremely difficult, especially when they are represented as surface finds.

This difficulty is accentuated by another method once used to alleviate drainage problems. With the lowering of the water table ditches needed

to be deepened and this, together with normal upkeep, caused banks to form along the ditch edges around the fields. *'These banks had to be spread by hand. This job is known as spreading the dyke bank but a man could only throw the earth about twenty to thirty feet. In a few years the outside of the fields became higher than the centre so they had to dig what were called sock grips to drain the water from the inner part of the field to the ditches'* (Wells, 1976, 17). A notable find recorded during this process was the Wilburton hoard, found while "gripping" in 1882 (Evans 1884, 106). Again the true number of finds disturbed by this widespread process is not determinable.

Results

4a General Distribution in the Fenlands

278 stray finds and 23 hoards are listed from the fen zone (see methods above and catalogue 9). Of these the majority have no detailed accounts of how, or in what stratigraphical context, they were discovered, and all too frequently the findspot is either unknown, vague or even suspect (eg C7304, N4886, N5297, N16863 and note that many of the items in the Clouston collection were falsely denoted as having fenland provenances, Lawson 1979a, appendix III).

Forty-seven stray finds and two hoards appear to derive from areas mapped (above part 2) as deep peat, alluvium or lake marl (ie potentially 'wet' locations). Of these the Stuntney hoard (C7111) and five other items (C6955, 6959, 6987, 6999 and 7002) appear to be related

to the known causeways at Stuntney and Barway (Little Thetford, cf Lethbridge 1935) and four artifacts (N2540, 2542, 5248 and 5267) were found close to, and one (N2586) with, human skeletal remains. A further, unprovenanced, find from Southery (N2567) was also recorded as being 'found near a skeleton' in 1889. Seven objects (C1517, 2120, 2922, 4068, 7185, 7256 and N2569) are located only to the Farm or Fen in which they were found. Six items (C1517, 7305, 7616, N4795, 5369 and 11958) were probably from river or canal courses (in addition to those clearly from dredgings) and a further five (C2027, 2769, 6953A[2] and 7182) probably result from the excavation of drainage ditches or trenches. Other finds also clearly come from below the 'wet' deposits (eg C7182, N2382, 2387 and possibly 22265). The great majority of the metalwork was found close enough to other soil type boundaries to cause some doubt over their inclusion within a 'wet zone'. Of the 47 stray finds only 16 or 17 finds come from 50m or more away from other soil boundaries and, all other factors aside, might be considered as likely candidates for ritual or votive deposition.

An examination of these shows five (C7305, N2593, N11949(2) and ?N5369) come from rivers/canals; or dredgings from them, and one (N4481) possibly derives from a former (now infilled) ditch.

Two more (N2382 and 2387) come from circa six feet and ten feet below the surface and were found during excavations for a brick pit and a cistern respectively. One (C7304) appears to be an incorrect national grid reference and three/four more (C2120, C6917, C7256 and N4432) are

farm locations only, one of which (N4432) was probably found as a result of 'claying' (above part 3a) the fen peat soils.

This leaves only four finds, a rapier (C7297), a side-looped spearhead (C1746) and two socketed axes (C5991 and N13461), for which we have no specific details, although from the cited grid references the rapier and the spearhead were found close to modern buildings.

Archaeological examination of the finds' contexts are limited to the 1930s excavations at Little Thetford (C6987), and of the Stuntney hoard (C7111), both of which appeared to show that the finds were related to contemporary wooden causeways; to the Southery Fen female (N2586), an apparent drowning, and the Methwold Fen spearhead site (N5250) which, as with the Stuntney hoard site, suggested deposition in a drier phase (for further discussion see chapter 7.8).

Detailed accounts of other discoveries are relatively limited but include the side-looped spearhead from Wood Fen Farm said to 'lay directly on the surface of the clay and was covered by about six inches of peat' (C7182). The Suffolk peat finds are discussed above (part 2).

Several finds were located or are recorded as coming from areas of former meres both in the fens (eg Stretham Mere C2120, C6917; Whittlesea Mere C2769) and elsewhere in Norfolk and Suffolk (table 17 and catalogue 7). Unfortunately no precise details survive although structures, appear to have been found in some lake locations, in general association with metalwork, for example at Barton Mere (S6874).

Amongst the other finds with no known findspot are several with relevant surviving accounts. Again some are listed as being found during ditching operations (C2952, C3587, N4883) or from depths suggesting burial under, rather than within, peat deposits, eg the sword blade from Southery (N2566) and the hoard from Oxborough (N2615). Occasionally details of the position of discovery in relation to the peat are recorded. Again, significantly, most are positively identified as being found below peat. Exceptions are two basal-looped spearheads (N2602) said to have been *'dug up from the peat'*, and a pegged spearhead (N5297) *'found peat digging'* although both accounts are probably unreliable (see Lawson 1985 for N2602 and note 5297 was purchased from the same person who is believed to have falsely provenanced the Clouston collection - see chapter 6.5c). The only other published example is that of two shields from Coveney Fen (C6020) which Coles (1962, 189) claims to have been found together *'in peat'*, although, according to Fox they were said, like the Longwood Fen find (below), to have been found lying on the subsoil under peat (Fox 1923, 65). Two other accounts of shield find recorded in connection with fen deposits are those from Sutton St. Michael (N8318), *'under seven feet of peat lying on and partly covered by white sand'* and from Langwood Fen (C3697), associated with a basal-looped spearhead, and said to be *'laying on the clay under the peat'* (Fox 1923, 65). Two finds of rapiers are also noteworthy, an example from near Chatteris (C3777) is recorded as being *'found at the bottom of an old canoe, between the peat and clay'* (Evans 1881, 250, figure 315) and another from Ponds Bridge (Cambridgeshire, not in the Sites and Monuments Record) as being *'found in the peat with its point sticking in the underlying clay'* (Burkitt and Fox 1926, 205).

Another 18 or 20 stray finds come from findspots on the boundaries of these fenland soils and some may, given the inexactness or inaccuracy of most cited grid-references, also come from former wetlands. Of these a socketed axe (C1515) has a grid reference centred to the farm only and a rapier (C7018) was probably found as a result of ditching operations. Three further items, an axe (C6998), a dagger (C8306) and a spearhead tip (C8308) again appear to be associated with the Barway causeway (see above). The remainder do not usually record any details as to how or in what soil horizon they were discovered although from the comments of Fox (1923, 7), that *'in Burwell Fen the stone (and Bronze) implements are found lying on the clay below the peat, and it is on record that finds in other fens have been similarly situated'* it would appear, as in the examples cited above, most of the finds came from beneath, rather than within, peat deposits.

A further thirty stray finds and one hoard are mapped from shallow peat soils, and 17/18 stray finds and three hoards from its boundaries, Additionally 46-47 stray finds and one(+) hoards are recorded from skirtlands and four more stray finds from the junction of skirt and chalk or chalk/sand soils (for definitions see 'soils' above).

As expected with this larger number of finds more details are available. At least one find, a flanged axe (C6453), is located only to the farm and other finds, mainly amongst the better recorded finds from the skirt soils of north-west Suffolk, are listed as being found only as a result of being caught up in agricultural machinery (halberd S8802; socketed axes S8895 and S9196). Again finds likely to be from river (sword

N4728) or dyke dredgings (hoard N13891; spearhead N2533; torc S0179; socketed axe S8816 and knife S8960) are evident. Some of the earlier accounts include a socketed adze from Wood Walton Fen (C2856), purportedly found *'lying loose on a piece of "bog oak", two feet deep'* in 1928, and in 1941-2 a palstave, also from Wood Walton (C2058) was found *'stuck in a bog oak tree ... subsequently covered by peat'* (Garrod 1952).

A hoard of six bronze torcs (N4726) were found at Stoke Ferry in 1881 during the construction of foundations for a railway station, which had to be built on piles, up to 12 feet deep, through the unstable surface peat. Other finds likely to be from below any peat deposits include a spearhead (N16517) which was *'found six feet deep in meadow'*. A further spearhead (C5856) is recorded as being found *'near base of the peak'* (peat?) whilst a palstave (C7214) is believed to have been found in clay beneath peat.

Two surface finds of socketed axes are also noteworthy. One (N11409) was said to have come from a large clay area in an otherwise peat fen and a second (N1774), from a field *'where gault'* (clay) protrudes through the black fen.

Detailed field work in south-west Norfolk and north-west Suffolk has identified numerous prehistoric scatters on the field surfaces in the shallow peat and fen skirt soils and has allowed several of the stray finds of metalwork to be related to them (see chapters 6, 7 and 11 and maps 19-25 and 46), even if only loosely ie, although occurring on the

same sites, all were surface finds. These include six spearheads (S8785; S8964; S9595; S9851(2); S12342), three socketed axes (C5864; N5317; S9196), a palstave (S8818), a flat axe and ogival dagger (N5245), a gouge (S12088), four knives (S8934; S8941; S8960; S9097), a razor (N5368), two awls (S8964), a rapier (N5251), a sword fragment (S12088), a rivet (S8964), a bronze fragment (N5324), a piece of 'cake' (S8813) and two sprue cap wasters (S8964).

These surface scatters have also led to the excavation of a number of sites in this area, some of which have also produced metalwork. Some of the sites have been of bronze age date, for example the settlements at Mildenhall Fen (MNL 165, Martin and Murphy 1988), which produced two 'tracer-awls' (S9027); at Hockwold (Bamford 1982, 9-12, 21-2, 26) with a fragment of bronze (N5324) and at Wilde Street, Beck Row (Kelly 1967) where a knife (S8759) was found. The 'Eriswell hoard' (S8896) apparently came from a 'burnt flint patch' excavated by Briscoe (Briscoe and Furness 1955).

Other excavated sites revealing bronze age metalwork have been of later periods, for example, the spearhead tip (N5367) from the Roman temple site at Hockwold and the arrowhead/spearhead tip and rapier/sword tip (S9823) from the middle Saxon site at Brandon (Carr et al 1988).

The occupation of sites during the Roman and Saxon periods, when, due to rising water levels, they are more likely to have been 'wet' than in the bronze age, emphasises their dryness during the bronze age. The relatively high percentage of finds from these soils now being found as

a result of metal detecting (at least 20 of the listed finds), mostly on Roman sites, is a further demonstration of the dryness of these locations.

Additionally other finds, significantly including the majority of late bronze age hoards, are listed and mapped from various non fenland soils on the edges of the fen deposits. Some of these findspots were once peat-covered, for example, the findspots of the Wilburton (C5717) and Grunty (Granta) Fen (C5785) hoards and the Padnal Fen rapier (C7209).

It would appear that, where details are recorded, the great majority of the metalwork finds from the fenlands of northern East Anglia came from horizons which, during the bronze age, were dry, and only came to be buried by fen deposits of silt, peat or lake marl in later phases of increased wetness or inundation. However in view of the variable local drainage and history of the fens this cannot always be confirmed, especially with regard to the problems of interpretation and re-deposition discussed above. With these problems in mind, two areas of the fens and fen edges, in north-west Suffolk and south-west Norfolk, noted for their major concentrations of metalwork, were examined in more detail, and are largely discussed above (chapters 6 and 7). The relationships of the finds to the wet deposits in these areas are summarised below.

4b. The north-west Suffolk survey

For details of the north-west Suffolk survey see chapter 6 and for the finds see the catalogue (part 1). The major concentration revealed by

intensive survey techniques (chapter 6.6 and chapter 11.2), in Mildenhall parish in particular (115 stray finds and 8 hoards), together with details of the findspots, obtained where possible by personal interviews with the finders, has allowed critical analysis of the distribution of the finds. From this large body of evidence it was seen that only one apparent deep peat context was recorded and this was probably a case of re-deposition (above part 2). Three further possible wet fen locations also appear to be dubious (ibid).

The majority of the finds came from the shallow peat (11-12 stray finds) and fen skirt (38-43 stray finds, 1 hoard) soils. Where findspots could be verified the great majority appeared to derive from the sand ridges rather than the peaty hollows that are characteristic of the micro-topography, and an association with worked flint and flint gritted pottery, even if only in ploughsoil, could commonly be demonstrated (personal research and see map 46). In fact the lack of metalwork further into the fens is mirrored by the complete absence of non-metallic artifacts, despite the sandy subsoils, on which so much material was found on the fen edges, now occurring on the ploughed field surfaces due to the wastage of the former deep peats (unpublished fenland survey results and personal research). From this it could be concluded that no evidence existed to relate finds of bronze age metalwork to deliberate wetland deposition in Suffolk. Indeed the duplication of settlement material and metalwork patterns strongly supports a likely secular reason for the distributions.

4c. The south-west Norfolk survey

For details see chapter 7 and for the finds see the catalogue (part 4).

This study differed from that in north-west Suffolk in that no attempt was made to check or verify details of known finds or to gather information on unrecorded material. Instead it was decided to utilise a study of some of the metalwork that was being listed by Dr Frances Healy as part of the Norfolk fenland survey and to amalgamate this information with the results of the fenland survey itself (which at the time of writing had not been completed in Suffolk).

The area studied equates with that of the Fenland Wissey Embayment Survey (Silvester 1991) and is bounded on the south by the river Little Ouse and the north by the river Wissey (map 19.). Healy's catalogue of metalwork covers the whole of this area. The fenland survey fieldwalking in the 'Wissey Embayment' was restricted to available fields on the eastern fen edges as shown by Silvester (1991). Finds of metalwork (based on Healy) have been plotted in relation to the prehistoric scatters and sand ridges located as part of the fieldwalking surveys (maps 19-25). It was notable that settlement scatters were apparent at much lower elevations in south-west Norfolk than found in the adjoining portion in north-west Suffolk. This demonstrates the variable local drainage patterns in the fenland basin and the need for detailed localised research. Unlike north-west Suffolk, this area seems to have some genuine finds from within the peat (chapter 7.8). Significantly, the majority of these occur either in direct relationship to human skeletal remains or close enough to them to suggest

association. It would appear that these are representative of either accidental drownings, or, more probably, deliberate burial (cf Healy and Housley in prep).

However, apart from these instances, the great majority of the finds show a similar pattern to those from north-west Suffolk.

The relationship between the metalwork distribution and the sandy ridges protruding through the peat, on which the finds scatters are found, is, again, very marked (map 21).

5. Artifact status and proportions

One of the main themes repeatedly highlighted to support the votive nature of finds from the fens and other wet locations has been the relative frequency of 'high status' objects (which have been listed as including, 'weapons', swords, rapiers, daggers, spearheads, shields, cauldrons, torcs and objects of gold) found in these deposits (for example Bradley 1984, 100; Wait 1985, 15 and 47).

The increased incidence of these objects in some wet locations can be due to a variety of factors. An examination of river finds (chapter 10) does demonstrate a slightly greater rate of high status finds, but no more than might be expected (chapter 10.4). However the fens, not being affected by the same biases that are likely to occur with recording finds from rivers, are more likely to produce an accurate reflection of the proportion of large or prestigious objects present in bronze age times. In view of this it is perhaps only reasonable to accept that

'such dramatic and conspicuous consumption of wealth' (Barrett and Bradley 1980, 263) that may occur in the fens is a result of ritual or votive action.

The acceptance of this depends on four basic factors, namely:

- a. Society was controlled by an elite, which was based partially on an ostentatious consumption of wealth.
- b. Metalwork was valuable.
- c. The listed items of metalwork are truly 'high status'.
- d. The proportion of 'high status' finds from wet deposits is actually higher than in other, profane, locations.

If accepting the premise, it is necessary that some, if not all, of these vital elements are fact. This needs to be considered before a case for ritual deposition can be made.

5a. Social organisation and elites

This is not the place to discuss the organisation or politics of bronze age society. Finds of metalwork from the fenlands are clearly not going to resolve what is probably the greatest unanswered and debatable question during most phases of later prehistory. For a fuller discussion of the maintenance of status by ostentatious disposal of wealth see, for example, Bradley (1984 and 1990). A few points help to illuminate aspects of this issue in East Anglia. For example, the relative lack of high status objects in burials in the area during the early bronze age may indicate, but not prove, a regional lack of social stratification during this period. Similarly the frequency of items, such as stone battle axes, jet beads and buttons, amber beads, flint

daggers, a tanged copper dagger and a halberd etc amongst early bronze age domestic scatters (cf chapter 6.12f), and the large quantities and general distribution of high quality metalwork in the later bronze age suggest a generally wealthy society, which need not necessarily be associated with ranking. However these issues are contentious and not resolveable in this work, although, while it is reasonable to suppose that differences existed, it is evident that no clear case exists to demonstrate the presence of a stratified society with elites de facto, within this fen/fen edge society.

5b. The value of metalwork

It would appear that all items of metalwork have, up until recent industrialisation, been valued partially for their metal content alone. Throughout the historic and pre-historic periods metalwork was either used, purposely deposited, eg, as grave goods or as some have suggested for the deliberate consumption of wealth in a status goods economy (cf Bradley 1984, 101-5) or re-worked. Instances of deliberate abandonment of worn-out, damaged, obsolete or unfashionable items of larger metalwork are considered to be extremely rare, especially when of bronze or gold. In other words larger items of metalwork, even when beyond their use-life, were never considered to be rubbish. This assumption is very significant and the implications, were it not to be true, considerable. A scarcity of large metalwork, other than accidental losses, deliberate deposits or occasional unrecovered metalworker's (and personal) hoards is all that should be expected to support a model which recognised the value of the metal.

An examination of the finds from northern East Anglia follows. The general rarity of gold finds (catalogue 8) strongly suggests that the hypotheses that gold was valuable is correct. The same can, up to a point, be said of earlier bronze age (up to the Arreton tradition) metalwork some of which may have been partially prestigious.

However, whilst early bronze age metalwork is relatively rare, the north-west Suffolk study area, particularly the fen edge settlement zone, does record a high frequency of large finds, some 24 flat axes, a halberd, a flat tanged copper dagger and a tanged knife. A further eight flat axes and two daggers are recorded from south-west Norfolk. Based on a chronology, such as in Burgess and Coombs (1979, 111-1v) and Lawson (1984, fig 6.1), this represents a deposition rate of about 2.7 large bronzes per 100 years in north-west Suffolk, or 3.8 per 100 years for north-west Suffolk and south-west Norfolk together (appendix 11 and table 19). Only the tanged knife came from a burial. The distribution of the other finds suggests an association with the contemporary fen edge settlements. The south-west Norfolk fen survey has demonstrated that at least one of the flat axes and an ogival dagger (N5245) were found amongst such a scatter, although usually a lack of accurately cited findspots does not allow such correlations to be made.

Hoards first appear as a significant element in the assemblage at the end of the early bronze age, with items in the Arreton tradition. The hoards are usually comparatively small and never contain scrap. The great majority appear to be traders' hoards (see chapter 8), mostly of axes, and are relatively scarce. They appear to mark the onset of the

increased production of metalwork which continues throughout the later bronze age (table 1) in the fen edges and, it can be expected, elsewhere in northern East Anglia. In terms of artifact usage and production this phase should probably be recognised as the beginning of the later bronze age industrial phase, when bronze replaced stone as the principal material for tools. With the general abandonment of barrow burial clear evidence of deliberate deposition of metalwork disappears in East Anglia.

Disregarding the hoards, the remainder of the metalwork in this short period includes some four flanged axes and a spearhead in north-west Suffolk and circa five flanged axes and a dagger from south-west Norfolk. Assuming a period length of some 200 years (cf Lawson 1984, fig 6.1) deposition rates of 2.5 per 100 years in north-west Suffolk or 5.5 for north-west Suffolk and south-west Norfolk together occur. Again, where findspots are known, most occur within the fen edge settlement zone.

In terms of metalworking the traditional middle bronze age differs from the late early bronze age in two respects. First some of the hoards can loosely be classified as personal, for example ornament hoards, although again they tend to be fairly small. There continues to be an absence of anything classifiable as founder's hoards in East Anglia. Secondly far more implements are now present (due jointly to a steady numerical increase and to a longer period of time).

Hoards continue to be a relatively minor component numerically (tables 3 and 5) although the 'personal hoard' label is supported on the fen edge by their proximity to the distribution of single finds. The stray finds (excluding river-finds) amount to at least 99 individual finds in north-west Suffolk and a further 51 objects from south-west Norfolk. With a time span for the middle bronze age of circa 550 years (from c1550 BC to the end of the Penard/late bronze age I phase of circa 1000 BC) this represents a deposition rate of 18 objects per 100 years in north-west Suffolk and 27.3 objects for the north-west Suffolk and south-west Norfolk region together. Some evidence for deliberate deposition is suggested by two finds of metalwork apparently in association with human skeletal remains (rapier N2540; palstave N5248). In Cambridgeshire a relationship between causeways and bronzes is also notable, for example rapier C6955, palstave C7002, dagger C8306 and ?spearhead C8308.

Nonetheless the majority of the findspots recorded show a marked correlation with the zone of scatters of settlement debris. A surface association can be demonstrated in at least eleven instances on the south-eastern fen edges where both findspots are recorded and fieldwork has been undertaken (eg rapier N5251; side looped spearheads ?S9851(2) S9595, S8785; basal looped spearhead S8964; razor N5368; knives S8934, S8941, S9097; palstave S8818).

From the onset of the Wilburton phase the collection of scrap suggests that growth in demand, or difficulty in supply, was necessitating a stock of provisions and/or the re-working of obsolete metalwork.

Alternatively the increased turnover may, for the first time, have made storage and collection a worthwhile process. The rate of deposition in the late bronze age, if surviving hoarded and single finds were counted together, would amount to over 40 objects per 100 years in the two adjoining areas of the south-eastern fen edges. For the first time significant proportions (circa 38% in north-west Suffolk) of the total consists of hoarded material. It is noteworthy, in view of a suggested relationship between hoards and settlements noted elsewhere (cf Pearce 1976, 21; Lawson 1984, 165 and Bradley 1990, 13) that hoards do not form a significant element of the metalwork from the fen edges. When known, the great majority of the findspots are well separated from the concentration of stray finds on the fen edges. The single finds, (excluding those from rivers) total 55 from north-west Suffolk and a further 41 from south-west Norfolk, representing a deposition rate of 12.2 objects per 100 years in north-west Suffolk and 21.3 per 100 years in north-west Suffolk and south-west Norfolk together (appendix 11, table 19).

One find, a sword (N5267), may constitute an item associated with human remains in the fens. Further finds from Cambridgeshire are associated with causeways, eg, the Stuntney hoard (C7111), a barbed spearhead (C6999), a socketed axe (C6959), and a 'ring' (C6987) excavated by Lethbridge (1935). The detailed work on the south-eastern fen edges, however, still shows a relatively large, though smaller than that for the middle bronze age, number of substantial objects occurring as single finds within the area noted for its concentration of settlement scatters. Where information survives, surface associations between

metalwork finds and artifact scatters are recorded in at least six instances (socketed axes N5317, S9196; knives S8759, S8960; gouge S12088 and sword fragment S12088). Some of the frequent spearhead tips from these scatters are also likely to be of late bronze age date (eg S8964, S9851(2), and S12342). Significantly one of the finds, a knife (S8759), was actually found in direct association during one of the rare instances of excavation of a later bronze age site on the fen edges (Kelly 1967).

The above totals take no account of finds not designated to any single period. The sum totals of surviving bronze age single finds of metalwork amount to 335 from north-west Suffolk and a further 125 objects from south-west Norfolk.

From the above discussion it should be clear that the great majority of these finds are associated with areas of settlement scatters. The few that show any evidence of deliberate deposition appear to be related to burials. The remainder do not correlate with the proposed model for a high value material (above part 5) and appear to be more typical of waste disposal. The practice of hoarding in the late bronze age does seem to have caused this deposition of stray finds to have lessened, although the remaining relatively high frequency suggests re-cycling may not have been of major concern. Indeed the overall figure for Cambridgeshire, Norfolk and Suffolk of well over 11,000 surviving bronzes, even given that the majority are from hoards, very few of which date to the end of the bronze age when iron could be claimed to have replaced bronze, can do little else than indicate a massive surplus, and

consequential low value, as is suggested by the evidence from the two areas where detailed research has been undertaken. In view of this the assumption that bronze, during the bronze age, was in its own right valuable, must now be carefully reconsidered.

5c. 'High status' finds

The definition of 'high status' for the purposes of this discussion will be for items of relative importance rather than relating specifically to ascribed social significance. This avoids the problem of social organisation outlined in 'a' above, although the objects listed, namely, weapons, swords, rapiers, daggers, spearheads, shields, cauldrons, torcs and objects of gold, have been isolated by various authors who have often used this as one of the criteria. Despite this it is the social importance of artifacts that separates 'status' finds from everyday objects, and it is material from within this restricted group which we are seeking to identify.

The relative importance of gold is clear. This is reflected by its scarcity. However objects of bronze are open to more debate. If disregarding any unknown hidden significance other factors might be important. These are the function, weight and time (and care) spent during manufacture of an object. In view of the discussion above regarding the value of metalwork it seems unlikely that the weight factor is of much significance. Larger objects are usually not markedly weightier than smaller ones; the heaviest comparatively common artifact type, the sword, averaging 700gms, weighs less than two palstaves at about 800gms. Some items such as ornaments, being decorated, might be

considered to be of higher status than tools. Likewise weapons, especially if we were to assume a warrior controlled society.

Certainly some of the ornaments and weapons would have taken longer to manufacture, although the working up of blade edges may be considered to have taken significantly longer on working objects such as tools than on objects made only for show. But here we must question how important, relatively, time was in the bronze age. Many would argue that labour was cheap in elitist controlled, or pre 20th century societies. Perhaps the care exercised in producing and finishing would be a better reflection of value. In this case it is noteworthy that many spearheads are noted as having unfinished loops and others show excessive wear/bluntness. Similarly some dirks and swords passed into use with clear casting flaws. Considerable variety in finish is apparent in these 'weapons', as it is in tools, many of which demonstrate considerable thoroughness and detail of workmanship.

The sheet bronze objects, especially shields, necessitate some of the most care in production and would appear to be objects of relative importance. Their rarity supports this as does their interpretation as symbolic, ceremonial or ritual rather than functionally useful objects (eg Coles 1962, 185; Needham 1979a, 127-8).

However this raises the problem of use, which is likely to be the most significant factor regarding an object's importance, and yet is the most difficult to determine. As has been stated a few shields show use damage which strongly argues against their use only as symbolic/parade

objects. Cauldrons were also extensively repaired, indicating considerable or long standing utilization. Even basic objects, such as axes, are open to various interpretations (above chapter 6.9b) and were clearly designed to perform different tasks. The same applies to spearheads (cf Ehrenberg 1977, 22-3). Some of the larger and finer examples obviously underwent less or different usage than the smaller examples which frequently show heavy use wear. Without knowing exactly what the uses were, it is, at this level, impossible to determine their relative importance.

The frequency of the different artifact types may be helpful in this respect. If certain types are common it can be taken that, although they were probably the most useful, they were not of high social value, unless society was generally very wealthy. From a count of metal-detected finds (excluding hoards), which will tend to favour the remains of smaller items, it is shown (chapter 9) that 5.6% (6) of the 106 or 107 finds are ornaments, about 27% (28-30) weapons and about 66% (69-72) tools. The small share (despite being higher than expected) for ornaments may support a prestige role, although it could equally be an indication of sexual bias in male-dominated artifact assemblages. Of particular relevance is the high proportion of weapons, especially in terms of prestige objects such as swords and rapiers, which amount to about 11% (11/13) of the finds. This is a much higher count than might be expected if they were restricted to being status objects.

5d. Finds proportions

The final, and most decisive consideration concerns the actual proportions of high status finds from the fens. Due to differing recognition and survival rates of bronze age metalwork in separate (fen and non-fen) locations it will never be possible to know either exact numbers or proportions of implement types. The area best suited to gain an accurate reflection is the fen/fen-edge zone, where post bronze age peat deposition has, until recently, protected the bronze age landscape. The argument over whether this is a localised, and possibly atypical, assemblage forms a crucial element of this chapter.

The hypotheses that rely on an increased incidence of high status finds from the fens depend upon the fact that there was indeed a higher incidence. Remarkably no one seems to have attempted to enumerate this.

An examination of the contexts of some of the 'high status' finds, that is: cauldrons, shields, torcs and gold artifacts, can be found in catalogue 8. The results demonstrate a lack of finds that clearly originate from 'wet' contexts. Unfortunately the poor records and rarity of these finds means they are not suitable for comparing fen and non-fen finds.

Finding such comparative data is difficult due to the loss of the majority of the larger items of metalwork in areas of longstanding arable agriculture. The best means of overcoming this problem has been provided by the use of metal detectors (see chapter 9) which have, for the first time, offered a balanced indication of the types of bronze age

metalwork in use in these areas. Direct comparisons of the figures of finds metal detected from non-fenland situations in Suffolk (catalogue 5) with those from the fens and fen edges are shown in table 20.

Details of fenland finds have been taken from two sources; first those items listed in the Sites and Monuments Records and forming the basis of the discussion earlier in this chapter. This information forms an unrepresentative sample, particularly for Cambridgeshire, and should only be used with its obvious limitations and biases in mind. Secondly, and most importantly, the detailed survey of the fen edge finds from north-west Suffolk has been used. The information from this latter listing offers far more accurate data than is available elsewhere and provides the most realistic reflection of actual bronze age metalwork proportions in the fenland area.

The results from this fen edge area and the detailed study of metal detected finds from the non-fenland soils show remarkable consistency with a maximum of a 2% differential being shown (table 20). The slightly elevated figures (5-6% higher for bladed weapons, 4% higher for spearheads) for weapons listed in the county Sites and Monuments Records are to be expected with information based mainly on published and early records. Prior to detailed research a similar imbalance was also evident in north-west Suffolk. It is therefore clear that there is no evidence for an increased incidence of objects defined as being of high status (even if this label is accepted) in the fens of northern East Anglia and the proposition that a greater proportion of prestige objects

in these locations is due to ritual, votive or ostentatious consumption of wealth cannot, therefore, be accepted.

6. Conclusions

This chapter has examined the evidence relating to wet fen finds. The first, and most significant, discovery was that where recorded contexts existed they demonstrated that very few objects actually came from within fen deposits. Similarly it was apparent that the majority of finds without detailed records also occurred in a fenland situation due to re-deposition rather than originating in wet horizons. Nonetheless, a proportion, even if only minor and fairly insignificant, of bronze objects was still found in former wetlands. A variety of possible reasons can be suggested: boating accidents; drownings; deliberate disposal of rubbish; disposal of war 'booty'; associations with structures and settlements, such as or causeways or crannogs; deliberate destruction to maintain a prestige goods economy; acts of conspicuous consumption to demonstrate personal status; sepulchral 'grave' goods; other ritual/votive offerings or admixtures of these.

All have been discussed above or elsewhere. In East Anglia evidence exists to support a number of the practices: both 'crannogs' and causeway constructions have been described and excavated in association with metalwork. A boat is actually associated with a rapier and evidence of possible drownings and/or burials with bronze artifacts exists. It is suggested that a proportion of the objects represent rubbish disposal, which is supported by the large number of broken, damaged or very worn items. Whether any of the weapons in the fens (and

the rivers) actually result from warfare is altogether more debatable, The comparable proportions and long chronology of weapons, both in and away from the fens, suggests that if warfare was a factor then it must have been widespread and a normal element of bronze age life. Similar comparisons of local figures also show that deliberate deposition of prestige items in the fens is not consistent with the evidence.

Finally, whilst it is obvious religion must have formed an active part, both in life and death, in bronze age society, it is the identification of formalised acts, ie ritual, that presents one of the most problematic areas. Some forms can be witnessed, most notably in burial rites. As Pader has said, a funeral, *'by any definition, is a ritual activity'* (1982, 36). This must be accepted yet in most instances, even with burials, it is the degree of ritual that is important for *'ritual and non-ritual behavior cannot be distinguished absolutely from one another'* (*ibid*). This has been taken to be the case and my main concern has been with the more highly formalised, indisputable "ritual" behaviours.

Significantly, as this chapter has shown, no positive evidence for ritual activity of this nature can be shown in the fens, in fact, the body of extant information strongly supports a contrary, secular thesis.

CONCLUSIONS

1. The survival and nature of the evidence

In view of the excess of 11,000 pieces of bronze age metalwork recorded from northern East Anglia, it may seem surprising that one of the principal conclusions concerns how little actually survives in the archaeological record. Although no precise figures can be given for the extent of the loss, the detailed survey work in north-west Suffolk provides, for the first time, a relatively good sample for comparisons with the other areas in East Anglia where no detailed evidence either survives or has been studied.

The north-west Suffolk evidence, despite being far from complete (chapter 6.5d), probably presents the most reliable and representative guide to a reasonably large, both numerically and geographically, assemblage surviving at the end of the bronze age. Lying roughly in the geographical centre of northern East Anglia, the metalwork found in north-west Suffolk is likely to average the proportionate make-up of the surrounding areas. In fact approximately a quarter (25.4%) of the recorded metalwork (catalogue 1) was hoarded (including the possible Stibbard hoard material from 'Eriswell', S7958, catalogue 1.H3).

Believing there to be a relatively good survival of hoards in the region, and records relating to them, it can be assumed, if the fen edges are indeed a microcosm of other East Anglian assemblages, that the hoards from northern East Anglia also represent about 25% of the total.

If the 7,000 or so items in the Isleham hoard are excluded, 2,730 hoarded artifacts remain, suggesting the existence of 8,190 stray finds, whereas only 1,440 are recorded. If the Isleham hoard were to be included a staggering total of 29,190 stray finds should be expected. Although this is probably an over-simplification, it does highlight the poor survival of the evidence, particularly regarding single finds.

The area of the intensive survey, amounting to 144 square miles, or just under 3% of northern East Anglia, has produced 11% of the metalwork (excluding the Isleham hoard) and 23.7% of all stray finds. In spite of this concentration it is not felt that the south-eastern fen edges, from which the majority of finds derive, were in any way exceptional in bronze age East Anglia. They certainly are now in terms of artifact frequency, but it is believed that this is mainly the result of differential land use, and recovery/survival of the artifacts (chapter 9), over the last 2,500 years, rather than the choice of the fen edge zone for high density settlement or mysterious votive practices. Indeed the evidence for the fen edges suggests low density settlement with a similarly low bronze deposition rate (chapter 12.5b, table 19 and appendix 11). Despite this the organisational implications of the artifactual wealth of bronze age East Anglia suggest substantial settlements in the region. Although, as yet, these are unlocated, they were most likely to have been situated in the major river valleys and could subsequently have been submerged under later river alluvium, hillwash and urban deposits. The importance of such deposits has been a common oversight in the appreciation of the area's archaeology, especially its prehistory.

Perhaps more alarming has been the frequent failure to observe similar phenomena in the areas known to be archaeologically rich, particularly the Brecklands and fen edges.

In the Brecklands, hillwash is replaced by windblow, and despite instances being both historically and archaeologically recorded, little regard has been given to the potential offered by landscapes which, on the surface, appear today to be artifactually sterile. These same areas were, prior to large scale afforestation and the control of rabbits, one of the leading national hunting grounds for prehistoric artifacts, due not only to the wealth of finds, but also to the shifting soils and changing exposures (and corresponding inundations) of early horizons.

The fens and fen edges differ slightly. Although similar to the brecklands in that gradual or sudden exposures of prehistoric levels have occurred, due to the wastage of the former peat cover and the associated drainage methods, few comparable instances of sites being protected by soil movement can be cited. Here, however, the very reasons for the finds being revealed, namely the substantial drainage practices, have, with regard to the archaeological considerations/consequences, been similarly ignored.

First and foremost in all of these regions it is the effects of agriculture and land use that have caused the variation in the numbers of finds, rather than radically differing prehistoric densities. Whilst not denying localised variation occurred in prehistoric settlement and land use patterns, an examination of the evidence, giving careful regard

to agricultural history, is beginning to demonstrate uniformity to have been more prevalent than has previously been considered (chapter 9). Indeed the need for detailed research regarding land use should be a primary factor in any consideration of artifact distributions. This has been amply demonstrated by some of the findings of this work. For example an examination of the results of fieldwalking in the principal soil areas have shown how arable cultivation causes the loss of evidence, through the fragmentation of friable materials and the collection of useful objects, and the dispersal of other remains. The extent of the loss is clearly related to the longevity of agriculture. Localities rich in finds and sites are invariably those which have been taken into arable usage relatively recently, such as the fens. Conversely areas low in finds and sites are those which are historically the arable farming centres of East Anglia, such as the claylands of High Suffolk and south-east Norfolk, which were the earliest parts of East Anglia to have been enclosed. It seems likely that the slightly greater number of finds recorded from the clay soils in central and north Norfolk reflects the greater proportion of land formerly under pasture and the lateness of enclosure and intensive cultivation. The frequent finding of bronzes on Roman and, particularly, medieval sites in High Suffolk, although partially a result of metal detecting bias, is probably largely a result of the destruction of bronze age sites by Roman and medieval farming practice, just as the mass of metalwork surviving today mainly relates to modern agricultural destruction of sites.

The fens are a case where particular attention to detail is needed. A general consideration of the distribution shows the frequency with which finds are recorded from areas of contemporary (to the time of discovery) fenland deposits. This has resulted in a variety of explanations, the most popular of which is votive or ritual deposition of finds in bogs, meres and watery places during a period of climatic deterioration. A close examination of the detail demonstrates that many of the finds (mainly of neolithic and early bronze age date) clearly predate the postulated climatic deterioration, for which the dating evidence is often debateable and very localised in the fens. However, most relevantly, a close examination of the original, often published accounts, together with the findspots, reveals that the overwhelming majority of objects derived from below the 'wet' horizons. Those apparently from deep peat soils were usually discovered as a result of drainage or other excavation works, and probably come from deposits predating the formation of the peat (chapter 12.3).

In the same way an examination of river finds (chapter 10) shows how many of the cited findspots are either false or relate to modern water courses. Those bronze age objects that do appear to derive from early water courses are rare and occur in rivers in much smaller proportions than comparable objects of later periods, for which no votive reasons are postulated (chapter 10.3).

From the above discussion it can be seen how important precise provenances and details relating to them are to the interpretation of both single and associated finds. Unfortunately such detail rarely

survives. This is particularly true of the artifacts from museum collections which contain many of the more spectacular individual finds. The great majority have no detailed contexts recorded. Of those with a national grid location listed most are only generalised six figure references of dubious validity. For finds from the fens, where major and minor drains traverse a high proportion of the landscape, these grid references are inadequate for anything other than generalisations.

Two of the major concerns in a consideration of artifacts are the proportionate size and representative nature of the sample. Very few bronze age finds were recorded before the 19th century establishment of the learned societies and major museums, and the quality of the 19th century documentation, with a few notable exceptions, was usually poor. Unfortunately the same can be said of the earlier 20th century. In general terms it is only since the establishment of the county Sites and Monuments Records and the improvement of museum documentation, seen with the utilization of the Museums Documentation Association indexing system, that a marked improvement has occurred. Nonetheless, in practice, the standards are still low.

In the intensive study area only 44% of the single finds of metalwork listed were referred to in publications (of varying quality) and 62% were, theoretically, in museums (many items could not be located within the museum collections).

As the listed artifacts only represent those recorded in documents or museums, or made known to the author through this research, the figures

for finds in museums or published represent maxima which would be markedly reduced by the inclusion of other bronzes that have not been recorded. The recent adoption of metal detecting is, unfortunately, likely to increase the extent of this problem. A large proportion of reported finds of bronze age metalwork, over 90% in Suffolk, are now metal detected. This clearly represents only a small proportion of that actually found. A vivid example of this can be given by metal detected finds of bronze age goldwork from Cambridgeshire, Norfolk and Suffolk. To my knowledge seven separate gold items, a torc, a bracelet, two 'lock-rings', one plain and two banded examples of 'ring-money', have been detected since 1980. All finds of gold should, by law, be declared to a coroner and then considered with regard to the law of treasure trove. Therefore this sample might be seen as inappropriate due to the increased likelihood of gold finds being reported. However only one of the objects, the torc, has been declared to the coroner and officially reported to an archaeological body or individual. Three of the other items (two 'lock-rings' and a banded 'ring-money') have been recorded in Sites and Monuments Records, principally due to the finders requiring identification of their finds. The frequency of verbal reports of items of bronze age (and other periods) metalwork being sold to dealers, and at trade fairs on American military bases in the region, has alarming implications which need further detailed examination.

From these observations it is plain that the proportion of finds presently reported is low, yet nonetheless is probably far higher than in earlier times.

A related issue is the question of how representative the existing body of information might be. The frequency of small and fragmentary items amongst metal detected collections is a new, and significant, departure from the material forming the bulk of former museum and private collections and appearing in publications. It is clear that considerable selectivity has occurred (as indeed it still does), due in part to the comparative difficulty in physically seeing the smaller finds, but mostly relating to collecting policies and saleability, especially where fragmentary artifacts are concerned. The change in the nature of the record is visibly displayed in tables 11-13 and 15 and illustrates how misleading and unrepresentative the earlier evidence, based mainly on large and complete objects (ie museum collections and published accounts), is likely to be. The same conclusion resulted from the work in north-west Suffolk, where intensive survey methods (chapter 6.6) were able to identify a huge proportion of small or incomplete/damaged items within a metalwork assemblage considered to be relatively representative of that existing in the bronze age. It is significant that the available results of metal detecting over the rest of Suffolk (chapter 9.7, table 20) reveal almost identical artifact proportions to those in north-west Suffolk.

This uniformity suggests that the two assemblages are relatively accurate reflections of those present during the bronze age, at least in comparison to the unrepresentative samples used for earlier research.

2. The distribution

The foregoing discussion highlights how poor the evidence is for the bronze age in most of East Anglia, despite the region being recognised as one of the two foremost in Britain in terms of artifactual wealth.

The arguments in section one largely invalidate the formation of hypotheses based on existing finds distributions. Despite originally believing that the material from the south-eastern fen edges represented an ancient, as well as modern, East Anglian concentration, a consideration of the factors affecting finds distributions elsewhere now suggests that it did not. The main value of the fen edge metalwork now is in its use as a cross section of the metalwork make up within bronze age society in East Anglia and as an example of assemblages which have disappeared elsewhere in the region.

The high proportion of stray finds preserved amongst the fen edge assemblage, in comparison to those areas where no detailed survey work has been undertaken, and where single finds are less likely to have survived due to long term exposure (chapter 9.6), or burial (cf chapter 2.3), illustrates the difficulties of interpretation. The under-representation of stray finds in the archaeological record, although obvious, has in the past been seriously under-estimated.

Despite being severely restricted by the above factors, some conclusions may still be drawn from the finds distributions. The first of these is the relative uniformity in the dispersal of finds. It is apparent that all areas of East Anglia were utilized in the bronze age. From the similarity witnessed in different artifact type distributions, it can

be assumed that no significantly different activities divided the region. In the area of deep fen soils, finds, as might be expected, are markedly rarer. Occasional discoveries of metalwork from drainage works through these deposits suggest that masking may be the main cause, although it is likely that the nature of the fens would have prevented anything other than marginal activities in the truly wet locations. The only other area showing a notable dearth of findspots is south-central Cambridgeshire, which adjoins the fen basin on its south side. This may be significant as these locations divide western from eastern Cambridgeshire, which may also be divided on historic and archaeological grounds (chapter 8.9), although the lack of detailed evidence, especially regarding recent metal detected finds in this area, may support a coincidental rather than a real cause for this gap.

Of some interest, and supporting the suggested post bronze age re-use of bladed implements following their discovery during arable agriculture (chapter 9.7), is the rarity of large or fairly complete portions from the clay lands of central Suffolk and south-east Norfolk, despite smaller fragments being comparatively common. This may also be a factor contributing to the apparent absence of artifacts from south-central Cambridgeshire where the soils are also clay based.

As stated above, the numerical dominance of the surviving fen edge concentration of finds is no longer as marked as it once was, especially when the reasons for differential artifact survival are given due consideration. An important observation regarding this fen edge assemblage is its limited extent. The relative density of finds on the

south-eastern fens is markedly restricted to the fen edges, and it is not paralleled in the western fens. With a few exceptions (chapter 12.4) metalwork is not generally recorded from the fens proper. This is despite continuing peat wastage and the exposure of increasing amounts of pre-peat subsoils. This limited south-eastern fen edge distribution pattern usually corresponds precisely with the other artifact scatters that are a prominent feature of this particular landscape. Their dating is problematic, but is mostly limited to later prehistoric material, from the mesolithic to the iron age. The overwhelming majority of finds are bronze age. A consideration of the evidence (chapter 11) indicates that the parallel distributions of metalwork and settlement-based scatters are not coincidental but represent a similar, though not always identical, dispersal of debris from the same occupation sites.

3. The significance of the metalwork

This work was not intended to be a specific study of the metalwork itself but an examination of its meaning. It is suggested that the great majority of the surviving material, excepting sepulchral goods, deliberately concealed personal belongings and losses, consists of bronze age rubbish (chapters 6.12f and 10.3). The sheer quantity and condition of most of the material testifies to this. Even hoards of deliberately collected metalwork are so frequent (185 are listed) and contain so many items (over 9,700) that the failure to utilise them can hardly be accepted as accidental. The scrapped nature of the majority of the objects within these hoards is probably significant in this respect.

This conclusion, coupled with detailed studies relating to distribution of the metalwork and other contemporary assemblages in East Anglia has significant implications. The principal of these are noted below.

a. The value of metalwork

Bronze age East Anglia is renowned for the finds of fine metalwork it has produced. The prominence these items are given is largely a result of the selective collecting practices outlined above (cf chapters 6.5 and 9.7). Not so commonly known or considered is the amount of less distinguished or damaged objects from the area. The detailed research suggests that a large proportion of the stray finds are visibly incomplete and/or damaged (chapters 6 and 9.7c). A feature of the complete objects is their worn condition (chapter 6.12c and Rowlands 1976, 119 and 121). A substantial proportion are also miscasts or have casting flaws although this did not necessarily prevent their utilization (eg S8000 and S10696). This, together with the rarity of gold items, supports the supposition that the majority of the metalwork consists of dumped material, a proportion of which may have been deliberately removed from circulation by fragmentation or by removal of functional parts such as hilts. Even if this is not accepted, the sheer quantity of recorded stray and hoarded finds, none of which were recovered during the bronze age, demonstrate the availability of bronze. It is therefore inconceivable that bronze was, from the end of the early bronze age, in its own right, of particularly high value. This finding is contrary to many of the propositions concerning bronze age metalwork, especially assertions regarding high status settlements (cf Bradley 1984, 121) or depositions of valuable metalwork (eg Pryor 1992b, 529).

b. Ritual

Closely connected to the value of the metalwork and the nature of the survivals are connotations of ritual or votive deposition in watery places. Numerous works have favoured such explanations for the 'wealth' of artifacts located in rivers, meres and the wet fens, and East Anglia has been identified as one of the primary centres for such a water based religion (chapter 12, p.284). With the profusion of bronze evident in the region, the status of the metalwork is now less easy to sustain, although it could still be argued that certain items were more prestigious than others. However analysis of the finds from 'wet' locations in East Anglia shows no significant predominance of individual artifact types and does not support a model for the deposition of prestigious metalwork. In fact detailed studies of the individual find locations even challenges the 'wet' nature of the great majority of the actual find-spots. Despite their preservation being due to the protective covering of peat, only a very small proportion of the fen finds appear to have originated from within the peat. Detailed accounts of the finds' contexts and examination of the sites normally show definite evidence of their having derived from below the wet horizons, ie, they belong to phases predating the onset of wetter conditions. Clearly some artifacts come from more convincingly wet locations, although even these are more frequently a result of recent re-deposition than contemporary bronze age activities. Those objects which remain as evidence to support bronze age ritual, in wet locations, including sepulchral practices, are so few as to be acceptable as anomalies, which are likely to be of very little or no consequence in an interpretation of bronze age society.

With a rejection of a ritual explanation for the presence of the metalwork on the fen edges, other interpretations are needed. The most obvious and rational of these is settlement.

c. Settlement

Despite the association of early bronze age metalwork with clear evidence for settlements on the south-eastern fen edges, no such correlation is usually claimed for the abundant metalwork of the later bronze age. Indeed it is the lack of contemporary occupation evidence that is usually highlighted (eg Lawson 1984, 157; Healy and Housley in prep), although the distribution of the later bronze age metalwork also matches that of the early bronze age settlement scatters. Following analysis of the available evidence (chapter 11) it became clear that the apparent rarity of later bronze age artifacts, other than metalwork, was principally the result of problems in identification rather than a genuine absence. In most of East Anglia the location of occupation sites is usually dependent on the identification of settlement debris, in the form of surface scatters, on ploughed field surfaces. This is particularly true of the fen edges where such scatters survive relatively well. However the majority of the finds, consisting of lithics, bone and small pottery fragments, mean that dating is usually very difficult. This is compounded by the chronologically indistinguishable nature of most bronze age artifacts. Few of the sites identified have assemblages that can be closely dated.

Only one common artifact type could be identified that was characteristic of later bronze age sites (though not exclusively) in

northern East Anglia, namely pottery with flint fillers. If occupation sites of the later bronze age were a feature of the fen edges, pottery of this fabric group should be present. An examination of the material from field walking surveys demonstrated the frequency of 'flint-gritted' pottery. When compared to the distribution of metalwork finds (map 46) a marked correlation was noticed and established the likelihood of contemporary fen edge occupation. These fen edge settlements appear to have been small and well spaced. Although appearing as a concentration on small scale plans the amount of contemporary metalwork was not great and fits well within such a dispersed settlement model (chapter 12.5b, appendix 11 and table 19).

Despite the lack of such good evidence for metalwork and settlement scatters in the rest of East Anglia (chapters 9.1, 9.4, 9.5 and 11.4), the surviving find patterns (see maps) and occasional excavations demonstrate the presence of occupation across the region. Its extent and form are difficult to determine on the basis of so few excavations, although it would seem likely that some considerable diversification occurred. Alongside the smaller undefended sites, as witnessed on the south-eastern fen edges, slightly more substantial and occasionally enclosed sites of later bronze age date are known, such as the 'mini-hillforts' at West Harling sites 2 and 3 (Clark and Fell 1953) and the Mucking North and South Rings (Jones and Bond 1980, 473-5). Other potential bronze age sites of similar or rectangular (cf Lofts Farm and Broomfield, Essex: N Brown 1988 and P Gilman, pers comm, 1992) form are known from a series of aerial photographs (Lawson 1984, 160).

It is also likely that much larger centres, possibly of a semi-urban form, existed in this period (cf Potterne, Wiltshire, Gingell and Lawson 1984). Although none has yet been identified in East Anglia, this could be due partially to their positioning in river valleys where they will have become masked by hillwash, river silt or later urban deposits, and by the limited examinations of cropmark enclosures in northern East Anglia. The probability of their existence is supported by the considerable organisation apparent in the metalwork, the uniformity in its make up in the region, and to a certain extent by the regular dispersal of the substantial hoards, some of which clearly cluster around 'centre points'.

d. Social structure

Even fewer clues remain to indicate the organisation and form of society in bronze age East Anglia than survive for an analysis of settlements. The frequency of imported metalwork and the existence of local 'industrial' output has marked similarities to the axe and stone trades of the neolithic and earlier bronze age. This suggests the area produced enough surplus wealth to sustain long distance trade/exchange networks throughout later prehistory, although the economic basis of this is uncertain (chapter 4.3). The surviving monuments and particularly the artifacts of the early bronze age illustrate this prosperity. The evidence for other areas, for example Wessex, has suggested that such artifactual wealth is a result of elite controlled societies. Marked differences, however, occur in East Anglia, where sepulchral practices appear to be different (chapter 4.6) and the survival of the evidence is not comparable. Whether this means that the

social structure was also different is more problematic and unresolvable at present. It has been claimed that 'cultural' boundaries are recognisable in the neolithic and early bronze age, and these may be an indication of localisation, although the evidence for this is disputable (chapter 4.5).

The gradual development of artifacts in East Anglia indicates a considerable degree of local stability. The changes that occur tend to suggest technological and external factors rather than insular sociological causes. The similarity in artifact proportions and types also suggest considerable regional and social unity. An exception may be the later middle bronze age, where some variability in the make up of hoards and stray finds is noted (chapter 8.7 and 8.10), although this may largely be a result of supply problems associated with a change in direction of metal supply (cf Northover 1982a and 1982b 54-9) which herald the changes of the late bronze age industries. Despite this it is clear that East Anglia continued as one of the metalworking centres of Britain and the continuity in artifact proportions, frequency (tables 1-3 and 5) and production supports a relatively unchanging social background.

Although various authors have claimed an increase in the martial element in the evidence presented by bronze age metalwork, and have associated this with the development of martial elites, the material from East Anglia does not support this. Proportions of 'weaponry', as far as can be told, remain static, although the nature of it does change through time, principally from arrowheads in the early bronze age to dirks,

rapiers and spearheads in the middle bronze age and swords and spearheads in the late bronze age. Although not necessarily to be expected in the nature of the evidence there are no clear indications of a segregated society or, indeed, of any form of divided social structure. Together with the comparable distributions of different artifact types (maps 30-42) one of the most remarkable indications of the unified cohesion of East Anglia is the numerical consistency with which these separate artifact types are hoarded in the late bronze age. The most obvious interpretation of this is that hoards are an exact proportionate replication of stray finds, and that no separation occurred between the bronze tools, weapons or ornaments or between items which might, according to some (eg Northover 1982b, 51 and 67) be deemed to be of 'high' or 'low' status.

4. Summary of the main conclusions

Using the methods outlined in chapter 5.3 and detailed in the subsequent chapters it has been possible to formulate the following conclusions regarding the bronze age in northern East Anglia:

1. The records relating to finds of all types are generally so variable in quality and reliability that extreme reservations must be voiced over their use without independent confirmation of the evidence.
2. The distribution of bronze age metalwork is more useful as a guide to subsequent agricultural practices in East Anglia than it is as a guide to bronze age distributions.

3. Considerable selectivity has been employed in the formation of museum collections of metalwork which, as a result, are atypical of bronze age assemblages.
4. The fen edge concentration of metal and other artifacts is a historical record of modern finds. It was far less likely to have represented a concentration in the bronze age.
5. The records for over 11,000 bronzes in northern East Anglia relate to only a relatively small portion of the metalwork surviving the bronze age, especially as a proportion of the stray finds.
6. The principal local bronze hoard, from Isleham, Cambridgeshire, the largest in western Europe consisting of circa 7000 items, represents the importation of scrap metal into northern East Anglia. It may have been the consequence of a breakdown in former supplies of copper and tin that may have been the impetus for some of the technological and typological (and economic) changes that distinguish the later bronze age in lowland England.
7. Despite having no metal resources, East Anglia was one of the most important British centres of metal-working, from the end of the early bronze age, and possibly earlier, until the end of the bronze age. The artifactual predominance of the area in the later bronze age reflects that occurring in the neolithic and early bronze age.

8. The evidence for local sepulchral practices in the early bronze age suggests that they were unlike those in evidence elsewhere. The conspicuous disposal of 'wealth' with burials was very rarely practiced in East Anglia.
9. Informal disposal of the dead seems to have been common practice in the early bronze age and may have represented the main mode of deposition by the later bronze age although the relative lack of evidence suggest this was likely to have been primarily cremation.
10. Most 'prestigious' items of neolithic and early bronze age date occur within occupation scatters.
11. Similarly, where details survive, most of the metalwork of later bronze age date is associated with occupation debris.
12. The most significant changes evident in the metalwork are probably related to the technological rather than social changes.
13. The proportion of weaponry appears to remain relatively stable throughout the bronze age.
14. No clear evidence for social stratification exists in later bronze age East Anglia, and its existence is debatable and very restricted within the early bronze age.
15. A marked consistency in artifact proportions between hoarded and

single finds illustrates the uniformity of regard for all bronze artifacts in the later bronze age, ie, none of the principal types appear to have been reserved for special treatment.

16. The evidence strongly suggests that bronze age ritual or votive deposition of metalwork in rivers did not occur in East Anglia.
17. There may be some, slight, evidence to support the association of a small number of bronzes with sepulchral practices in the wet fens. However, apart from this, the imputed ritual/votive significance of finds from the fens, from the evidence provided by detailed research, is illusory.
18. Substantial changes in the nature of the metalwork assemblages are likely to occur as a result of systematically recording metal detected finds.
19. The distribution of finds suggests a relatively extensive utilization of the varied principal soil types of East Anglia which probably relates closely to settlement pattern.
20. Modern land use is the most influential factor in the distribution of recorded finds of prehistoric artifacts.
21. The metalwork evidence (as plotted) for territorial boundaries does not demonstrate the purported divide along the claylands of south Suffolk particularly well although a void does support a separation

between west Cambridgeshire and the rest of northern East Anglia.

These hypotheses have been dependent on the results of intensive research carried out within East Anglia. The nature of the evidence has imposed considerable limitations and has made it necessary to examine the most basic beliefs concerning bronze age finds as well as identifying further research needs. For example problems of territorial boundaries and internal, industrial and social organisation, might be better understood by detailed examination of the bronze age hoards and stray finds using coupled typological and metallographic analysis, in a few, choice, sample areas in East Anglia. General problems relating to localised land use might be examined by a series of environmental studies from, for instance, the surviving undisturbed mere and river valley deposits in the region. Similarly specific locations might be chosen to examine the nature of bronze age settlement, such as some of the fen edge sites producing pottery with flint fillers and/or significant crop mark sites. The river valley locations should also be surveyed for silt and hillwash deposits that may mask major settlements. Finally, and in some respects most significant, is the need for further in-depth research to record the large amount of unrecorded artifacts held by many interested individuals. The value of information they hold is demonstrated by the results of this work which have resulted in the reassessment and abandonment of many earlier conclusions reliant on generalised, extensive or poorly studied bases, rather than on intensive detailed research.

APPENDIX 1

LIST OF PRINCIPAL JOURNALS RESEARCHED

Antiquity 1927-1991

Archaeologia 1770-1991

Archaeological Journal 1845-1991

The Antiquities Journal 1921-1991

Proceedings of the Cambridge Antiquarian Society 1859-1991

Proceedings of the Prehistoric Society of East Anglia 1908-1934

Proceedings of the Prehistoric Society 1935-1991

Proceedings of the Society of Antiquaries of London 1859-1920

Proceedings of the Suffolk Institute of Archaeology 1848-1976

Proceedings of the Suffolk Institute of Archaeology and History 1977-1991

APPENDIX 2

LIST OF MATERIAL INCORRECTLY DENOTED AS FROM NORTH-WEST SUFFOLK

- a. The Clouston Collection, (a total of 69 bronzes from various locations) Ipswich Museum. Lawson 1979a appendix III and other various publications.
- b. Looped palstave and casting jet from the Coomassie Plantation hoard, Cranwich, Norfolk. Both formerly recorded as from Lakenheath CUM A1906.71, A1906.72.
- c. Rapier of unknown provenance, Suffolk. Listed as from Wilton Bridge by Trump 1962 p.98. Colchester Museum.
- d. Socketed axe with 3 ribs and pellets and side looped spearhead. Published by Evans 1881, 122, 123 and 321 and 394(F) respectively, and in Victoria County History of Suffolk Vol 1 p.276 as from Thetford, Suffolk. Also PSIA Vol 1 p.305 and p.150 respectively. Thetford, Suffolk became Thetford, Norfolk, with the county boundary changes in the 1920's. Formerly Warren then Evans collections, now Ashmolean Museum.
- e. Pegged spearhead, 31.5 cms long and retaining bronze rivet (set through blade midrib). Recorded as from Thetford, West Suffolk, in NBIC (see above). Moyses Hall Museum (now unlocated).

- f. Palstave listed as from Shippea (Hill), Suffolk by Rowlands 1976, no. 960, but according to CUM catalogue from Quaveney, Cambs. CUM 9.22.544.
- g. Flat axe fragment/palstave? Labelled 'Herr..... June 9.1869'. Could be Herringswell but complete lack of material from this vicinity suggests Herringsfleet may be alternative. IM 1920.51.16.
- h. List no. H3 may originate in the Stibbard hoard, Norfolk.
- i. 'Celt with loop and ridge' recorded as from 'Barrow Field, Gazeley' by IM card index. Actually from 'Barrow Field', Barrow (PSIA 1 1853, 59) and found by Mr Wilson of Gazeley.
- j. See spearhead no. 257, said to be from 'Icklingham, Suffolk, but probably Italian'. (Anon, Proc Soc Antiq London, V, 1870-3, 432).

APPENDIX 3

LIST OF MUSEUMS RESEARCHED

Various locations

Ashmolean Museum, Oxford

British Museum, London

Colchester and Essex Museum, Essex

Devizes Museum, Wilts.

Jewry Wall Museum, Leicester

Nottingham University Museum, Nottingham

The Manchester Museum, Lancs.

Cambridgeshire

Cambridge University Museum of Archaeology and Anthropology

Chatteris Museum

City Museum and Art Gallery, Peterborough

Cromwell Museum, Huntingdon

Ely Museum

Haddenham Farm Museum, Haddenham

Norris Museum, St Ives, Huntingdon

Peterborough Museum and Art Gallery

Wisbech and Fenland Museum, Wisbech

Norfolk

Kings Lynn Museums

Norwich Castle Museum

Thetford Ancient House Museum

Suffolk

Elveden Estate Museum, Elveden

Ipswich Museums

Mildenhall Museum

Moyses Hall Museum, Bury St Edmunds

APPENDIX 4

POSSIBLE ASSOCIATIONS OF ITEMS LISTED SEPARATELY

- a. TL 690789, 690790 approx, Kenny Hill. Two pointed and chisel ended tracer/awls (145 and 146), tip of spearhead (262), small rivet (333) and three bronze sprue cap wasters (334). Found scattered over two adjoining fields mixed with Roman occupation and brooch manufacturing (?) debris. If all bronze age may represent imported metal debris for Roman brooch production although presence of flint filled pottery and location suggests possible residual bronze age occupation/metalworker's material.
- b. TL 6645723, Gravel Drove, West Row. Rapier with hazelwood scabbard remains (186) in identical(?) location in ploughed field as rapier/dagger (190) in peat. Probably associated. For more complete details see appendix 5. Also see spearhead tip (261) rapier (H20) and rivet (338) from same field.
- c. TL 74288701, Little Ouse river, Brandon. Bronze sword, bent with part hilt missing (233) of approx 7th century BC. Found near bronze ring headed pin and bronze ribbed(?) bracelet. (PSIAH 1983, 229, fig 48) of 'EIA'. Found in dredgings from Little Ouse river so associations dubious although all items could have been contemporary, depending on the age of the sword at time of deposition.

- d. TL 692797 approx, Undley. 'About 3 bronze swords' (223-5) known to have been kept together in farmer's barn in 1920s. Suggests hoard but association and details unknown.
- e. TL 72408535, High Fen, Lakenheath. Spearhead blade (236) and spearhead tip (237) found in same spot. Possibly associated.
- f. TL 727867 approx, Wilton Bridge, Lakenheath. Spearhead blade (238) said to have been found in same provenance as spear ferrule (279). Found in dredgings from Little Ouse river. Spearhead not located so possibly not contemporary.
- g. TL 73258700, Wilton Bridge. Socketed gouge (282) found near cast bronze ring headed pin (Norfolk SMR no. 54 56 context 2) of 'EIA'. Possibly contemporary. Deriving from material probably originally dredged from course of Little Ouse river.
- h. TL 77757225 approx, Mitchells Hill, Icklingham. Small quoit headed pin (314) and incised ribbon bracelet (315). Lawson doubts date (Lawson 1979a) but if bronze age association seems probable. Details of discovery unknown.
- i. Brandon. Four pieces of bronze cake (see list no. 329) listed in NBIC. Association unknown.
- j. Icklingham. Bronze 'stylus' (174) probably a tracer/awl(?) and 'fragment of bronze cake' (331) labelled 'from founder's hoard' in IM card index. Details unknown.

APPENDIX 5

DETAILS OF WORK ON A SITE AT GRAVEL DROVE, WEST ROW Presented to Suffolk Archaeological Unit by C F Pendleton in 1976

Discoveries on, and trial excavation of, a mixed prehistoric site at
Gravel Drove, West Row

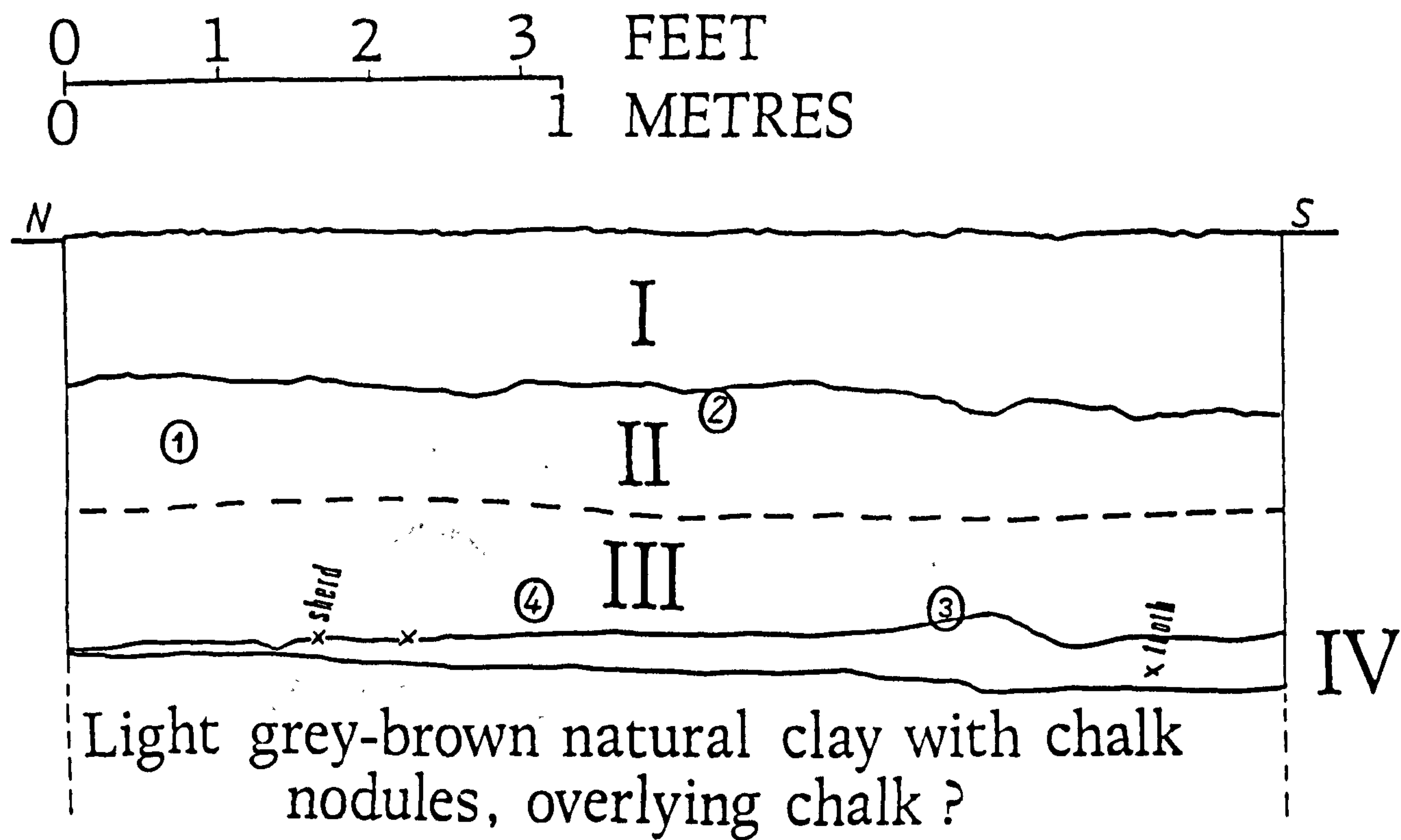
In the spring of 1966 Mr Brian Aves, whilst ploughing on his father's land, found an almost perfect rapier with portions of its hazel scabbard still adhering to the blade [list no. 186, fig 46]. This rapier is of middle bronze age date and belongs to group IV (according to Burgess 1974). As this weapon is well documented (Trump 1968; Rowlands 1976; Coles and Trump 1967; Edwardson 1968) this description will suffice for the purpose of this note.

The surface finds from the same field have so far amounted to only a flat quern stone and a few short, rough flint flakes with poor, if any, secondary working. Nearby is a late neolithic/early bronze age site yielding an assortment of distinctly patinated flint implements. The surface found flakes from the rapier field were probably not produced by the knappers of the late neolithic flints, and indeed are more fitting to a middle bronze age to late bronze age assemblage than to one earlier though with only such a small quantity age is difficult to determine. It cannot, of course, be said that the rapier and other finds are associated and, in fact, the survival of the scabbard (presumably because of its burial in peat) would indicate that it had either been lost or placed there deliberately.

It came as a surprise when in October 1972, despite the attention of several metal detectors wielded by people both known and unknown, the landowner, Mr Derek Aves picked up another rapier/dagger [list no. 190 fig. 45] in a similar location as the first whilst harvesting potatoes. This second rapier was of group II, and in a rather poorer condition, having had both of its perimeter rivets broken out in the past, though the blade is for the most part in sharp and serviceable condition.

In January of 1976 a small trial excavation of 8' by 1'8" was carried out on the approximate site of the finds to determine the nature of the underlying soil and to confirm that the survival of the scabbard was due to its being disturbed from damp peat. The axis of the excavation was placed north to south, 80' away from the parallel ditch to the west, and 140' from the centre of the large ditch to the north (running NW-SE) besides Gravel Drove at grid reference TL 6645/7523. Excavation [fig 1 of this appendix] did prove the immediate subsoil to be peat, which is separated by colour into two zones (II and III). No distinct line divides the two layers and it may in fact be a 'false' breakdown of the peat and certainly no obvious difference was found, but this also created a problem in explaining why the rapier had no hilt, especially as there are indications of a hilt on rapier 2 [list no. 190].

Trump (1968) is of the opinion that the peat may have been too acidic to preserve bone (assuming a bone handle), this, in fact, is not the case in this instance as bone was found in a reasonably good condition in all the substratum above the natural clay.



| | Bones | Teeth | Flakes | Burnt flint | Flint tools | Pottery | |
|-----|-------|-------|--------|-------------|-------------|---------|--|
| I | - | - | - | - | - | - | Dark peaty plough soil. |
| II | 1 | | | | 1 | | Red / brown peat/loam. |
| III | | | | 1 | 1 | | Darker brown peaty loam. |
| IV | 1 | 1 | 9 | 1 | 1 | | Grey brown clayey loam, occasionally stoney. |

FIGURE 1. Excavations at Gravel Drove, West Row.

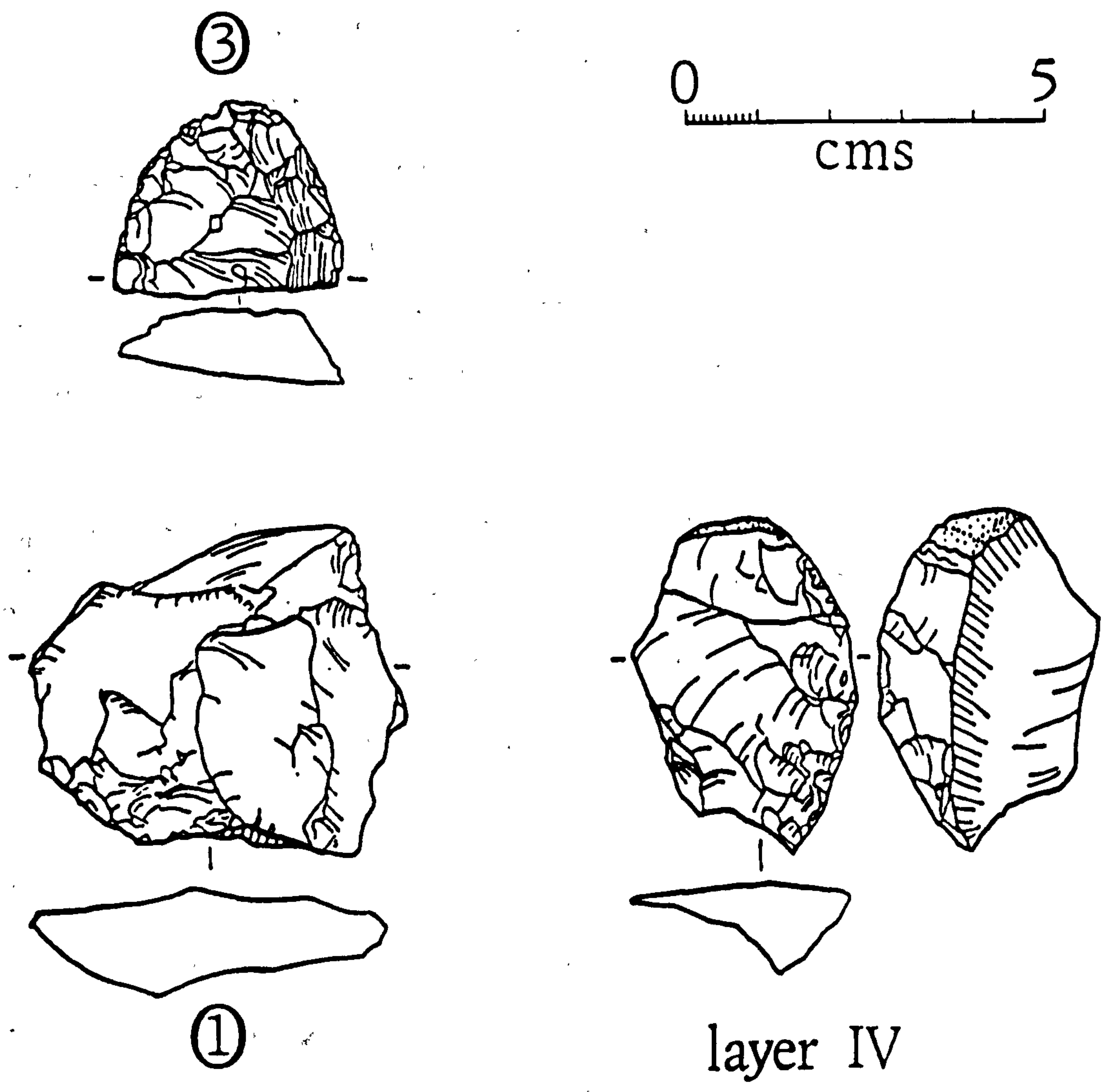


FIGURE 2.

The flint tools from layer II, III and IV.

Surprisingly, in such a small excavation, a potsherd, 4 bones, and some 12 worked and 2 burnt flints were found, (see fig 2 this appendix). Several of these flints and bones were, in fact, found within the peat, most of the flints showing a calcine patination almost certainly originating previous to their deposition in the peat. One bone [2 on fig 1 this appendix, not illustrated] had visible teeth marks probably made by a rodent. These objects were almost certainly cast into the peat, probably from the higher chalk to the north or from a trackway in the peat, although the possibility some were thrown overboard cannot be completely discounted. It is unlikely such mundane objects would have been cast as offerings to water deities as is a possibility in the case of rapiers (as suggested by Trump 1968, 225 and Burgess 1974, 209).

Most of the artifacts from the excavation were found on the surface of and within layer IV and unlike the finds from the peat are unlikely to have been redeposited. The potsherd, which is neither very large nor in very good condition, can be cautiously dated to the early neolithic.

Description of rapier 2 [fig 45, 19]

The rapier can be said to be generally in an excellent state of preservation. One cutting edge on the blade has the mid half fairly blunted (possibly quite recently if ploughsoil has disguised the relative freshness of the blunting), but otherwise is sharp. Light fresh plough grazes are visible on either side. Slight green corrosion is visible along parts of the median ridge on one face and is apparent on reverse in a few small patches and on some linear grazes - (caused by plough?).

The rapier is 221mm in length, 52mm wide at widest point and the two rivet holes are from the centres just over 30mm apart and are set at right angles to the blade. The two rivet holes are set in the base corners of the trapeze-shaped tang and in both cases the corner fragments have been broken off in a similar position, leaving nearly $\frac{1}{2}$ of the rivet holes intact. A median ridge runs along the length of the blade and a bevel exists where sharpening has occurred. The tang is blunt on all sides with the rivet holes bevelled from both faces.

According to the blade cross-section the rapier falls clearly in Burgess's group II of the middle bronze age. A hilt mark is faintly discernable on one face and is of the same form as hiltmarks found on several other rapiers from the district, one in fact, also from West Row [fig 45, no 189].

Conclusions

After the initial occupation phase (Layer IV) of the site a rise in water level caused continued waterlogging. The dampness and peat formation resulted in occupation moving to drier land, and, judging from the material found in the peat, this was probably only a short distance away. The discovery of the two rapiers may not be related to any occupation sites in the immediate areas. How or why they were deposited remains debatable. The two finds could be interpreted as being an indication of a cache of personal possessions of one individual such as seen in the late middle bronze age hoard from Downham Market (Clark 1960, 80 and plate 15). In view of the condition and the fact that the

scabbard was still adhering to rapier 1, it can be discounted as a bronzeworker's hoard.

The main doubt in the personal cache theory would be the difference in phase of the two rapiers. Overlaps are common however, and certainly a parallel of phase II and IV rapiers being found together in East Anglia exists (Burgess 1974, 204, note 250, hoard from Bulpham Fen, Essex); indeed one would not expect a perfectly good and valuable possession to be discarded merely because it was not part of the current 'fashion'. Peat however does seem an unlikely spot to choose to bury such a cache if recovery was ever intended.

Votive offerings of bronzes in meres and bogs to a water-based religion appears as a possible explanation, supported elsewhere (Trump 1968 and Burgess 1974). It may either be considered a coincidence that the two should be deposited so near each other, or, on the other hand, it could represent a double offering.*

It is clear that rapier 2 had been in the ploughsoil for some time before its discovery, and this would account for the patinated/corroded grazes, the slight blunting of the edge, the loss of the rivets and the handle (as is indicated by the hilt mark), the loss of any scabbard that may originally have existed, and the fresh grazes on either side. The condition of rapier 2 could therefore have matched that of rapier 1 had it also been found freshly disturbed. In view of this, the amount of finds, the preservative nature of the soil and almost undisturbed stratigraphy occurring on the site, further excavation of a more

scientific nature would undoubtedly be invaluable if undertaken in the next few years before plough damage becomes too extensive.

Colin F Pendleton March 1976

* I would now revise the possibility of a votive explanation (see discussion pgs 123-130, chapter 12.2 and 12.6 and addendum below).

Addendum

A reconsideration of the 1976 work, especially in view of subsequent fieldwork and finds allows a completely different interpretation. The potsherd, cautiously dated to the early neolithic, has flint fillers and is equally likely to be middle or late bronze age in date, which would be consistent with the associated flintwork. The clayey/chalky subsoil horizon below the peat is known to be very variable in depth and is now, some 16 years later, also visible on the field surface to the west and south-east and very close to the supposed findspot of the rapier and rapier-dagger. This strongly suggests that the metalwork is likely to have been disturbed by agriculture from the deposit/s (ie layer IV) below the peat which are probably part of an occupation horizon.

Three further late middle bronze age metalwork items have been metal detected on this same field more recently. The first (261), was the tip of a basal looped(?) spearhead. This would appear to have been found within the ploughsoil and was therefore in a disturbed horizon. However, the contexts of the latest finds, three parts of a single(?) rapier (list no. H20) and a single bronze rivet (338), are far more

significant. Fortunately the finder clearly recalled the find locations. The rivet, although in ploughsoil, was found on the crown of one of the chalk ridges now protruding just above the wasting peat. The (deliberately broken) remains of the rapier were also from this chalk ridge, this time from the southern edge just before the ploughsoil changes to become a wetter, peat-based, soil. The tip (H20.1) and rivet (H20.3) were also ploughsoil finds, but the hilt was, according to the finder, still in situ (with a modern plough cut beside it) within a non-peaty layer with flint nodules at about one foot depth. This offers further support for the hypothesis that these items, notably the remains of the wooden scabbard, survived due to wet conditions subsequent to their original deposition within a dry, occupation(?) horizon.

Unfortunately this problem cannot be satisfactorily resolved until further action is, hopefully, carried out on this potentially key site which is plainly drying out rapidly.

APPENDIX 6

NUMERICAL SEQUENCE FOR CITED LOCATIONS OF A GENERALISED NATURE (and number of finds from each)

1. Mildenhall 33 and 4 hoards
2. West Row 9
3. Gravel Drove, West Row 1
4. West Row Fen 6
5. Mildenhall Fen 4
6. Near Mildenhall 13
7. Holywell Row 5 and 1 hoard
8. Kenny Hill 4
9. Wilde Street 1
10. Eriswell 7
11. Near RAF Lakenheath 1
12. Burnt Fen 5
13. Cupola Farm, Undley 6
14. Undley 14
15. Undley Common 2
16. Undley Fen 1
17. Lakenheath Fen 4 and 1 hoard
18. Near Lakenheath 2
19. Lakenheath 27 and 1 hoard
20. Wangford 3
21. Little Ouse, Lakenheath 2
22. Near Brandon 2
23. Brandon 5

24. High Lodge, Santon Downham 1
25. Elveden 1
26. Icklingham 20
27. Between Cavenham and Icklingham 4 and 1 hoard
28. Cavenham 1
29. Tuddenham 2
30. Freckenham 1
31. 'Roman Mound', Eriswell 1/2 hoards
32. Newmarket 1
33. Exning and near Exning 1 and 1 hoard
34. Lakenheath Warren 4 and 1 hoard

No cited location 5

APPENDIX 7

BAR DIAGRAMS

Chronology

The chronology blocks have been based on the dating of metalwork typological forms and do not necessarily represent cultural or actual divisions of the period. The earliest recognisable metal artifact with adequate datable associations elsewhere is the tanged copper dagger (no. 181). Tanged copper daggers have been recognised in association with Clarke's (1970) Wessex/Middle Rhine or Lanting and van der Waals step 2 beakers (Gerloff 1975, 32) which on mainly Dutch analogies are dated to between circa 1950 and 1850 bc (c.2200-2400 BC) by Lanting and van der Waals (1972). Although one suspects these dates are not particularly satisfactory, until a chronology for British beakers is established (Alex Gibson of Leicester University has been offered a free series of radio-carbon determinations for this purpose) they must suffice for this work. The chronology for the late early bronze age and later bronze age is based on Burgess and Coombs (1979, iii-iv) although their phase terminology has not been adopted. It also proved difficult to detect chronological divisions based on typological differences in the earlier middle bronze age and an overall early middle bronze age was adopted for this period (cf Rowlands 1976).

Presentation

Bar diagrams were used to express the minimum (known) and maximum (due to the imprecise dating of many implements) counts of implements within each chronological block. However, due to the variation of time span

covered by each block it was felt a more realistic approach would be to adopt a mean count over each 'phase'. The resultant minimum and maximum flow diagrams superimposed over the bar diagrams probably reflect a more accurate relative chronological count of implement frequency. The impression given by the flow diagrams is one of continued growth of metalwork frequency with a slight increase experienced in the late middle bronze age/late bronze age 1. This increase, however, is not as marked as to suggest a massive change in the organisation, distribution or industry that may be representative of a bronze age period subdivision. The declining growth rate in late bronze age 2 is slight, especially in view of the proximity of the Isleham hoard (see p.103), and is much less than might be expected if the Isleham material was a local collection of scrap material. In view of this it is more likely that the Isleham hoard represents, at least in part, an importation (from outside East Anglia) of scrap material and that this collection and its effect on the frequency of local metalwork was relatively slight. The final stage of the bronze age shows a slight decline in frequency of material that is experienced elsewhere in Britain and probably marks the beginnings of the use of iron. Overall, a lack of divergence from a relatively smooth flow line is the marked feature of the comparative frequency table (table 1), despite the fact that changes are apparent in the nature of the source metal (cf Northover 1982a).

APPENDIX 8

NORTH-WEST SUFFOLK PARISH CODES

| | |
|----------------|-----|
| Barton Mills | BTM |
| Brandon | BRD |
| Cavenham | CAM |
| Dalham | DAL |
| Elveden | ELV |
| Eriswell | ERL |
| Exning | EXG |
| Freckenham | FRK |
| Gazeley | GAZ |
| Herringswell | HGW |
| Higham | HIG |
| Icklingham | IKL |
| Kentford | KTD |
| Lakenheath | LKH |
| Mildenhall | MNL |
| Moulton | MUN |
| Newmarket | NKT |
| Santon Downham | STN |
| Tuddenham | TDD |
| Wangford | WNG |
| Worlington | WGN |

APPENDIX 9

SUFFOLK FIELDWALKING SURVEY RESULTS: PREHISTORIC SCATTERS

For comparative totals of finds and areas in different soil types see tables 6, 7, 8, 9 and 10. Soil descriptions are based on those of the fieldwalkers and the 1:250,000 Soil Survey of England and Wales (Ordnance Survey 1983).

Fen Edge Soils

Mildenhall: (soils - mainly sandy skirt consisting of areas of hummock and hollow micro-relief in the form of sand hummocks with thin peat and sand soils and peat filled hollows).

Systematically fieldwalked by C Pendleton and by J Clipson, M Hardy and C Pendleton for the Fenland Survey in 1983-87. Two-hundred and fifty-eight scatters are recorded (excluding the Fenland Survey), 191 of which are prehistoric. For this reason only a random sample of the Fenland Survey fieldwalking results has been analysed. Identified scatters were usually walked at 2m traverses although recovery was usually aimed at being representative rather than complete. This sample is for 1 Km grid squares at TL 6479, 6579, 6777 and 6978.

TL 6479

site 109: 'BA'; 1 grogged sherd, 1 barbed and tanged arrowhead roughout?, 1 broken borer, 7 scrapers, 52 other worked flints. Total 1 sherd, 62 flints (0.92kg) over circa 2500²m area.

site 110: 'Preh'; 1 grogged sherd, 4 scrapers, 46 other worked flints.
Total 1 sherd, 50 flints (0.45kg) over circa 2400²m area.

site 111: 'Preh'; 8 scrapers, 1 knife, 57 other worked flints. Total
66 flints (0.51kg) over circa 2800²m area.

site 114 a and b: 'Neo/BA'; 1 grogged sherd, 1 leaf shaped arrowhead, 1
scraper, 1 ?saw, 54 other flints. Total 1 sherd, 58 flints
(0.53kg) over circa 2800²m area.

TL 6579

site 105: 'Preh'; 3 scrapers and 82 other worked flints. Total 85
flints (0.97kg) over circa 2800²m area.

site 108: 'Preh'; 2 scrapers, 1 knife and 25 other worked flints.
Total 28 flints (0.23kg) over circa 2000²m area.

TL 6777

site 121: 'Preh'; 1 sherd flint filled pottery, 1 sherd hand made sand
filled pottery (?IA or Med), 1 polished stone axe flake, 1
?unfinished leaf arrowhead, 1 arrowhead blank, 1 bifacial
chisel (from polished flint axe), 8 scrapers, 1 knife, 1
edge polished blade, 1 serrated blade, 40 other worked
flints. Total 2 sherds, 54 flints (0.72kg). No detailed
information regards extent of scatter.

site 123: 'Neo/BA'; 1 polished flint axe fragment, 2 scrapers, 1 knife
fragment, 90 other worked flints. Total 94 flints (1.16kg)
from circa 2500²m area. Weathered beaker
pottery was previously recorded from this site.

site 124: 'Preh'; 2 scrapers and 11 other worked flints. Total 13
flints (0.19kg) from circa 1000²m area.

TL6878

site 130: 'Preh'; 9 scrapers, 3 knives, 62 other worked flints. Total

74 flints (0.74kg) from circa 7200²m area.

site 139: 'BA'; 6 rim and body sherds and miscellaneous very small fragments flint filled pottery (0.52kg), 4 sherds grog tempered pottery (0.2kg), 1 barbed and tanged arrowhead, 4 pecked flint quern fragments, 2 scrapers, 1 saw, 1 borer and 186 other worked flints. Total 72 sherds, 195 flints. (2.03kg) from circa 5000²m area. Also burnt flint patch.

site 142: 'BA'; 3 sherds flint filled pottery, 1 sand and grog filled rim with diagonal cordon with fingertip rustication, 1 plano-convex knife, 1 scraper, 28 other worked flints. Total 4 sherds, 30 flints (0.39kg) from circa 3400²m area.

site 143: 'Preh'; 4 scrapers, 1 rod-like implement, 38 other worked flints. Total 43 flints (0.47kg) from circa 1200²m area. Also burnt flint patch.

Mildenhall totals:

81 sherds, 852 worked flints on 13 sites.

79 sherds over 35,600²m = Average 1 per 450²m.

798 flints over 35,600²m = Average 1 per 44²m.

Count of scatters recorded in SMR (excluding Fenland Survey):

| | | |
|--------|---|-----|
| 'Pal' | - | 6 |
| 'Mes' | - | 22 |
| 'Neo' | - | 70 |
| 'BA' | - | 84 |
| 'IA' | - | 11 |
| 'Rom' | - | 44 |
| 'Sax' | - | 3 |
| 'Med' | - | 4 |
| 'PMed' | - | 2 |
| 'Un' | - | 12 |
| Total | - | 258 |

Soil Grade 2

Little Bradley: (soils - loamy, locally flinty soils in river valley, mainly loamy clays, occasionally heavy).

Fieldwalked by Haverhill and District Archaeological Group in 1985-6 (Charge 1989).

BRL 005: 'Neo'; 3 scrapers, 3 utilized flakes, 12 flakes, patinated core and 2 patinated blades. Total 21 worked flints. Scatter area circa 200x150m = 30,000²m.

BRL 006: 'Neo/BA'; 11 scrapers, 1 saw edged backed knife, 46 utilized flakes, 5 cores, 2 blades. Total 124 worked flints. Scatter area circa 150x150m = 22,500²m.

BRL 007: 'Mes/Neo'; 1 pick(?) roughout, 1 leaf arrowhead, 4 scrapers, 3 borers, 32 utilized flakes, 288 flakes, 3 cores, 11 blades. Total 343 worked flints. Scatter area circa 400x100m = 40,000²m.

BRL 008: 'Mes/Neo'; 3 scrapers, 1 borer, 19 utilized flakes, 48 flakes, 5 patinated flakes, 7 blades. Total 83 worked flints. Scatter area circa 200x150m = 30,000²m.

BRL 009: 'Mes'; 1 tranche axe, 9 flakes, 5 blades, 1 prismatic core. Total 16 worked flints. Scatter area circa 100x400m = 40,000²m.

'Neo'; 1 leaf arrowhead, 2 scrapers, 3 knives, 1 saw, 1 burin, 105 flakes, 4 cores. Total 117 worked flints. Area as above.

BRL 010: 'Neo'; 1 leaf arrowhead, 1 scraper, 52 flakes. Total 54 worked flints. Scatter area circa 600x300m = 180,000²m.

BRL 014: 'Mes'; 2 tranchet axe fragments, 2 rejuvenation flakes, 21 flakes, tortoise core fragment, core. Total 27 worked flints. Scatter area circa 20²m.

BRL 017: 'Neo/BA'; 3 scrapers, 1 hammerstone, 4 utilized flakes, 56 flakes, 8 cores, 1 blade. Total 73 worked flints. Scatter area circa 280x150m = 42,000²m.

Little Bradley totals:

858 worked flints on 8 sites.

858 flints over 424,520²m = Average 1 per 495²m.

Count of scatters recorded in SMR:

'Rom' - 4

'Med' - 5 (1 very large)

Total - 9

A general background of worked flint is also noted (Charge 1989, fig 37).

Soil Grades 2/3

Grundisburgh: (soils - light sandy-loam to moderate-heavy clay-loam).

Fieldwalked by J Newman for South-east Suffolk Survey, 1986.

GRU 011: 'IA'; 2 sherds amongst Roman scatter of 120x90m area. No further details.

GRU 015: 'IA'; 3 flint, 2 flint and sand and 2 organic filled sherds. Total 7 sherds amongst Roman scatter of 200x200m area.

GRU 022: 'IA'; 2 flint and 1 flint and sand filled sherds. Total 3 sherds, scatter area circa 20x20m = 400²m.

- GRU 024: 'Preh'; 14 flakes, 1 core. Total 15 worked flints. Scatter area circa 40x40m = 1600²m.
- GRU 026: 'IA'; 12 flint filled sherds 'over most of small field'. Also Roman middle and late Saxon and Medieval. Area of scatter circa 150x60m = 9000²m. No further details.
- GRU 028: 'IA'; 1 flint filled sherd, 1 scraper, 12 flakes. Also Roman scatter. Total 1 sherd, 13 worked flints. Scatter area circa 120x40m = 4800²m.
- GRU 030: 'IA' 2 flint filled sherds. Also 2 sherds middle Saxon. No further details.
- GRU 033: 'Preh'; 1 flint filled sherd, 3 scrapers, 100(+) flakes. Total 1 sherd, 103(+) worked flints. Scatter area circa 300x200 = 60,000²m.

Grundisburgh totals:

- 28 sherds, 131(+) worked flints on 8 sites.
- 17 sherds over 75,800²m = Average 1 per 4458²m.
- 131+ flints over 75,800²m = Average 1 per 4578²m.

Count of scatters recorded in SMR:

| | | |
|--------|---|----|
| 'Rom' | - | 7 |
| 'Sax' | - | 6 |
| 'Med' | - | 19 |
| 'PMed' | - | 2 |
| Total | | 34 |

Bredfield: (soils - light sandy-loam to moderately heavy clay-loam)

Fieldwalked by J Newman for South-east Suffolk Survey, 1986-7.

BFD 006: 'IA'; 1 sand and 1 sand and vegetable filled sherds.

Probably late IA. Also Roman scatter. No further details.

BFD 019: 'IA'; 9 flint filled sherds, 1 scraper, 8 flakes. Also medieval scatter. Total 9 sherds, 9 worked flints. Scatter area circa 50m diam = 2000²m.

Bredfield totals:

11 sherds, 9 flints.

9 sherds over 2000²m = Average 1 per 222²m.

9 flints over 2000²m = Average 1 per 222²m.

Count of scatters in SMR:

'Rom' - 3

'Med' - 17

Total - 20

Soil Grade 3

Boulge (soils - moderately heavy clay-loam).

Partially fieldwalked by J Newman for South-east Suffolk Survey, 1986-8.

5 medieval, 3 post-medieval but no prehistoric scatters identified.

Debach (soils - moderately heavy to heavy clay-loam).

Partially fieldwalked by J Newman for South-east Suffolk Survey, 1985.

1 Roman, 7 medieval but no prehistoric scatters identified.

Walsham le Willows (soils - some river gravels, mainly boulder clay).

Fieldwalked by Dr S E West and the Walsham History Group, 1980-5 (West, in prep).

In the late 16th century up to 25% of the parish was arable. By 1842 nearly 66% was arable (ibid).

23 Roman, 43 Medieval and 15 post-medieval but no prehistoric scatters have been identified. However 'a considerable scatter of flintwork was recovered (over 300 worked flints, with occasional denser concentrations and a few artifacts)'. Nonetheless it was decided that none of these 'concentrations' was of sufficient density to be defined as a 'site'.

Metfield (soils - mainly heavy clay).

Fieldwalked by M Hardy, Waveney Valley Survey 1982-4. (Hardy 1985, 48 plus additions).

MTF 134: 'IA'; 4 sherds sand-filled pottery, one with impressed dot decoration - late IA. Also Roman scatter. Total 4 sherds.
Scatter area circa 1000²m.

Metfield totals:

4 sherds.

4 sherds over 1000²m = Average 1 per 250²m.

Count of scatters in SMR:

'Rom' - 16

'Med' - 44

'PMed' - 13

'Un' - 67 (burnt flint scatters, probably post-Medieval)

Total - 140

Mendlesham: (soils - mainly medium to heavy clays).

Fieldwalked by Mr and Mrs Colchester, 1973-89.

MDS 131: 'Neo'; 1 oblique arrowhead, flake from polished flint axe, 'fabricator' and 10 struck flakes. Total 13 worked flints.
Found over 'area of 7-8 acres', ie, 30,000²m.

MDS 136: 'Mes'; 1 scraper and 10 blades and flakes. Total 11 worked flints. Found over 'area of 5-6 acres', ie circa 22,000²m.

MDS 137: 'Mes'; 14 flakes. Found over elongated area about 400x200m = circa 8,000²m.

Mendlesham totals:

38 worked flints.

38 flints over 60,000²m = Average 1 per 1579²m.

Two further loose groups of finds have been identified by Mr and Mrs Colchester consisting of a) 3 Mesolithic tranchet axes and eight flakes 'in a strip over 7-8 acres', ie up to 30,000²m in area, and b) 5 flakes 'over 2-3 acres', ie circa 10,000²m area.

Count of scatters in SMR:

'Rom' - 18

'Sax' - 3

'Med' - 97

'PMed' - 3

Total - 121

Note two palstave fragments and a reworked bronze knife were found within 3 of the medieval scatters.

Preston St Mary (soil - some fine loam over clay but mainly clay soils).

Partially fieldwalked by A Thorpe and the Suffolk Archaeological Field Group, 1972-90.

PSM 008: 'IA'; 1 shell filled and 5 flint filled sherds within larger Belgic and Roman scatter. Probably late IA/early Roman.
Total 6 sherds over 30x100m area = circa 3,000²m.

Preston St Mary totals:

6 sherds.

6 sherds over 3000²m = Average 1 per 500²m.

Count of scatters in SMR:

'Rom' - 7

'Med' - 5

Total - 12

Note blade fragment of socketed bronze axe also found within area of medieval pottery scatter.

Soil Grade 3/4

Mendham (soil - mixed alluvium/sands, mainly clay).

Fieldwalked by M Hardy for Waveney Valley Survey, 1983-4 (Hardy 1985 47-8).

MDM 027: 'IA'; 3 flint filled sherds, 1 with 'maggot' decoration on shoulder, 3 cores, 23 flakes, 2 re-worked flakes. Possibly from ditch dredgings, area not specified.

MDM 054: 'Neo'; 1 scraper and 'up to' 27 worked flints over circa 600²m area.

MDM 091: 'IA'; 9 flint filled sherds amongst large Roman scatter. Area of circa 50,000²m.

MDM 097: 'Neo' and 'IA'; 3 flint filled sherds, 1 scraper, 1 core, 12 flakes over circa 900²m area. Also Roman scatter.

Mendham totals:

15 sherds, 70 worked flints on 4 sites.

12 sherds over 51,500²m = average 1 per 4291²m.

42 worked flints over 51,500²m = average 1 per 1226²m.

Count of scatters in SMR:

'Rom' - 12
'Med' - 26
'PMed' - 16
'Un' - 31 (burnt flint patches, probably post-Medieval)
Total - 85

Soil Grade 4

Melton (soil - light to very light sandy loam).

Fieldwalked by J Newman for South-east Suffolk Survey, 1986-8.

MTN 018: 'IA'; 11 worked flints from whole field during rapid survey not initially designated as site. Detailed survey followed and located two scatters:

a) 1 rim and 2 body sherds flint filled pottery, 1 baked clay fragment, 4 flakes over circa 400²m area.

b) 1 flint filled sherd, 3 flakes over circa 500²m.

MTN 019: 'Preh'; 7 flakes plus heavily burnt flints over circa 400²m area.

MTN 020: 'Neo'; 1 leaf arrowhead, 1 scraper, 36 flakes over circa 10,000²m area.

MTN 021: 'IA'; 3 flint filled sherds amongst large Belgic and Roman scatter over circa 6400²m area.

MTN 022: 'Preh'; 1 flint filled sherd, 1 scraper, 1 retouched and 13 other flakes over circa 6400²m area.

MTN 025: 'Preh'; 1 blade, 18 flakes plus heavily burnt flints over circa 3000²m area.

MTN 027: 'Preh'; 3 scrapers, 1 core, 32 flakes over circa 4800²m

area.

MTN 028: 'Preh'; 1 core, 19 flakes over circa 1600²m area.

MTN 029: 'Preh'; 2 scrapers, 1 core, 25 flakes over 5000²m area.

Melton totals:

20 sherds, 172 worked flints on 9 sites.

20 sherds over 38,500²m = Average 1 per 1925²m.

172 flints over 38,500²m = Average 1 per 224²m.

Count of scatters in SMR:

'Rom' - 4

'Sax' - 1

'Med' - 10

'PMed' - 3

Total - 18

Pettistree (soil - light sand/gravel).

Partially fieldwalked by J Newman for South-east Suffolk Survey 1983-5.

PTR 011: 'IA'; 11 flint filled sherds over circa 3600²m.

PTR 005: 'Mes'; 5 flakes found in drain dredging. No further details.

Pettistree totals;

11 sherds over 3600²m = average 1 sherd per 327²m.

Count of scatter in SMR:

'Rom' - 4

'Sax' - 2

'Med' - 2

Total - 8

Sutton (soil - sandy loam to very sandy)

Fieldwalked by J Newman for South-east Suffolk Survey, 1983-85.

- SUT 022: 'IA'; 33 flint filled sherds, 31 sand/organic filled sherds, 2 scrapers, 2 blades, 37 flakes, 1 battered flint lump. Found over circa 140,000²m area. Also socketed axe fragment (metal detected), Late Iron Age, Rom and Sax scatters.
- SUT 023: 'IA'; ?flint filled sherds (Ipswich Museum). No details.
- SUT 027: 'Mes'; 14 flints (Ipswich Museum). No details.
- SUT 030: 'Preh'; 51 sherds (mostly with flint fillers and including 3 'Neo', 2 'BA' and 46 'IA' sherds), circa 150 worked flints. Found over circa 36,000²m area. Also Rom scatter.
- SUT 036: 'Neo'; 1 scraper and 14 flakes from circa 6000²m. Also Med scatter.
- SUT 046: 'IA'; 32 flint filled sherds, 8 sand/organic filled sherds, 22 flakes from circa 8800²m area on former heathland. Also Saxon scatter.
- SUT 047: 'Preh'; 47 sherds (1 beaker, 5 grogged, 29 'IA', including 2 'Belgic', 7 flint filled, 5 ?IA), circa 500 worked flints (including 1 leaf, barbed and tanged and oblique arrowheads, scrapers etc). Found over circa 70,000²m area. Also thin Roman scatter.
- SUT 048: 'IA'; 3 sherds over circa 600²m area.
- SUT 051: 'IA'; 10 hand made sherds, 3 scrapers, 28 flakes over circa 10,000²m area on former heathland. Also thin Roman scatter.

SUT 055: 'Neo/BA'; 4 scrapers, 1 core, 19 flakes over circa 30,000²m area on former heath.

SUT 056: 'Neo/BA'; 3 flint filled sherds, 3 flint knives, 2 scrapers, 1 core, 54 flakes from circa 25,000²m area on former heathland.

Sutton totals:

218+ sherds, 848 worked flints from 11 sites.

218 sherds over 342,600²m = average 1 per 1571²m.

834 flints over 342,600²m = average 1 per 410²m.

Count of scatters in SMR:

'Rom' - 6

'Sax' - 4

'Med' - 10

'PMed' - 3

'Un' - 7 (3 burnt flint patches)

Total - 30

J Newman (pers comm) adds that the fieldwalking in the south-east Suffolk Survey area indicates that most of the sandling soils show evidence, in the form of manuring scatters, for some arable agriculture in the 13/14th centuries and the Napoleonic period in addition to modern ploughing. During these pre 20th century periods of arable intensification the majority of the area remained as sheep walks and heathland, especially east of the Deben.

APPENDIX 10

BREAKDOWN OF SELECTED WORKED FLINT ASSEMBLAGES FROM THE NORTH-WEST SUFFOLK FEN EDGES

During a collecting programme, aimed at site identification and assessment rather than complete artifact recovery, the following analysis of two stone implement types has been undertaken. The source material of the first of these, axes, is shown to be mainly imported to the fen edge locality. In contrast, the material of the second implement type, arrowheads, in common with all other lithic forms in the fens, appears to be mainly local. A significant proportion of the flint utilised for making the arrowheads was, from the beginning of the bronze age, re-used material.

A full discussion of the findings, written in 1984, follows.

From 1965 to 1983 a programme of field walking at West Row in north-west Suffolk was carried out by Mr Patrick Norman, a local amateur archaeologist, and by the author. The research revealed a mass of prehistoric material, in the form of pottery, stone and bone, from the mesolithic to the iron age, with the majority of the finds dating to the bronze age.

In view of the amount of material found it has been decided as an interim measure to isolate specific types of finds for analysis. This work deals with stone projectiles and axes.

The term projectile has been used in the broader sense to denote items that may, but not necessarily, have been used as the tip for various types of projectiles and which in the past have been recognised, although not always accepted, as such. Other material that may have served this purpose, but is not readily recognised, has necessarily been excluded. All the projectiles included are made of flint. The classification methods used, largely for convenience, are those of H S Green (1980).

'Axes' have been taken to include all flakes or parts that are considered to come from axe, chisel or adze heads, but does not include any perforated items such as hammers, adzes, axe hammers etc. No classification method has been used for axes due to the incomplete nature of the majority (only 7 [14.5%] of the axes were complete). Throughout this work 'flint' and 'stone' have been differentiated with 'stone' representing any stone other than flint.

Area of study and surface geology

This study has concentrated on an area of approximately 670 acres (271 hectares) of fen edge north-west of the village of West Row in the parish of Mildenhall, Suffolk [figs 1 and 2, this appendix]. The location is surrounded by varying surface geology (for a detailed description see Seale 1975a), with the Breckland lying to the east, the fens to the north and west and chalk soils of the village of West Row to the south-east.

An assortment of varying sand islands interrupted by hollows in which damp and freshwater deposits have formed, (hummock-and-hollow micro relief) forms the main characteristic of the fen margins of this area. Seale describes this as the Isleham-Adventurers-Willingham soil complex (Seale 1975a, 126).

In the first half of the second millennium BC settlement and artifactual evidence has been shown by Murphy (Murphy 1979, a and b and 1983) to be related to clearings on the sand ridges in a landscape of mixed woodland (mostly alder carr in the areas of hummock-and-hollow micro relief). These sand ridges appear relatively clearly in the contrasting peaty ploughsoils in a series of aerial photographs taken (during 1977) and plotted by the Suffolk Archaeological Unit [fig 1, this appendix]. Unfortunately oblique photography and varying crops have led to this mapping being incomplete and slightly imprecise at present.

Previous Study

The area of research has long been known for its proliferation of prehistoric materials. This was recognised early this century (eg Fox 1933), the 1930s peat shrinkage and ploughing causing widespread disturbance of artifacts from prehistoric settlements. A number of small scale excavations were carried out at this time, notably by Leaf (1935a) and Clark (1936). However the majority, which took the form of exploratory holes, were neither published nor recorded.

Leaf's Hayland House site was situated in field F19 [fig 2, this appendix] and Clark's site in field F27. In a note by T.C. Lethbridge

at the end of Leaf's report it is also recorded that Leaf had carried out a field to field survey for this area and had plotted the settlements and other features on six inch maps. Unfortunately these maps no longer exist.

The practice of the collection of lithic material (either for cash sale or to form personal collections) is also of particular relevance to this study. Many of the agricultural labourers subsidised their low wages with profits made from the sale of implements to both local and visiting (on a regular basis) collectors. One such labourer has related to me how he clothed himself with these profits, another has told of the discovery, by himself and his father, of some thousand arrowheads from one field (just off this survey area), all of which were sold. Even allowing for some exaggeration (for which he is not inclined) this information puts the definite recorded finding of two arrowheads from this same field in its true perspective. Clearly a staggering amount of archaeological material has been removed unrecorded from this area. This practice has however declined in the post war (Second World War) years due to the increase in mechanisation.

It is only recently, due to this present work, that further archaeological research has been carried out in the region.

Excavations have been carried out by the Suffolk Archaeological Unit on fields F8 (E Martin site no. MNL 130, unpublished, 1977), F4 (Murphy 1979b, MNL 137) and F26 (Murphy 1983, and Martin 1983, MNL 165). It is not my purpose to discuss these sites in detail here, let it suffice to say that radio-carbon determinations indicated clearance horizons at all

these sites at c1700 bc. The main occupations at sites MNL 130 and MNL 165 appear to date to between c1500 bc and c1200 bc and are principally associated with collared urn (MNL130) and collared and biconical urn (MNL 165). The artifacts from MNL 165 are related to Clark's 1936 site, where an earlier, neolithic, occupation was also found.

Aims

The overall intention of this work has been to produce an accurate survey of this known, but unassessed, archaeologically rich area and to evaluate its potential for future work (in part already realised, see above).

The main aim of this paper is to present the results of the finds of projectiles and axes made within the field walking programme. As a result of this, however, it is also hoped that the settlement sites present in the area can be adequately isolated and, if possible, further differentiated on a cultural or period basis by means of variations in the assemblages.

Methods

Field walking, by its very nature, is a haphazard affair. At the onset of this programme it was decided that due to variation in discovery rate, surface conditions, soil types etc, the methodical walking of the area on one, two or three occasions was both impractical and relatively pointless. For this reason the study has lasted some 18 years, to take full advantage of the limited time available and the conditions of the

land, and has allowed a reasonably accurate assessment of the sites located.

Nevertheless as has already been illustrated the previous research makes the quantification of specific implements relatively meaningless, particularly so with projectiles and axeheads.

Despite this drawback the relatively systematic methods employed in this survey have allowed a far better understanding of the archaeological situation than the presently common fieldwalking practice of a 'once over', however thorough.

The field walking was carried out only if the surface conditions were good for recovery, ie, usually weathered. Traverses were made at approximately 20 metre intervals. If a find was made within close proximity to another this area was traversed at 10 metre intervals and if still producing a concentration of material this was reduced to approximately 2 metre intervals with the aim of maximum recovery.

Although a great deal of the material amassed inside the survey area, but outside this study, has known findspots, it has been deliberately omitted. Both projectiles and axeheads are relatively common in private collections but due to different methods employed in the collection it has been felt an unbalanced bias would result from their inclusion. This has also been applied to excavated material, information for which is not yet available for sites MNL 130 and 165, although both produced projectiles and axeheads.

The Finds

The field walking has produced a total of 180 projectiles and 48 axeheads [see catalogue, this appendix]. The distribution of these is plotted on fig 2 [this appendix] and is further discussed below. All percentages quoted are rounded to the nearest percent with figures bracketed being the actual number of finds representing this percentage.

72% (130) of the projectiles consist of 38% (68) leaf shaped arrowheads and 34% (62) barbed and tanged arrowheads. The 1% (2) hollow based arrowheads and 3% (6) pointed triangles (which are probably blanks for barbed and tanged arrowheads) can readily be grouped along with the barbed and tanged arrowheads making a total of 39%. Triangles (relatively crude bifacially worked flint triangles usually assigned as triangular arrowheads) form the next largest group consisting of 9% (17) of the projectiles. The final 14% (25) is made up of 6% (10) oblique arrowheads, 5% (9) laurel leaves, 3% (5) chisel arrowheads and a single petit tranchet arrowhead.

The condition of the projectiles, considering their discovery in plough soil, is generally very good. 58% of the total have received some form of damage, however this is often quite slight and only 34% have damage serious enough to render them ineffective given that all damage was present when originally deposited. In view of the likelihood that many were deposited broken, table 1 [this appendix] has been compiled to show any variations that may occur in various types and is further discussed below.

Of the 48 axeheads found only 14% (7) were complete and 37% (18) were only represented by flakes. Flint axes comprised 77% (37) of the axes with the majority 92% (34) being polished. Of the 23% (11) of stone axes 64% (7) of these were merely flakes and no complete stone axes were found (they occur relatively commonly on potato and carrot harvesters). Although all the stone axes have been submitted for petrological examination at Norwich Castle Museum, at the time of writing the results were not available.

A large variation in colour was also recognised in the flint material. Due to the non-patinating nature of the majority of the soils it has been possible to record these variations within each of the defined groups. The significance of this colour variation is further discussed below.

Discussion

Hopes of differentiating (chronologically or culturally) the local clusters identified (see below) rely heavily on recognising any differences found in their material make-up. These differences are most plainly seen in the evidence offered by various projectile types. The first need is to outline their chronological value.

A problem has long existed over the true age of the leaf shaped arrowheads found on the settlement sites of the fen edge. Although middle(?) neolithic assemblages including leaf shaped arrowheads and laurel leaves are found locally ie. Hurst Fen (Briscoe 1954b; J G D Clark et al 1960) and Hayland House (Leaf 1935a) the date range for the

Mildenhall Ware associated with these specific sites is so far unknown. Although Leaf found Mildenhall Ware at Hayland House (field F19) none has been recognised from this survey and the only definite earlier neolithic pottery form has been Grimston Ware from F23. Unfortunately this too is of limited use for dating purposes with a range between 3800-2200 bc at Broome Heath (Wainwright 1972). So one is still faced with the problem of whether the leaf shaped arrowheads and laurel leaves (some 43% of the projectiles) are truly a representation of neolithic occupation or continue into the early bronze age and are therefore contemporary with most of the other projectile types (see below). The surface association of the mixed projectile types has suggested in the past that this may be so.

Despite this, good stratified associations of leaf shaped and barbed and tanged arrowheads are extremely rare, and when found the leaf shaped arrowheads can often be either residual or, occasionally, blanks for barbed and tanged arrowheads (see Flanagan 1970). Although suggesting a chronological difference this may also be due to a separate cultural division.

Barbed and tanged, hollow based and pointed triangles form a homogeneous group dating from c2000-1000 bc (at the latest). Triangular arrowheads also appear to belong mainly to this range although earlier neolithic examples are claimed such as at Coygan Camp, Carmarthenshire (Wainwright 1967, fig 31). Oblique arrowheads also belong in this time frame, ranging from c2500-1500 bc. As already pointed out the petit tranchet

form has a long survival possibly from mesolithic times to c1500 (probably due to their simple mode of manufacture).

Chisel arrowheads are the only other form besides leaf shaped and laurel leaves to have relatively high proportions dated to the neolithic, with East Anglian examples at Broome Heath (Wainwright 1972) having dates of circa 2573 and 2629 bc. These also occur at Hurst Fen, however dates of about 1460 and 1324 bc from Mount Pleasant, although probably rather too recent, suggest a long survival for this type.

Several significant clusters are apparent on the finds distribution map [fig 2, this appendix]. Most notable are those on fields F7/F8, F11 and F23 with smaller groups represented on F3, F4, F9, F14, F15 and F32. Elsewhere any clustering is relatively dispersed. However, the dispersed appearance of F26, F27, F30 and F31 is in marked contrast to the other occupation debris found which occurs in notable concentrations in fields F26 and F30. The reasons for this non-concurrence of abundance of projectiles and axes with occupation debris is also notable in some other fields, for instance F17, and cannot be readily explained. Nevertheless in most instances concentrations would appear to relate well with abundances of occupation debris.

The distribution of projectile types does show some significant groupings. Laurel leaves and leaf shaped arrowheads always occur together and although often surface associated with the early bronze age types the dense concentration on F23 suggest they represent a separate entity occurring residually on early bronze age occupation sites. The

occurrence of a cluster of barbed and tanged arrowheads on F15 supports this separation as does the identification of earlier neolithic occupation at MNL 165 (see above) which has produced leaf shaped arrowheads and laurel leaves, which also occur residually on the mixed occupation horizons. This situation is paralleled locally at Shippea Hill (J G D Clark et al, 1935) where once again a mixed assemblage is found on the sand ridges, but where stratigraphically separated in a peat hollow, no mixture of barbed and tanged and leaf shaped arrowheads occurs. The neolithic levels are there dated to around 2990 and 2910 bc (Clark and Godwin, 1962).

The evidence for non-contemporarity of the leaf shaped and laurel leaf forms with the barbed and tanged, pointed triangle and hollow based forms is further supported by colour differences. The colour of the flint varies considerably, with medium and darker shades of brown and black being the most common, but paler shades and greys also occur (see fig 16, this appendix). Overall the variety is similar in both the 'neolithic' and 'early bronze age' groups and both suggest a random collection of material for projectiles. However one major difference is noticeable in the case of arrowheads, with a honey colour flint forming 21% of the 'neolithic' assemblage, but only 4% (3) of the 'early bronze age' assemblage. These three arrowheads came from F8, F11 and F23 which are the main concentrations of 'neolithic' material. Differences in the two groups are further demonstrated by patination.

The presence of patination on the 'neolithic' and 'early bronze age' groups is 1% and 13% respectively. Material from field F16 is excluded

due to the occurrence of calcareous patinating soils on this field. The high proportion of patinated material amongst the 'early bronze age' group (which recurs in 11% of the oblique and 12% of the triangles) is particularly interesting and probably reflects scavenging of earlier calcareous (ie not fen) sites for sources of flint, although whether this was deliberate or merely a by-product of some activity such as arable agriculture is not clear. In some cases old flint implements were re-knapped to make fresh arrowheads (83, 113, 124, 126 and 140 barbed and tanged, triangles 165 and 174 and oblique 151) and in others they were re-used unadapted (barbed and tanged arrowheads have little potential for re-use except as arrowheads) in their original deposited state (82, 102, 125 and 138) even if the original was partially broken (102 and 138).

The re-use as an arrowhead is best demonstrated by barbed and tanged arrowhead no.82. This represents an extremely rare occurrence of evidence for hafting on prehistoric arrowheads. Green lists only 15 other examples from Britain and only four of these are barbed and tanged (Green 1980, 179-182 and table VIII, 3). Only two others have differential staining, an oblique/hollow based form from Undley (only three miles away) and a leaf shaped arrowhead from Northern Ireland. Arrowhead 82 is particularly interesting as the position of the arrowshaft is patinated pale grey showing that it was already patinated when mounted. This is differentiated from the tip end which is 'stained' noticeably darker over the patina, particularly around the area abutting the shaft. This indicates the presence of some staining agent on the mounted arrowhead. The staining is unlikely to be due to

agents in the peat/sand soils, certainly no other flint artefacts from this fen edge area show any staining. The emphasis at the shaft abutment would support the supposition of a deliberate application of a potion. Unfortunately any firmer evidence for the use of such potions is unlikely and although this evidence is of dubious quality its chance survival is important.

The apparent scavenging/opportunism of these early bronze age settlements is further supported by re-use of flint axeheads (and even flint quernstones, see J G D Clark 1936) with 32% showing signs of re-working, although in some cases this re-working may be neolithic. The flakes, a further 19%, are possibly also partially a result of re-knapping. In the predominantly neolithic field, F23, four of the nine axes are either re-worked (3) or flakes (1), although this field also shows the greatest proportion of complete axes (3 of a total of only 7). The area with the greatest occurrence of early bronze age projectiles, (32% of the barbed and tanged type, both the hollow based and 53% of the triangles), F7 and F8, has produced no complete axes, and 7 of the 9 axes located are flakes or have been reworked.

Damage incurred in use may be another method of identifying differences in the types. Due to the possibility of agricultural damage some reservation must be held over the results, but overall the figures are probably not too distorted by this fact. Unfortunately only leaf shaped and barbed and tanged arrowheads have been included [see table 1, this appendix] as the numbers of the other forms are too few to be

statistically meaningful and in the case of the triangles the mode of use, if as arrowheads, would be radically different.

The percentages of leaf shaped and barbed and tanged arrowheads broken are 57% and 73% respectively, which compares relatively well when one considers the increased likelihood of damage to the more complex barbed and tanged form. These percentages alter radically, however, when considering those breaks rendering the arrowhead useless. Here the leaf shaped form hardly alters with a 50% count, but the barbed and tanged count is reduced from 73% to 23% of the arrowheads being unusable. Similarly the percentages of transverse and tip breaks are significantly higher in the leaf shaped than in the barbed and tanged. This probably relates to either (a) different or increased usage, or (b) the improved design of the barbed and tanged form ie. the usual slimmer section of the leaf shaped arrowheads caused an increased liability of serious breakage in use, or (c) increased likelihood of minor damage in manufacture of the barbed and tanged form. Without further experimental work, however, the significance of different rates of breakage remains unclear.

Due to the large amount of arrowheads found it has also been possible to see how well the application of Green's classification (Green, 1980) works in a confined field situation. Regrettably, but as might have been expected, no significant groupings of any of Green's individual types could be identified, with a random distribution prevailing even within the recognisable clusters of neolithic or early bronze age arrowheads noted above. It was decided, however, to look more closely at the

occurrence of breakages within barbed and tanged arrowheads due to the increased numbers of breakable elements involved [table III, this appendix]. Although only a relatively small sample this breakdown shows some variation between Green's types that are not simply due to design differences. In each of Green's types the percentage broken is relatively comparable, but the Conygar Hill type shows markedly higher occurrences of tip and multiple element breakage, which cannot be readily explained but partially support Green's classifications.

Although separate types of projectiles have been identified it has been demonstrated above that these can probably be divided into two main chronologically divided groups, the laurel leaf and leaf shaped (and possibly also the chisel form) of the neolithic, and the barbed and tanged, pointed triangle, hollow based, oblique and triangular forms of the late neolithic/early bronze age. However, despite direct correlations being demonstrated between specific projectile types and 'cultures' ie, chisel and oblique arrowheads and grooved ware, elsewhere (Wainwright and Longworth, 1971), the projectile and ceramic evidence from West Row has shown no such 'cultural' associations or divisions within the chronologically divided groups. In fact quite the reverse is shown with projectile types appearing uniformly mixed within the settlement debris shown in the distribution map.

The distribution of axeheads reveals three main clusters, F5/F7/F8, F10/F11/F12 and F23 and a dispersed spread across F32, F34, F35 and F14. Only seven of the 48 axes are outside these areas. The common occurrence together with leaf shaped and laurel leaves on F23 is notable

and infers association. The presence of the leaf shaped and laurel leaf types in the other clusters may support this, although in these cases an early bronze age element is also present.

A particularly notable feature is the distribution of stone axes. These are confined (with the exception of axe number 43) to only two of the clusters, F23 (suggesting a neolithic date) and F11/F12. This, and the lack of stone axes elsewhere, especially from the F7/F8 cluster, is marked. However whether this is due to chance discovery rate (unlikely), localised specialisation or a cultural or chronological difference is unclear.

What is abundantly clear is the completely different colour of the flint axes. Only 19% (7) of the flint axes are in the colour range encountered in the projectiles (groups IV and V in catalogue). The patination of group IV is probably due entirely to the occurrence of calcareous soils at their findspots and does not relate to re-use of pre-patinated implements as is evident in the projectiles (see above).

The remaining 81% is divided into three groups of which group I is represented only by a single axe. Groups II and III form 78% (29) of the flint axes in approximately equal proportions (41% and 37%). Group II, a pale mottled brown flint is usually a poorer quality flint than the pale grey coloured flint of Group III. Groups II and III axes clearly show the specialised, non-local manufacture/trade of a high percentage of the flint axes and clearly shows this phenomenon is not confined to the more obvious importation of stone axes in East Anglia.

The relatively high proportion of stone axes (23%) in an area naturally rich in flint is probably largely a result of this specialised production illustrated for the flint axes, and emphasises the non-local manufacture of the axe heads found amongst the settlements of the East Anglian fen edges.

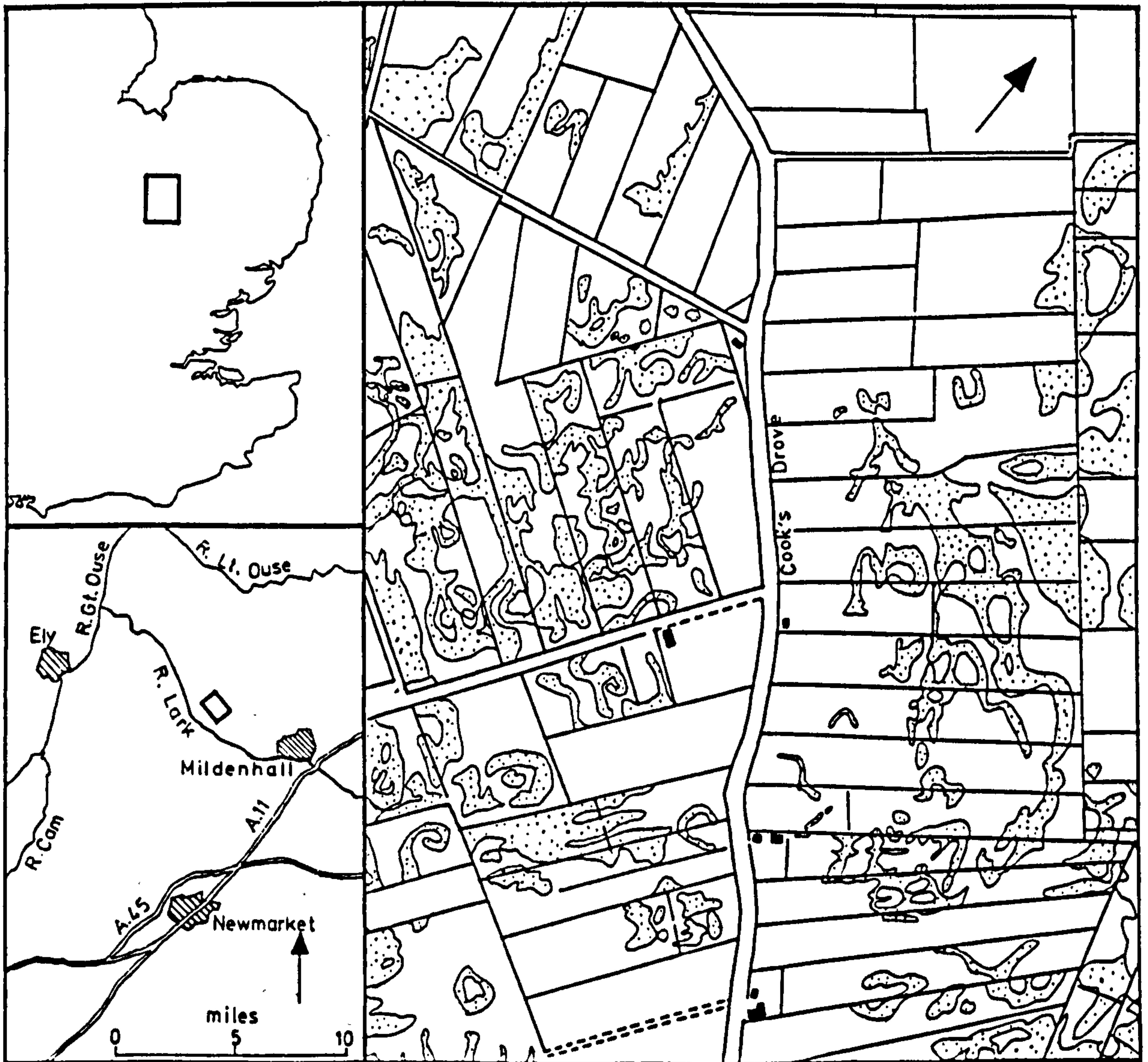
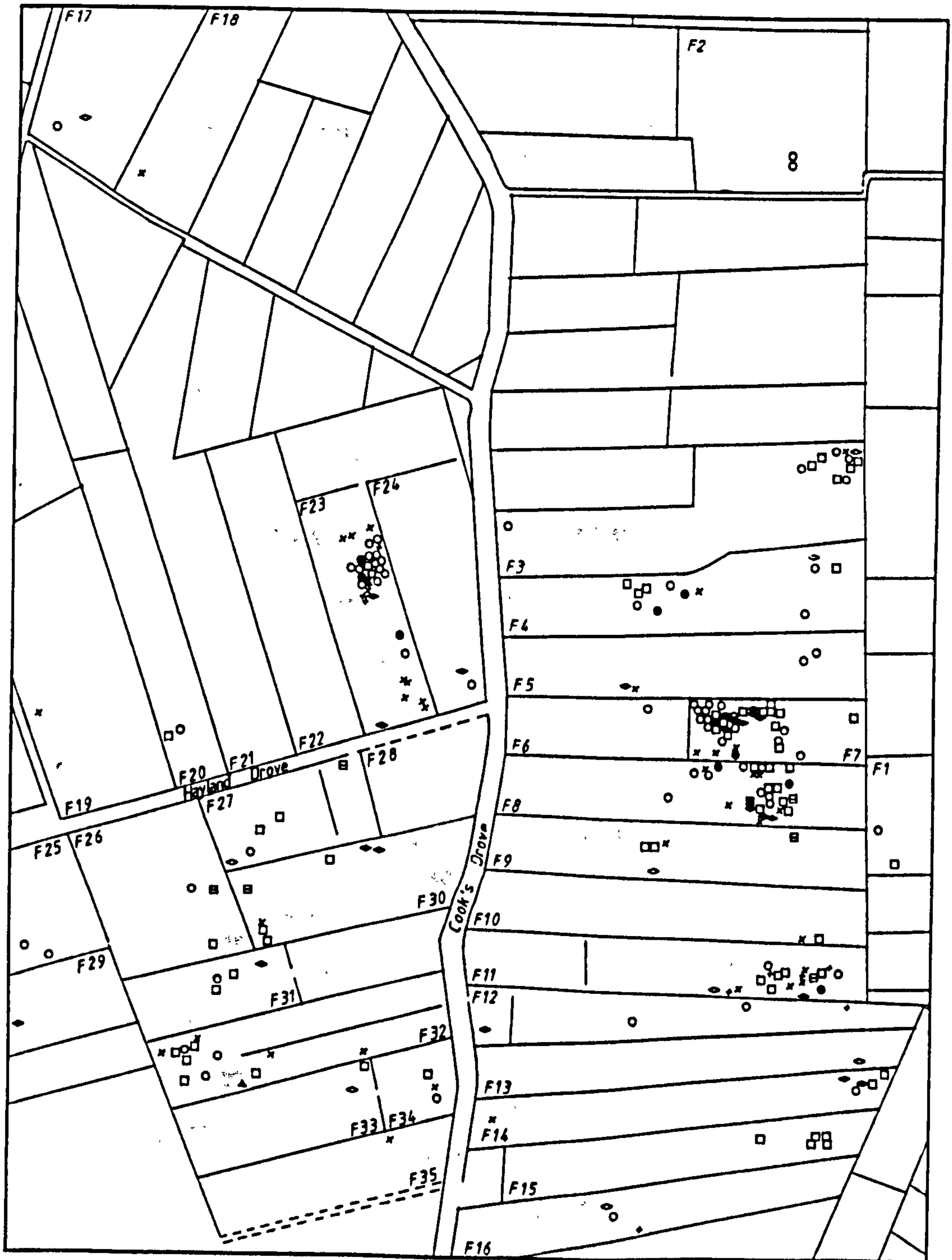


Figure 1. West Row Fen. Study area location map & sand ridge distribution.



PROJECTILE TYPES

- Barbed & tanged
- ▣ Pointed triangles
- Hollow based
- ◆ Chisel
- ◊ Oblique

- △ Petit tranchet
- Leaf shaped
- Laurel-leaves

AXE-HEADS

- × Flint

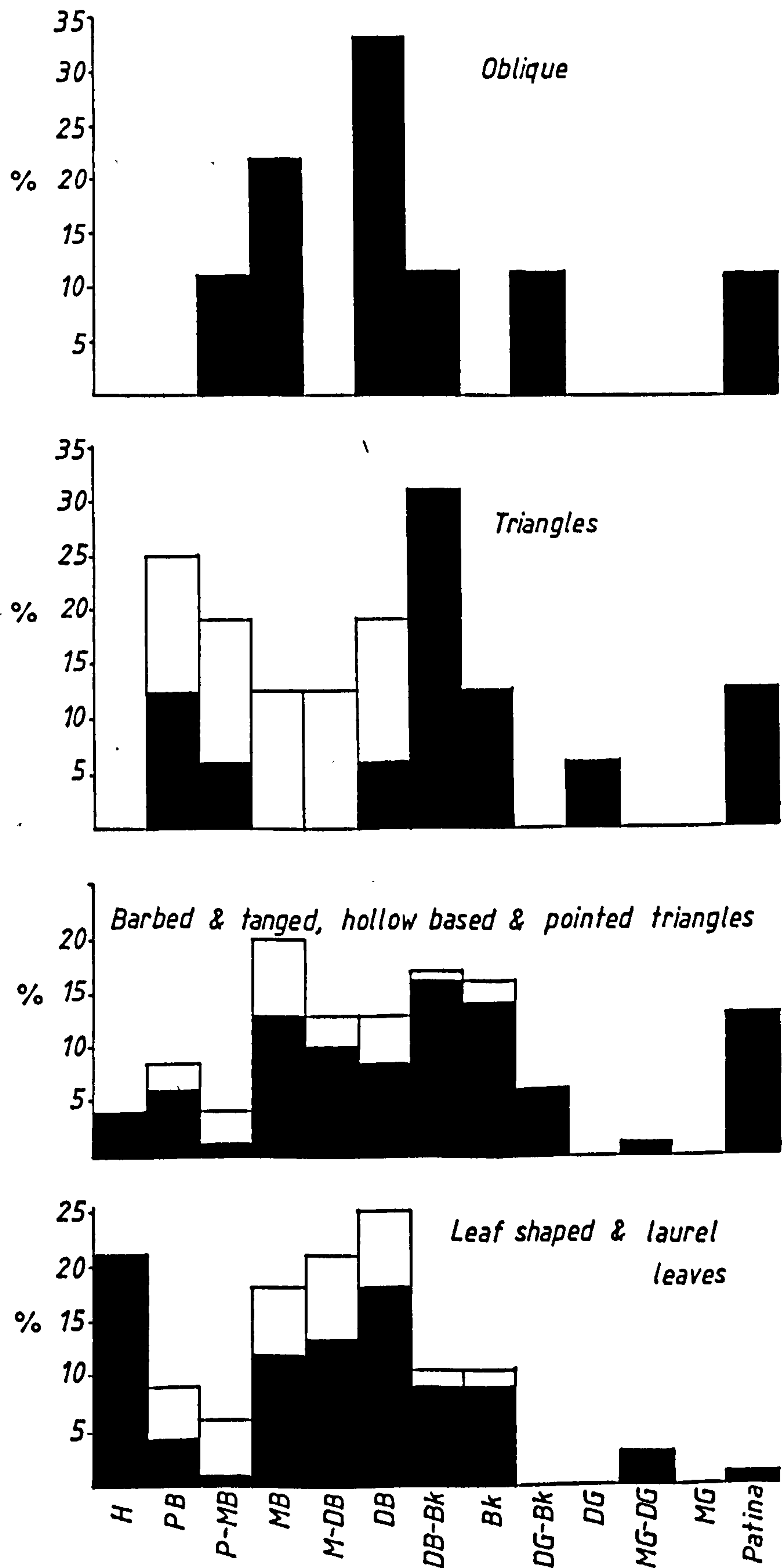


Fig. 16 Projectile colour variation and patination. Showing minimum (infilled) & maximum (open) percentages. Abbreviations shown as in catalogue.

TABLE I : arrowhead breakage

| | <u>Leaf shaped</u> | <u>barbed and tanged</u> |
|--------------------|--------------------|--------------------------|
| Total | 68 | 62 |
| Broken | | |
| % | 57% | 73% |
| Number | 39 | 46 |
| Effectively broken | | |
| % | 50% | 23% |
| Number | 34 | 14 |

TABLE II : analysis of breakage

| | | |
|------------|--------|-----|
| Total | 39 | 46 |
| Transverse | | |
| % | 99% | 60% |
| Number | 38 | 27 |
| Tips | | |
| % | 62-92% | 48% |
| Number | 24-36 | 22 |
| Butt | | |
| % | 26-54% | 30% |
| Number | 10-21 | 14 |

TABLE III : barbed and tanged breakages

Breakages are shown as a percentage of the broken total of barbed and tanged arrowheads.

| | | Total | Broken total | Tip | Tang | I Barb | 2 Barbs | Tip + Barb | Tip + Tang | Tang + Barb |
|-------|-----------------------------|------------|--------------|-----------|-----------|------------------|----------|------------|------------|-------------|
| TYPES | % Number | 100% 62 | 13% 46 | 48% 22 | 30% 14 | 54%-65% 25-30 | 11% 5 | 22% 10 | 13% 6 | 17% 8 |
| | Sutton a % Number | 100% 6 | 33% 2 | 50% 1 | 0% 0 | 100% 2 | 0% 0 | 50% 1 | 0% 0 | 0% 0 |
| | Sutton b % Number | 100% 20 | 70% 14 | 50% 7 | 29% 4 | 36%-43% 5-6 | 7% 1 | 7% 1 | 7% 1 | 7% 1 |
| | Sutton c % Number | 100% 10 | 80% 8 | 0% 0 | 13% 1 | 87% 7 | 0% 0 | 0% 0 | 0% 0 | 0% 0 |
| | Conygar Hill % Number | 100% 15 | 80% 12 | 83% 10 | 42% 5 | 50%-67% 6-8 | 17% 2 | 50% 6 | 33% 4 | 25% 3 |

CATALOGUE

Comments have only been made to give information not readily available from the illustrations. The following abbreviations have been used in this catalogue.

| | |
|-------------------|-------------------|
| DH - Dark Honey | Ba - Ballyclare a |
| H - Honey | Bb - Ballyclare b |
| PB - Pale brown | Sa - Sutton a |
| MB - Medium brown | Sb - Sutton b |
| DB - Dark brown | Sc - Sutton c |
| Bk - Black | CH - Conygar Hill |
| PG - Pale grey | GL - Green Low |
| MG - Medium grey | |
| DG - Dark grey | |
| C - Complete | |
| P - Part | |
| F - Flake | |

The survey catalogue numbers relate to the documentation and recording system used throughout this survey and are included to make location of individual objects easier for further study.

LEAF SHAPED ARROWHEADS

| No. | Greens Type | Field No. | Colour | Comments | Survey Cat.No. |
|-----|----------------|-----------|--------|--------------------|-------------------|
| I | IA | F32 | MG-DG | | AI3(b) |
| 2 | IC | F4 | MB-Bk | | A89 |
| 3 | I | F26 | DB | | A46 |
| 4 | I | F34 | H | trace of cortex | A97 |
| 5 | 2A | FI2 | MB | | A26 |
| 6 | 2A | FII | PB-DB | | AI56 |
| 7 | 2B | FII | MB-DB | | AI57 |
| 8 | 2B | FII | Bk | | A37 |
| 9 | 2B | F32 | PB | | AI3(c) |
| 10 | 2C | F23 | H | | A76 |
| II | 3A | F7 | MB-DB | | AI5 |
| I2 | 3A | F8 | H | | AI10 |
| I3 | 3A | F7 | H | | A30 |
| I4 | 3A | F27 | DB | | AI3I |
| I5 | 3A | F20 | MB-DB | cortex on one face | A20I |
| I6 | 3A | F8 | MB | | AI72 |
| I7 | 3A | F23 | H | | AI69 |
| I8 | 3A | F3I | DB | | AI6 |
| I9 | 3A | F23 | Bk | | A3I |
| 20 | 3B | F7 | DB-Bk | | A65(b) |
| 21 | 3B | F6 | MB-DB | | A200 |
| 22 | 3B | F7 | Bk | | AI20 |
| 23 | 3B | F3 | MB | | A2I |
| 24 | 3B | F7 | H | | AI04 |
| 25 | 3B | FI | H | | AI7 |
| 26 | 3B | F3 | PB | with PG patina | A23 |
| 27 | 3B | F7 | DB | | AI0 |
| 28 | 3B | F23 | DB-Bk | | A58 |
| 29 | 3B | F4 | H | | A98 |
| 30 | 3B | F8 | H | | AI34 |
| 3I | 3B | F3 | DB | | A43 |

| No. | Greens Type | Field No. | Colour | Comments | Survey Cat.No. |
|-----|----------------|-----------|--------|-----------------|-------------------|
| 32 | 3B | F5 | DB | with cortex | AI97 |
| 33 | 3B | F25 | MB-DB | | A96 |
| 34 | 3B | F7 | DB-Bk | retains bulb | A65(a) |
| 35 | 3B | F24 | MB | with cortex | AI74 |
| 36 | 3C | F4 | DB | with cortex | AI64 |
| 37 | 3C | F3 | DB | | AI2 |
| 38 | 3C | F23 | DB | with side notch | A63 |
| 39 | 3C | F5 | MB-DB | | AI98 |
| 40 | 3C | F23 | DB | | AI1 |
| 41 | 3C | FI2 | MB-DB | | AI1 |
| 42 | 3C | F3 | PB | | AI00 |
| 43 | 3C | F7 | MB-DB | | A41 |
| 44 | 3C | F8 | MB | | A80 |
| 45 | 3C | F4 | PB | | A59 |
| 46 | 3C | F25 | M-DG | with cortex | AI02 |
| 47 | 4A | F23 | H | | AI68 |
| 48 | 4A | F8 | H | | AI71 |
| 49 | 4A | F32 | Bk | | AI3(a) |
| 50 | 4A | FI6 | ? | patinated MG | A22 |
| 51 | 4B | F23 | Bk | | A78 |
| 52 | | F7 | MB | | A47 |
| 53 | | F23 | PB-DB | | AI70 |
| 54 | | F7 | MB | | A42 |
| 55 | | F2 | DB-Bk | | AI50 |
| 56 | | F23 | PB-DB | | AI44 |
| 57 | | F8 | H | | A75 |
| 58 | | F2 | DB | | AI49 |
| 59 | | F23 | P-MB | | AI39 |
| 60 | | F8 | MB | | AI33 |
| 61 | | F23 | DB | | AI67 |
| 62 | | F23 | P-DB | | AI38 |
| 63 | | FI4 | DB-Bk | | AI76 |
| 64 | | FI7 | DB | | A87 |
| 65 | | F23 | MB | | A44 |
| 66 | | F7 | DB-Bk | | A72 |
| 67 | | F8 | H | | AI18 |
| 68 | | F7 | Bk | | A28 |

LAUREL LEAVES

| No. | Field No. | Colour | Comments | Survey Cat.No. |
|-----|-----------|--------|----------------|-------------------|
| 69 | F7 | M-DB | | A52 |
| 70 | F4 | DH | | A53 |
| 71 | FI1 | M-DB | heavily flaked | A61 |
| 72 | F8 | M-DB | | AI26 |
| 73 | F23 | DB-Bk | | A79 |
| 74 | F23 | Bk | | A71 |
| 75 | F23 | DB | | A66 |
| 76 | F4 | DH | | AI0 |
| 77 | F8 | DH | | AI35 |

BARBED AND TANGED ARROWHEADS

| No. | Greens Type | Field No. | Colour | Comments | Survey Cat.No. |
|-----|----------------|-----------|--------|--|-------------------|
| 78 | Ba | F7 | MB | | AI47 |
| 79 | Bb | F4 | Bk | | A6 |
| 80 | Bb | F10 | MB | | AI |
| 81 | Sa | F11 | PB | poor quality flint, edge retouch only | AI41 |
| 82 | Sa | F4 | DB-Bk | shaft mark, patinated and stained | A73 |
| 83 | Sa | F7 | DB-Bk | reworked patinated flint | A56 |
| 84 | Sa | F15 | MB | | AI86 |
| 85 | Sa | F15 | P-DB | edge retouch only | AI81 |
| 86 | Sa | F3 | Bk | | A32 |
| 87 | Sb | F8 | H | | AI29 |
| 88 | Sb | F11 | M-DB | crude | A36 |
| 89 | Sb | F8 | P-MB | edge retouch only, extremely 'warped' | AI17 |
| 90 | Sb | F30 | P-MB | | AI07 |
| 91 | Sb | F7 | M-DB | | A2 |
| 92 | Sb | F9 | P-MB | | AI03 |
| 93 | Sb | F1 | M-DB | | AI43 |
| 94 | Sb | F15 | DB | | AI92 |
| 95 | Sb | F26 | MB | | AI95 |
| 96 | Sb | F32 | Bk | | AI19 |
| 97 | Sb | F9 | DB | | A92 |
| 98 | Sb | F14 | DB-Bk | | AI79 |
| 99 | Sb | F4 | PB | cortex | A82 |
| 100 | Sb | F23 | DB-Bk | | A77 |
| 101 | Sb | F7 | DB | trace cortex | A2(b) |
| 102 | Sb | F30 | Bk | MG patina (also on breaks) | A69 |
| 103 | Sb | F14 | Bk | cortex on barb. | AI80 |
| 104 | Sb | F32 | DB | | A9(a) |
| 105 | Sb | F31 | DB-Bk | | A24 |
| 106 | Sb | F7 | Bk | | A85 |
| 107 | Sc | F27 | DB-Bk | | AI94 |
| 108 | Sc | F11 | MB-DB | | AI55 |
| 109 | Sc | F3 | DB-Bk | | AI62 |
| 110 | Sc | F7 | Bk | | AI24 |
| 111 | Sc | F3 | MB-Bk | extensive cortex on both faces and tang | A64 |
| 112 | Sc | F8 | MB-DB | | AI14 |
| 113 | Sc | F33 | DB-Bk | reworked from patinated flint | AI51 |
| 114 | Sc | F15 | MB | | AI82 |
| 115 | Sc | F7 | MB | | A38 |
| 116 | Sc | F3 | MB-DB | small, edge retouch only | AI6 |
| 117 | CH | F32 | DB-Bk | | AI53 |
| 118 | CH | F7 | DB-Bk | | A48 |
| 119 | CH | F30 | Bk | serrated edges | AI05 |
| 120 | CH | F27 | Bk | | AI93 |
| 121 | CH | F15 | Bk | with iron pen stains | AI84 |
| 122 | CH | F8 | DB | | AI09 |
| 123 | CH | F7 | MB | | A2(a) |
| 124 | CH | F8 | DB | reworked from patinated flint | AI73 |
| 125 | CH | F8 | Bk | MG patina | A4 |
| 126 | CH | F11 | PB-MB | reworked from patinated flint | AI5 |
| 127 | CH | F20 | MB | | A202 |

| No. | Greens Type | Field No. | | Comments | Survey Cat.No. |
|-----|----------------|-----------|-------|--------------------------------------|-------------------|
| I28 | CH | F7 | DG-Bk | | A7 |
| I29 | CH | F3I | MB-DB | enlarged form | A6 |
| I30 | CH | F32 | Bk | | A9(c) |
| I3I | CH | F32 | DB-Bk | | A9(b) |
| I32 | GL | F4 | DB | primary flake forms one edge | A88 |
| I33 | GL | F3 | DB-Bk | | AI0I |
| I34 | | F34 | MG-DG | | AI52 |
| I35 | | F8 | DG-Bk | | AI45 |
| I36 | | F8 | DB-Bk | | A99 |
| I37 | | F7 | DB-Bk | | AI99 |
| I38 | | F7 | Bk | pale grey patina (also on breaks) | AI46 |
| I39 | | FII | H | trace cortex | A83 |

POINTED TRIANGLES

| No. | Field No. | Colour | Comments | Survey Cat.No. |
|------------|-----------|--------|--|----------------|
| I40 | F8 | DB-Bk | cortex and trace old patinated surface | AI9I |
| I4I | F26 | M-DB | | AI88 |
| I42 | F30 | DG-Bk | | AI06 |
| I43 | FII | MB | | AI28 |
| I44 | F27 | DG-Bk | cortex | AI7 |
| <u>I45</u> | F9 | PB | mottled | A94 |
| 6 | | | | |

HOLLOW BASED

| | | | | |
|------------|----|----|---------|------|
| I46 | F7 | PB | mottled | A40 |
| <u>I47</u> | F8 | DB | | AI1I |
| 2 | | | | |

OBLIQUE

| | | | | |
|------------|-----|-------|-----------------------------------|------|
| I48 | F27 | MB | | AI32 |
| I49 | F33 | DG-Bk | blue tinge | AI15 |
| I50 | F9 | DB | | A93 |
| I5I | FII | PB | reworked patinated flint | AI40 |
| I52 | FI6 | G | patinated | AI8 |
| I53 | F7 | DB | | AI2 |
| I54 | FI7 | DB | | AI65 |
| I55 | FI3 | P-MB | secondary on both sides, atypical | AI27 |
| I56 | F3 | MB | secondary on both sides | AI90 |
| <u>I57</u> | F4 | DB-Bk | | A86 |
| IO | | | | |

PETIT TRANCHET

| | | | | |
|------------|-----|------|--|------|
| <u>I58</u> | F32 | P-MB | | AI36 |
| I | | | | |

CHISEL

| | | | | |
|------------|-----|-------|------------|------|
| I59 | F23 | MB | with blue | A95 |
| I60 | F7 | MB | | AI89 |
| I6I | FI2 | DH | | A20 |
| I62 | F30 | DG-Bk | | A9I |
| <u>I63</u> | FII | MB-DB | blue tinge | AI48 |
| 5 | | | | |

TRIANGLES

| | | | | |
|-----|-----|--------|-------------------------------------|--------|
| I64 | F7 | D B-Bk | with brown streaks | AI4(b) |
| I65 | F3I | D B-Bk | cortex, reuse of patinated artifact | A45 |
| I66 | F7 | DB-Bk | | AI4(a) |
| I67 | F29 | Bk | cortex | AI54 |
| I68 | FI4 | PB-DB | | AI59 |
| I69 | F7 | PB | poor quality | A60 |
| I70 | F23 | Bk | | A25 |
| I7I | F24 | DG | with cortex | AI75 |
| I72 | F7 | DB | | A49 |

| No. | Field No. | Colour | Comments | Survey Cat.No. |
|------------|-----------|--------|-----------------------------|-------------------|
| I73 | F8 | DB-Bk | cortex | A8I |
| I74 | F30 | DG-Bk | reuse of patinated artifact | A90 |
| I75 | F7 | PB-DB | mixed banded colours | A26 |
| I76 | FI4 | PG? | fire crazed | AI78 |
| I77 | F5 | DB-Bk | | AI96 |
| I78 | F8 | P-MB | | AI13 |
| I79 | F8 | DB-Bk | cortex | AI12 |
| <u>I80</u> | F7 | PB | | AI60 |
| I7 | | | | |

AXES: FLINT

| No. | Part remaining | Field No. | Reworked | Comments | Survey Cat No. |
|---|----------------|-----------|---------------------|--------------------------------|----------------|
| <u>Group I. (reddy-brown)</u> | | | | | |
| I | P | F23 | as very large borer | | BII |
| <u>Group II (pale mottled browns)</u> | | | | | |
| 2 | C | F3 | | | A3I |
| 3 | P | F7 | | very large | B22 |
| 4 | P | F7 | | | B58 |
| 5 | F | F8 | | | B4I |
| 6 | F | F8 | | | B46 |
| 7 | F | F8 | | | B47 |
| 8 | F | F8 | flake retrimmed | | B53 |
| 9 | F | F8 | | | B66 |
| 10 | P | F9 | as core | poor quality flint | B37 |
| 11 | P | F10 | as core | | BI4 |
| 12 | F | F11 | | | B40 |
| 13 | P | F11 | | | B55 |
| 14 | F | F11 | flake retrimmed | | B56 |
| 15 | P | F23 | | | BI9 |
| 16 | P | F32 | as core | | B43 |
| <u>Group III (pale grey)</u> | | | | | |
| 17 | C | F4 | | | B23 |
| 18 | F | F5 | as core | | B73 |
| 19 | P | F7 | down one edge | | BI6 |
| 20 | F | F8 | | | B45 |
| 21 | P | F18 | | | SAU |
| 22 | P | F19 | | | B8 |
| 23 | P | F23 | as core | | BI5 |
| 24 | P | F23 | as core | | B35 |
| 25 | C | F23 | | | A32(a) |
| 26 | P | F23 | | | A32(b) |
| 27 | C | F23 | | very large unpolished | PI2 |
| 28 | C | F23 | | | A5 |
| 29 | F | F32 | flake retrimmed | | B42 |
| 30 | P | F32 | | | B67 |
| <u>Group IV (patinated grey)</u> | | | | | |
| 31 | C | F32 | | black flint, small, unpolished | BI7 |
| 32 | P | F34 | as core | black flint | B54 |
| 33 | P | F35 | | | A33 |
| <u>Group V (med/dark brown and black)</u> | | | | | |
| 34 | P | F11 | | | B28 |
| 35 | P | F14 | | black, unpolished | B3 |

| No. | Part remaining | Field No. | Reworked | Comments | Survey Cat No. |
|-----|----------------|-----------|----------|----------|----------------|
| 36 | F | F23 | | | B5I |
| 37 | C | F30 | | | B39 |

AXES: STONE

| No. | Part remaining | Field No. | Petrology No. | Group | Survey Cat.No. |
|-----|----------------|-----------|---------------|-------|----------------|
| 38 | P | FII | SI49 | | B5 |
| 39 | F | FII | SI39 | VI | B29 |
| 40 | P | FII | | | B57 |
| 41 | F | FII | | | B60 |
| 42 | P | FI2 | SI36 | | A34 |
| 43 | P | FI6 | SI48 | | B32 |
| 44 | F | F23 | | | B50 |
| 45 | F | F23 | | | B52 |
| 46 | F | F23 | | | B62 |
| 47 | F | F23 | | | B63 |
| 48 | F | F23 | | | B64 |

APPENDIX 11

INTENSITY OF OCCUPATION ON THE FEN EDGES

Due to the massive concentration of artifacts found on the fen edges an assumption has been made that this represents an area of intensive settlement (eg Fox 1923, Bamford 1982, 33-4, Healy 1984, 117).

However, in view of the length of the 'bronze age', some 2100 years, this concentration of material needs to be put into perspective.

For various reasons it is not a useful exercise to attempt to estimate actual population sizes in prehistory (cf P J Fowler 1978, 5-7).

However the relative protection of artifactual evidence from the destruction wrought by agriculture and erosion in the fen edges, due to masking by a protective blanket of peat (cf Lawson in Bamford 1982, 4 and 33) has offered an opportunity of estimating the number of settlements in this location. Unfortunately the estimation can only be very approximate as it must be based on several provisos, most of which concern the means of estimating the nature and intensity of settlement. Nonetheless a means of narrowing the parameters is provided by field-walking evidence.

An area, circa 25%, of the Suffolk fen edges, between the river Lark and Snare Drove, Kenny Hill, was intensively field walked (author unpublished manuscripts and Suffolk Sites and Monuments Record) over a number of years. Numerous prehistoric scatters were identified, a large proportion producing pottery as an element of the assemblages. One of the hardest of these, and therefore most likely to survive, most easily

recognised and reasonably well dated is beaker pottery. For this reason scatters with beaker pottery were counted, totalling 23 sites.

Therefore the north-west Suffolk fen edges, if occupied to the same intensity as the survey area, would have a total of approximately 92 sites with a beaker element. Whilst not all need have been settlements other sites may not have been identified, and in balance the figure is probably fairly accurate.

A guide to the duration of the use of beaker pottery locally are the early radio-carbon dates of 1850 ± 150 bc (c2200 BC) coming from two local sites, at Chippenham, Cambridgeshire, and Fifty Farm, Mildenhall, together with the evidence from excavations at Mildenhall 130 where beaker pottery had apparently gone out of use by the time the site, radio-carbon dated to 1440 ± 80 bc (HAR-2517, calibrated date circa 1750 BC, cf, Healy 1984, table 5.3) was occupied. A likely span of about 500 years should encompass the great majority of the 92 beaker sites. The life-span (based on estimated longevity of timber round houses) of each site probably ranges from between 10 and 50 years, averaging between 1.8 and 9.2 contemporary fen edge sites. From the results of intensive fieldwalking, coupled with limited excavation, it appears that fen edge settlements were small, probably of no more than one or two houses each in size.

The final assumption is that the settlement rate remained fairly static throughout the bronze age. Prior to more detailed work including excavation, it will not be possible to determine this, however there are no good reasons for believing that the occupation rate might increase to

any great extent on the fen edges. Although gradual population increase is presumed throughout prehistory any consequential expansion would probably be mainly into regions previously relatively sparsely or unsettled perhaps, for example, the heavier clay soils.

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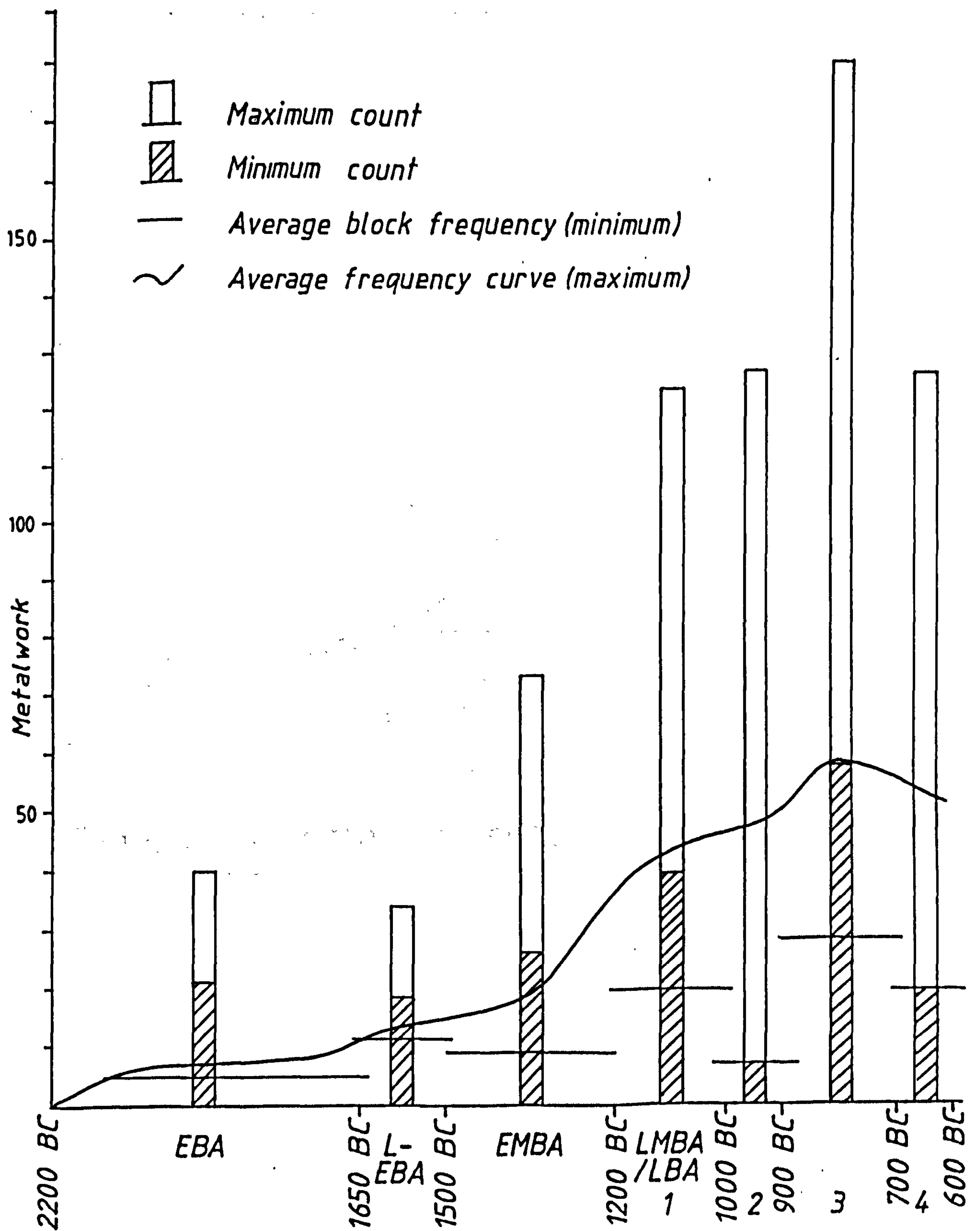


Table 1. Comparative frequency: all finds.

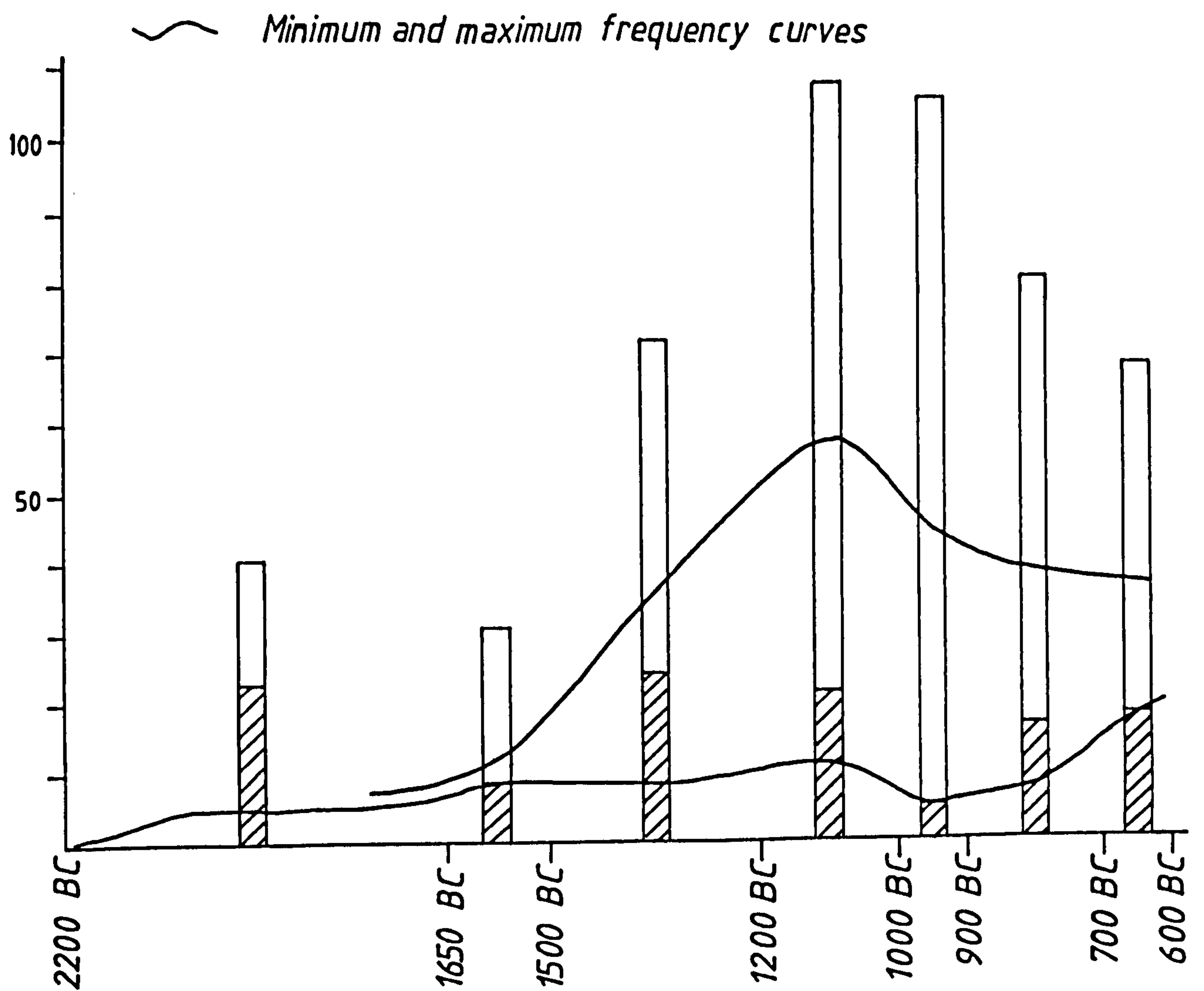


Table 2. Comparative frequency: stray finds.



Table 3. Comparative frequency: 'hoards'.

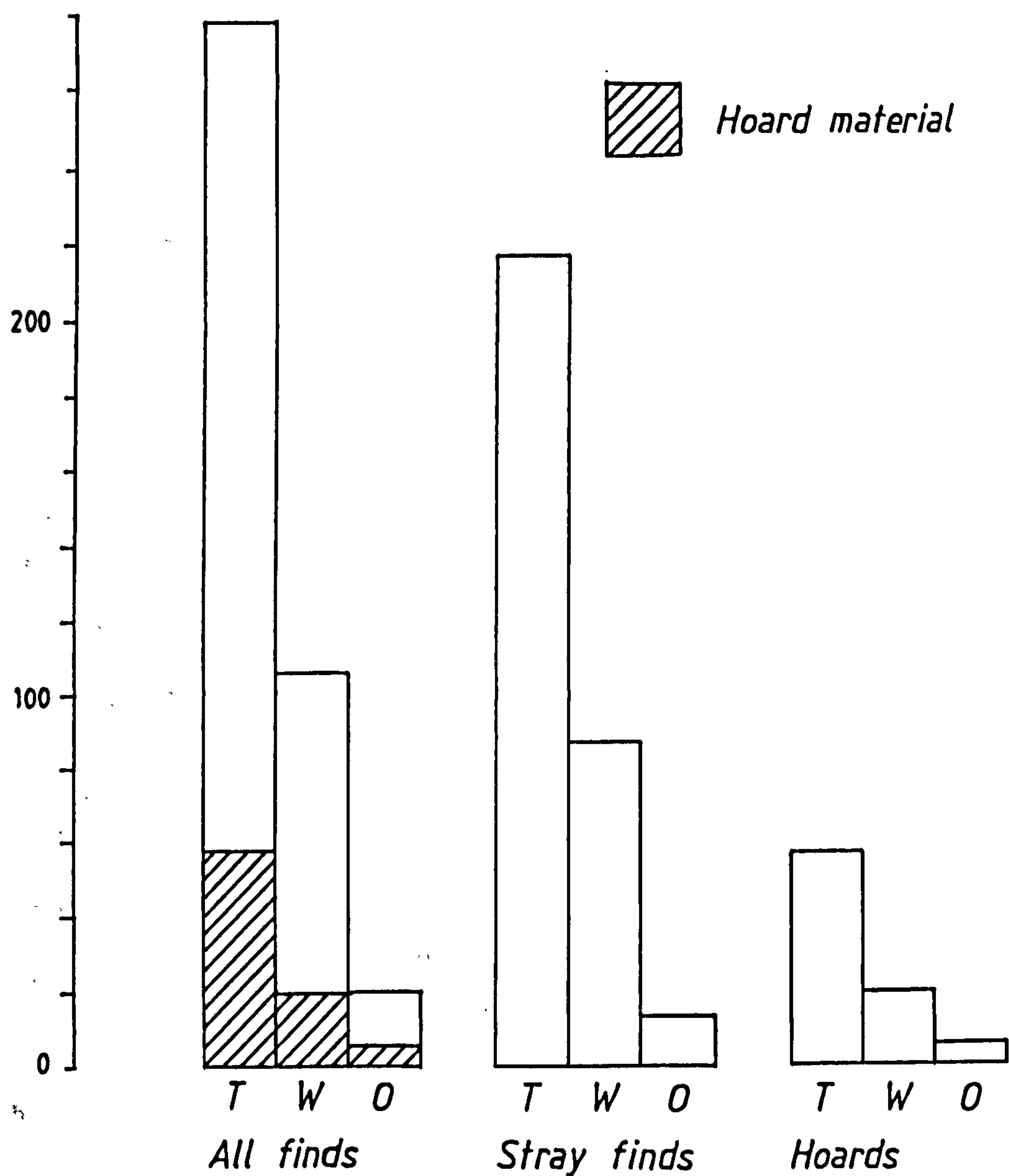


Table 4. Relative frequencies: tools, weapons and ornaments (all periods).

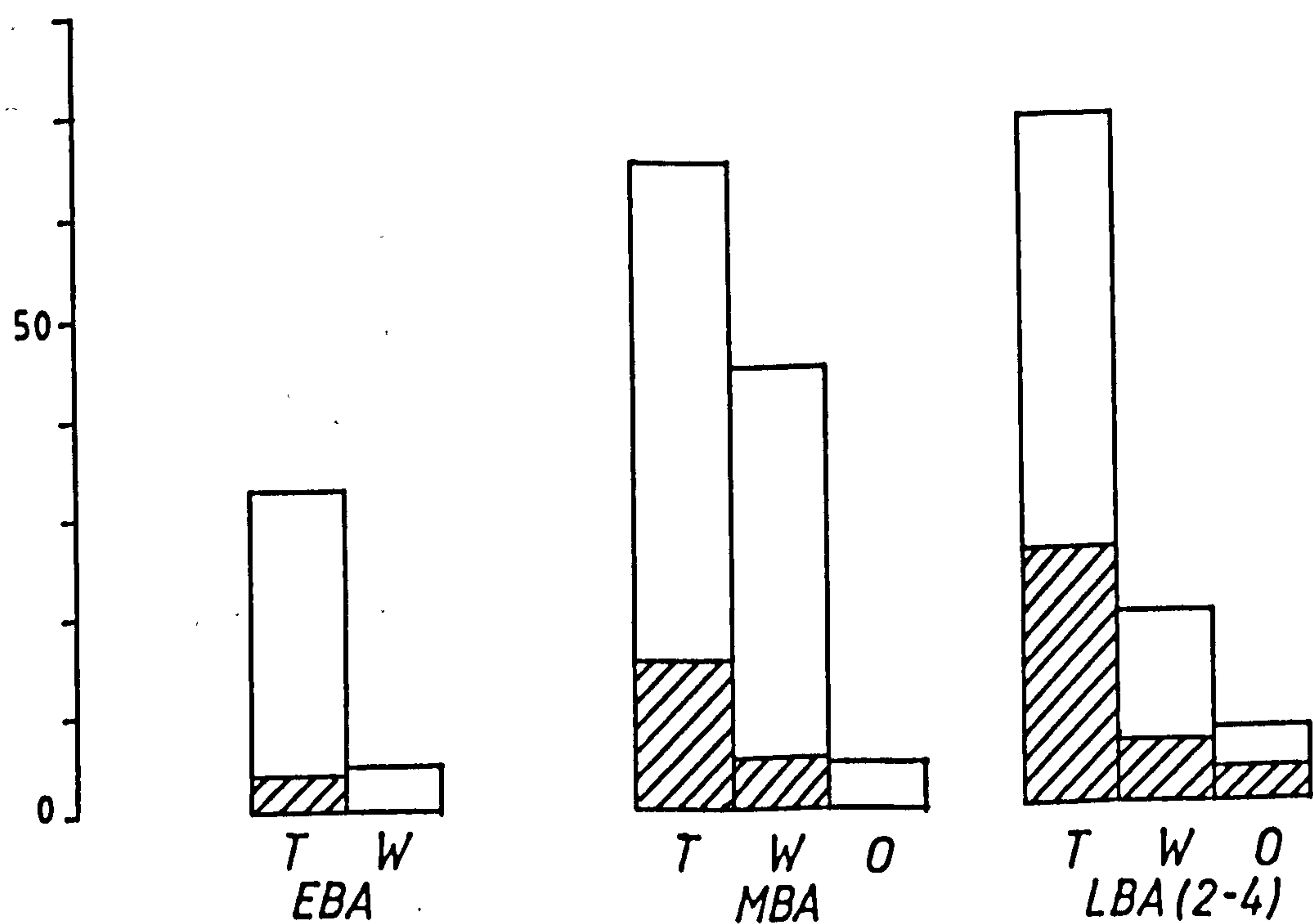


Table 5. Relative frequencies: tools, weapons and ornaments.

| PARISH | | | (a) Soil Sites | Scatters a:b(%) | (b)Preh. scatters | b:c(%) | (c)With pottery | a:c(%) |
|-----------------------|-----|-----|-------------------|-----------------|----------------------|--------|--------------------|--------|
| Mildenhall | FE | 422 | 258 | 74% | 191 | 39.3% | 75 | 29% |
| Lt. Bradley | 2 | 22 | 18 | 50% | 9 | - | 0 | - |
| Bredfield | 2/3 | 28 | 22 | 9.1% | 2 | 100% | 2 | 9.1% |
| Grundisburgh | 2/3 | 49 | 41 | 19.5% | 8 | 87.5% | 7 | 17% |
| Gr. 2/3 soil totals | | 77 | 63 | 15.9% | 10 | 90% | 9 | 14.3% |
| Walsham le Willows | 3 | 96 | 81 | - | 0 | - | 0 | - |
| Mendlesham | 3 | 142 | 124 | 2.4% | 3 | - | 0 | - |
| Metfield | 3 | 159 | 143 | 0.7% | 1 | 100% | 1 | 0.7% |
| Boulge | 3 | 11 | 8 | - | 0 | - | 0 | - |
| Debach | 3 | 10 | 8 | - | 0 | - | 0 | - |
| Preston St Mary | 3 | 29 | 12 | 8.3% | 1 | 100% | 1 | 8.3% |
| Gr. 3 soil totals | | 457 | 376 | 1.3% | 5 | 40% | 2 | 0.5% |
| Mendham | 3/4 | 110 | 91 | 6.6% | 6 | 66.6% | 4 | 4.4% |
| Melton | 4 | 37 | 27 | 33.3% | 9 | 33.3% | 3 | 11.1% |
| Pettistree | 4 | 18 | 10 | 20% | 2 | 50% | 1 | 10% |
| Sutton | 4 | 89 | 46 | 31% | 14 | 78.5% | 11 | 24.4% |
| Gr. 4 soil totals | | 144 | 83 | 30.1% | 25 | 60% | 15 | 18.1% |

Table 6. Summary of Suffolk field walking results

| Soil Group | No. of sherds | Area (sq m) | Area per sherd |
|------------|---------------|-------------|---------------------|
| FE | 79 | 35,600 | 450 ² m |
| 2 | 0 | 424,500 | - |
| 2/3 | 26 | 77,800 | 2992 ² m |
| 3 | 10 | 34,000 | 3400 ² m |
| 3/4 | 12 | 51,500 | 4292 ² m |
| 4 | 249 | 368,500 | 1480 ² m |

Table 7. Soil types and prehistoric pottery
 (within identified prehistoric 'scatters')
 FE = Fen Edge soils

| Soil Group | No. of flints | Area (sq m) | Area per worked flint |
|------------|---------------|-------------|-----------------------|
| FE | 798 | 35,600 | 44 ² m |
| 2 | 858 | 424,520 | 495 ² m |
| 2/3 | 140 | 77,800 | 556 ² m |
| 3 | 38 | 64,000 | 1684 ² m |
| 3/4 | 42 | 51,500 | 1226 ² m |
| 4 | 1016 | 368,500 | 363 ² m |

Table 8. Soil types and prehistoric worked flints
 (within identified prehistoric 'scatters')
 FE = Fen Edge soils

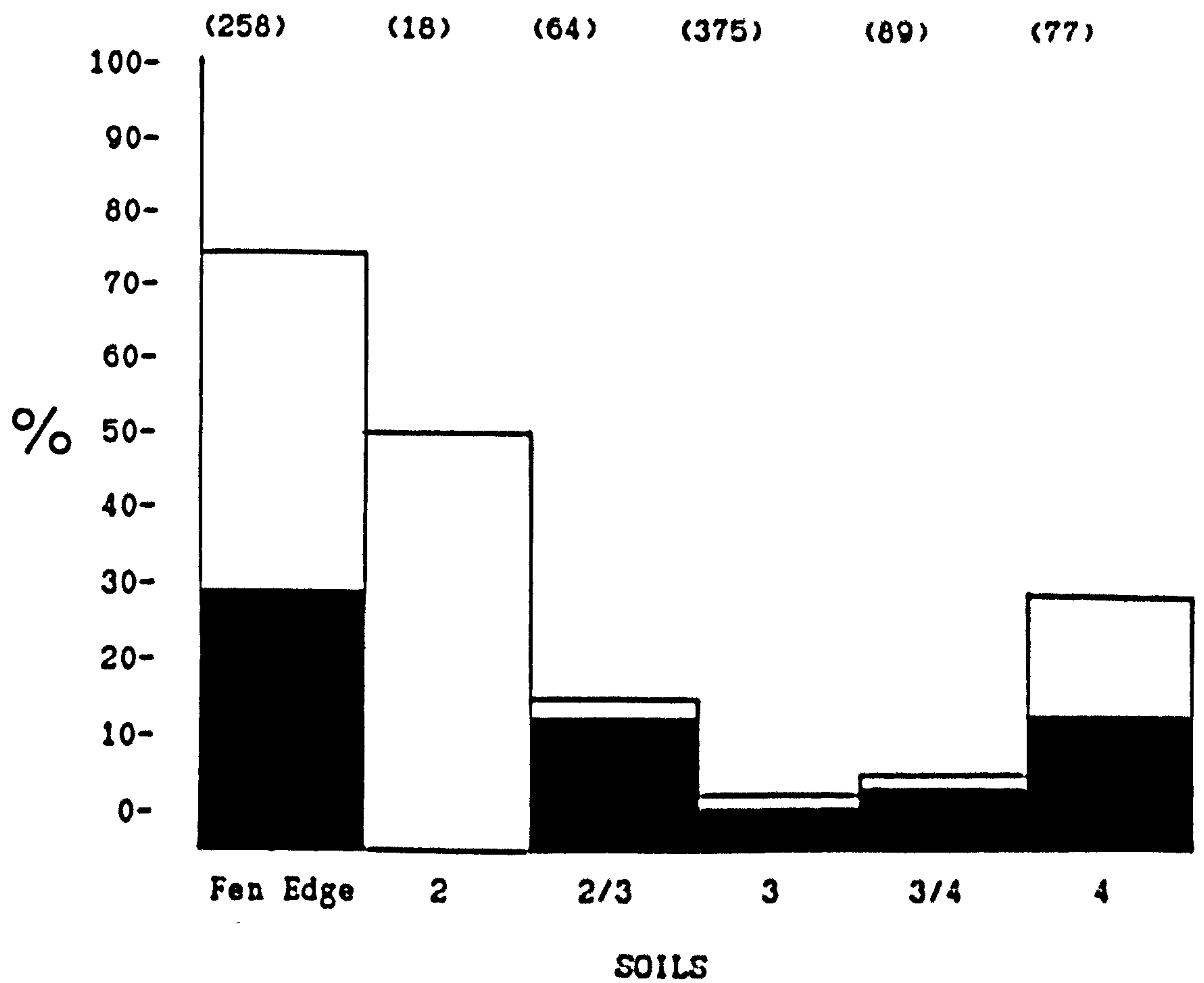


Table 9. Scatters identified field walking showing percentages of prehistoric scatters (open) and percentages of scatters with prehistoric pottery (infilled) in relation to soil type (total scatters bracketed)

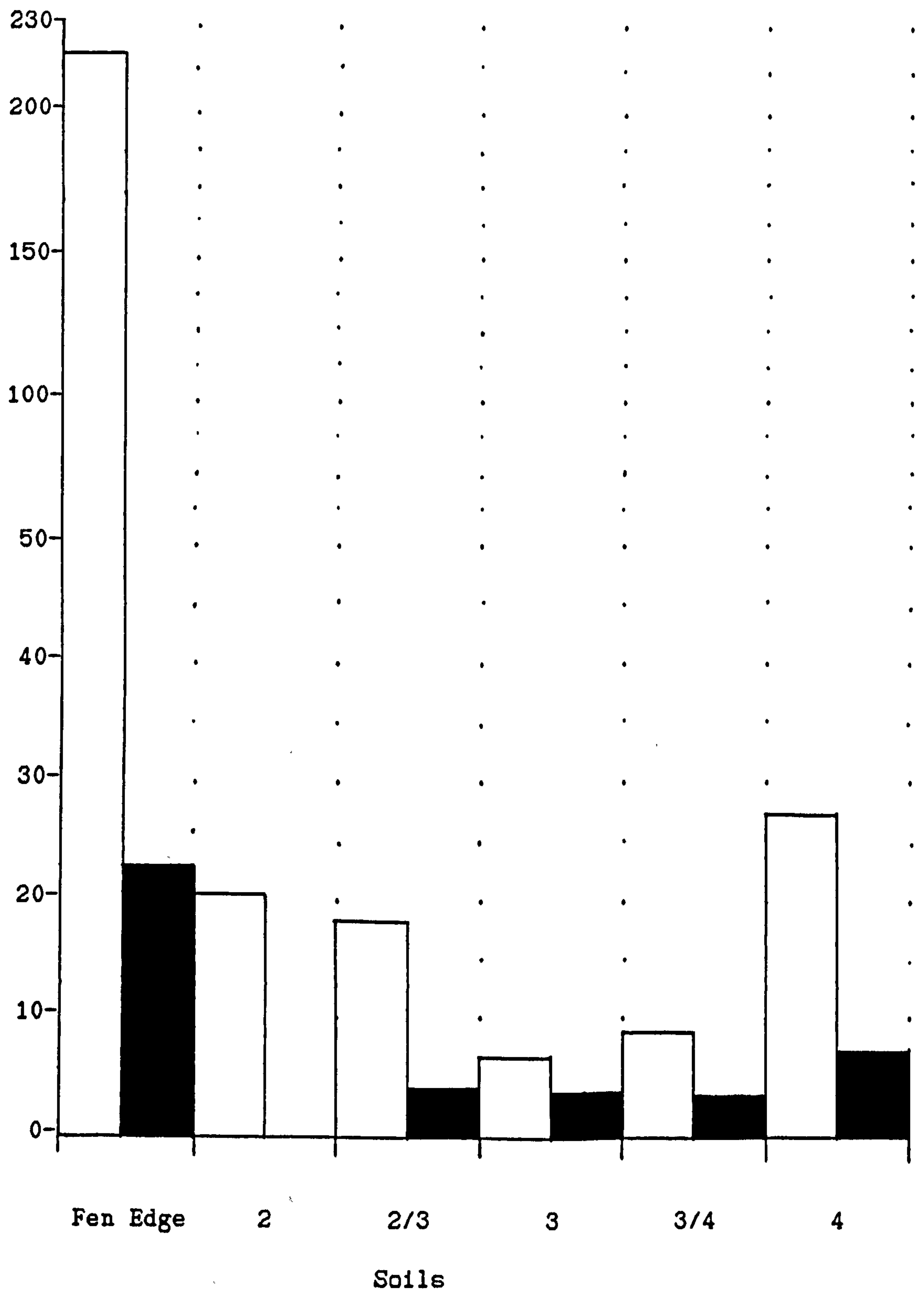


Table 10. Average numbers of worked flints per 10,000²m of prehistoric scatter and sherds per 10,000²m of post mesolithic prehistoric scatters (Worked flints open, sherds infilled)

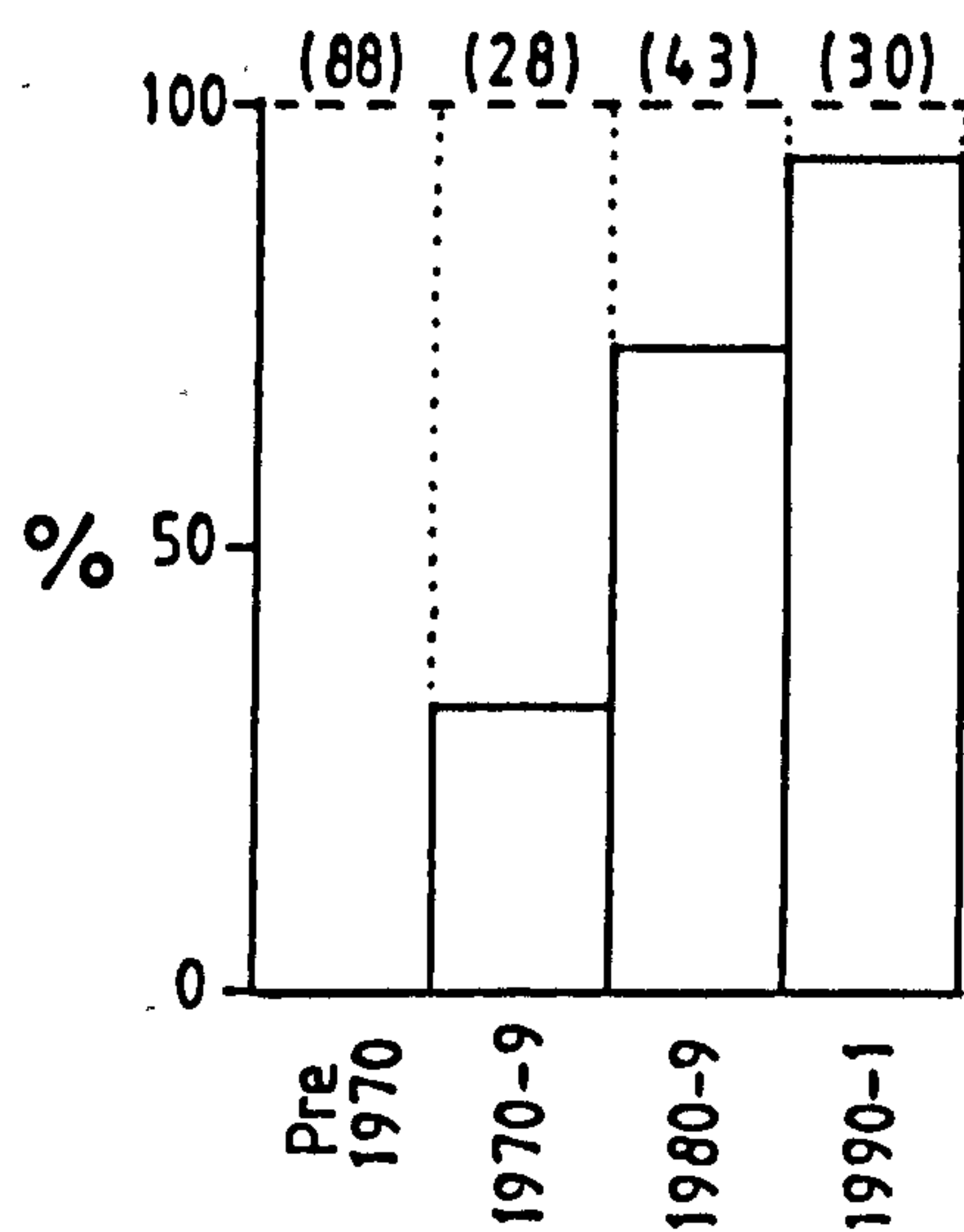


Table 11. Proportions of metal detected stray finds

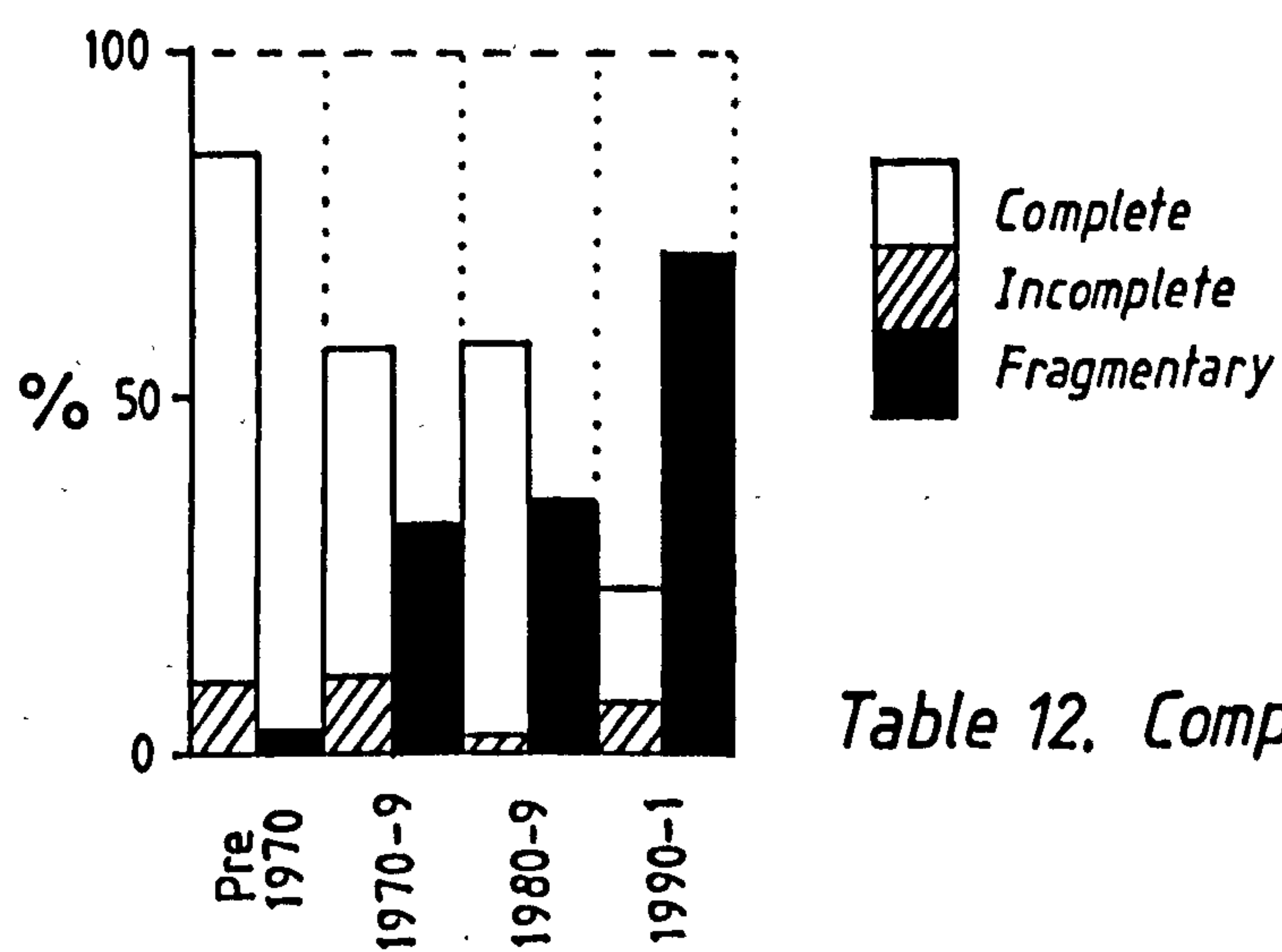


Table 12. Completeness of finds

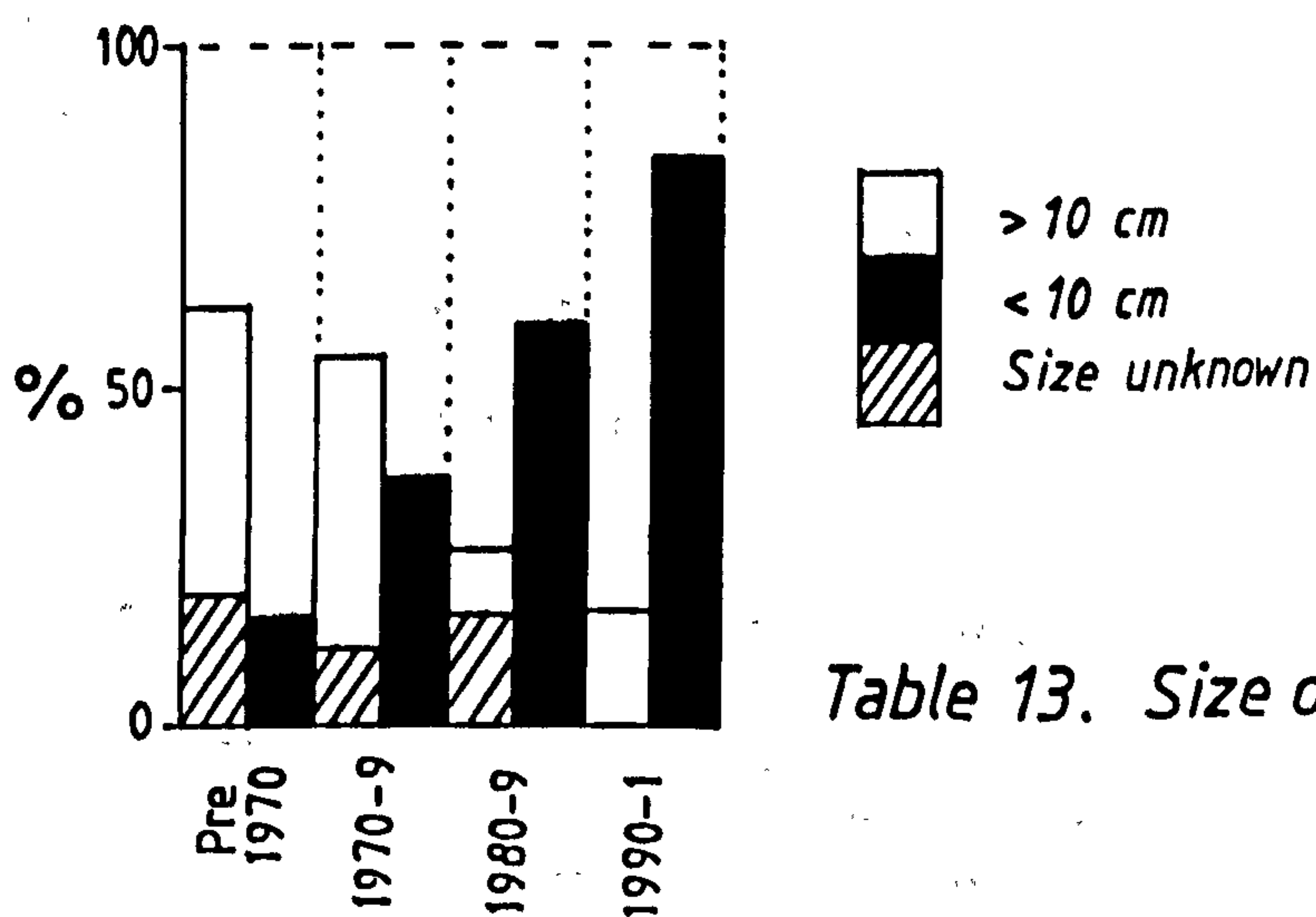


Table 13. Size of finds

| | | | | | | | | | |
|------------|-----|--------|----|----|---|---|----|----|----|
| SOIL GRADE | FE | Total | 11 | 17 | 8 | 6 | 18 | 9 | 28 |
| | | C | 5 | 8 | 4 | 2 | 8 | 3 | 13 |
| | | B/I | | 1 | | | 1 | 2 | 2 |
| | | F | 6 | 8 | 4 | 4 | 9 | 4 | 13 |
| | | <10 cm | 11 | 15 | 7 | 6 | 15 | 5 | 23 |
| | | < 6 cm | 8 | 11 | 6 | 4 | 12 | 3 | 15 |
| | 2 | Total | 2 | 5 | 2 | 1 | 5 | 5 | 10 |
| | | C | - | 2 | - | - | 2 | 4 | 6 |
| | | B/I | - | - | - | - | - | - | - |
| | | F | 2 | 3 | 2 | 1 | 3 | 1 | 4 |
| | | <10 cm | 2 | 5 | 2 | 1 | 5 | 4 | 9 |
| | | < 6 cm | 1 | 2 | 1 | - | 2 | 3 | 5 |
| | 2/3 | Total | 3 | 4 | 3 | 2 | 4 | 6 | 10 |
| | | C | 2 | 3 | 2 | 2 | 3 | 1 | 4 |
| | | B/I | - | - | - | - | - | 2 | 2 |
| | | F | 1 | 1 | 1 | - | 1 | 3 | 4 |
| | | <10 cm | 2 | 3 | 2 | 1 | 3 | 4 | 7 |
| | | < 6 cm | 2 | 2 | 2 | 1 | 2 | 2 | 4 |
| | 3 | Total | 4 | 10 | 4 | 5 | 16 | 16 | 32 |
| | | C | - | 1 | - | - | 1 | 6 | 7 |
| | | B/I | 2 | 1 | 2 | 1 | 4 | 3 | 7 |
| | | F | 2 | 8 | 2 | 4 | 8 | 7 | 18 |
| | | <10 cm | 2 | 9 | 2 | 4 | 9 | 14 | 26 |
| | | < 6 cm | - | 6 | - | 1 | 6 | 6 | 13 |
| | 3/4 | Total | 1 | 2 | 1 | - | 2 | - | 2 |
| | | C | - | - | - | - | - | - | - |
| | | B/I | - | - | - | - | - | - | - |
| | | F | 1 | 2 | 1 | - | 2 | - | 2 |
| | | <10 cm | 1 | 2 | 1 | - | 2 | - | 2 |
| | | < 6 cm | 1 | 2 | 1 | - | 2 | - | 2 |
| | 4 | Total | 2 | 8 | 3 | 3 | 9 | 8 | 17 |
| | | C | - | 2 | 1 | 1 | 2 | 3 | 5 |
| | | B/I | - | 1 | - | - | 1 | - | 1 |
| | | F | 2 | 5 | 2 | 2 | 5 | 5 | 11 |
| | | <10 cm | 2 | 8 | 3 | 3 | 9 | 6 | 15 |
| | | < 6 cm | 2 | 6 | 2 | 2 | 6 | 5 | 11 |

IA* Rom Sax Med Sub No Total
total assoc.

OTHER PERIODS

Table 14. Metal detected finds: soil types, completeness and other period 'associations'. (Excluding hoards, beach finds, 1 rivet, 3 sprue caps & 1 'irregular waste'. *Note: IA sites often represented by coins only, where these sites also have Roman material it is possible that the coins result from Roman rather than IA deposition.

| | | | | | | | | | |
|----------------|---------|---|----|-------|-----|----|-------|---|---------------------------|
| swords/rapiers | 11/13 | 2 | 4 | 3/5 | - | 1 | 1 | - | |
| knives | 4/6 | - | - | 1/3 | 1/2 | 1 | ?1 | - | |
| spearheads | 17 | 1 | ?1 | 12 | 1 | 2 | - | - | |
| axes | 45/47 | 5 | 4 | 17/18 | 1 | ?1 | 12/14 | 3 | |
| chisels | 5/6 | - | - | 0/1 | - | 1 | 4 | - | |
| gouge | 1 | 1 | - | - | - | - | - | - | |
| hammer | 1 | - | - | - | - | - | 1 | - | |
| razor | 1 | - | - | - | - | - | 1 | - | |
| tracers/awls | 11 | - | - | - | 1 | - | 10 | - | 2 lugged, 1 punch/awl. |
| ornaments | 6 | - | - | - | - | - | 6 | - | |
| TOTAL | 106/107 | 9 | 9 | 36 | 4/5 | 6 | 36/38 | 3 | |

TOTAL butt body tip lost lost complete ? Comments
tip butt

Table 15. Metal detected stray finds : completeness
(excluding 3 sprue cap wasters & 1 irregular waste)

| | | | | | | | | | |
|----------------|-------|----|----|----|---|-----|---|-----|-------|
| swords/rapiers | 3/5 | 1 | - | 3 | - | 2/3 | - | 1/2 | 11/13 |
| knives | 2/3 | - | - | 1 | 1 | 0/1 | - | 0/1 | 4/6 |
| spearheads | 8 | 1 | 1 | 6 | - | 2 | - | - | 17 |
| axes & chisels | 5 | 5 | 7 | 18 | 1 | 10 | 3 | 1 | 50 |
| gouge | 1 | - | - | - | - | - | - | - | 1 |
| hammer | - | - | - | - | - | 1 | - | - | 1 |
| razor | - | 1 | - | - | - | - | - | - | 1 |
| tracers/awls | 4 | - | 2 | 2 | - | 2 | - | - | 11* |
| ornaments | 2 | 2 | - | 2 | - | - | - | - | 6 |
| hoards | 1 | 2 | 2 | 3 | - | - | - | - | 8 |
| TOTAL | 26/28 | 12 | 12 | 35 | 2 | 17 | 3 | 2/4 | 111 |

FE 2 2/3 3 3/4 4 beach river TOTAL

SOIL TYPE

Table 16. Metal detected finds : artifact types and soils
(finds exclude 1 rivet, 3 sprue cap wasters and irregular
bronze waste). * 1 tracer/awl from unknown soil type.

FE = fen edge soils.

| | Rivers | Meres | Turbaries | Canals | Sea |
|------------------------------|--------|---------|-----------|--------|-----|
| <u>CAMBRIDGESHIRE</u> | | | | | |
| swords | - | - | - | - | - |
| rapiers | 1 | - | - | - | - |
| dirks/daggers | 1 | - | - | 1 | - |
| knives | 3 | - | - | - | - |
| spearheads | 1 | 2 | - | 1 | - |
| palstaves/ flanged axes | 4 | 2 | - | - | - |
| socketed axes | 1 | 4 | - | - | - |
| hammer | - | 1 | - | - | - |
| gouges | - | 2 | - | - | - |
| TOTAL | 11 | 11 | | 2 | |
| <u>NORFOLK</u> | | | | | |
| swords | 1 | 2+ | - | - | - |
| rapiers | 1 | - | - | - | ?1 |
| dirks/daggers | 1 | - | - | - | - |
| knives | - | - | - | ?1 | - |
| spearheads | 3 | 1 | - | - | ?1 |
| flat axe | - | - | - | 1 | - |
| palstaves | 1 | - | 1 | 1 | - |
| celt | - | 1 | - | - | ?1 |
| gouge | 1 | - | - | - | - |
| hoard | 1 | - | - | - | - |
| TOTAL | 9 | 4+ | 1 | ?3 | ?3 |
| <u>SUFFOLK</u> | | | | | |
| swords | 5 | - | - | - | - |
| rapiers/dirks/ daggers | 7/8 | - | - | - | - |
| knives | 1/2 | - | - | - | - |
| spearheads | 3 | 3+ | - | - | ?1 |
| ferrule | 1 | - | - | - | - |
| flat axe | - | - | - | - | ?1 |
| palstaves | 2/3 | - | - | - | - |
| socketed axes | 3 | - | - | - | - |
| chisel | 1 | - | - | - | - |
| Q headed pin | 1 | - | - | - | - |
| torc | - | - | - | ?1 | - |
| other | - | Yes | - | - | - |
| TOTAL (sub) | 25/26 | 3+(+?) | | ?1 | ?2 |
| TOTAL (grand) | 45/46 | 18+(+?) | 1 | ?6 | ?5 |

TABLE 17: metalwork from bodies of water.

RIVERS

| | C | N | G | L | | W | | G | O | S | A | B | Total |
|-------------------------------|---|---|---|-----|---|---|---|---|---|---|---|---|-------|
| | a | e | t | t | | i | a | i | r | t | l | x | |
| | m | | | | L | s | v | p | w | o | d | | |
| | | | | | a | s | e | n | e | u | e | | |
| | | | | | r | e | y | r | l | r | | | |
| | | | | | k | y | y | e | | | | | |
| swords | - | - | 1 | 3 | 1 | - | - | - | - | 1 | - | - | 6 |
| rapiers/ dirks/ daggers | 1 | 1 | - | 5/6 | 1 | - | - | 1 | 1 | 1 | - | - | 11/12 |
| knives | 2 | - | 1 | 0/1 | - | - | 1 | - | - | - | - | - | 4/5 |
| spearheads | 1 | - | - | 2 | - | 3 | - | - | - | - | 1 | - | 7 |
| ferrule | - | - | - | 1 | - | - | - | - | - | - | - | - | 1 |
| palstaves | - | 2 | 2 | 2 | - | 1 | - | - | - | - | - | - | 7 |
| socketed axes- | - | 1 | - | 1 | - | - | 1 | - | - | - | 1 | - | 4 |
| chisels/ gouges | - | - | - | 2 | - | - | - | - | - | - | - | - | 2 |
| pin | - | - | - | - | - | - | - | - | - | - | - | 1 | 1 |
| hoard | - | - | - | - | - | 1 | - | - | - | - | - | - | 1 |
| TOTAL | 4 | 4 | 4 | 17 | 2 | 5 | 2 | 1 | 1 | 2 | 1 | 1 | 45 |

TABLE 18: Count of metalwork types in rivers.

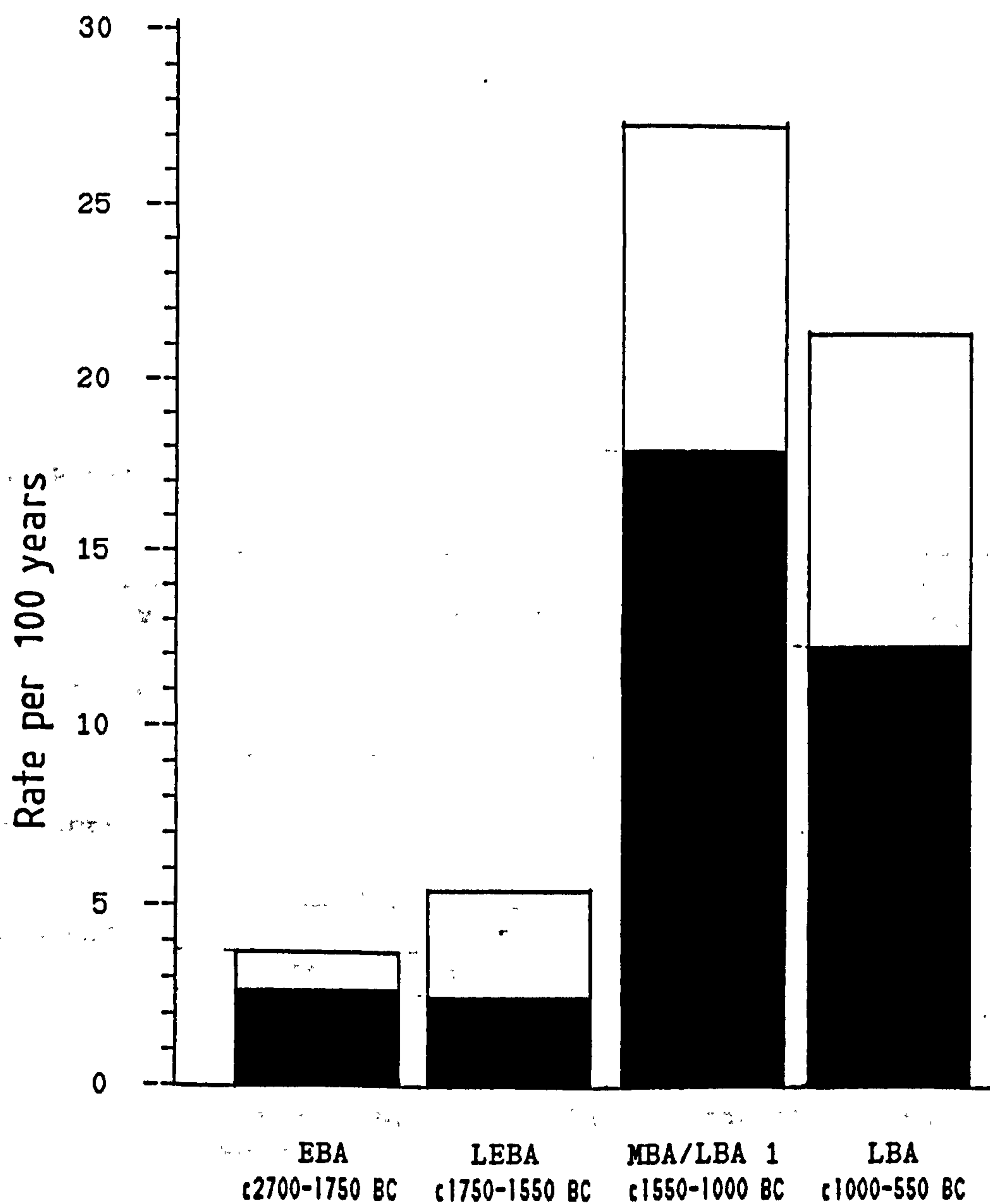


Table 19. South-eastern fen edge metalwork stray find deposition rates per 100 years
(excluding hoards, burials and river finds)

North-west Suffolk infilled, north-west Suffolk plus south-west Norfolk open.

FEN/FEN EDGE FINDS

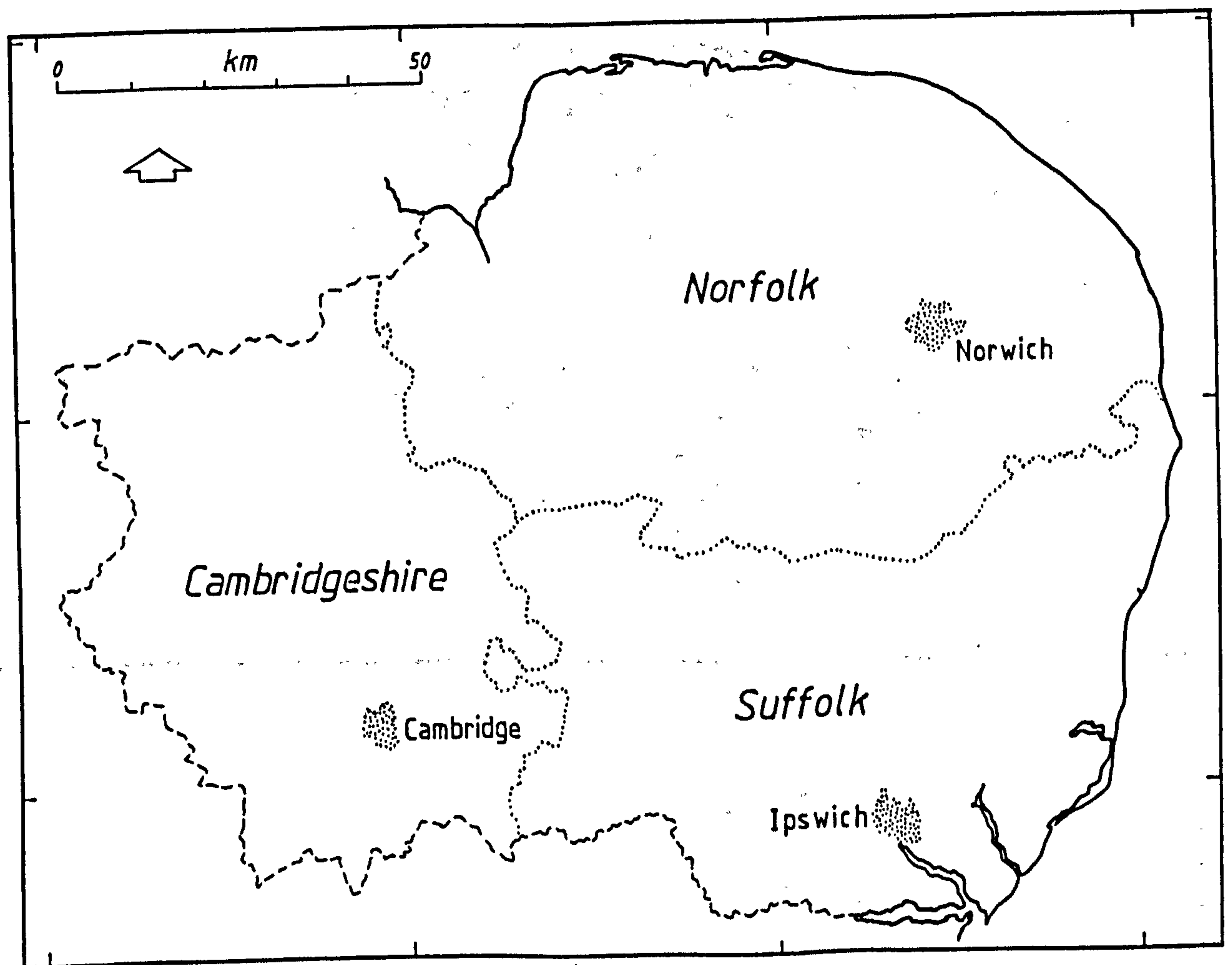
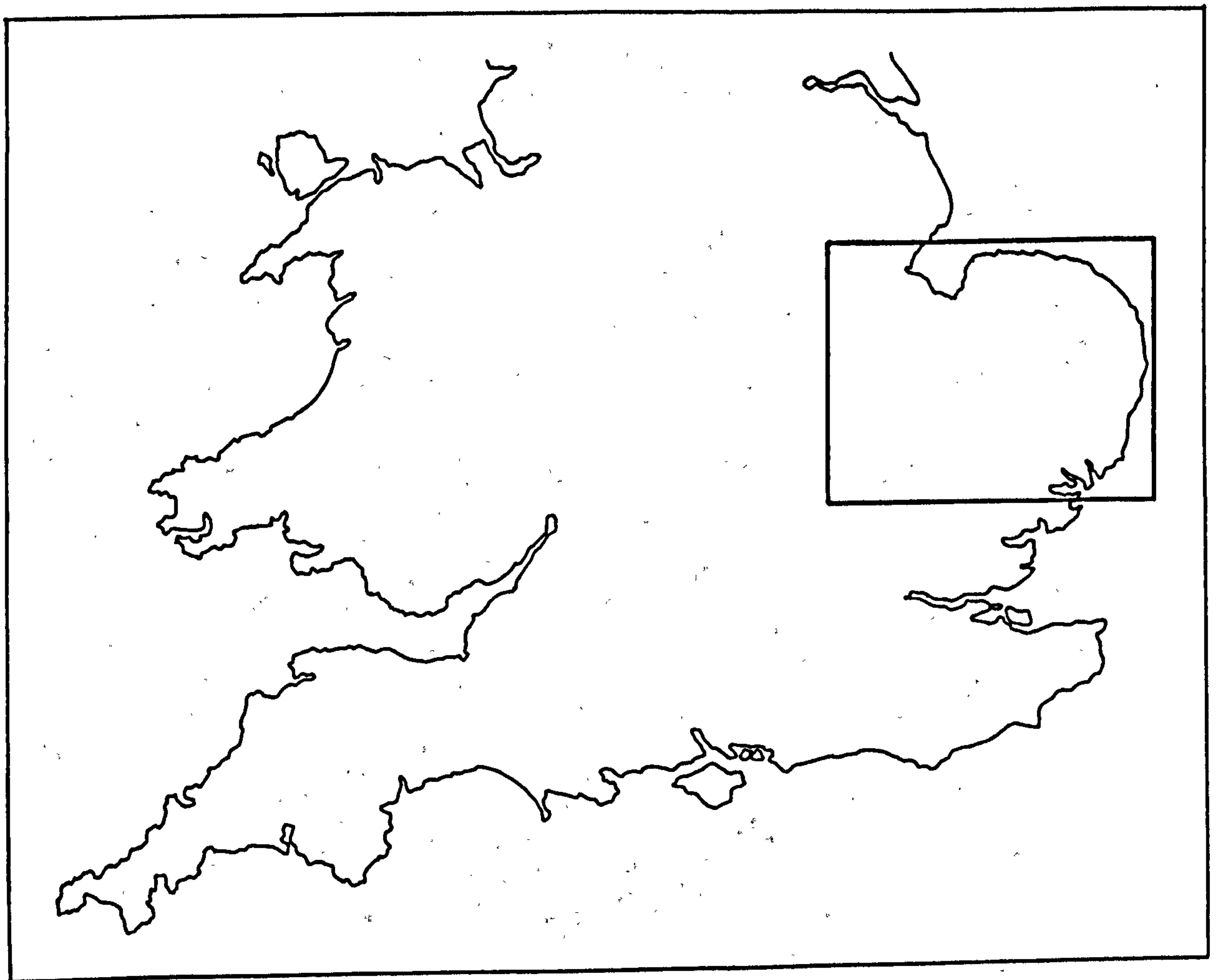
| | | | | | | |
|----------------------------------|-----------------|-----------|-----------------|---------|-----------------|-----------------|
| Cambs., Norfolk & Suffolk SMR | 22/23 15/16% | 27 18% | 49/50 32/34% | 4 3% | 94/97 62/66% | 147-151 100% |
| NW Suffolk survey | 24 10% | 34 14% | 58 24% | 9 4% | 171 72% | 238 100% |

SUFFOLK NON-FEN

| | | | | | | |
|-------------------------|----------|-----------|--------------|---------|-----------------|---------------|
| Metal detected finds | 7 10% | 10 14% | 17 23-24% | 4 6% | 51/52 70-72% | 72-73 100% |
|-------------------------|----------|-----------|--------------|---------|-----------------|---------------|

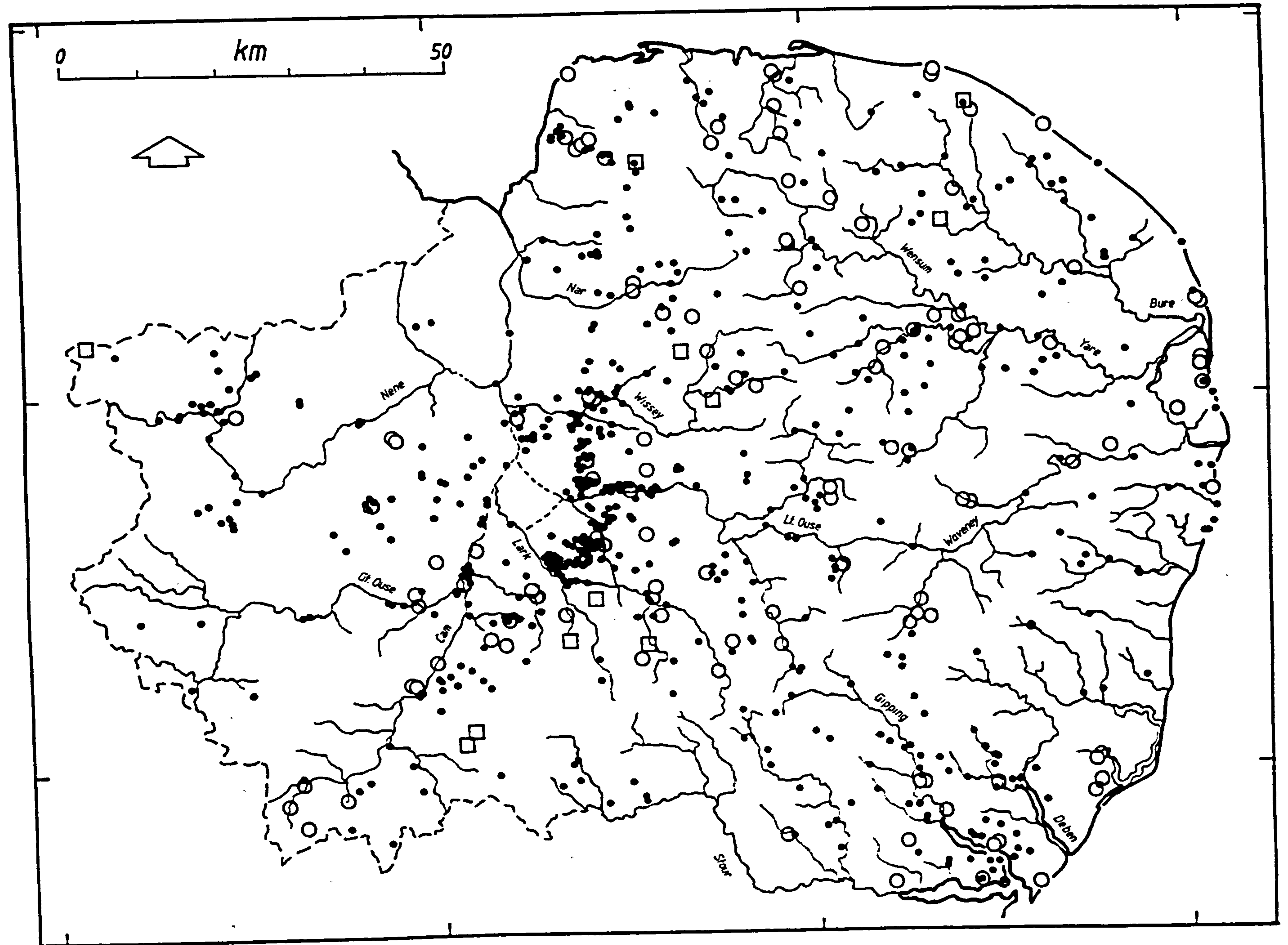
bladed spear- total ornaments tools TOTAL
weapons heads weapons

Table 20. Comparative proportions of fen edge and non-fen finds (excluding hoards).

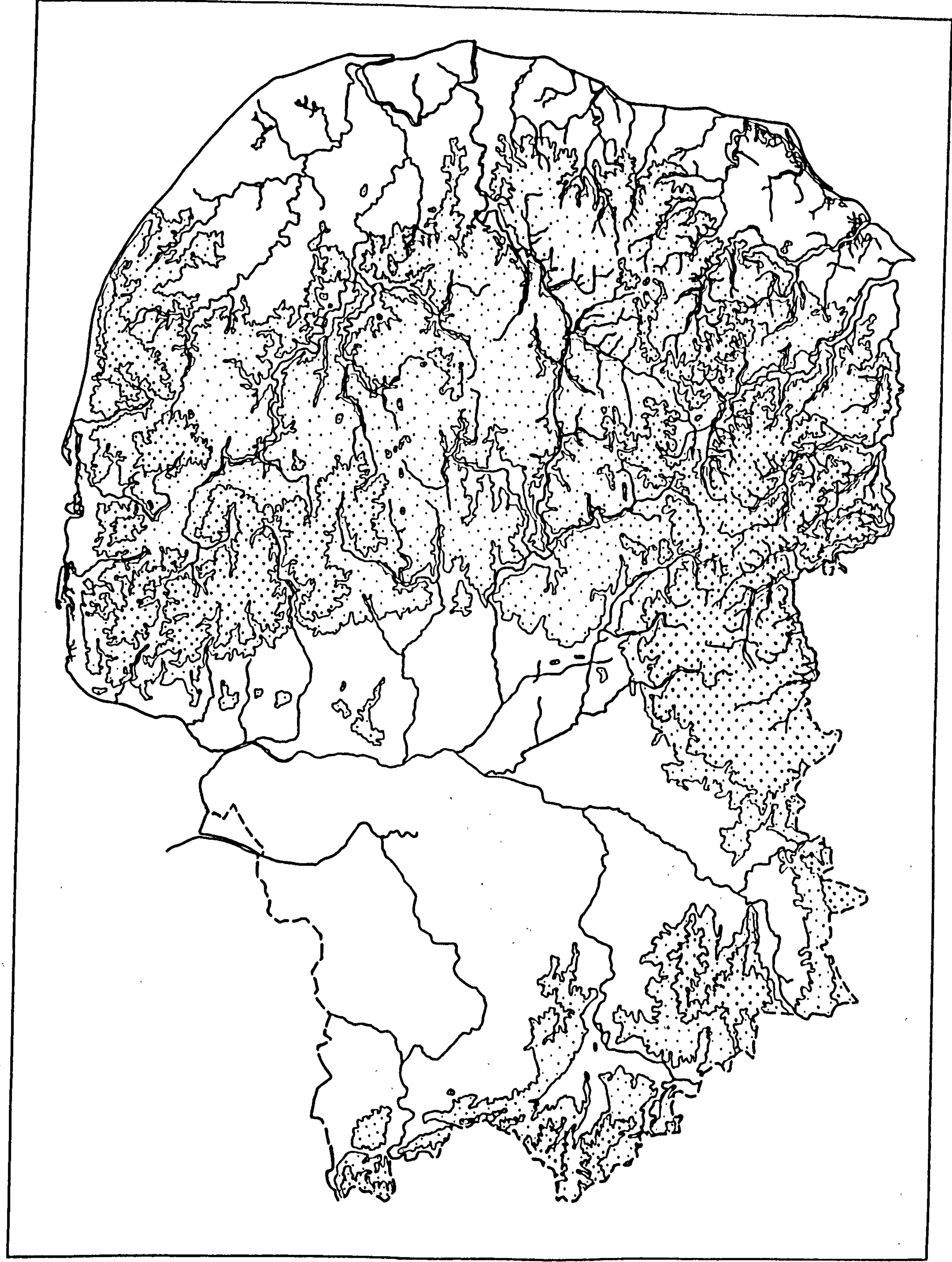


Map 1. Location

- *Single find*
- *Within barrow*
- *Hoard*

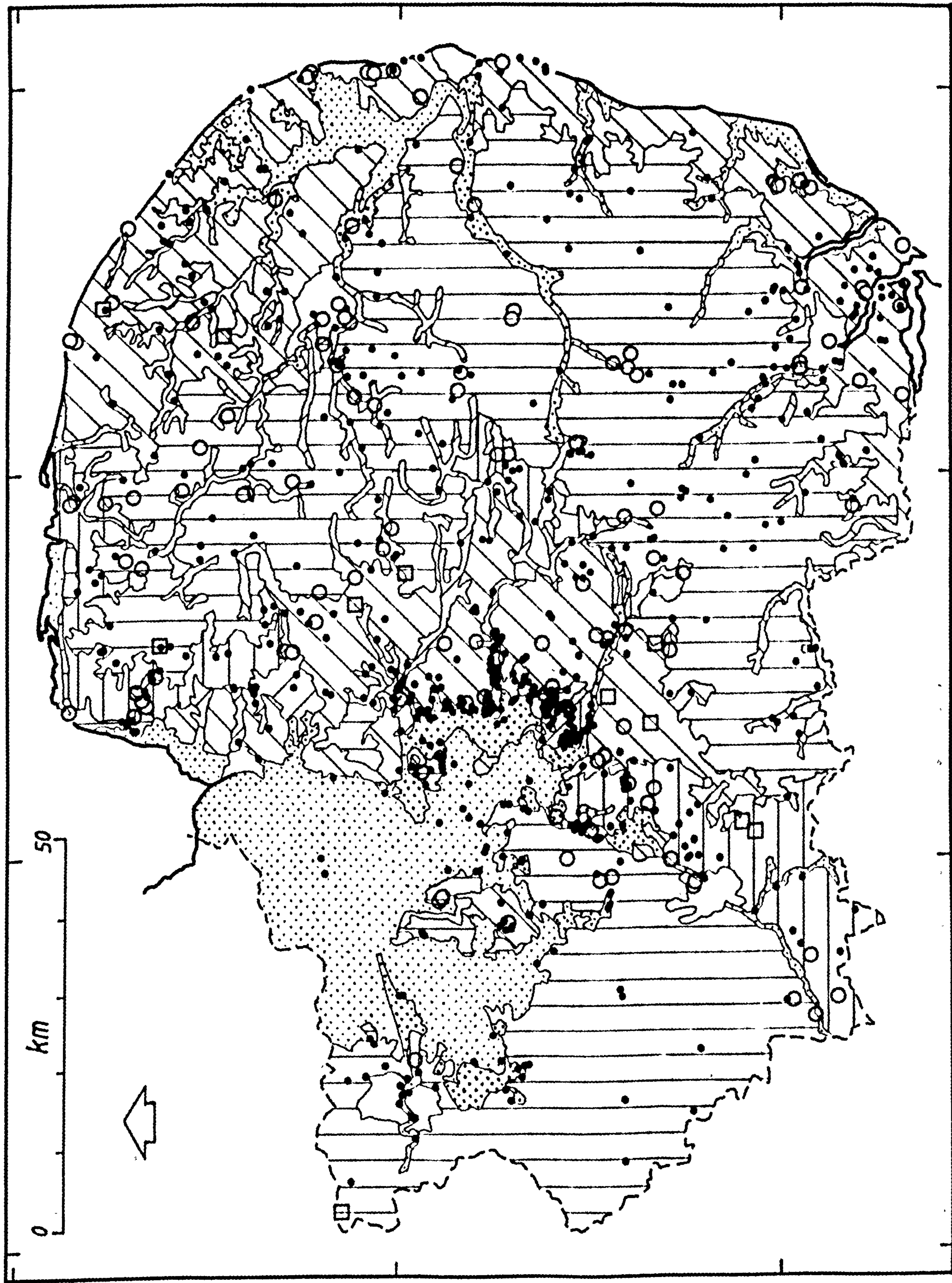


Map 2. Rivers



Over 100 feet
Over 200 feet

Map 3. Topography

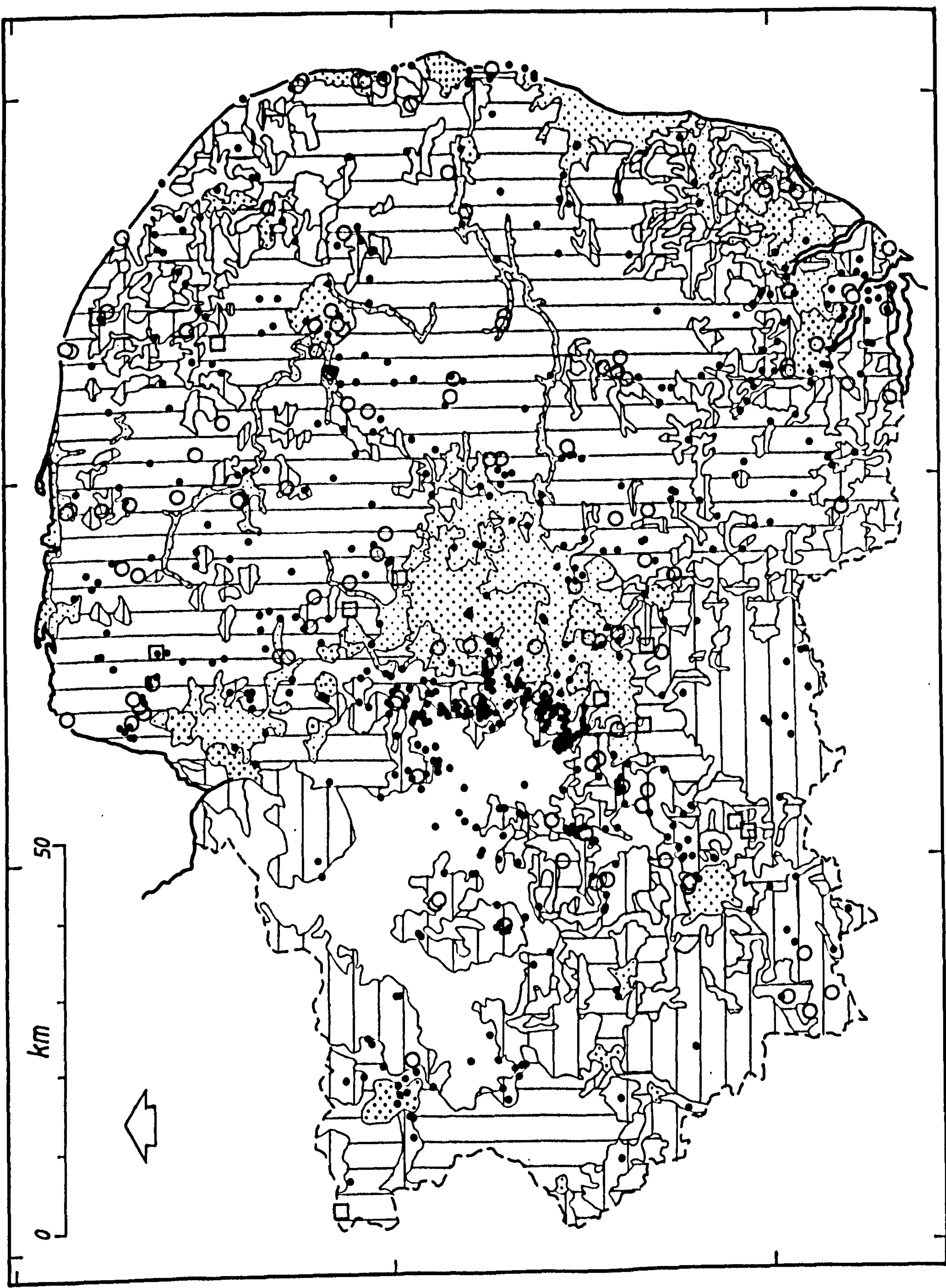



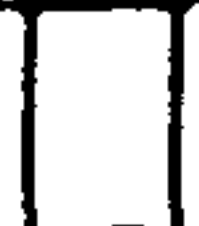
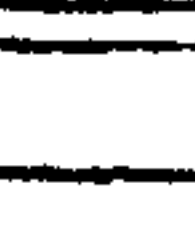


Alluvium
 Peat
 Drift & peat
 Drift
 Chalk based
 Clay / till
 Urban

□ Within barrow

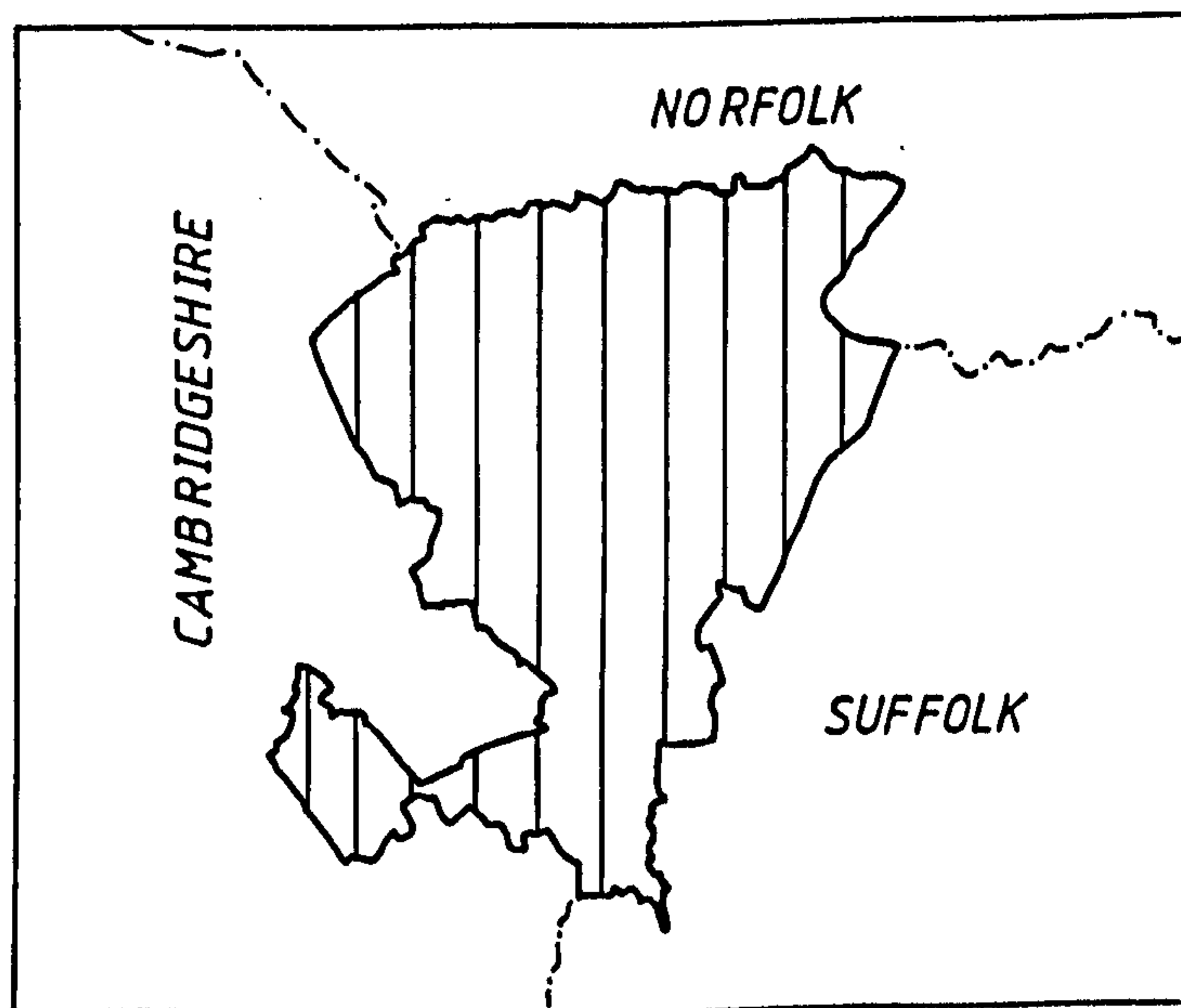
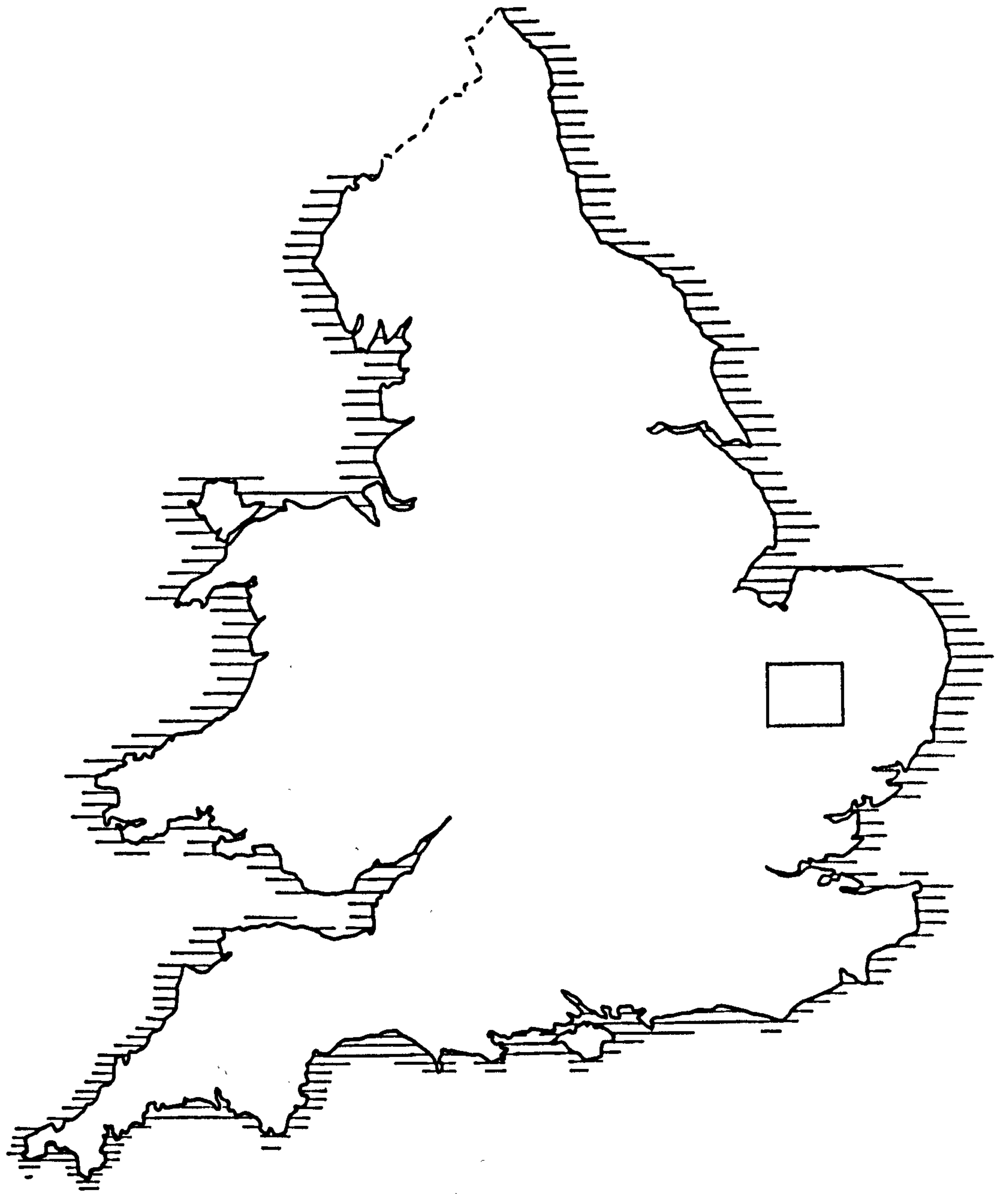
○ Hoard

Map 4 Soils (based on
 the Soil Survey of England
 and Wales 1983)



- | | |
|---|---------------|
|  | Grade 1 |
|  | " |
|  | " |
|  | " |
|  | Unclassified |
| • | Single find |
| □ | Within barrow |
| ○ | Hoard |

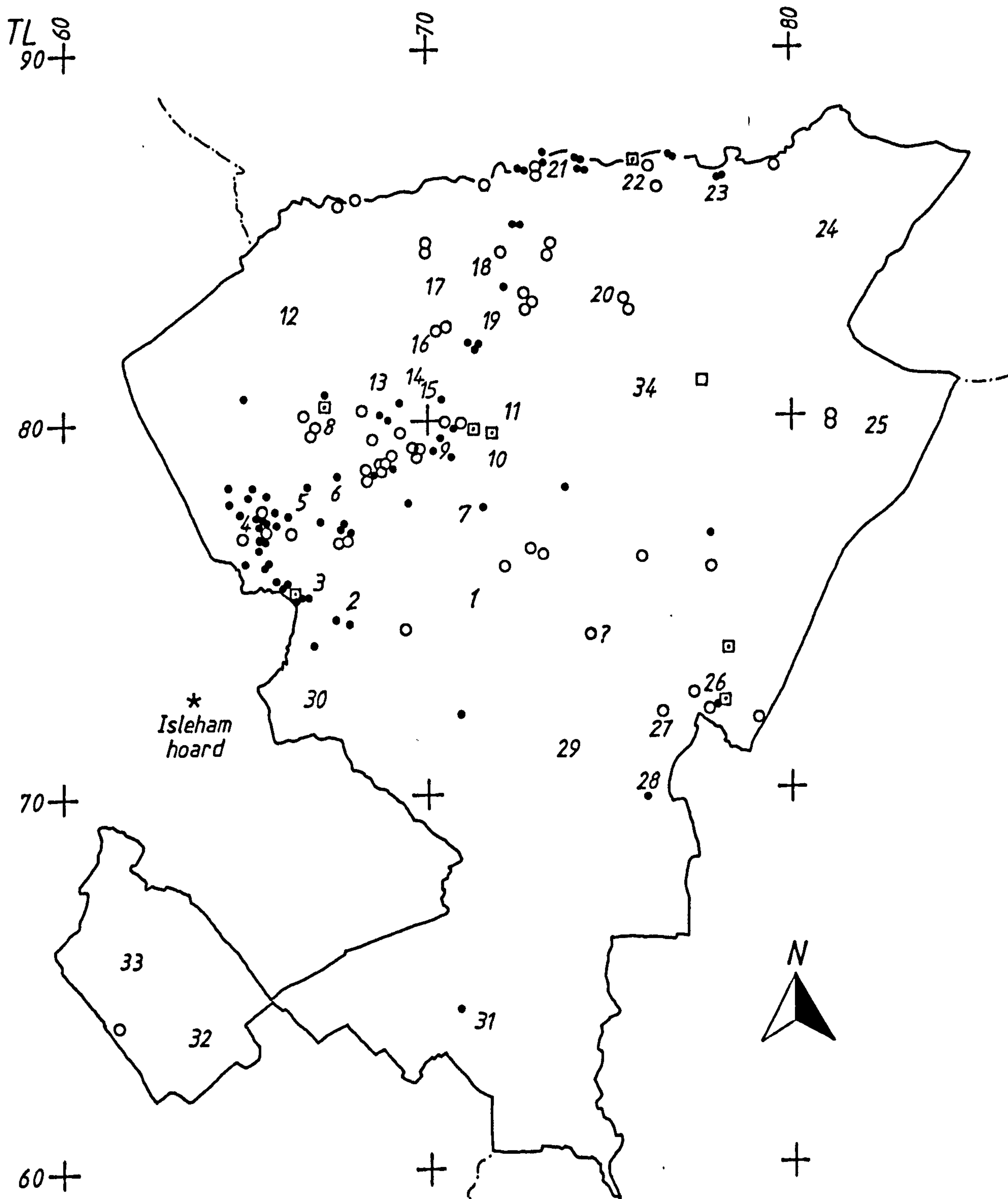
Map 5. Agricultural
land classifications
(based on M.A.F.F. 1974)



Map 6. North-west Suffolk location map



Map 7. North-West Suffolk: Parish boundaries



Individual findspots

• *Correct*

○ *Approximate*

'Hoard' findspots

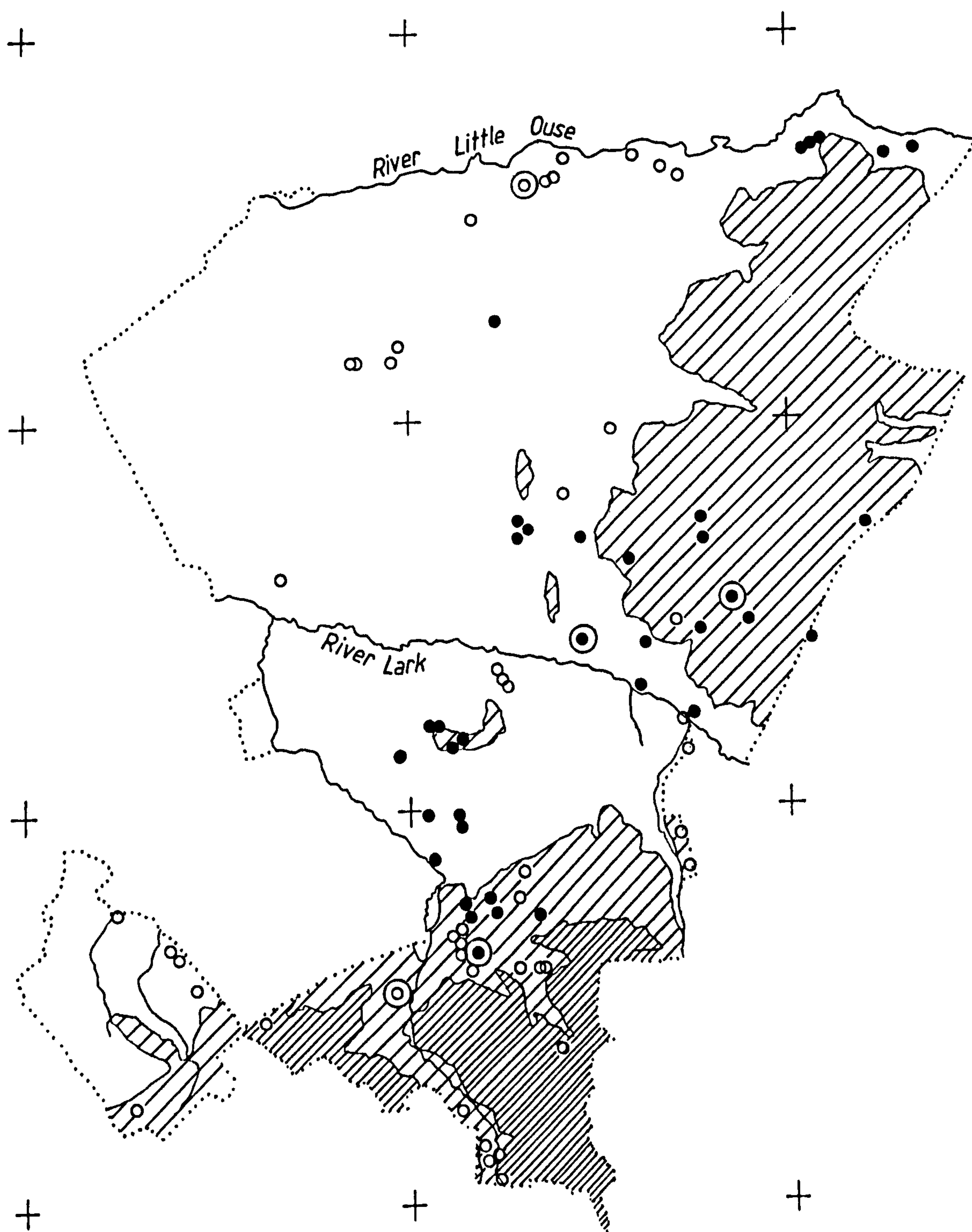
▣ *Correct*


▣ *Approximate*

+ *10 kilometre grid*

For key to numeric device see appendix 6.

Map 8. Finds distribution



 Land over 100 feet

 Land over 200 feet

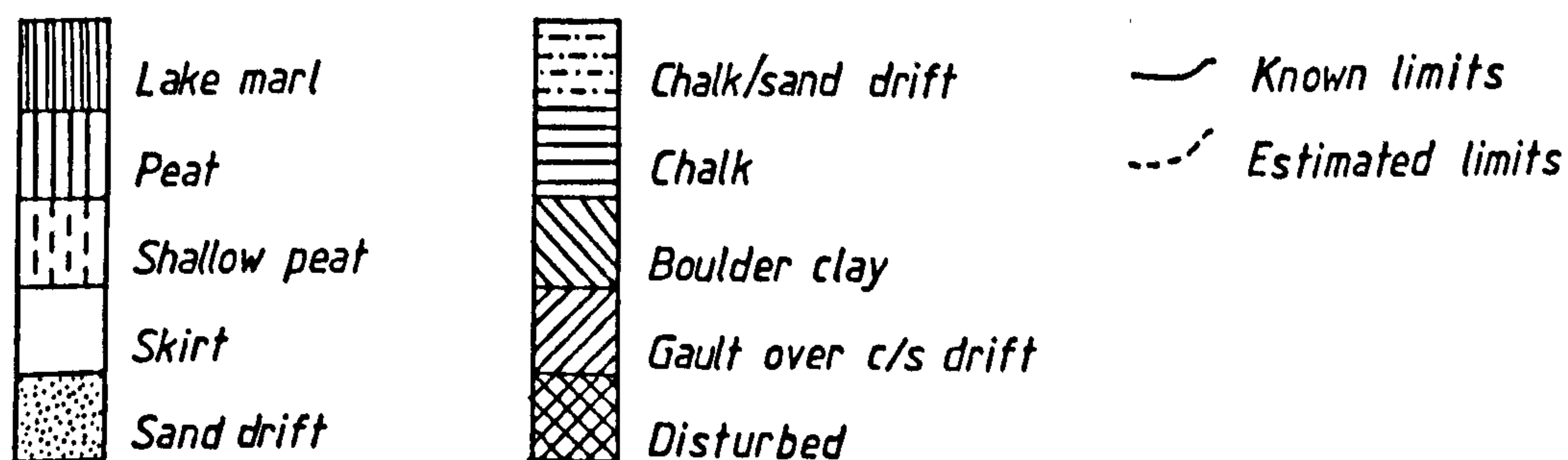
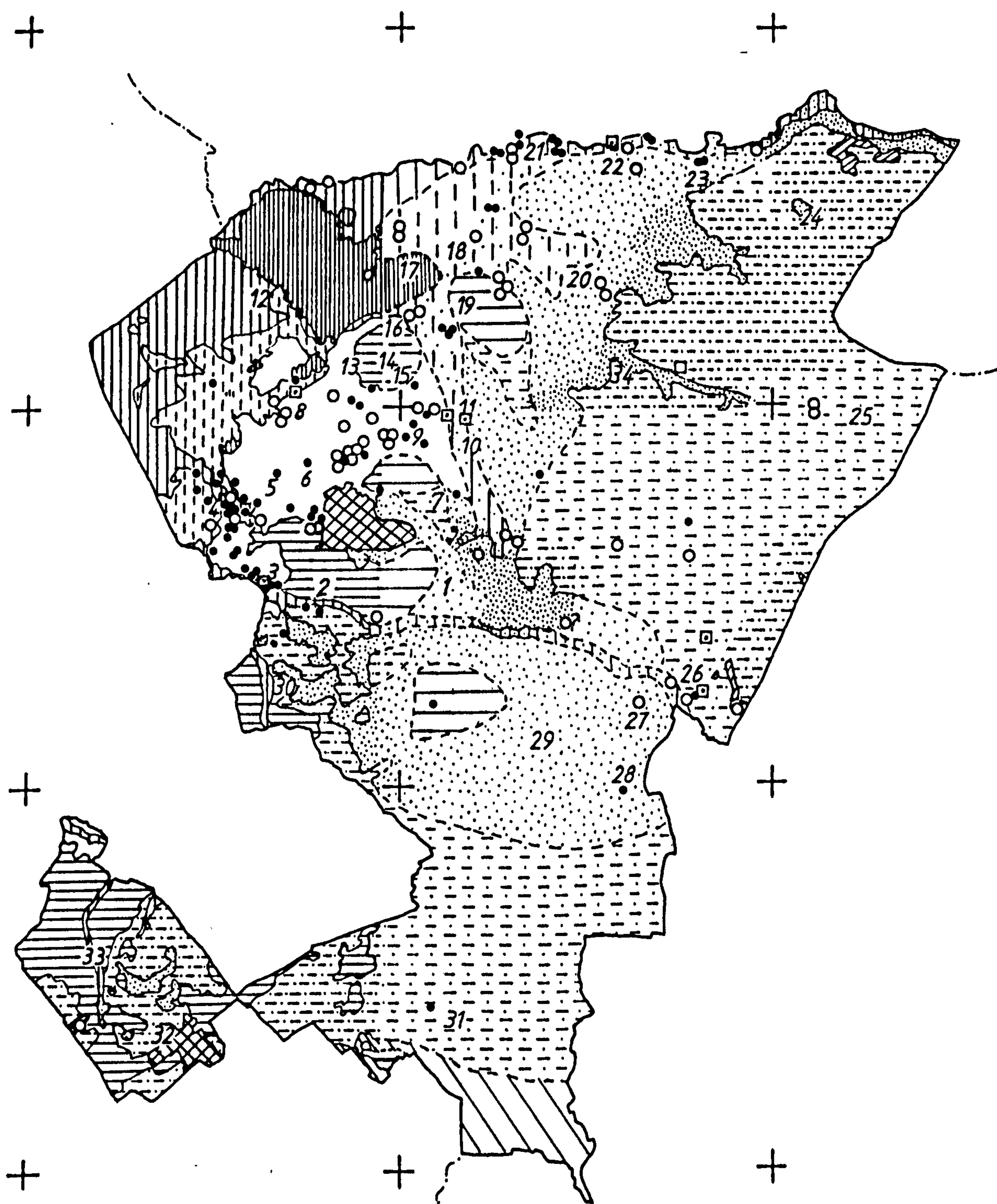
• Round barrow

⊙ 3-10 round barrows

○ Ring-ditch

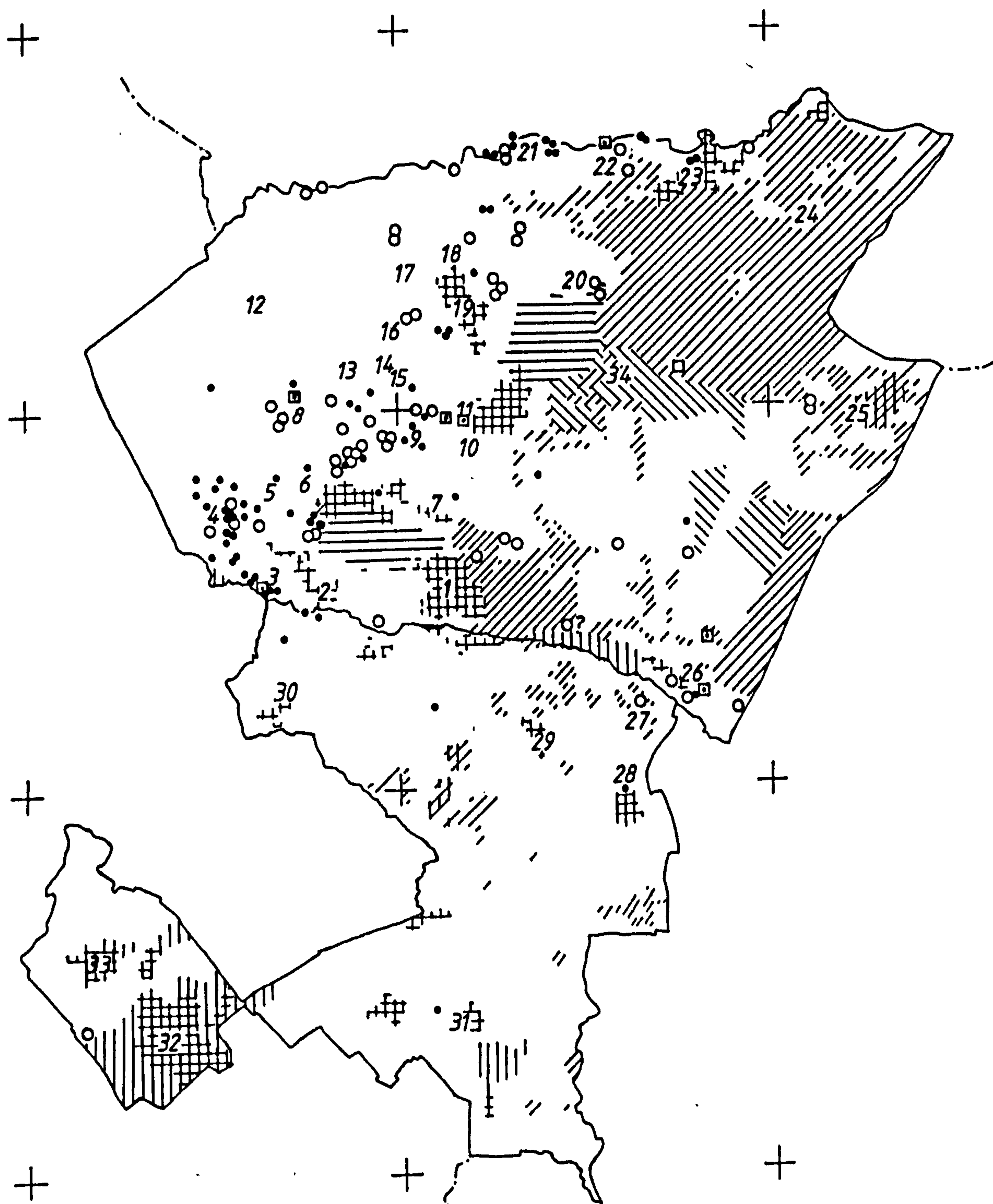
⊙ 3-10 ring-ditches

Map 9. Topography, barrows and ring-ditches (after Martin 1981, with additions).

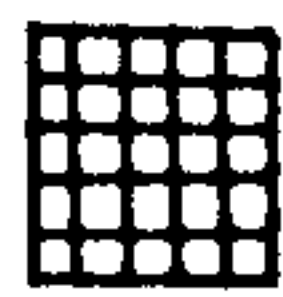


Map 10. Soil types

(based on Seale 1975 and Corbett 1973).



Woodland



Built up



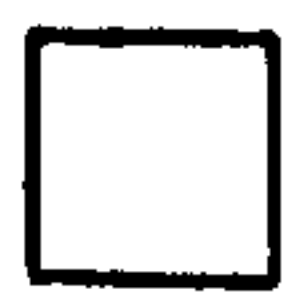
Heathland



Airfield

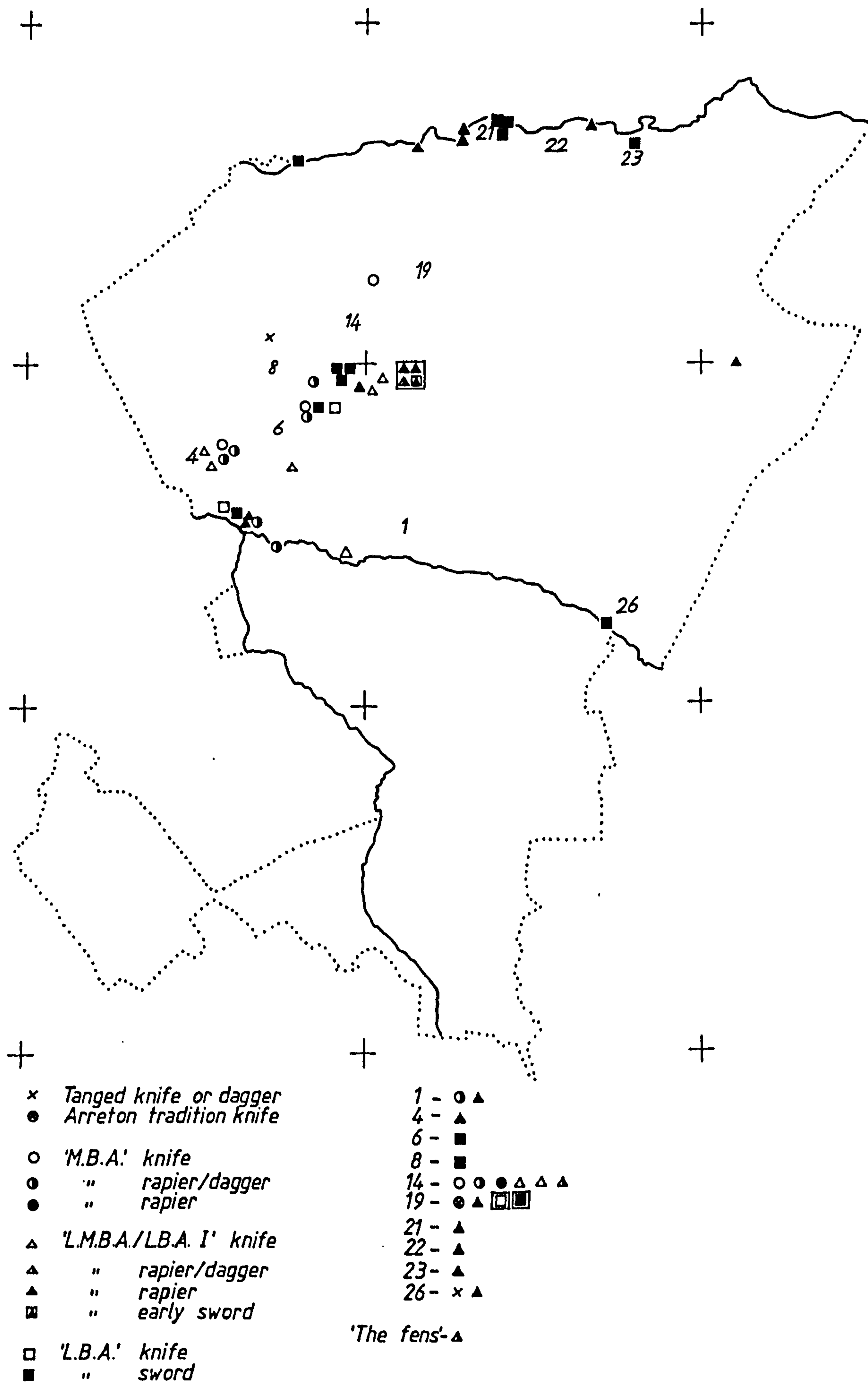


Grassland

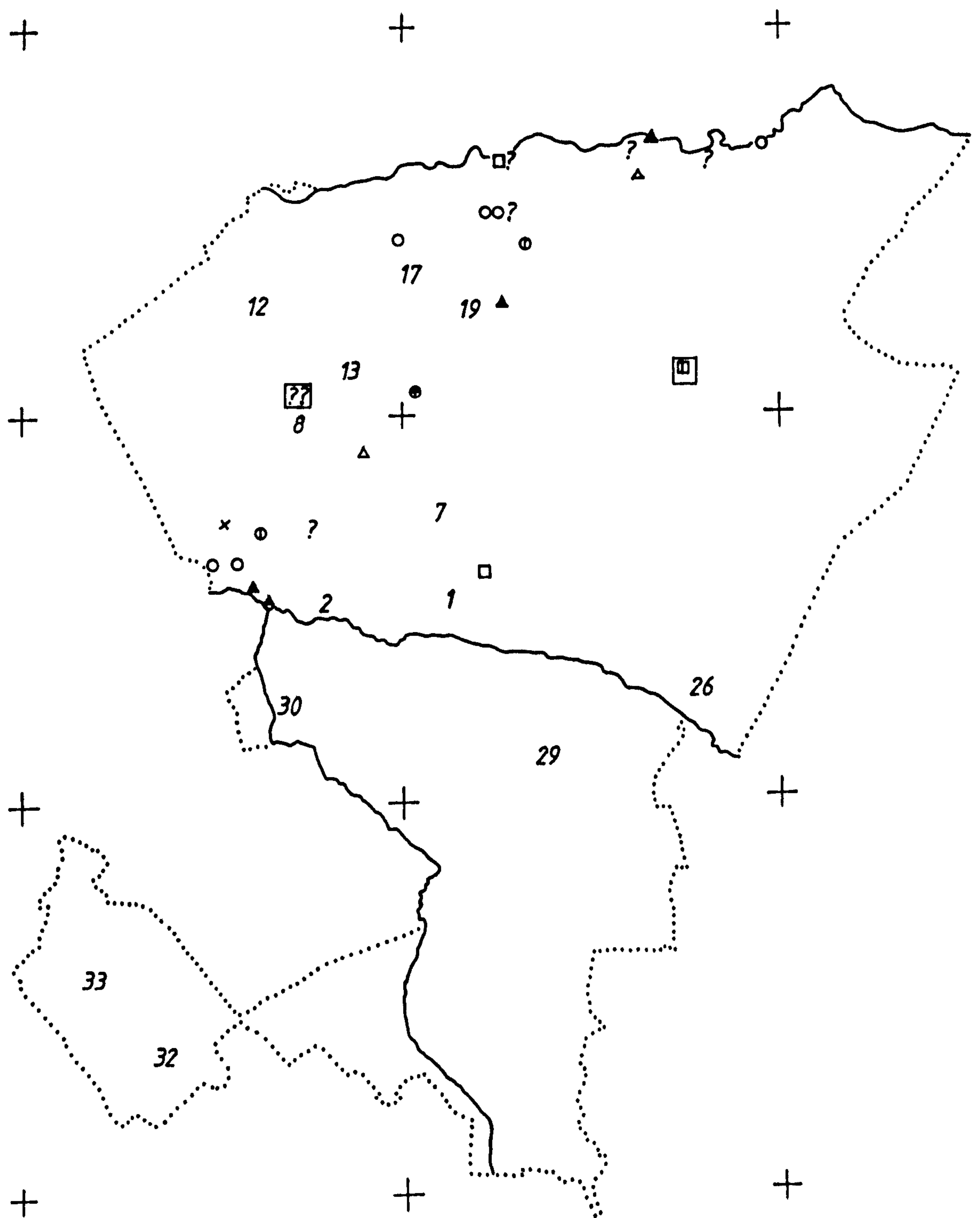


Mainly arable

Map 11. Land use.

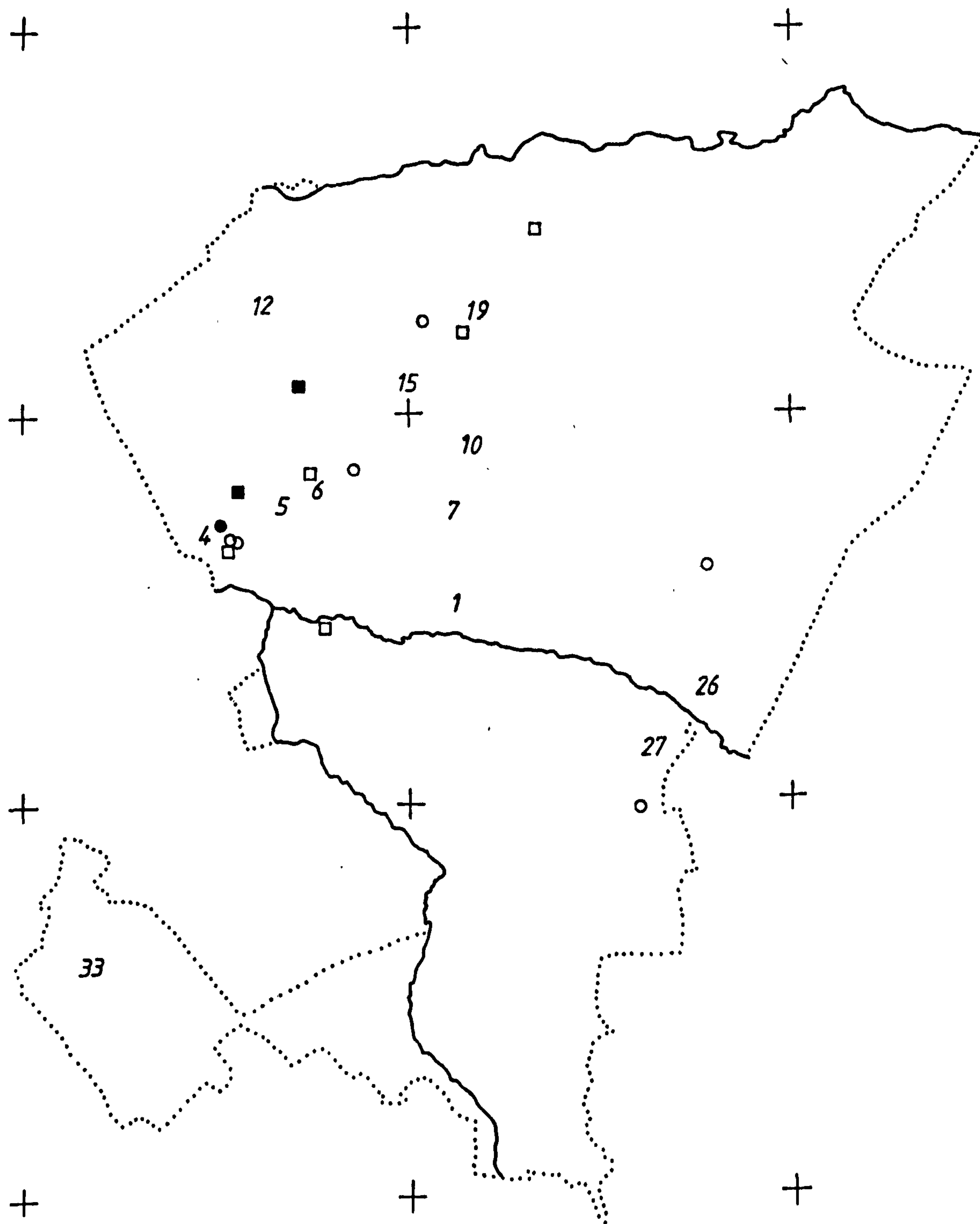


Map 13. Knife, dagger, rapier & sword distribution



| | <15 cm. | 15-20 cm. x | 20-25 cm. | >25 cm. | |
|-------------------|------------|-------------------|--------------|------------|-------------------|
| Arreton tradition | | | | | 1 - ○ ▲ □ ■ □ □ ? |
| Kite shaped | ⊙ | | | | 2 - ○ ? ? |
| Side looped | ○ | ⊙ | ○ | ● | 7 - ● |
| Basal looped | △ | ▲ | ▲ | ▲ | 8 - ○ |
| Pegged | □ | ▣ | ▣ | ■ | 12 - ⊙ □ |
| ? = form unknown | | | | | 13 - ■ |
| | | | | | 17 - ○ ▲ ? □ ▲ ▣ |
| | | | | | 19 - ▲ □ ■ |
| | | | | | 26 - ■ |
| | | | | | 29 - □ |
| | | | | | 30 - □ |
| | | | | | 32 - ⊙ |
| | | | | | 33 - [?+] |

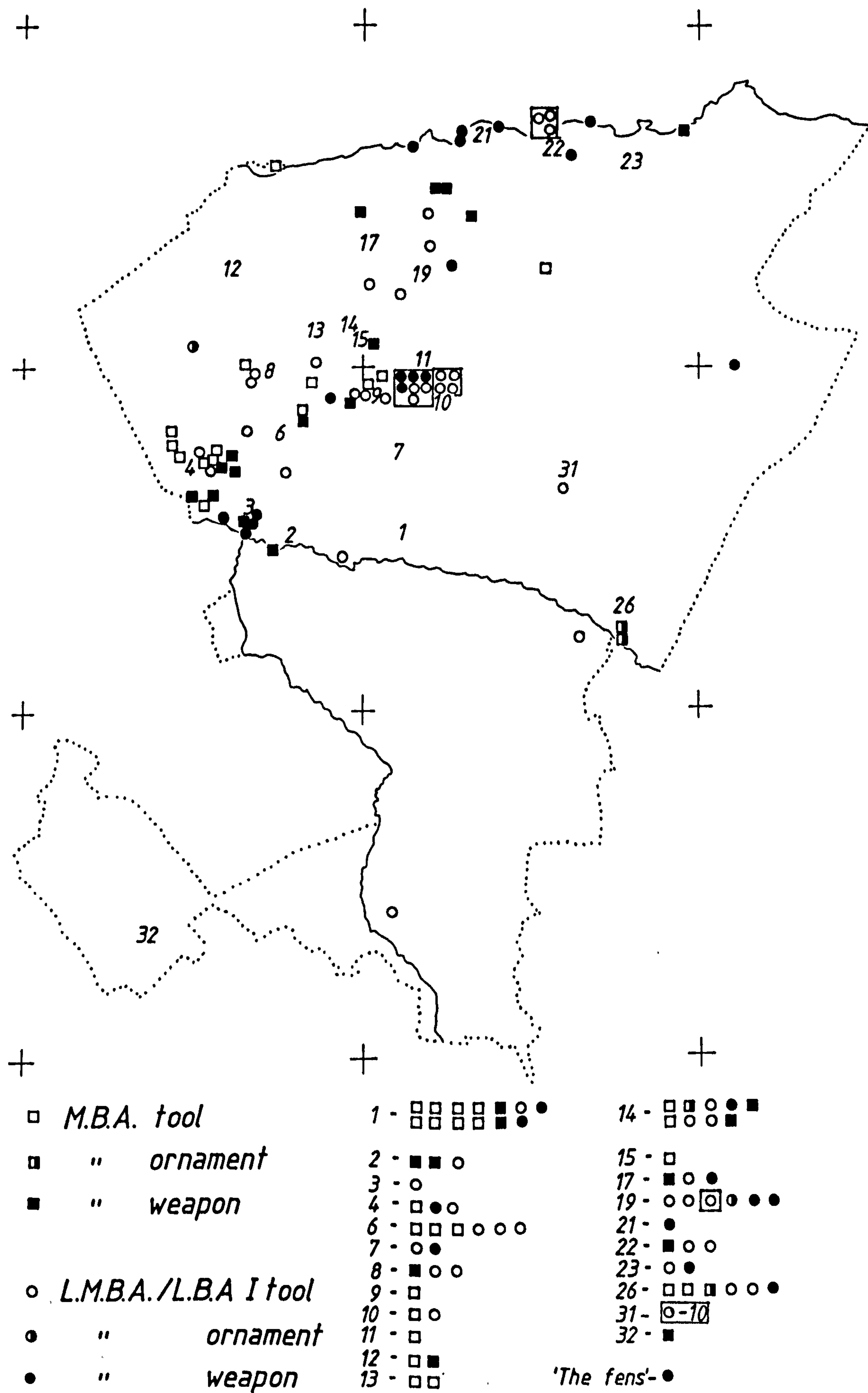
Map 14. Spearhead distribution



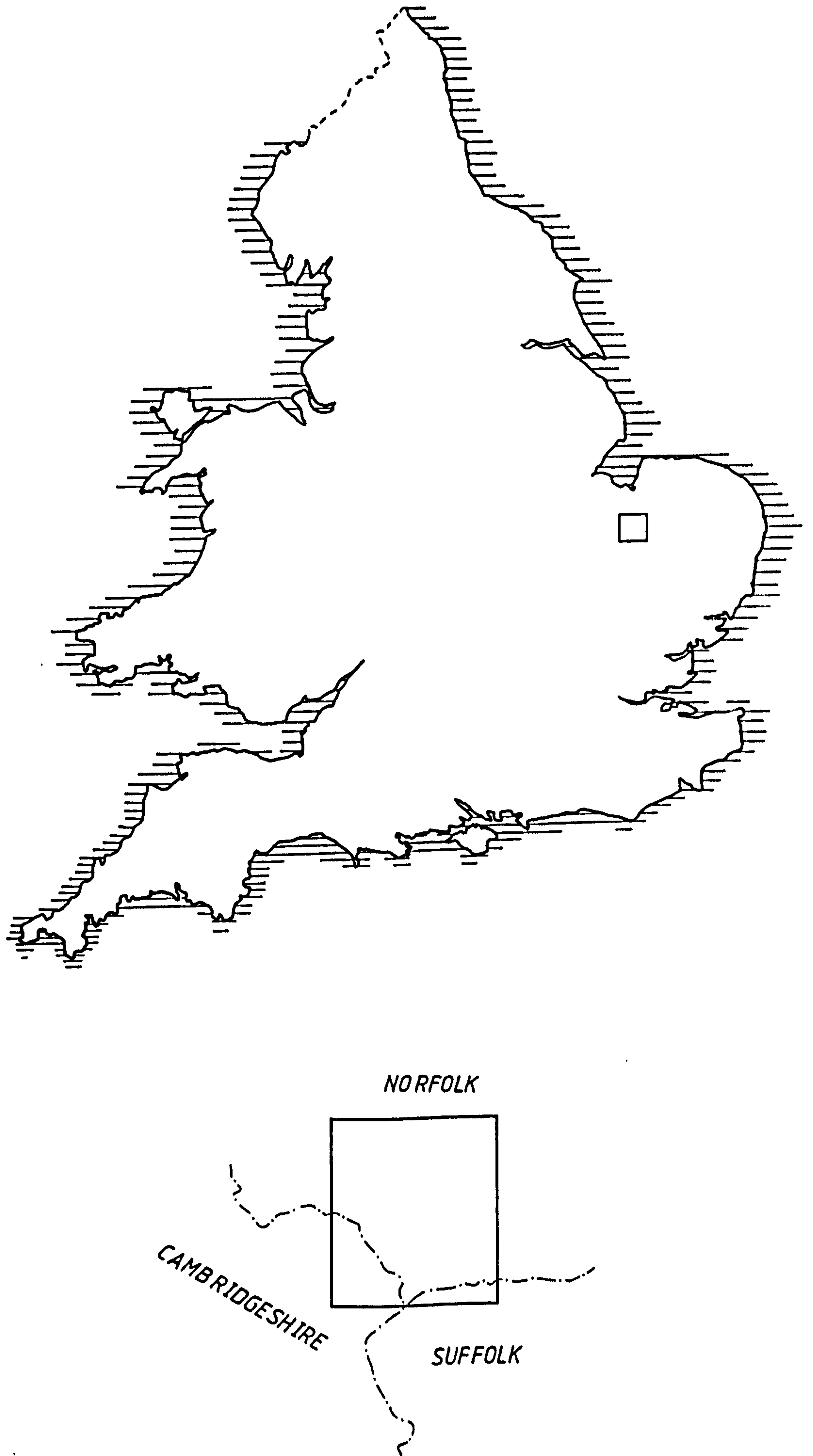
- E.B.A. 'tool'
- " 'weapon'
- L.E.B.A. 'tool'
- " 'weapon'

- | | |
|---|-----------|
| 1 - □ | 15 - □ |
| 4 - □○ | 19 - □● |
| 5 - □ | 26 - □□□■ |
| 6 - □□□○ | 27 - ○ |
| 7 - □ ○○ ○○ | 33 - □□ |
| 10 - □ | |
| 12 - ○ | |

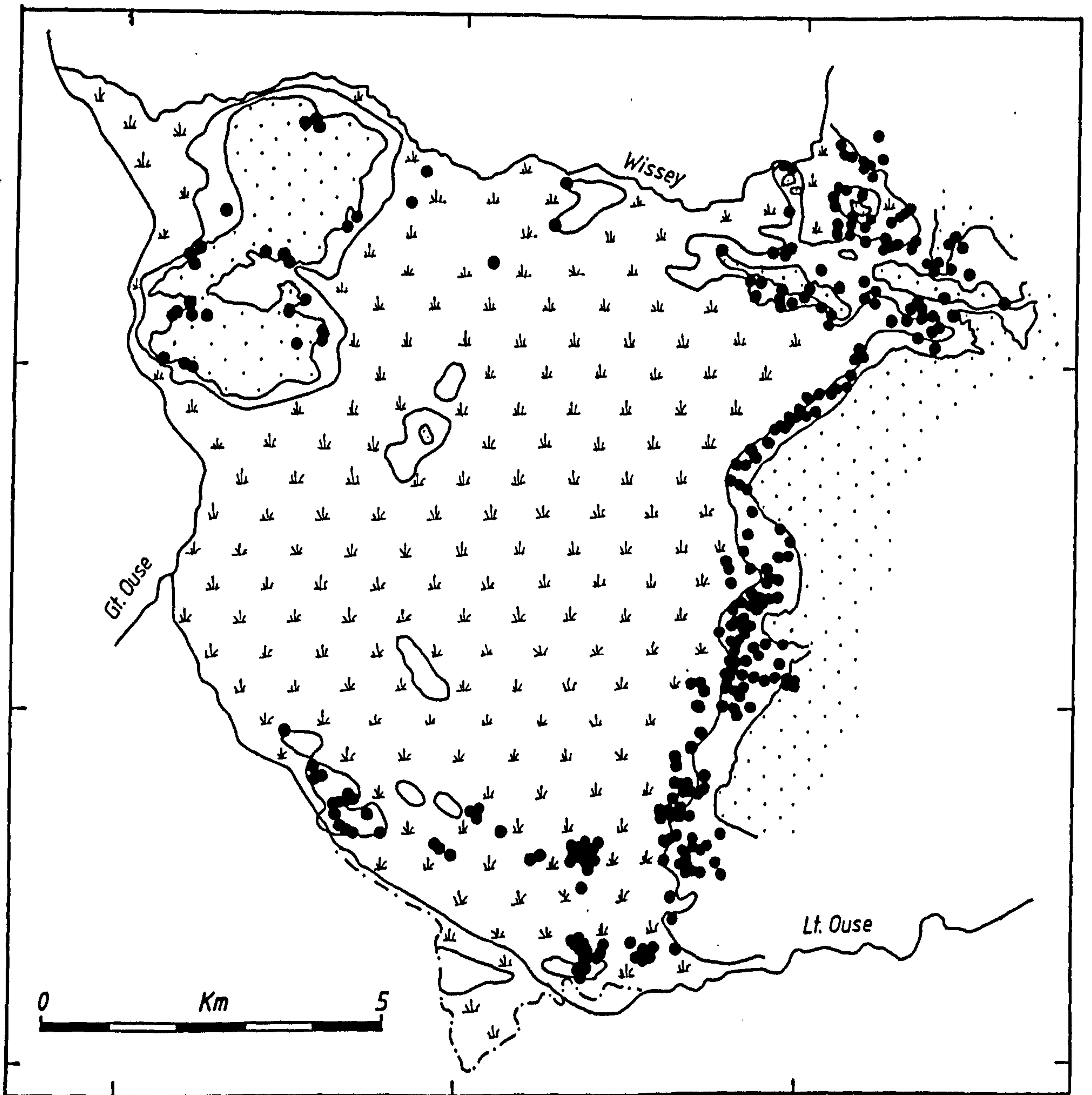
Map 15. Early bronze age tool & weapon distribution



Map 16. Middle bronze age tool, weapon & ornament distribution

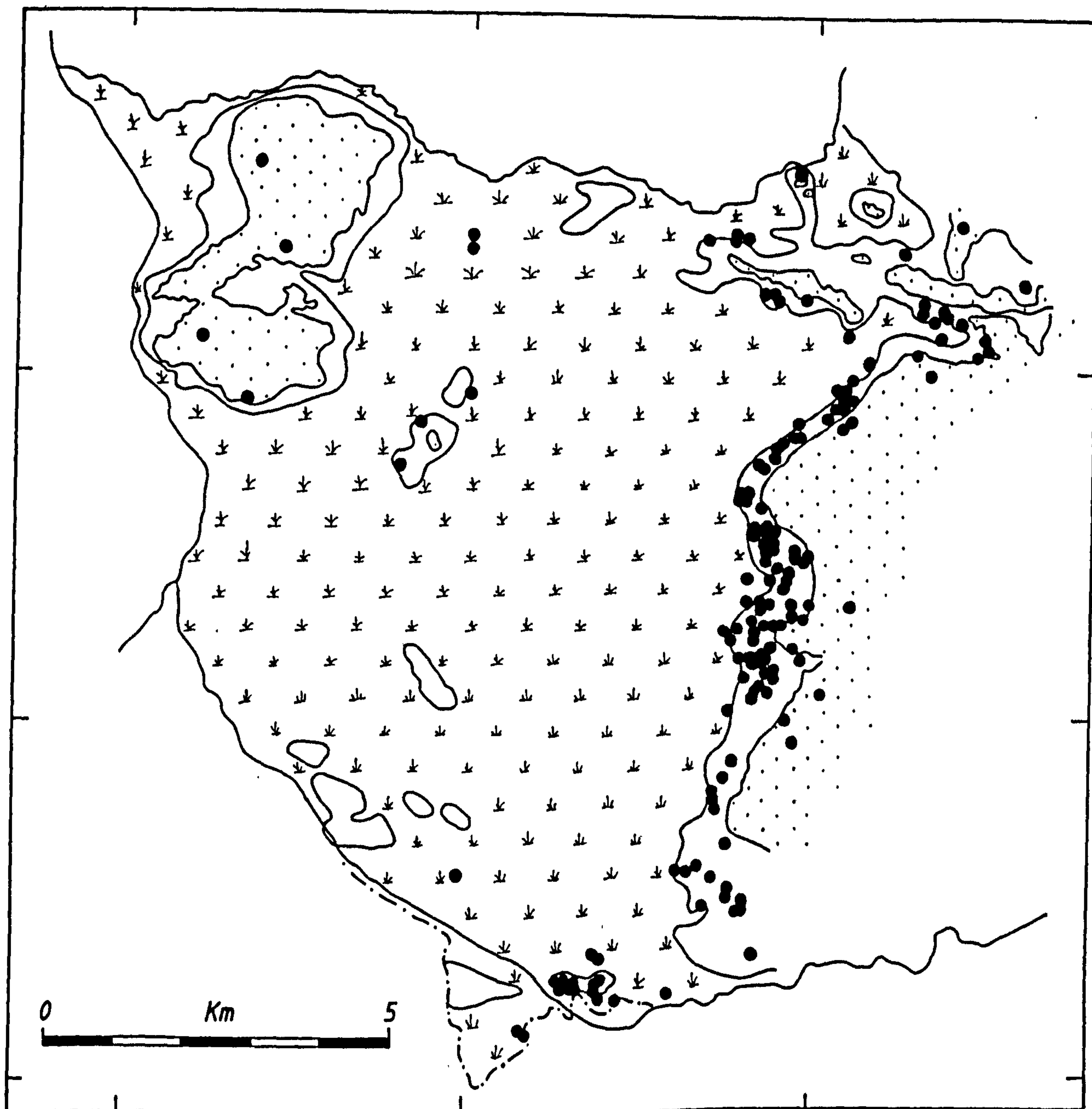


Map 18. South-west Norfolk study area location map



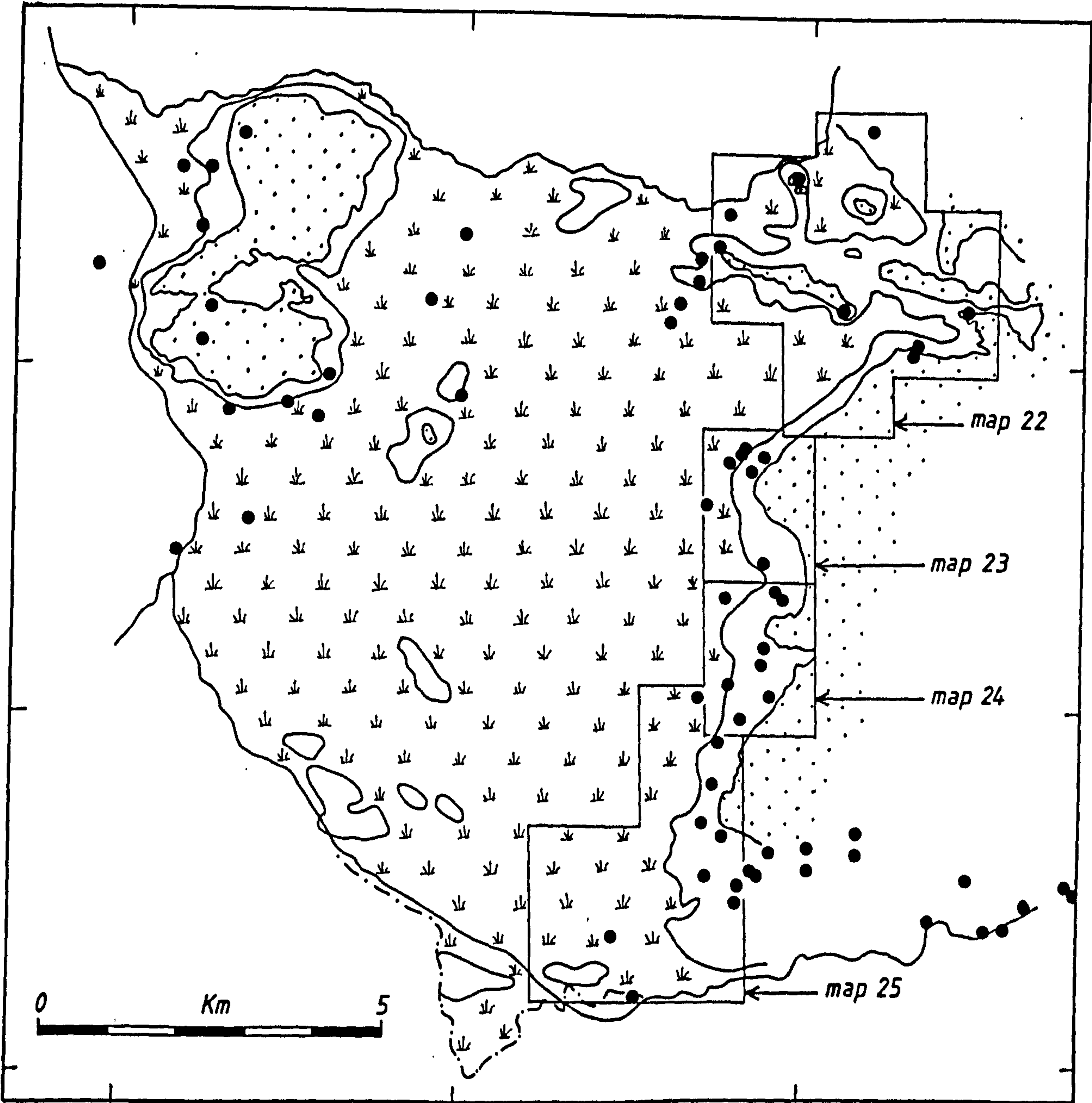
Map 19. Burnt flint patches (after Silvester 1991)



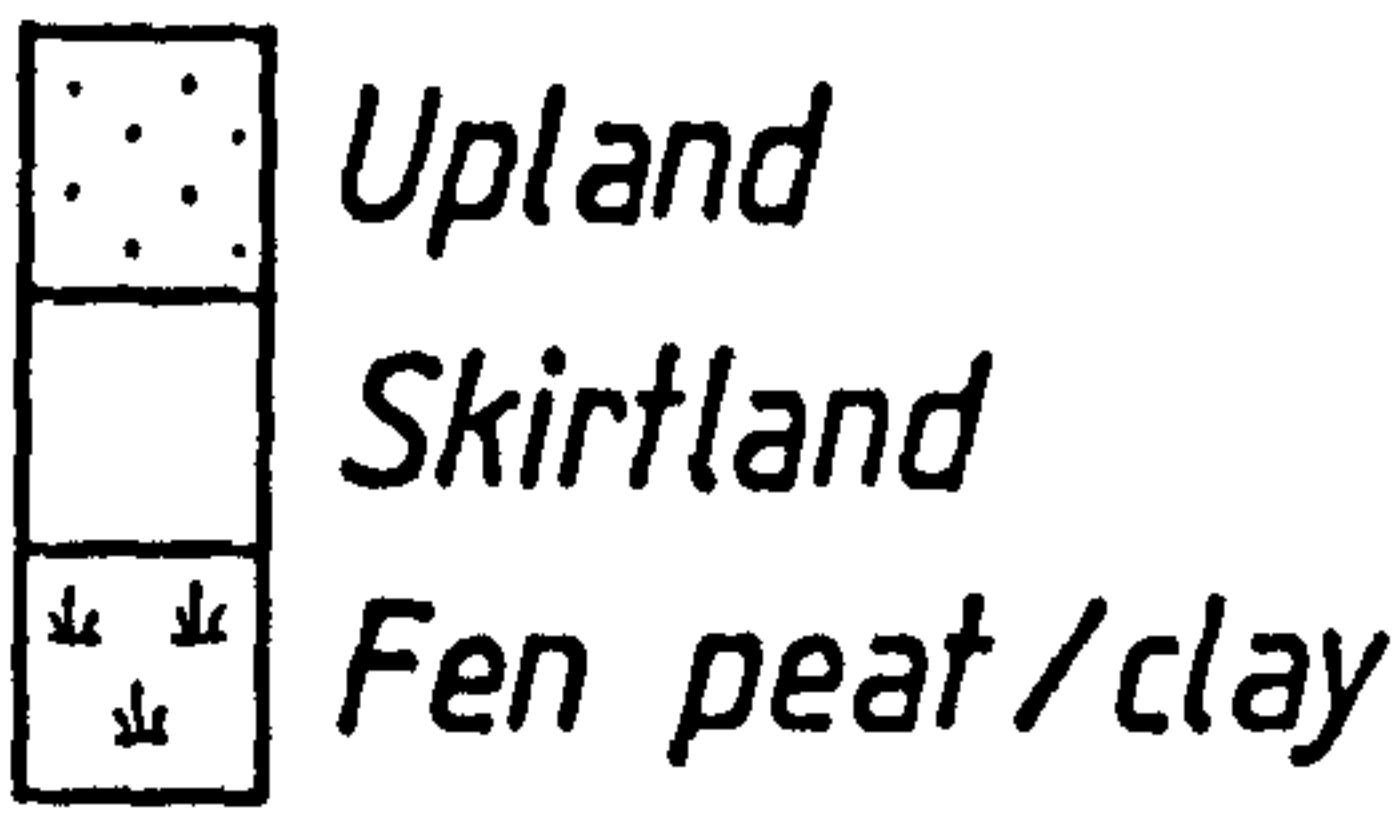


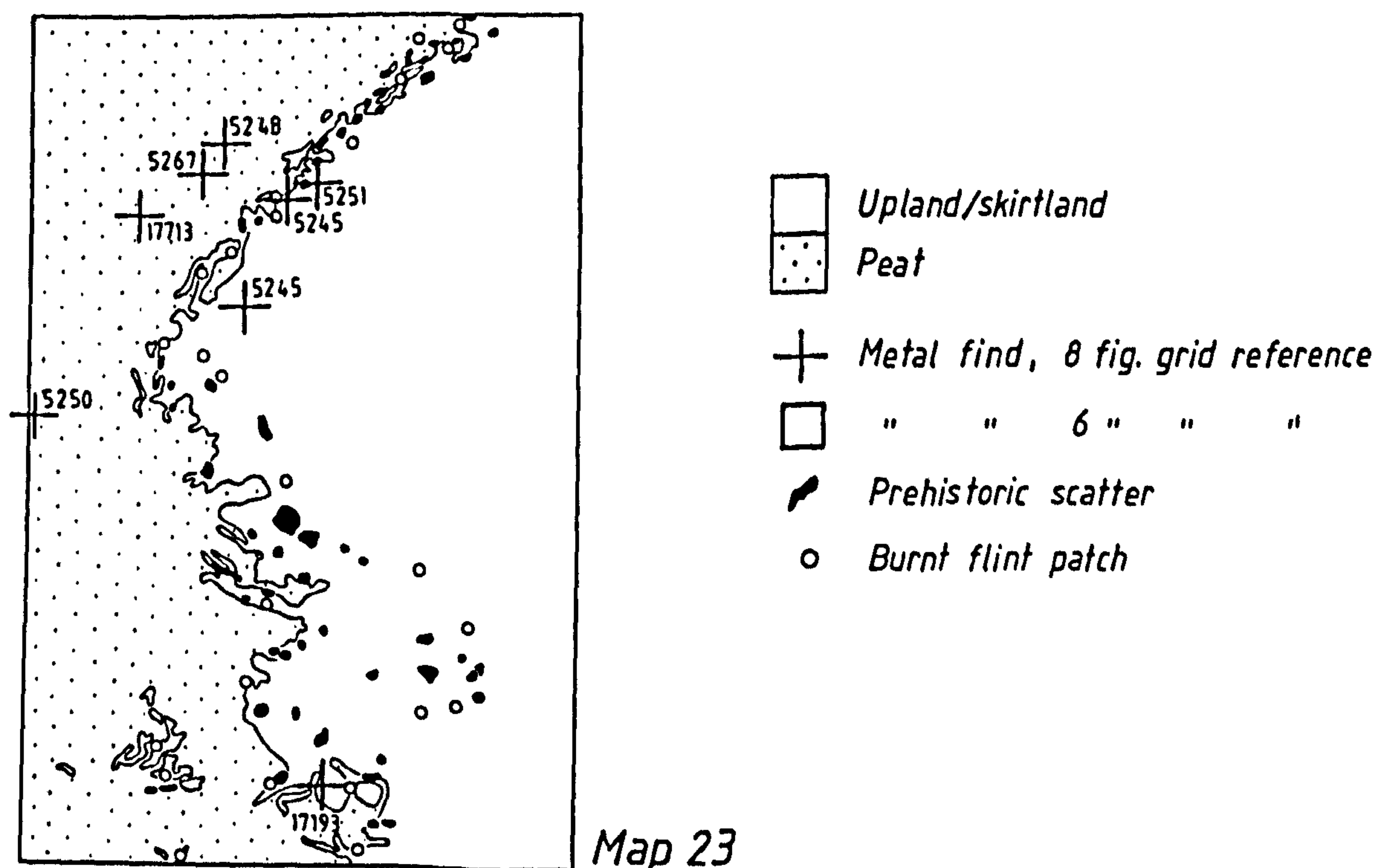
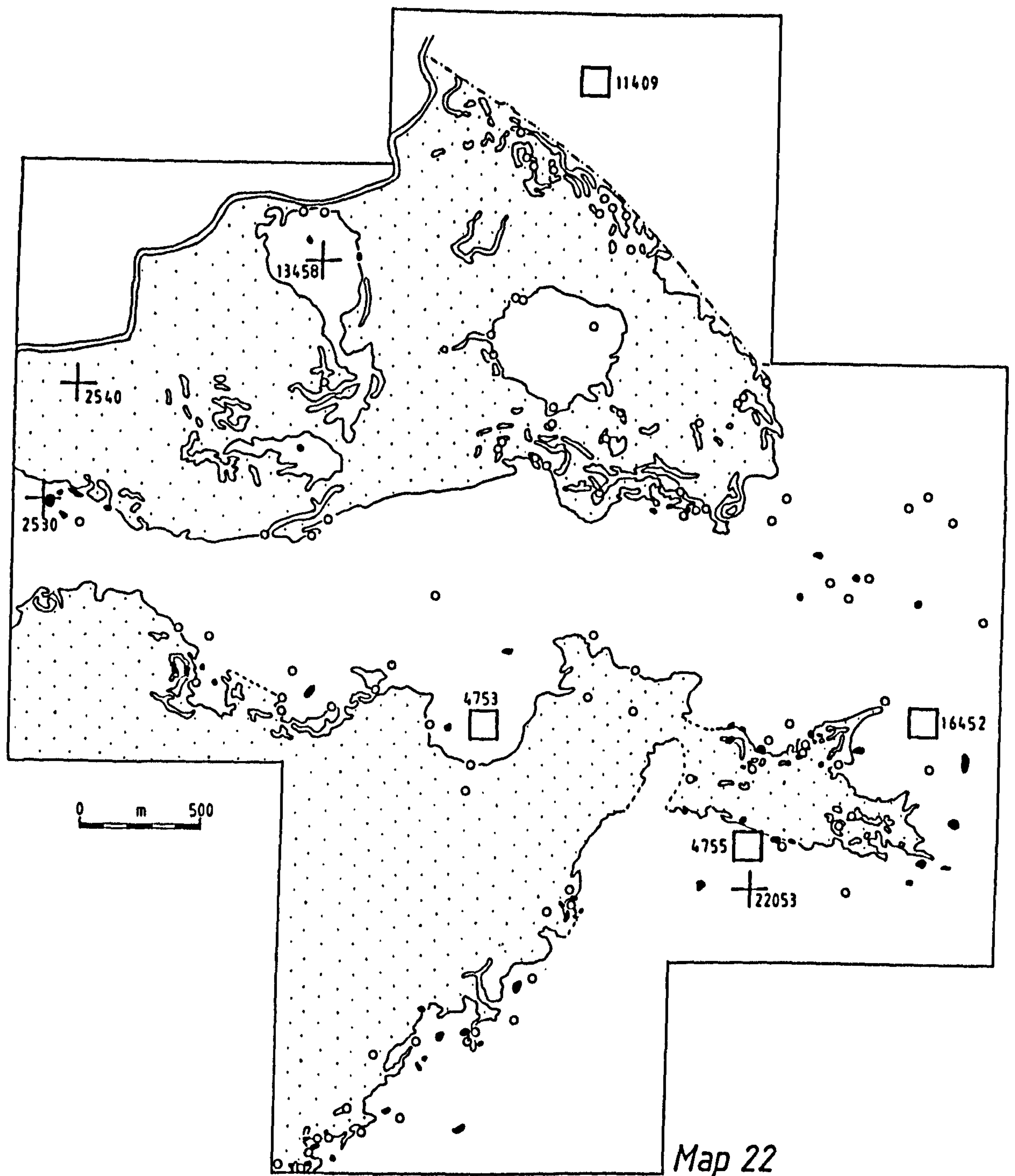
Map 20. Prehistoric 'scatters' (after Silvester 1991)











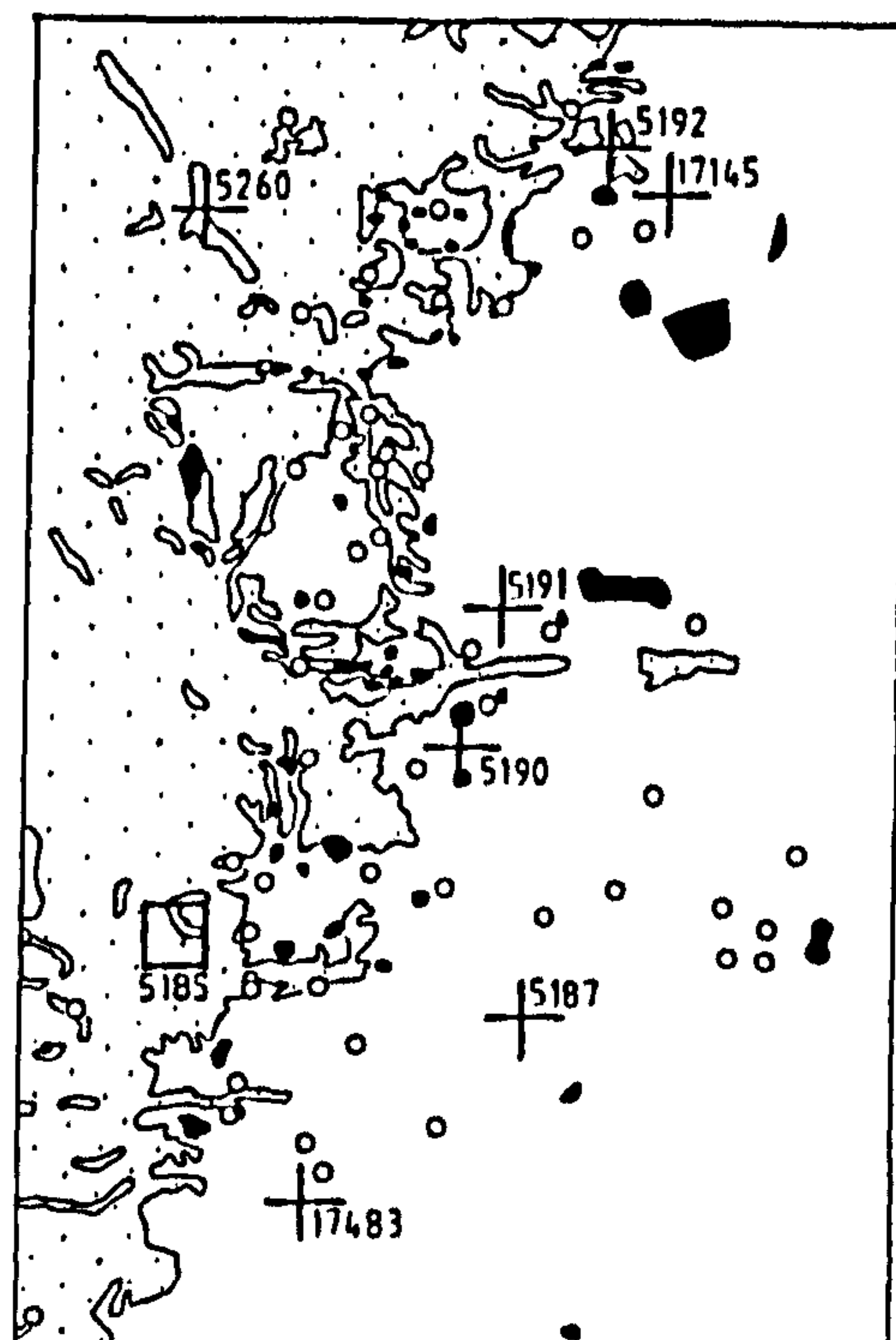
Map 21. Metalwork



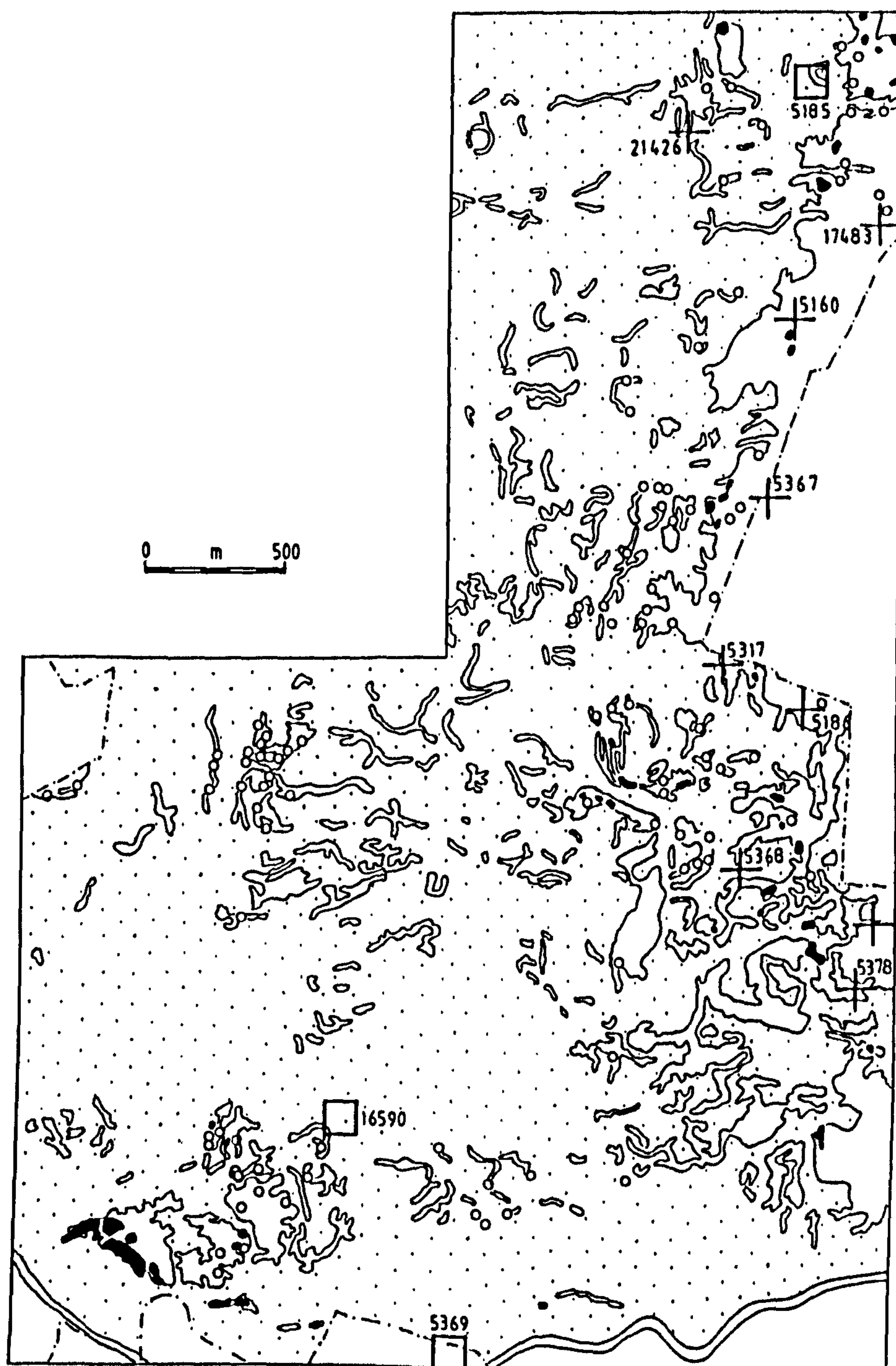


Maps 22 & 23. Metalwork & sites - detail (topography & sites after Silvester 1991)

-  Upland/skirtland
-  Peat
-  Metal find, 8 fig. grid reference
-  " " 6 " " "
-  Prehistoric scatter
-  Burnt flint patch

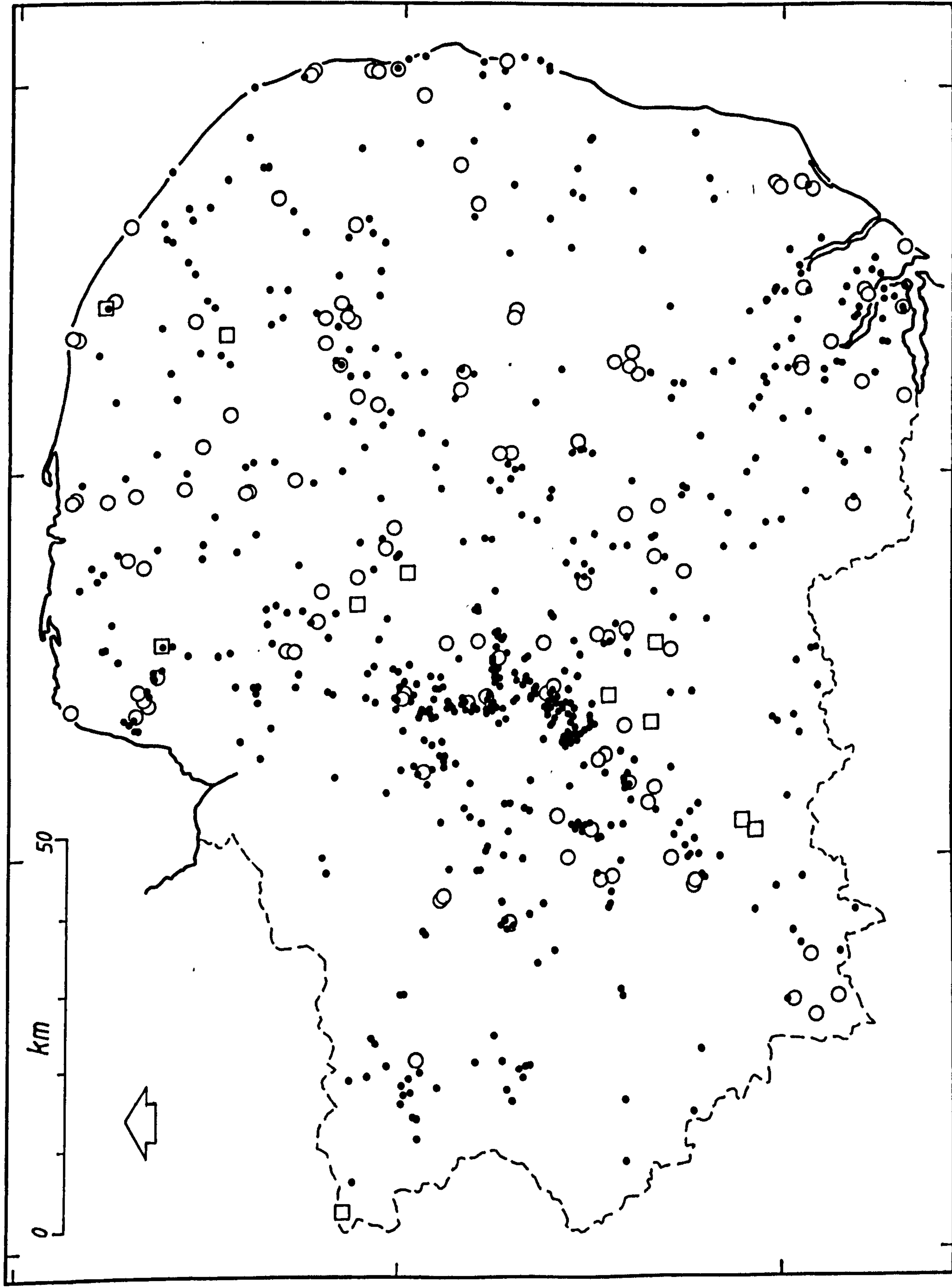


Map 24



Map 25

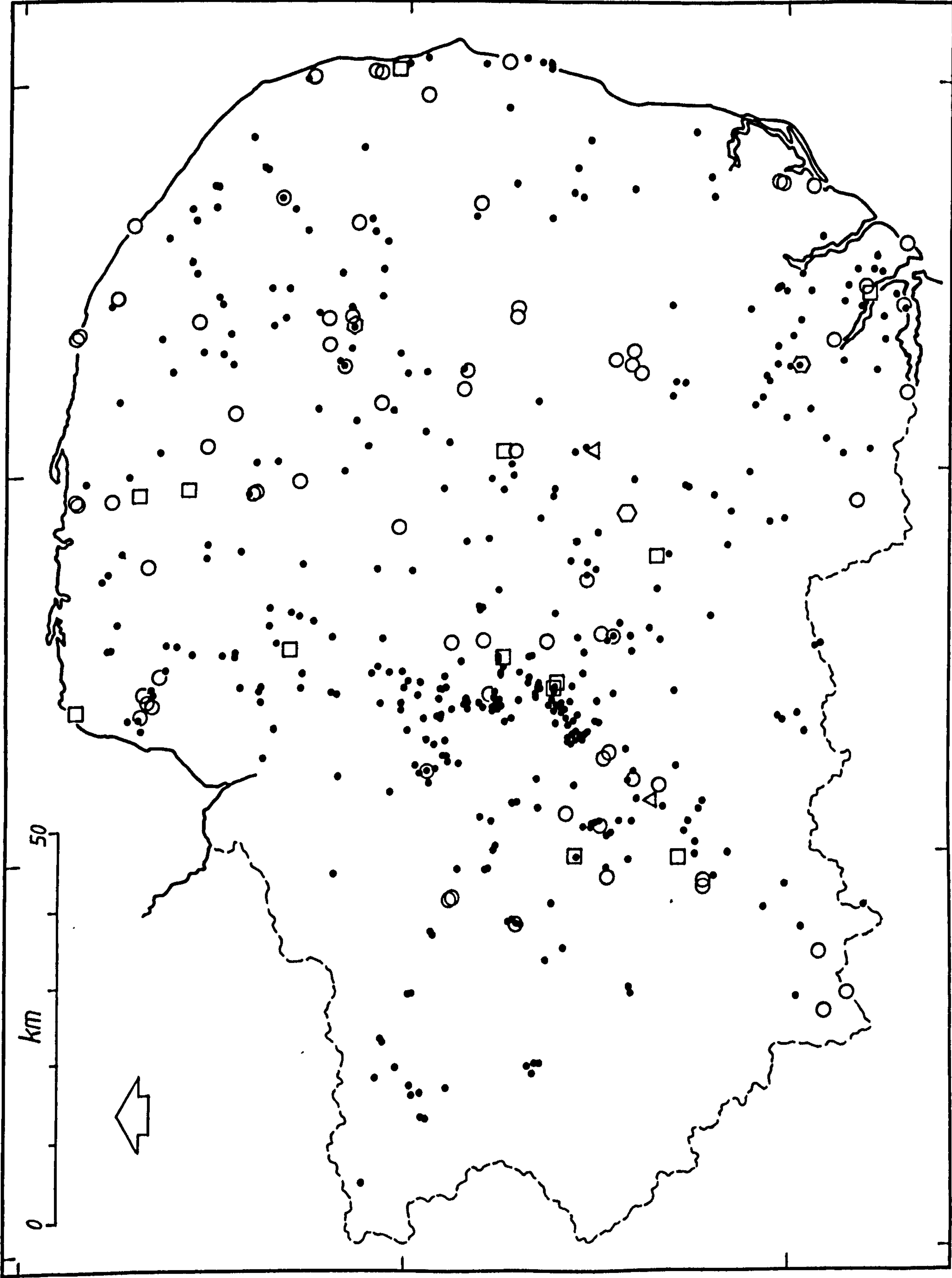
Maps 24 & 25. Metalwork & sites - detail (topography & sites after Silvester 1991)



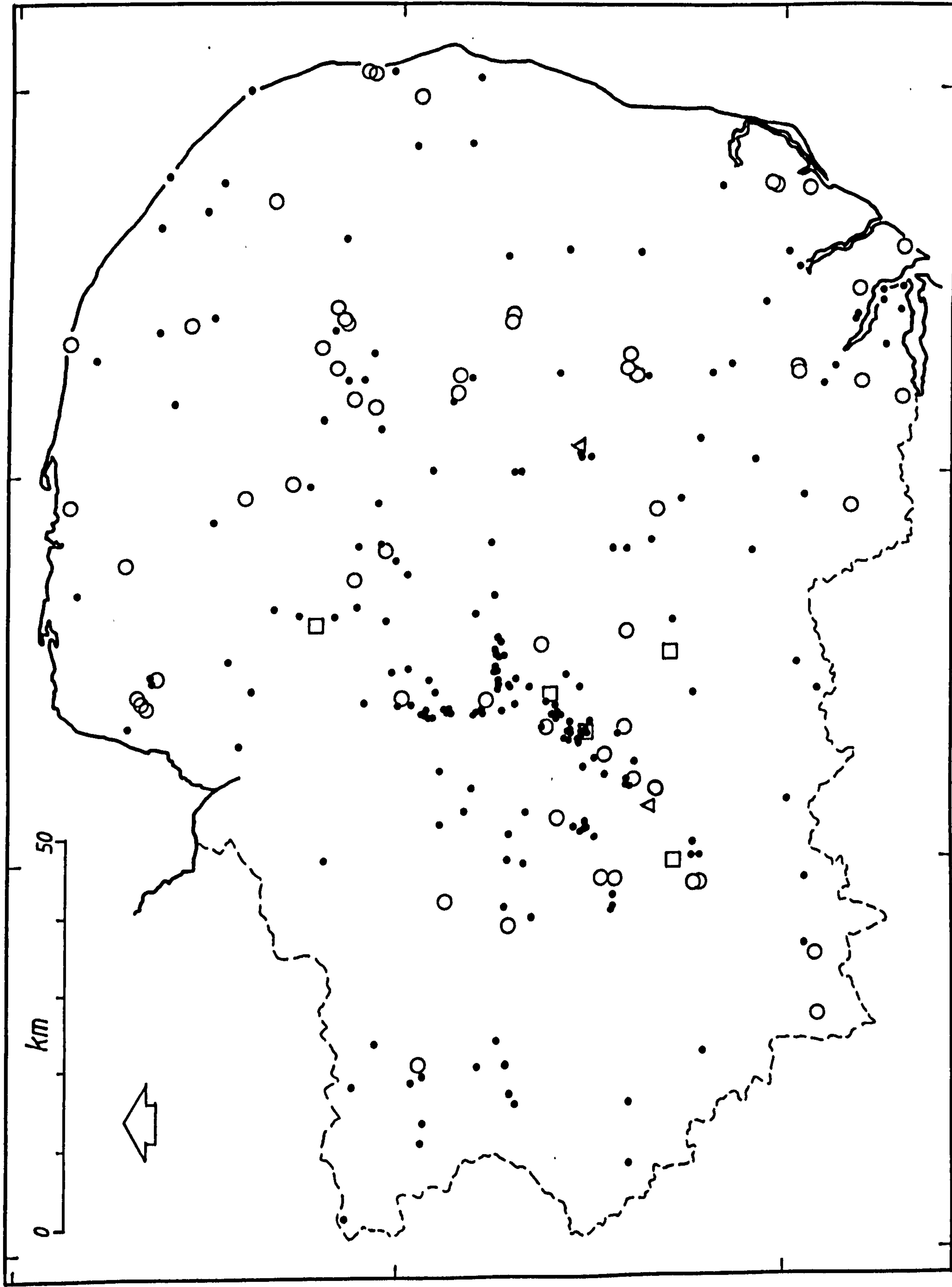
- *Single find*
- *Within barrow*
- *Hoard*

Map 26. Northern East Anglia: all plotted finds

- single finds
- △ in EBA hoards
- " MBA "
- " LBA "
- ◊ " undated "

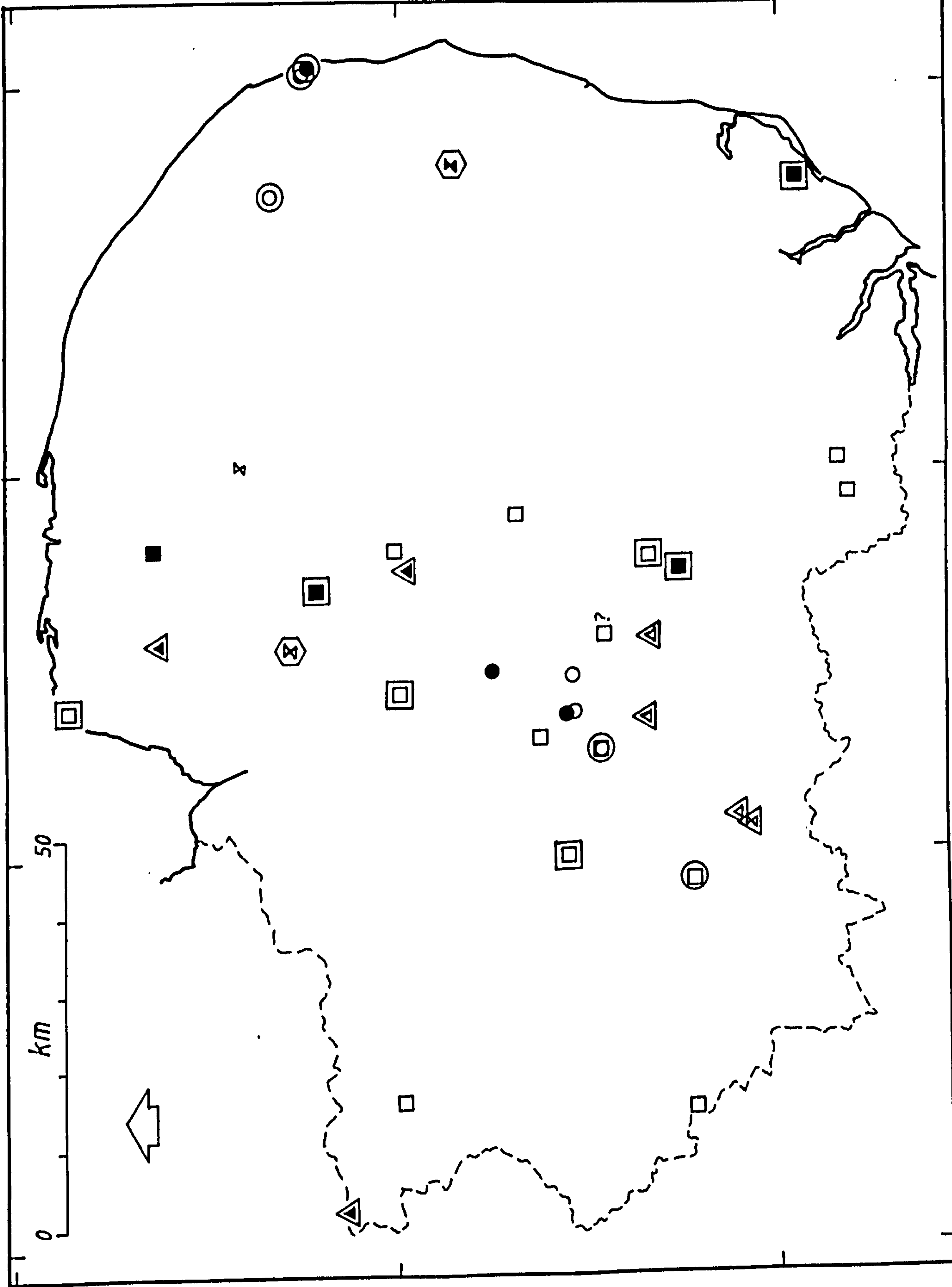


Map 27. Tools



Map 28. Weapons

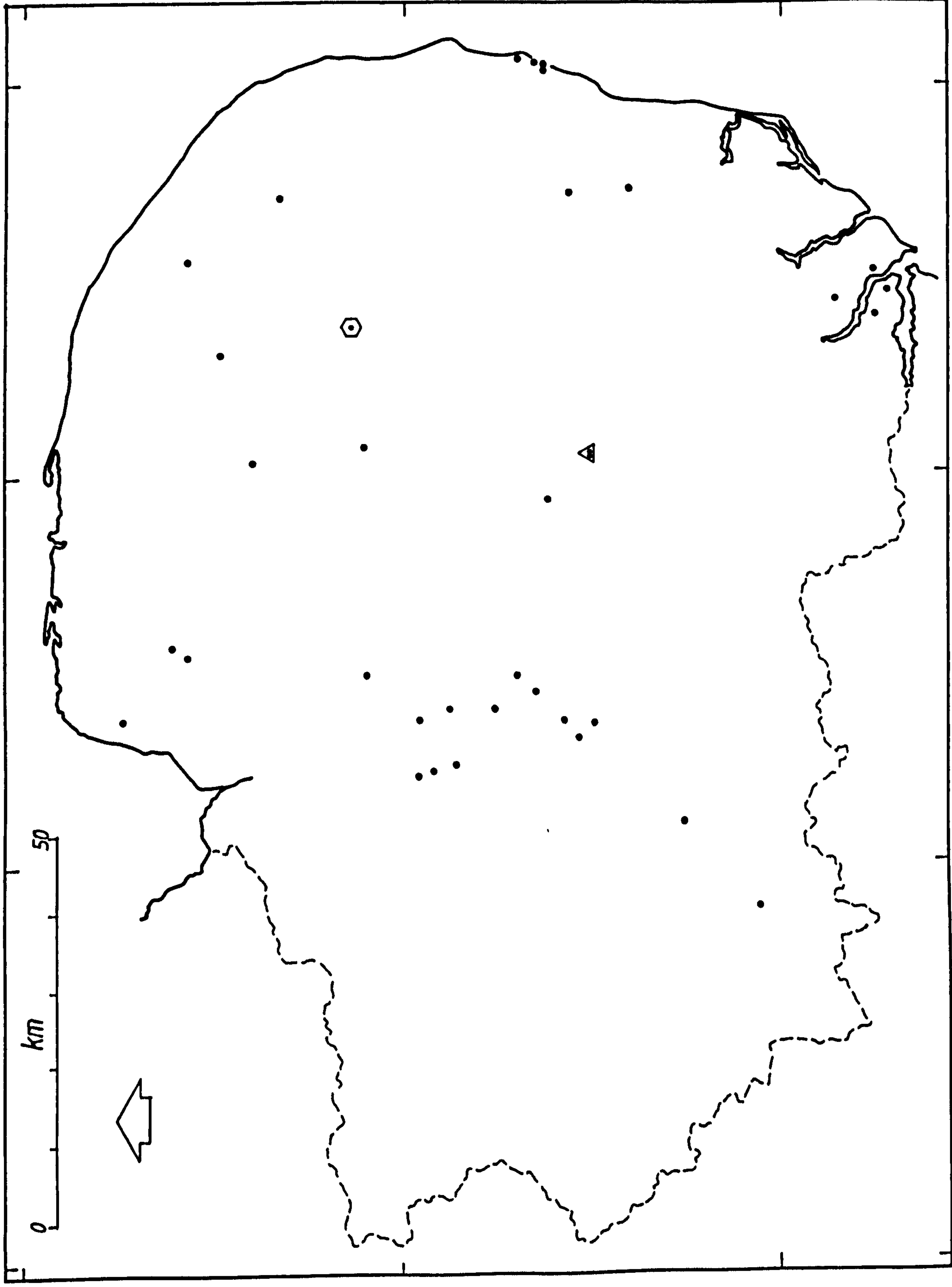
- single finds
- △ in EBA hoards
- " MBA "
- " LBA or undated hoards



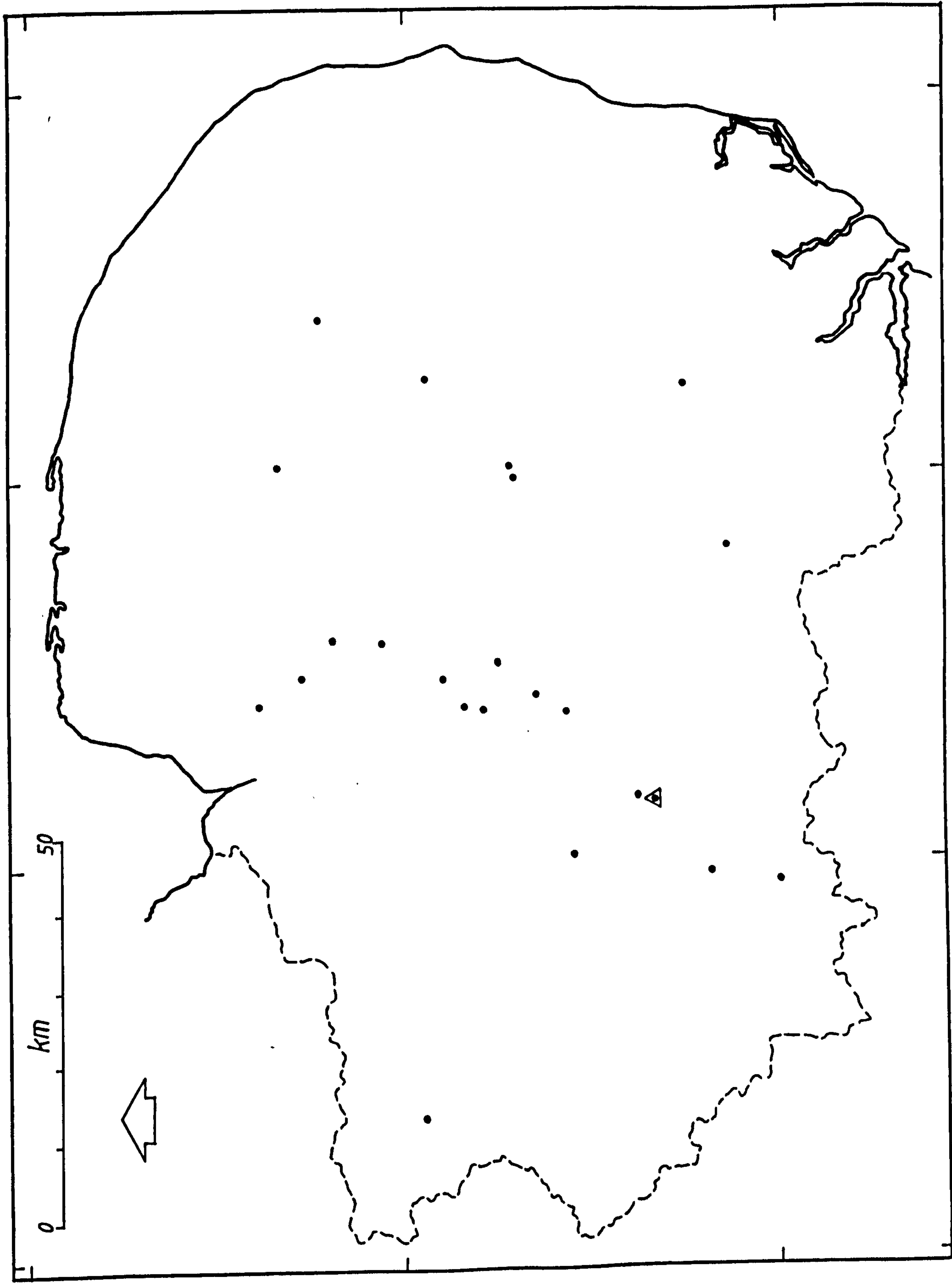
- △ EBA
- MBA
- LBA
- ⌘ Undated
- △ in barrow
- " MBA hoard
- " LBA "
- ⬡ " undated "

Open = bronze
 Infilled = gold

Map 29. Ornaments

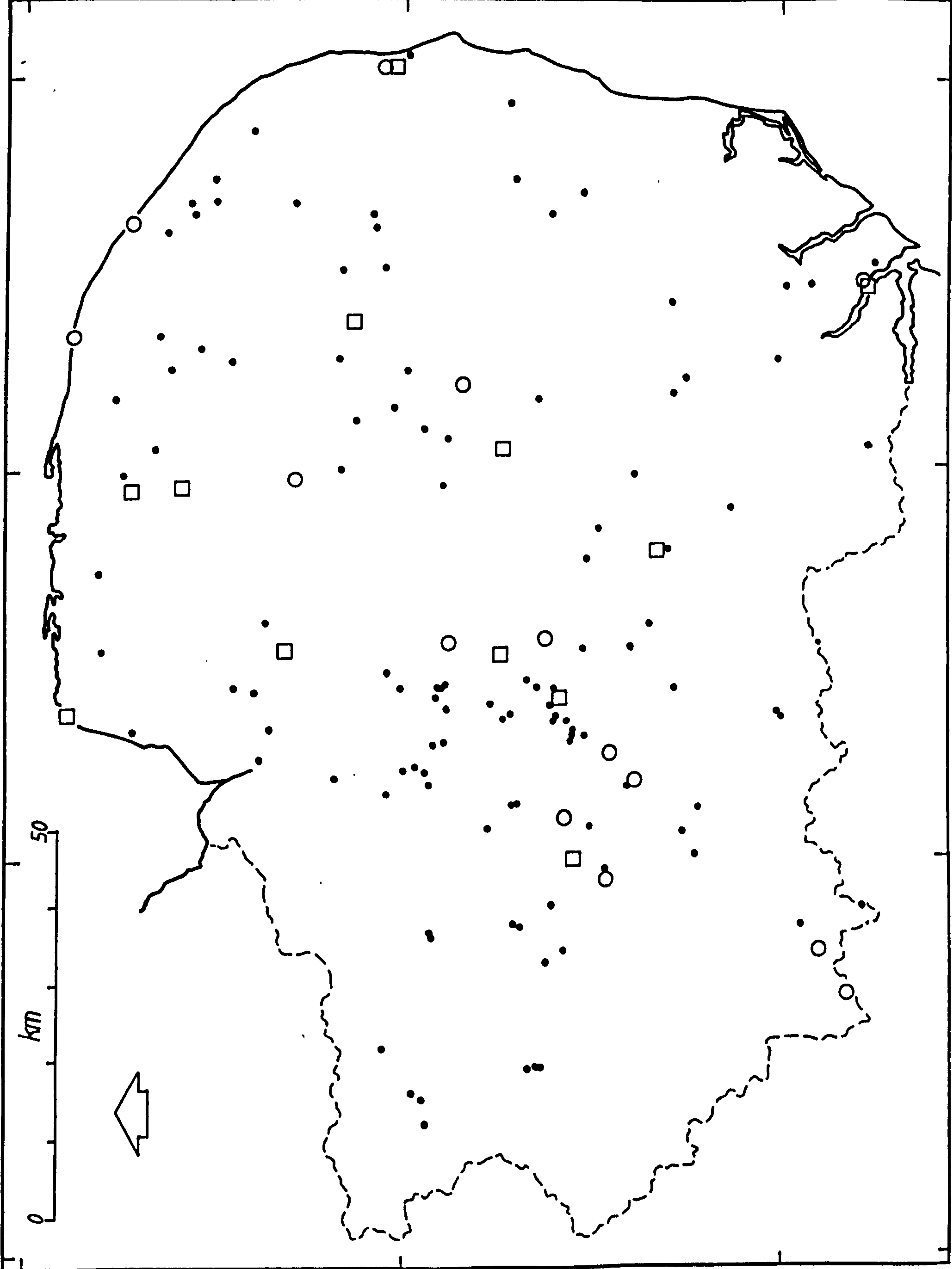


- single finds
- △ in EBA hoards
- " undated "



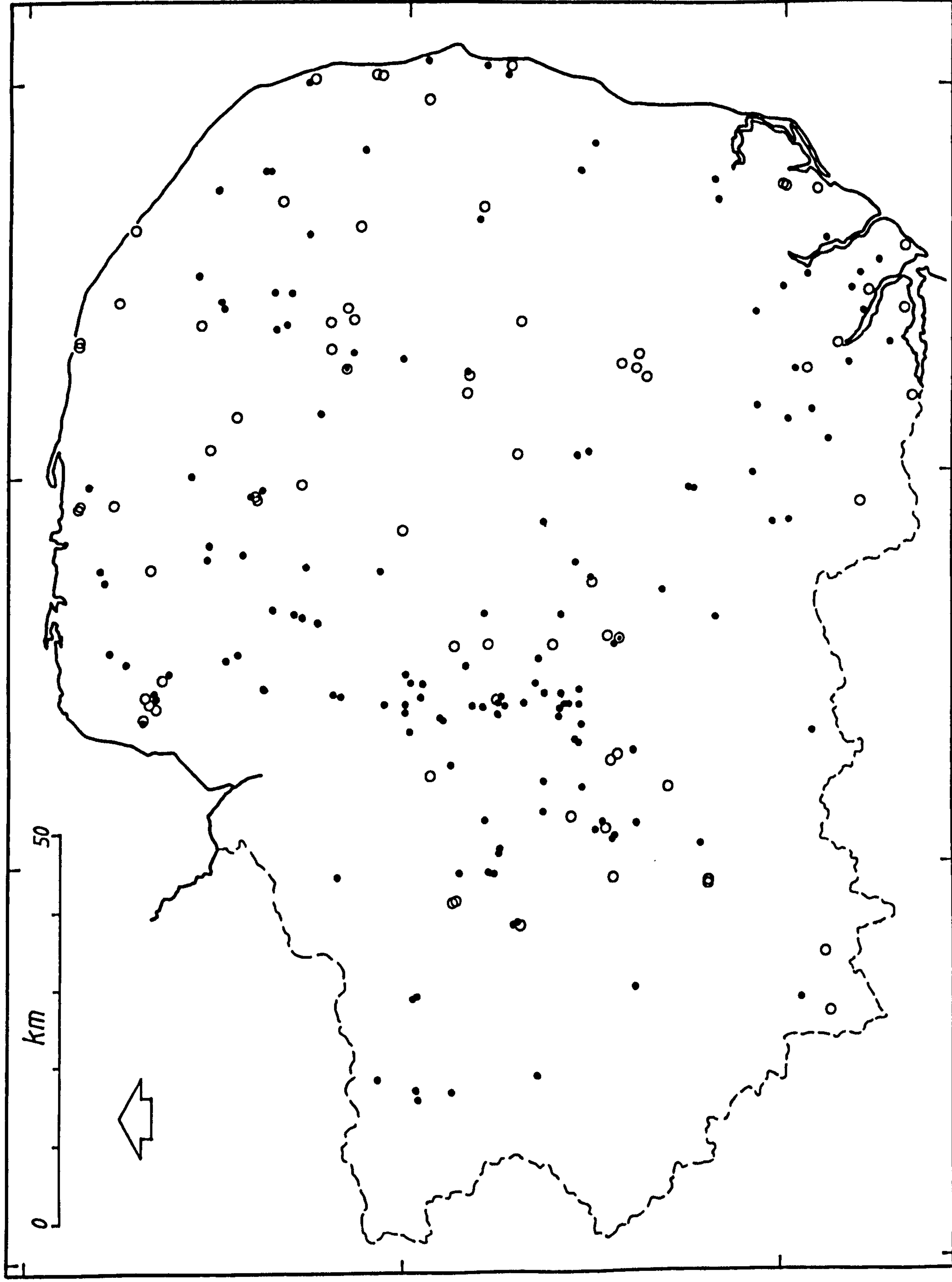
- single finds
- △ in EBA hoards

Map 31. Flanged axes



- single finds
- " MBA hoards
- " LBA "
- moulds only

Map 32. Palstaves

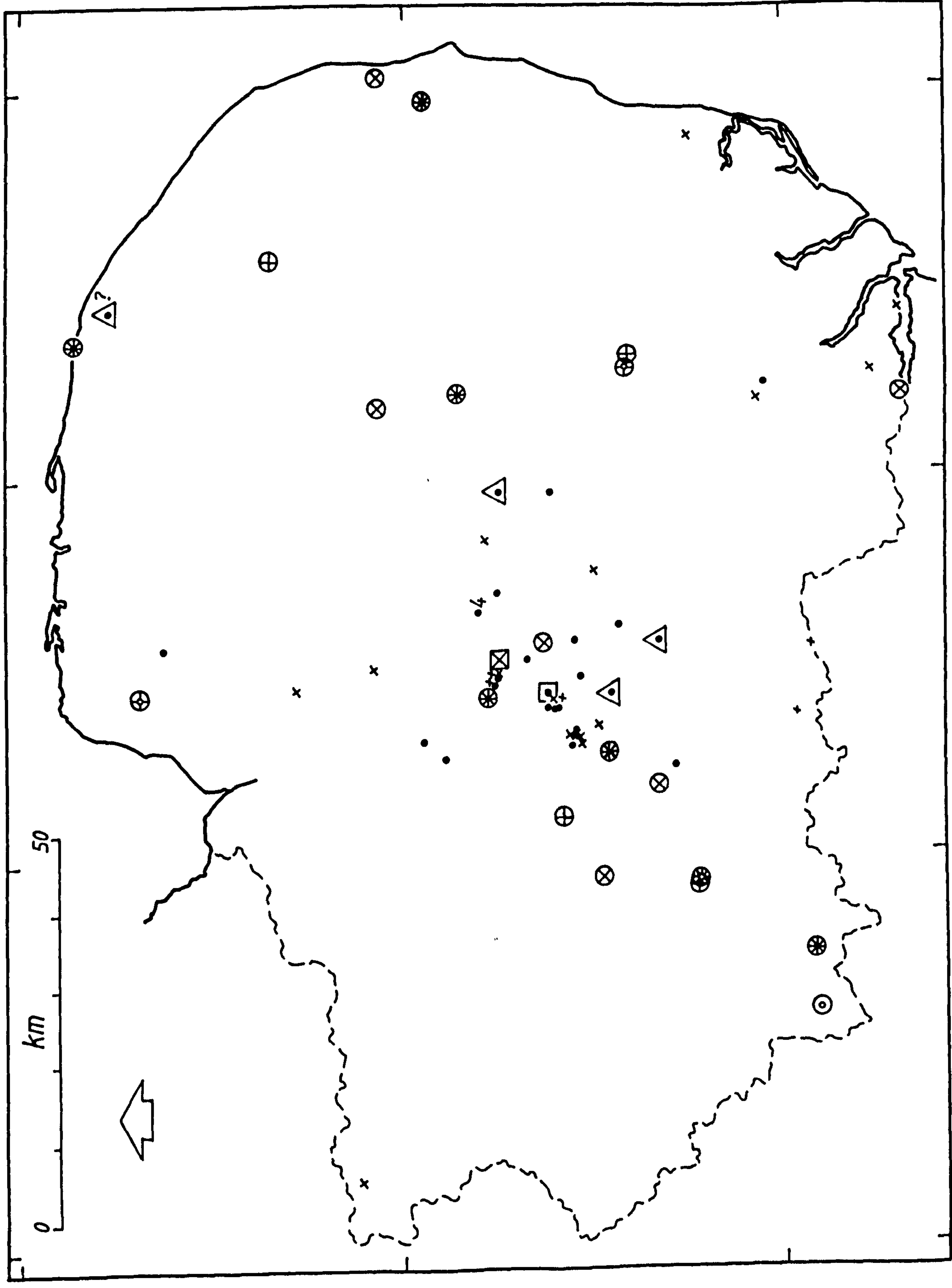


- single finds
- in LBA hoards

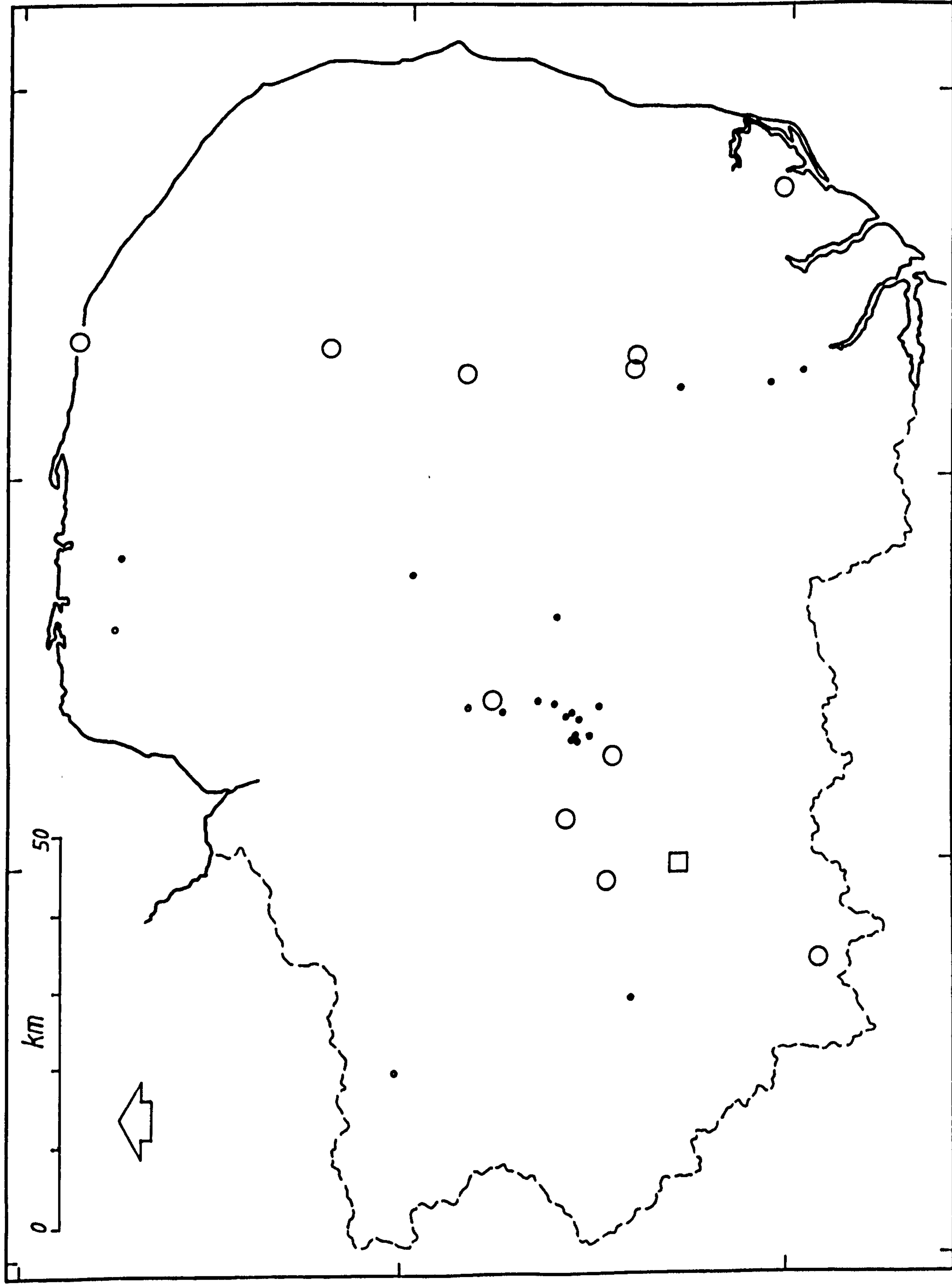
Map 33. Socketed axes

• tracers/awls
 + gouges
 x chisels/leather
 working knives
 △ Barrow burial
 ○ LBA hoards
 □ MBA hoards

⊙ including •
 ⊕ " +
 ⊗ " x

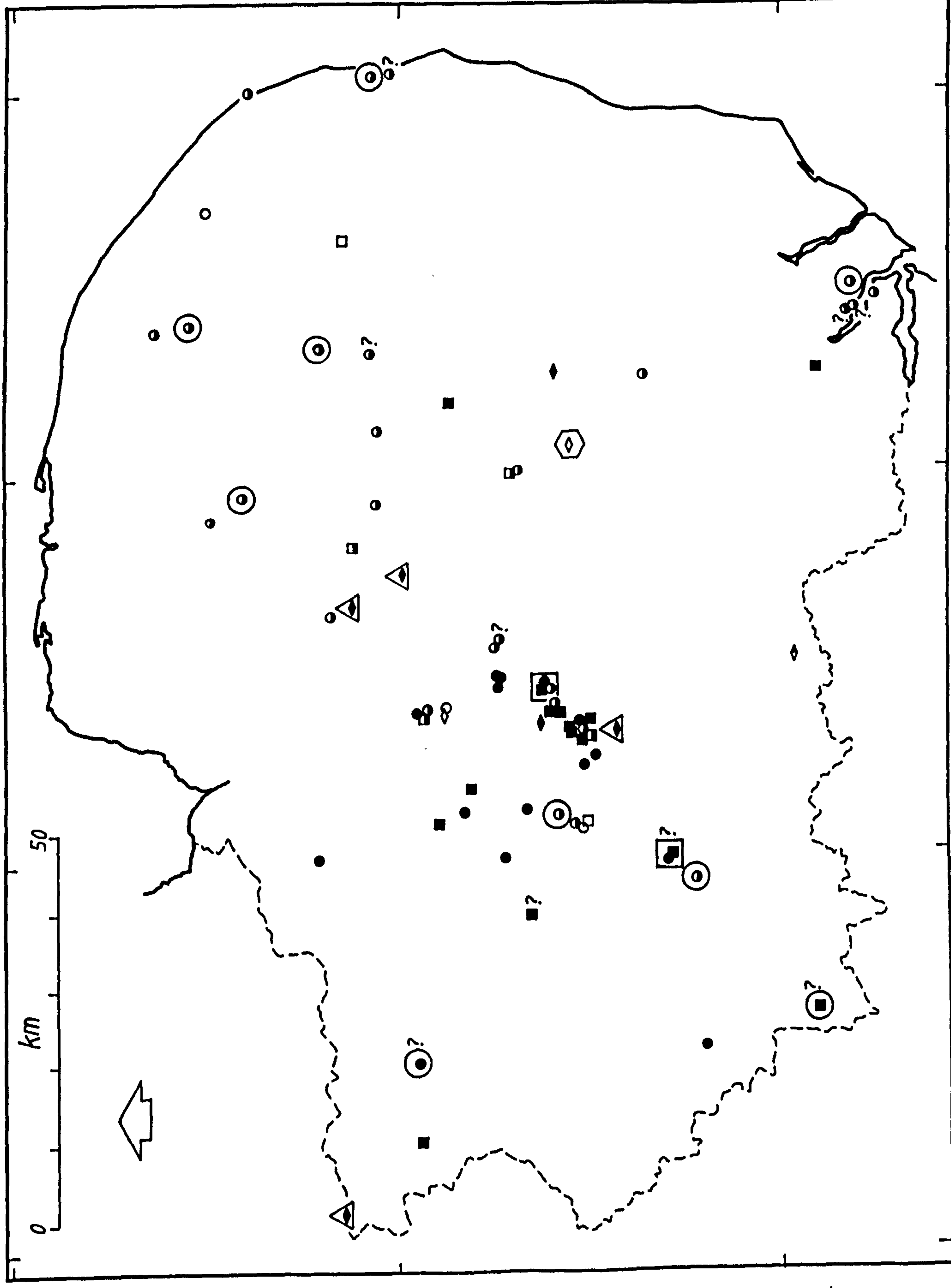


Map 34. Tracers/awls, gouges and chisels/leather working knives



- knives
- ?
- " in LBA hoards
- " " MBA hoards

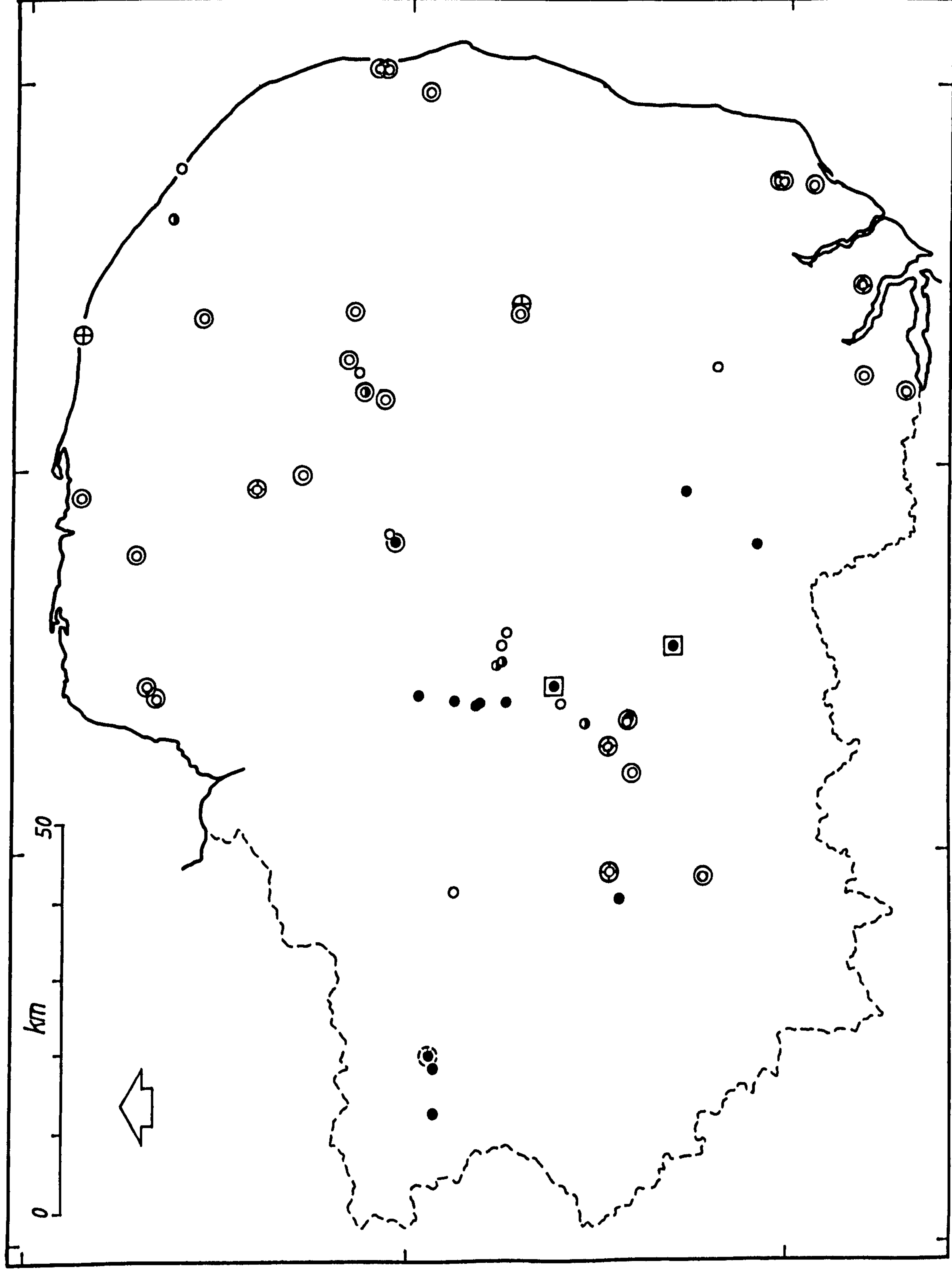
Map 35. Knives



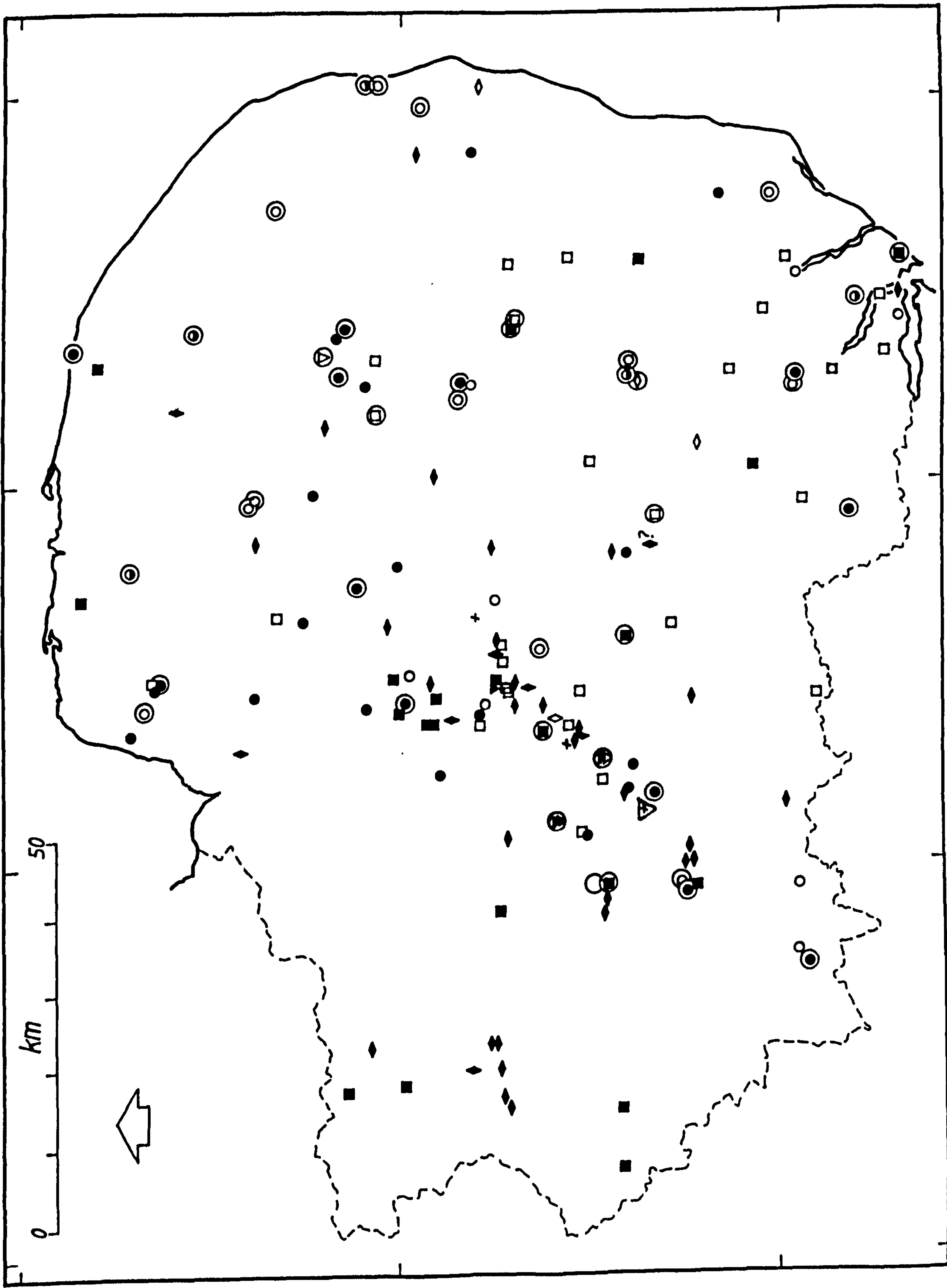
- ◊ EBA daggers
- ◻ daggers / dirks
- rapiers
- △ barrow burial
- ◻ MBA hoard
- LBA "
- ◻ EBA "

Infilled = complete
 Half open = fragment
 or incomplete
 Open = unknown

Map 36. Daggers, dirks and rapiers



Map 37. Swords and chapes



▽ Ferrules

SPEARHEADS

+ Arretton form

◇ side looped

◇ basal "

○ pegged

□ unspecified

▽ in EBA hoards

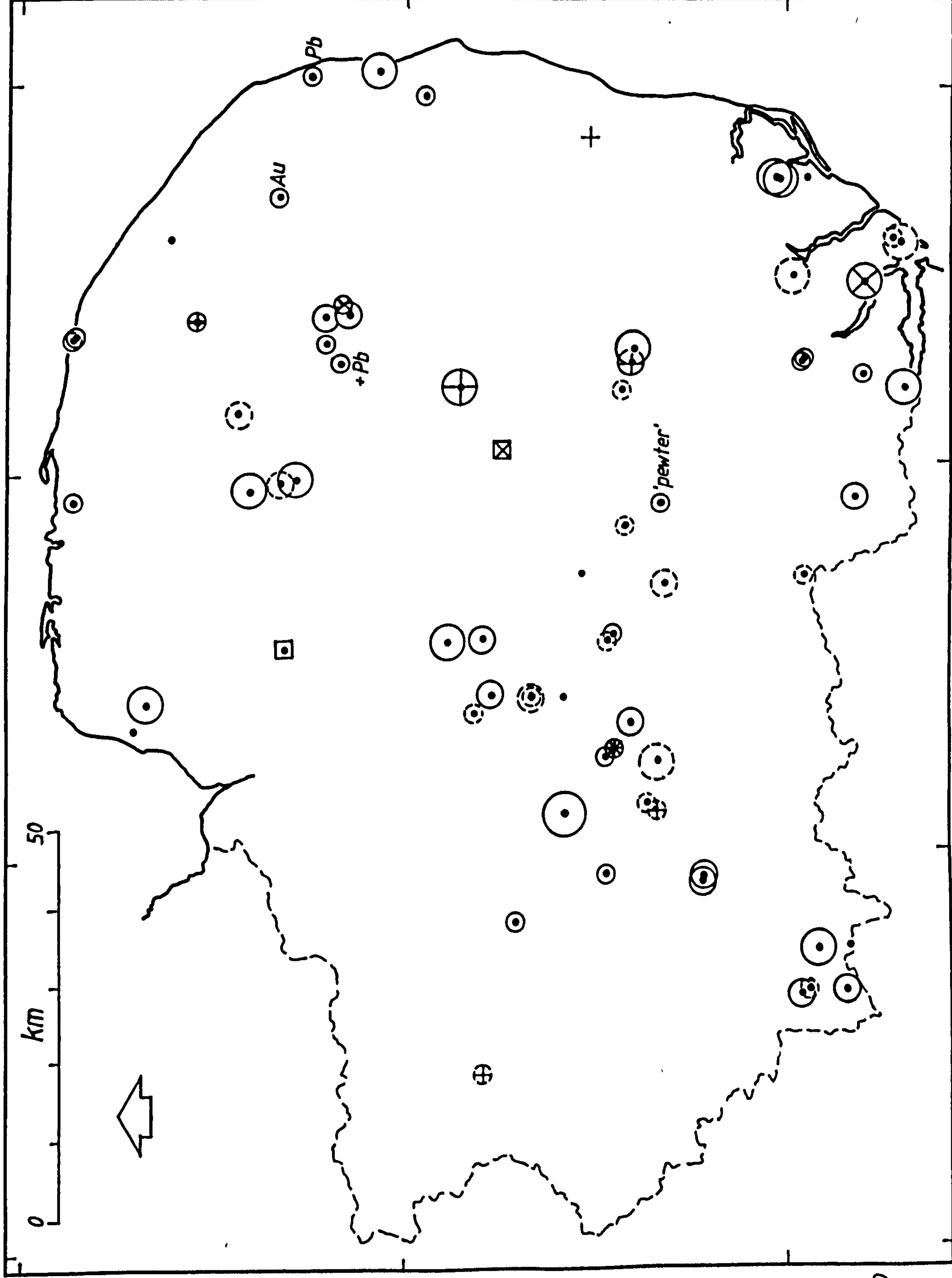
○ in LBA or undated hoards

Infilled = complete (?)

Open = fragmentary

Half open = hoard containing both

Map 38. Spearheads and ferrules



• 'Ingots'
 + Hammers
 X Moulds

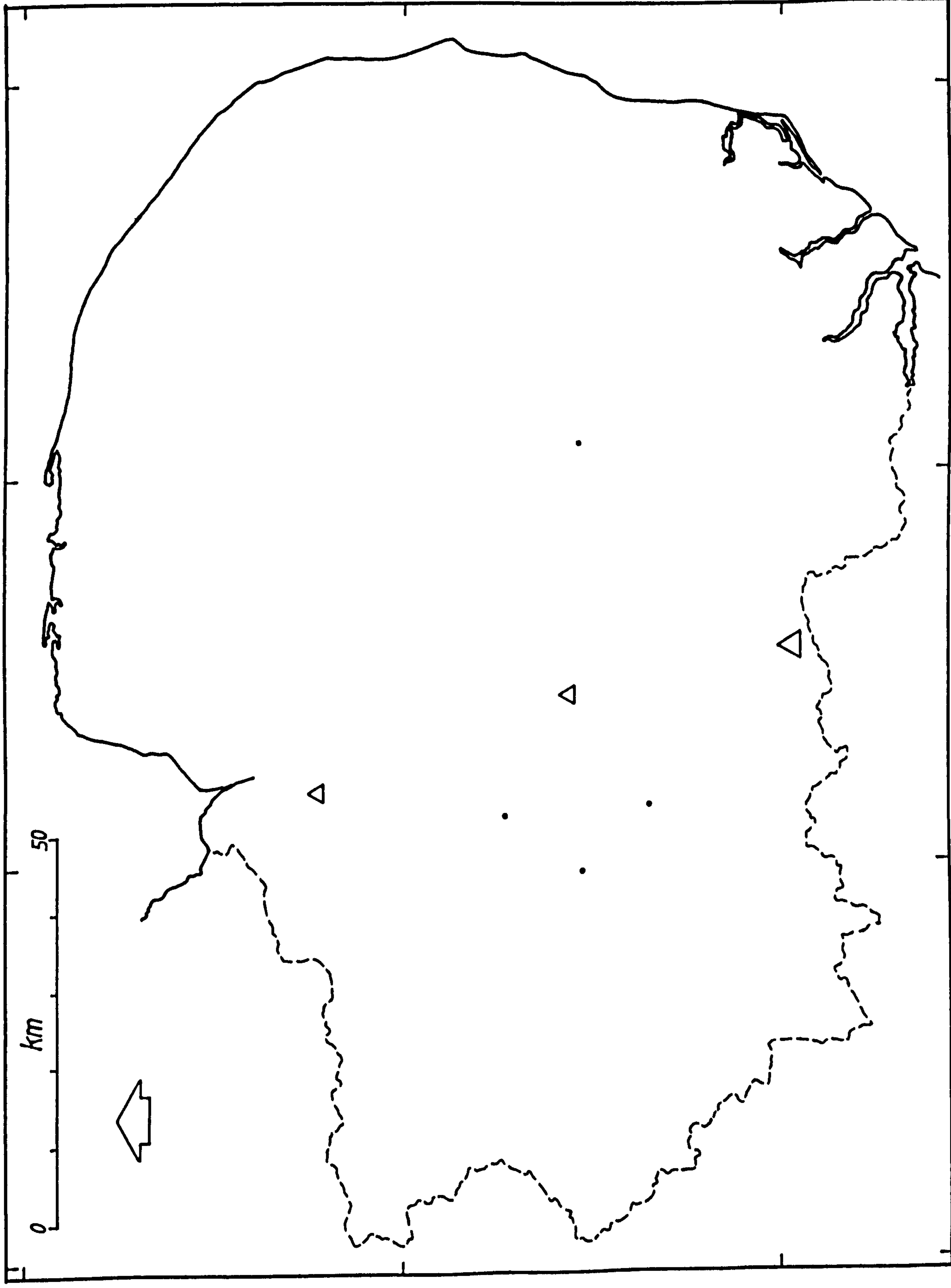
□ in MBA hoards
 ○ " LBA "

Numbers of hoarded ingots

○ 1-2
 ○ 3-6
 ○ 7-99
 ○ > 99

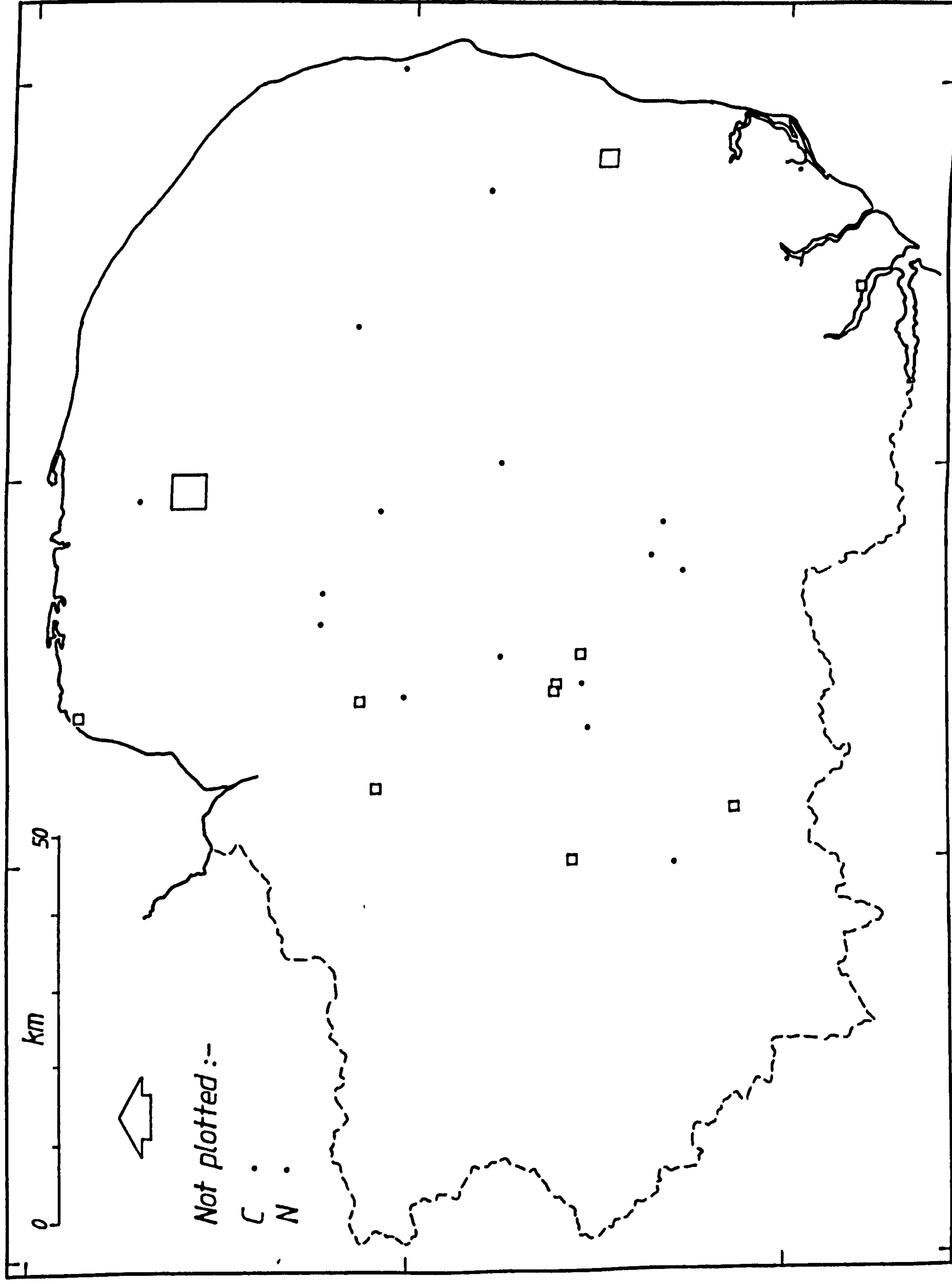
Dashed = located to
 parish only

Map 39. Ingots, hammers and moulds

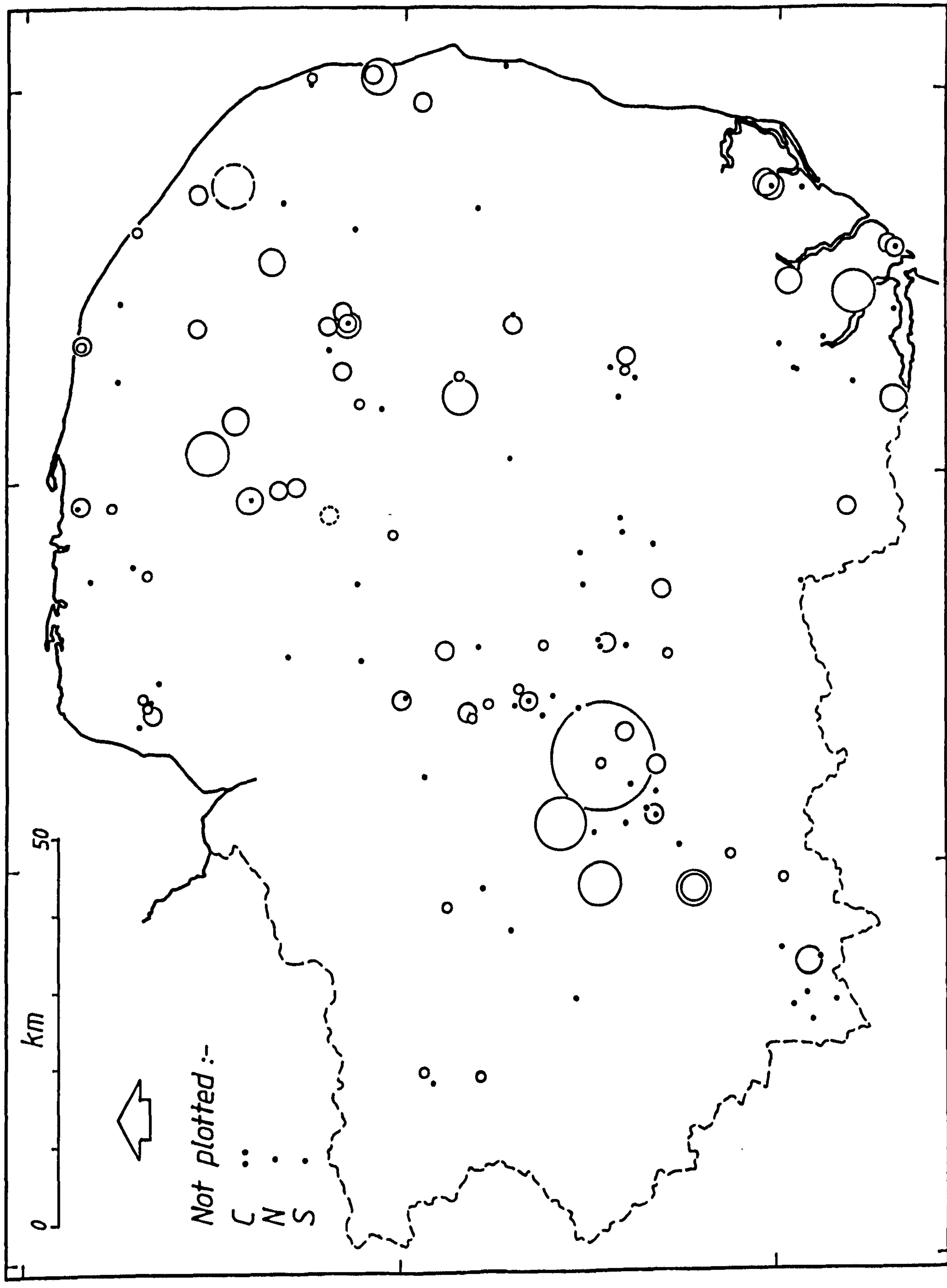


- <1 kg
- △ 1-2
- △ 5-10

Map 40. Early Bronze Age hoards according to weight. Plotted to parish centre where findspots unknown.



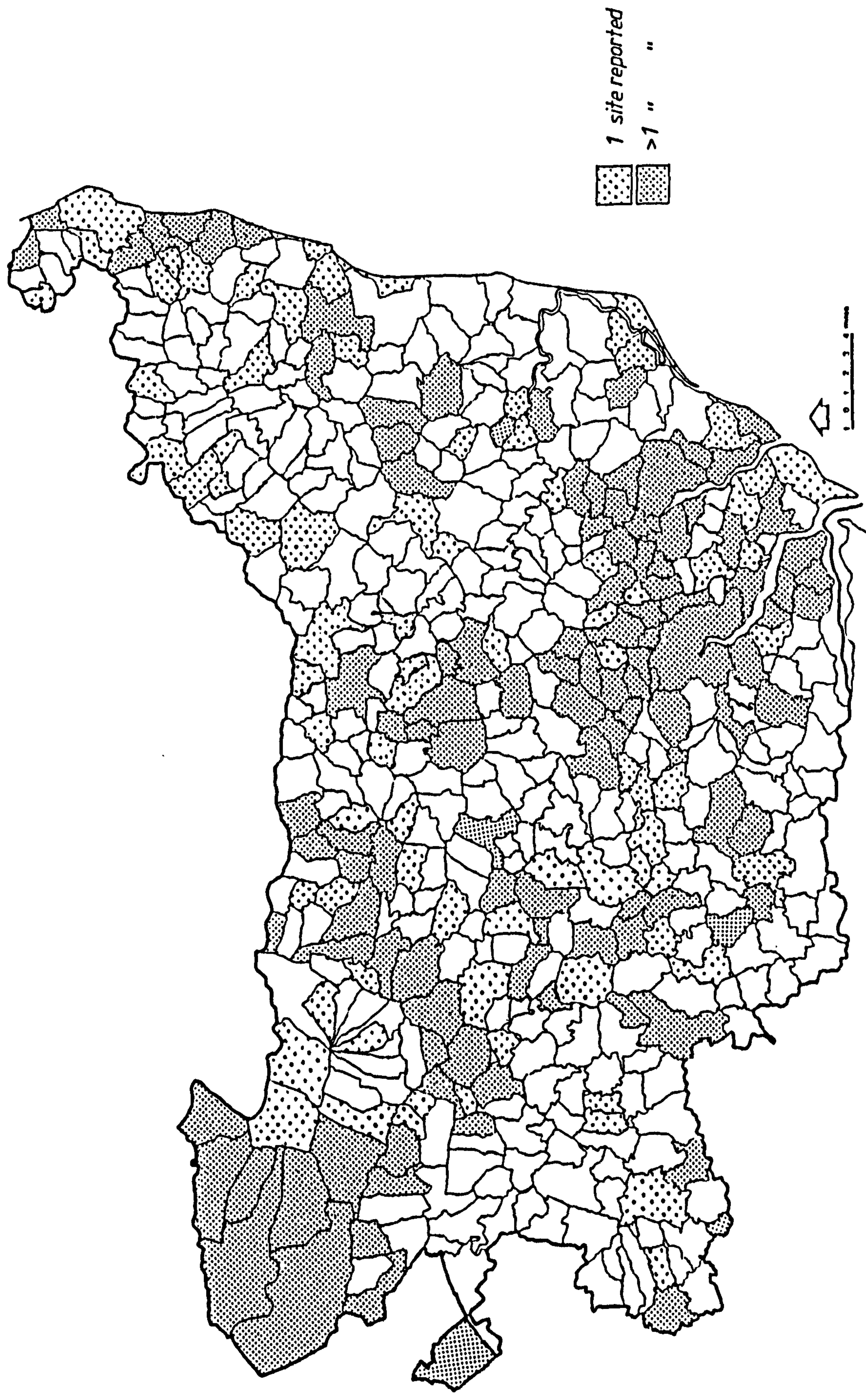
Map 41. Middle Bronze Age hoards according to weight. Plotted to parish centre where findspots unknown.



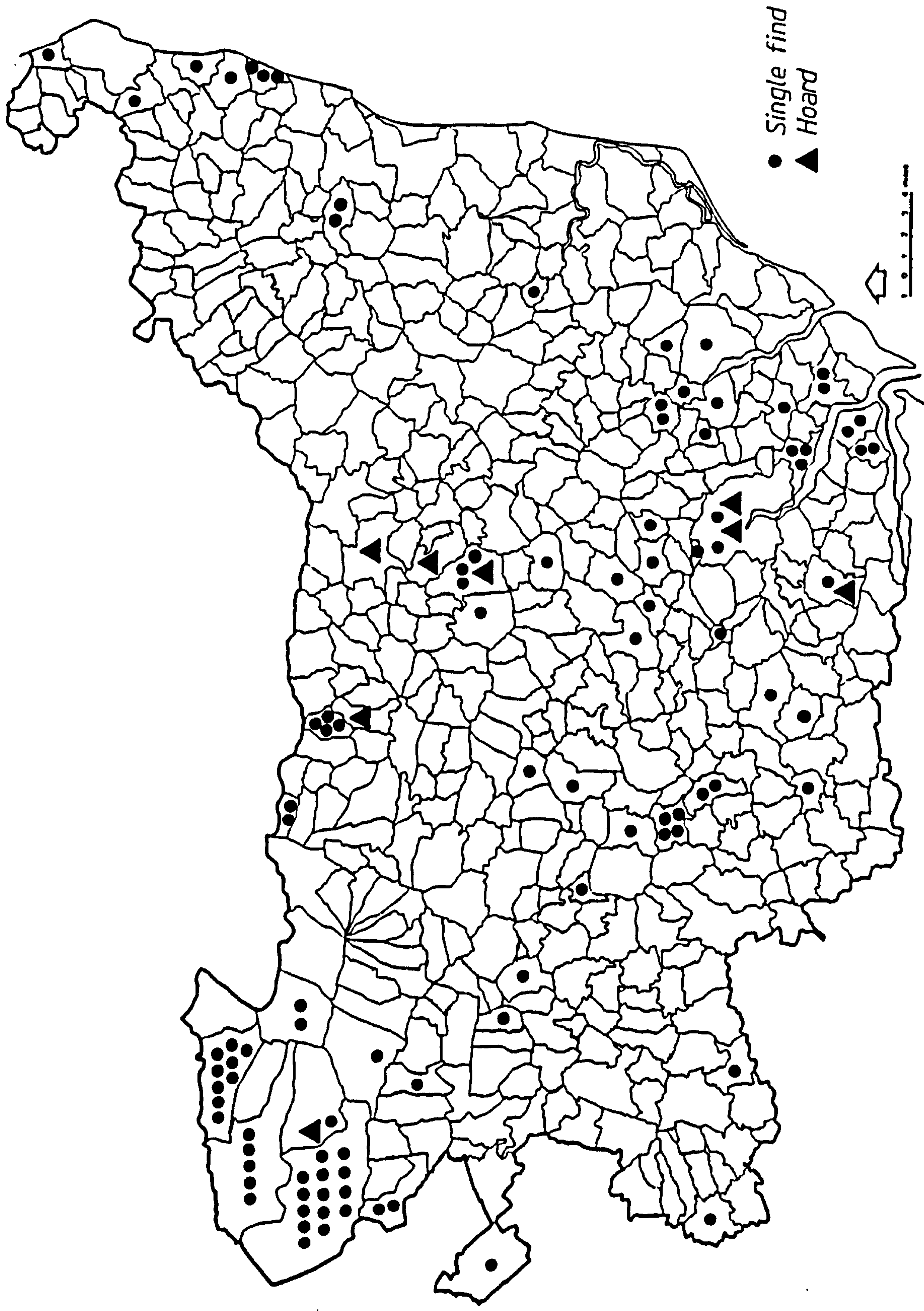
C = Cambridgeshire
 N = Norfolk
 S = Suffolk

- <1 kg
- 1- <2
- 2- <5
- 5- <10
- 10- <20
- 20- <30
- 30- <40
- >40 kg

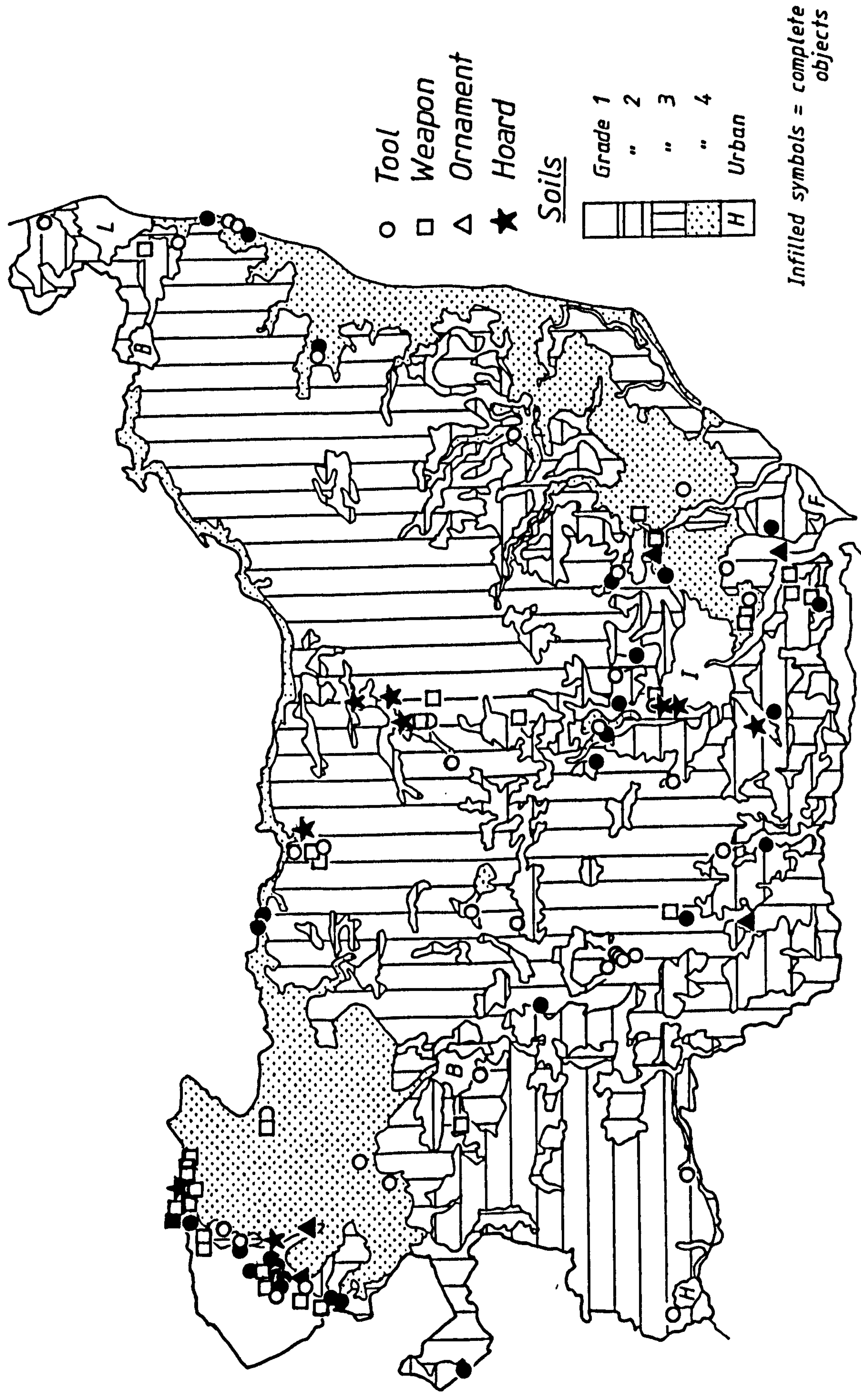
Map 42. Late Bronze Age hoards according to weight. Plotted to parish centre where findspots unknown.



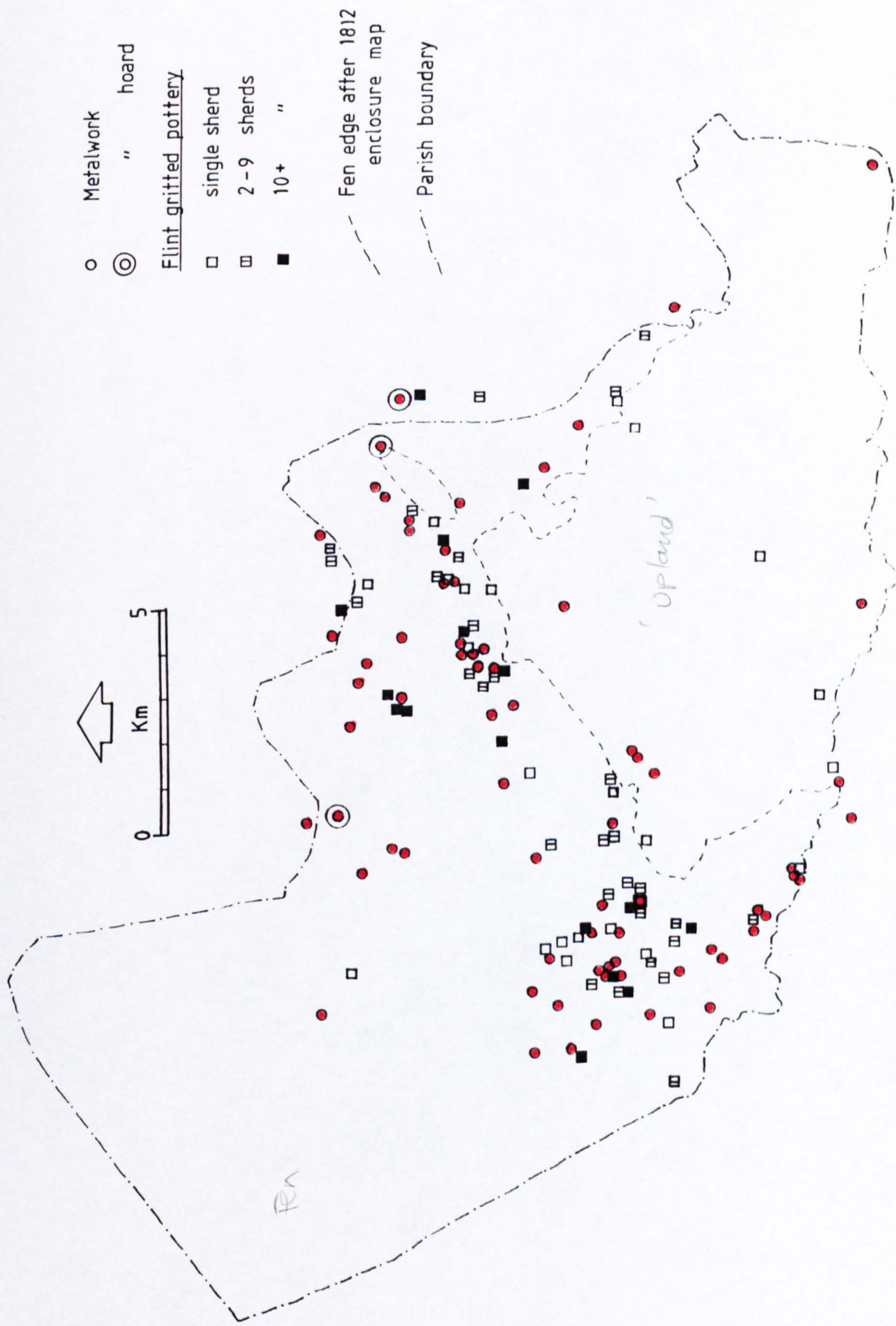
Map 43. Suffolk parishes with reported metal detected finds (up to September 1991)



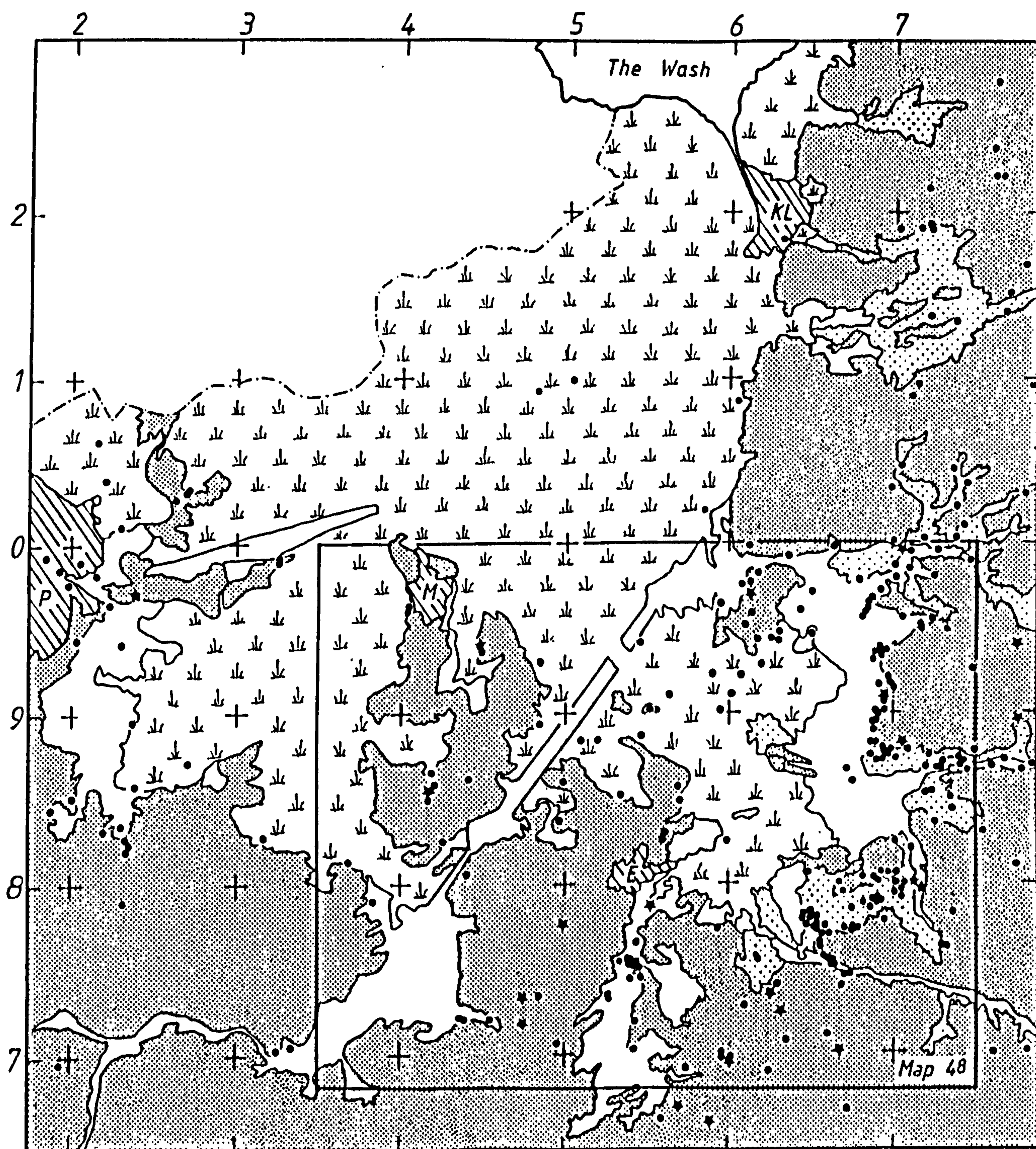
Map 44. Metal detected bronze age metalwork from Suffolk parishes



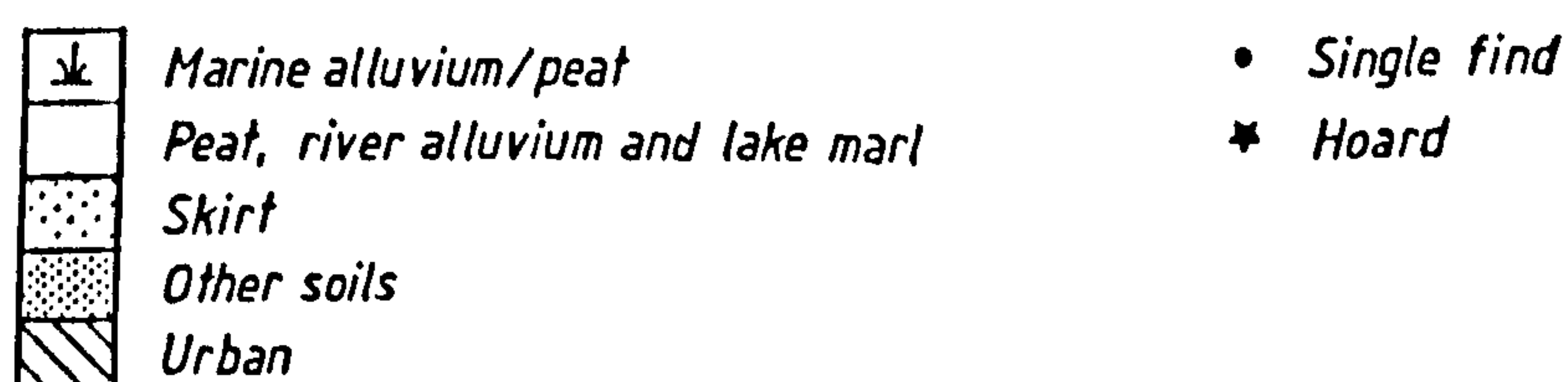
Map 45. Suffolk metal detected bronze age metalwork and soils

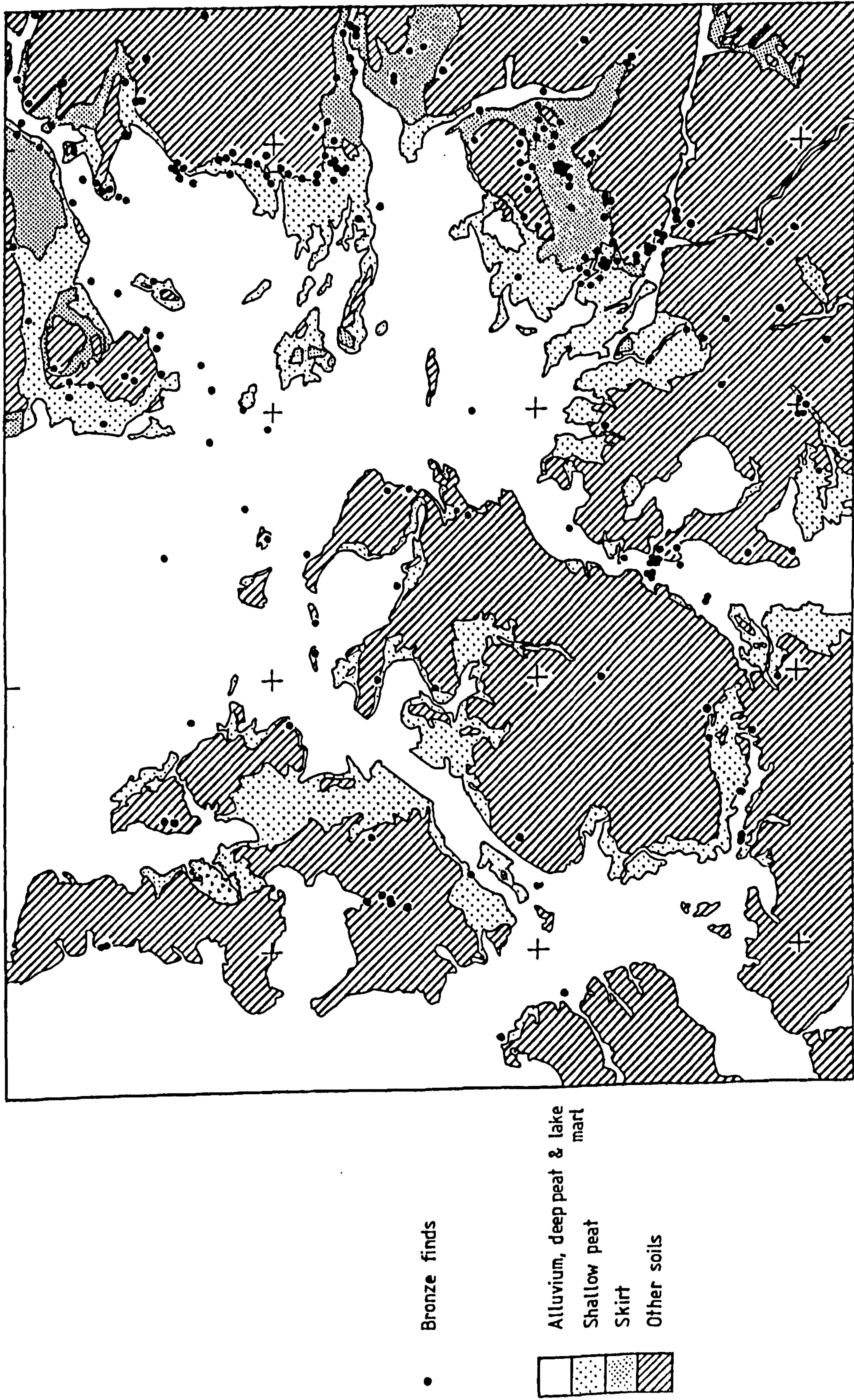


Map 46. 'Flint gritted' pottery and bronze age metalwork in Mildenhall parish

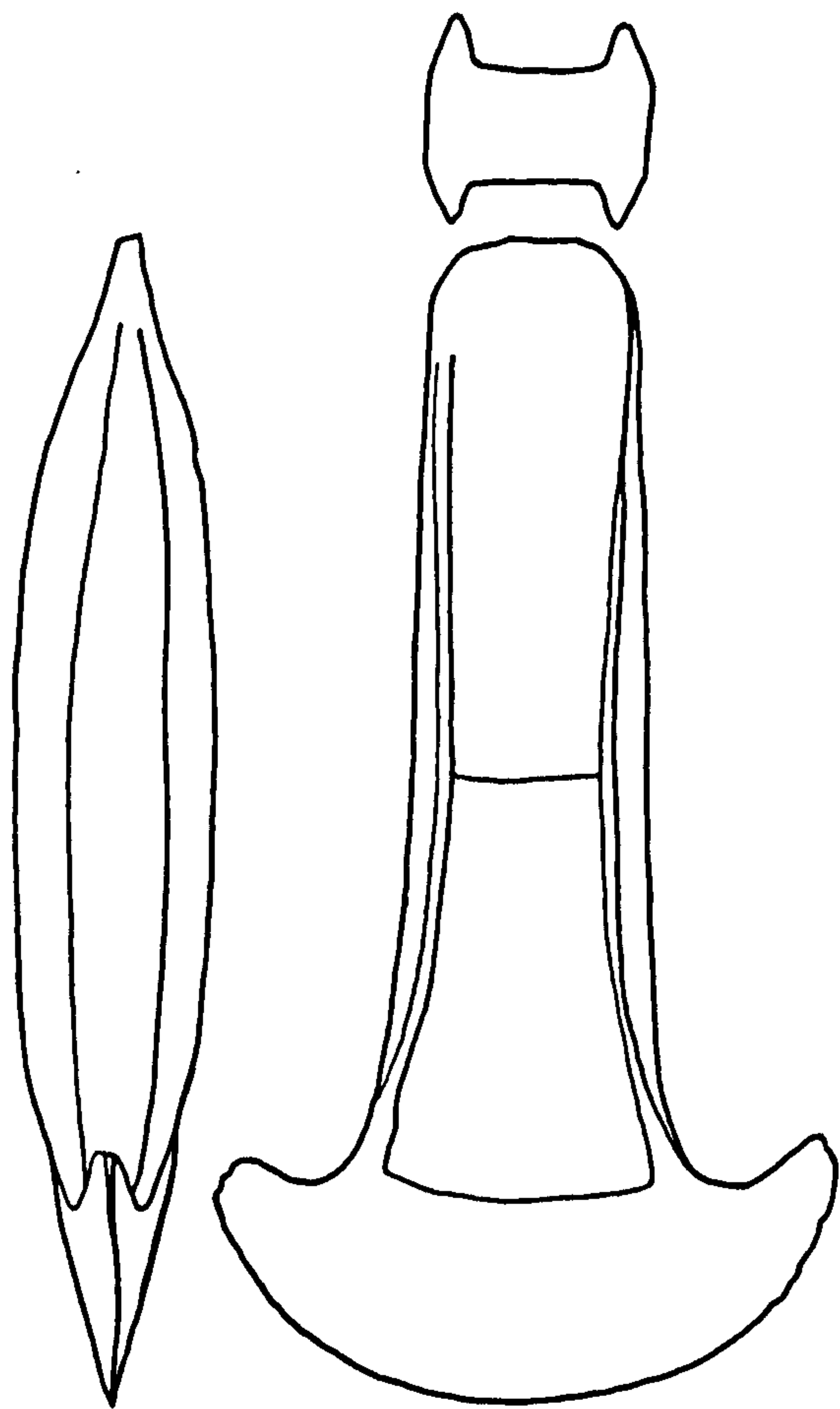


Map 47. Bronze age metalwork from the fenland zone
(soils based on 1:250,000 Soil Survey of England and Wales 1983)

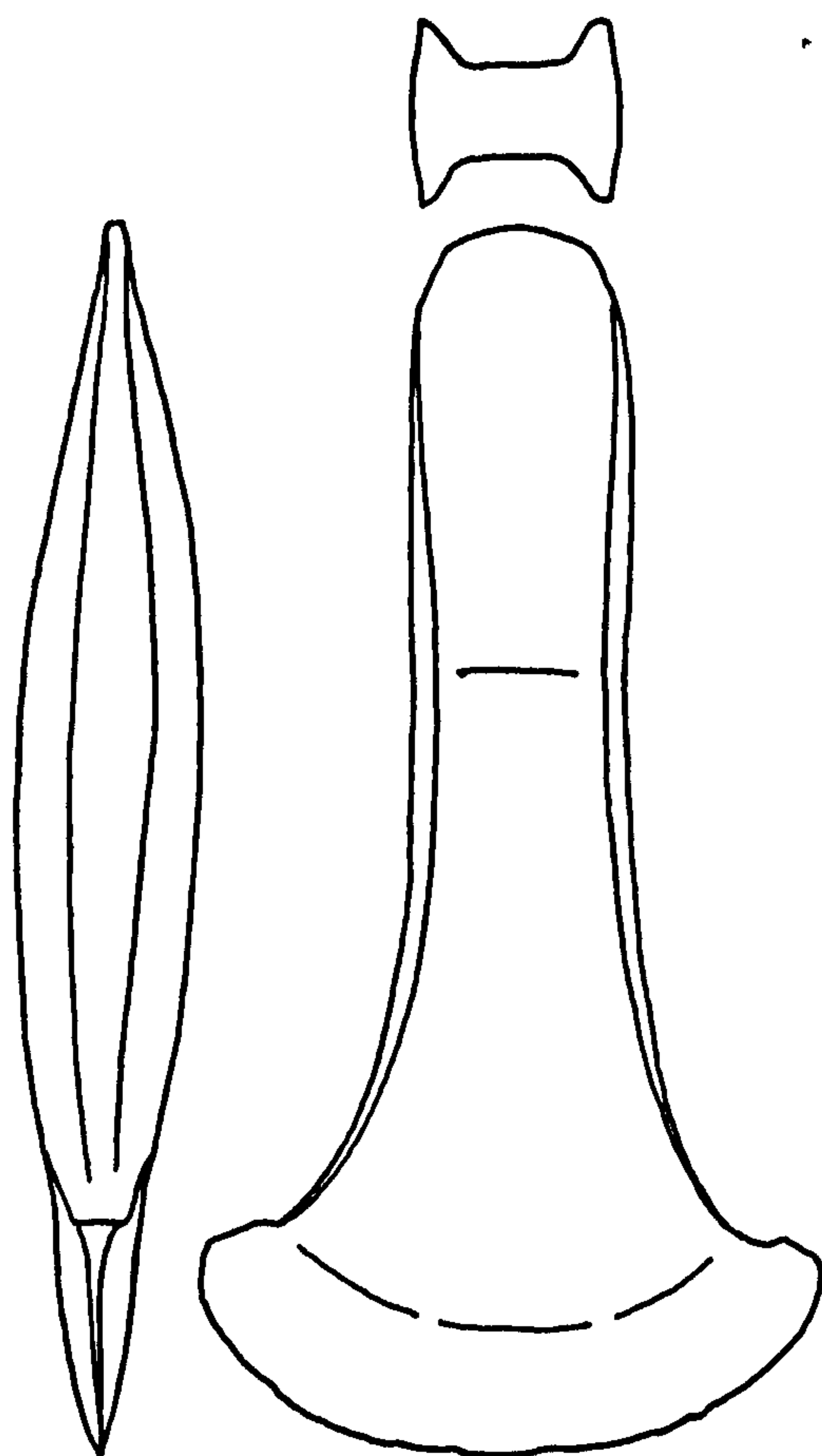




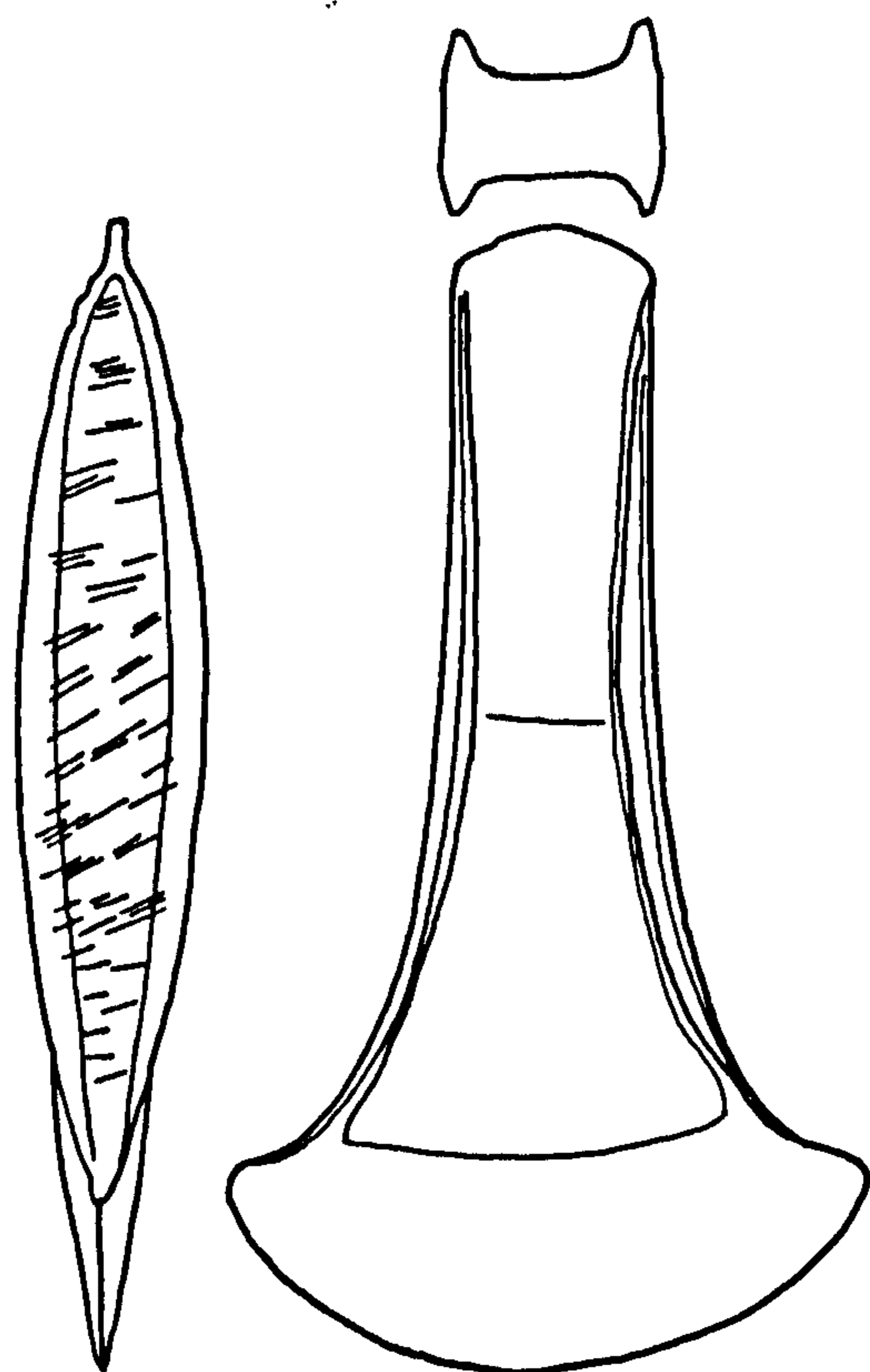
Map 48. Bronze age metalwork from the south-eastern fens (soils based on 1:63,360 Soil Survey of Cambridge and Ely, 1975)



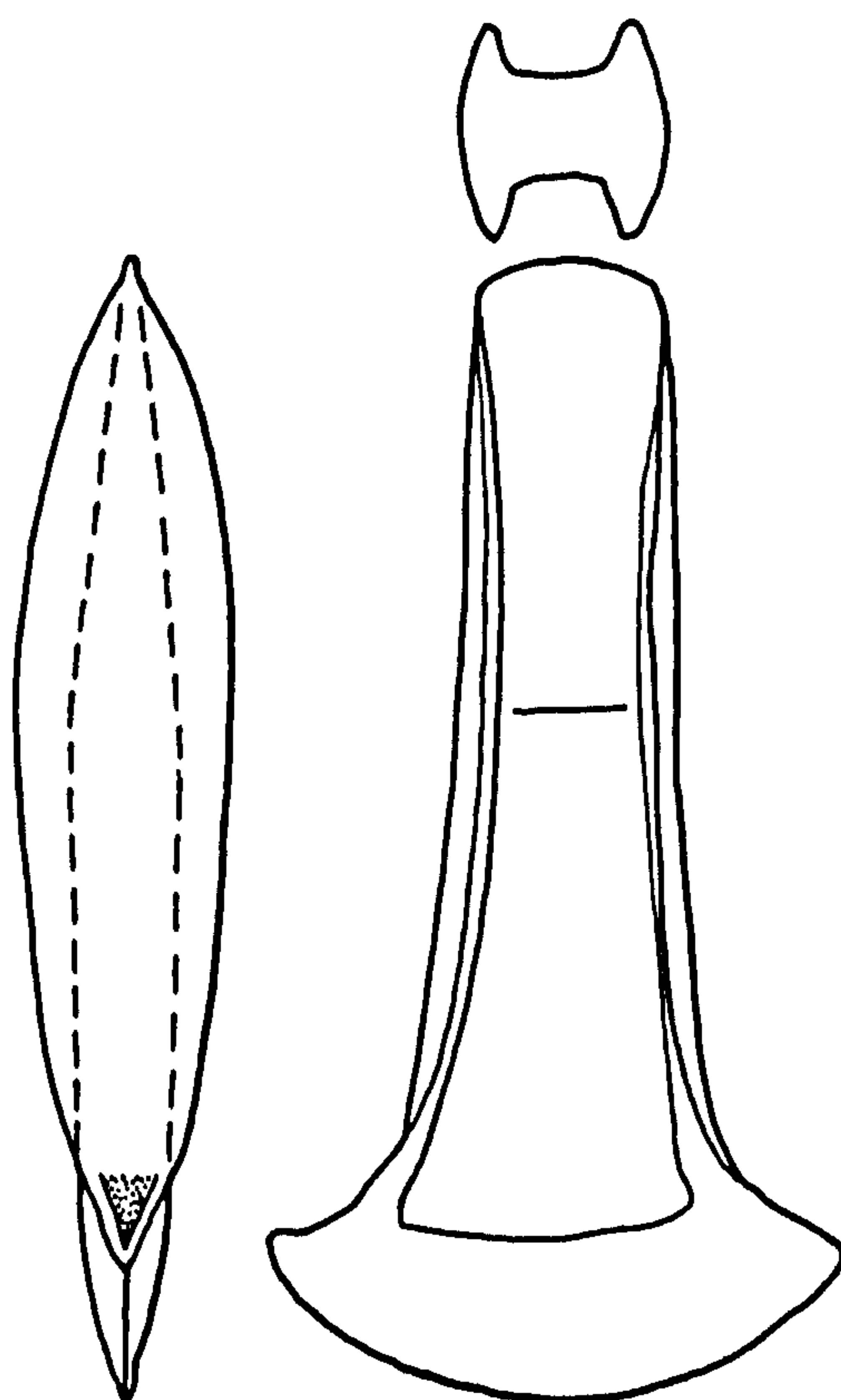
H1.1



H1.2



H1.3



H1.4



Fig. 1

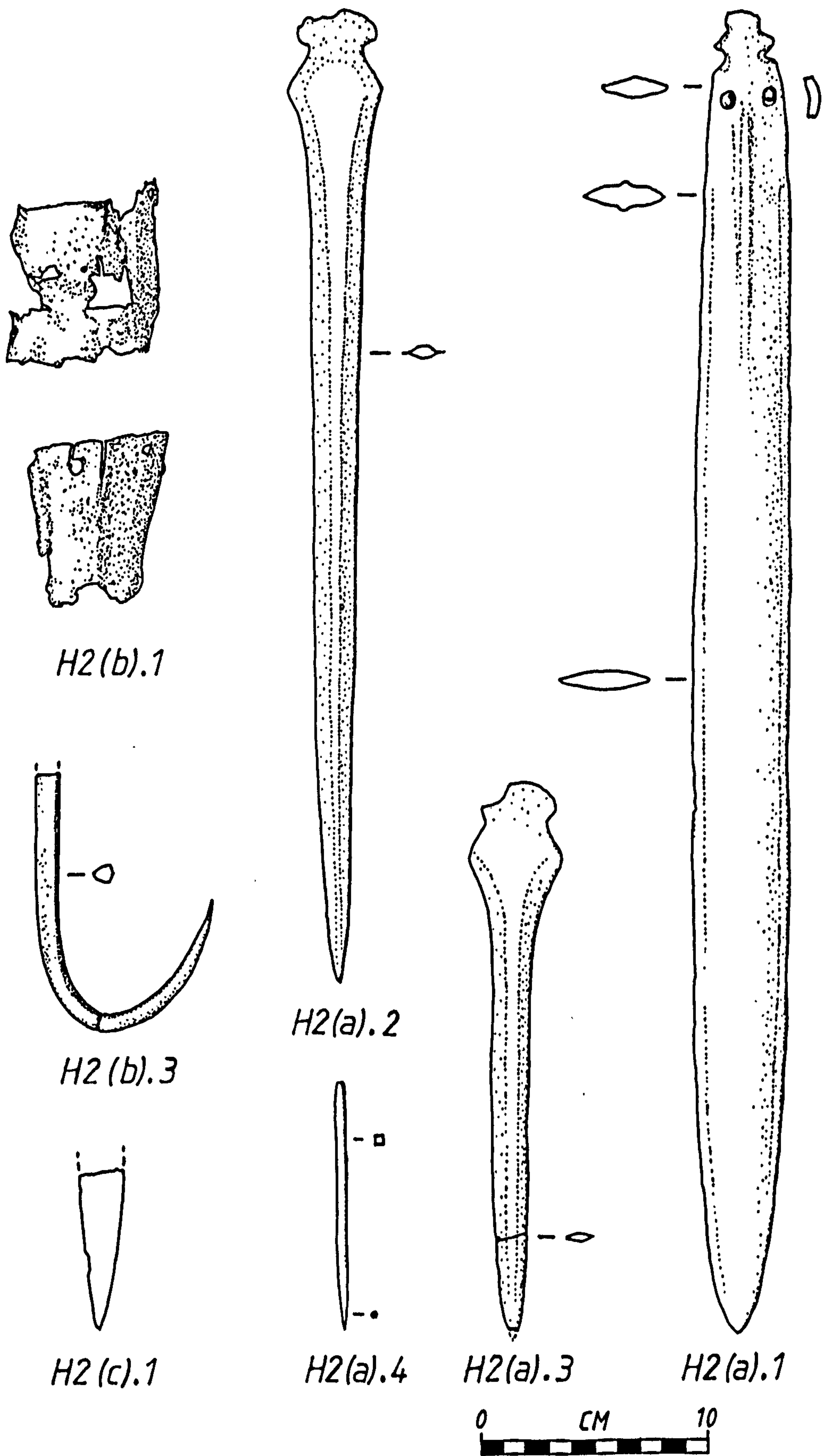
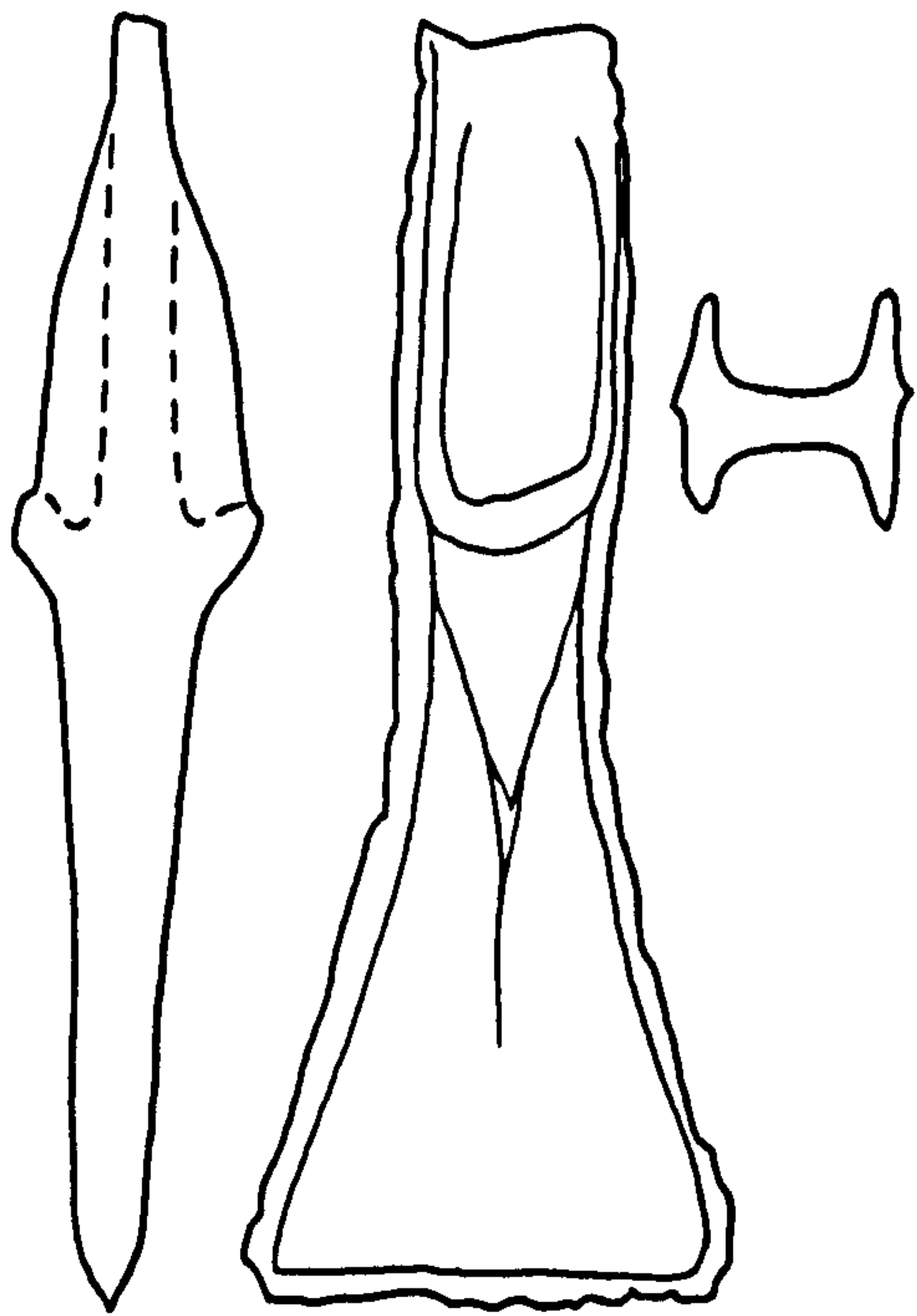
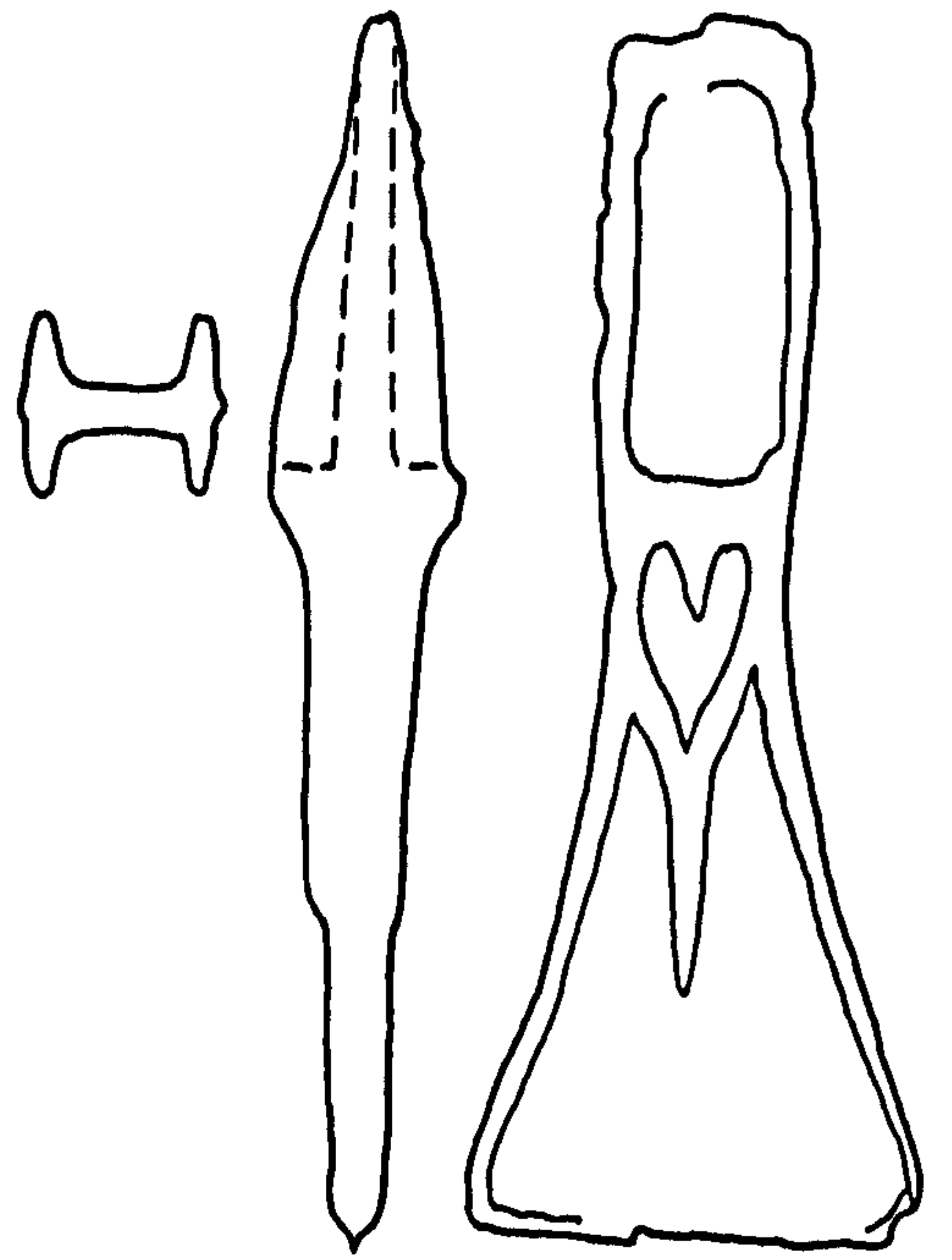


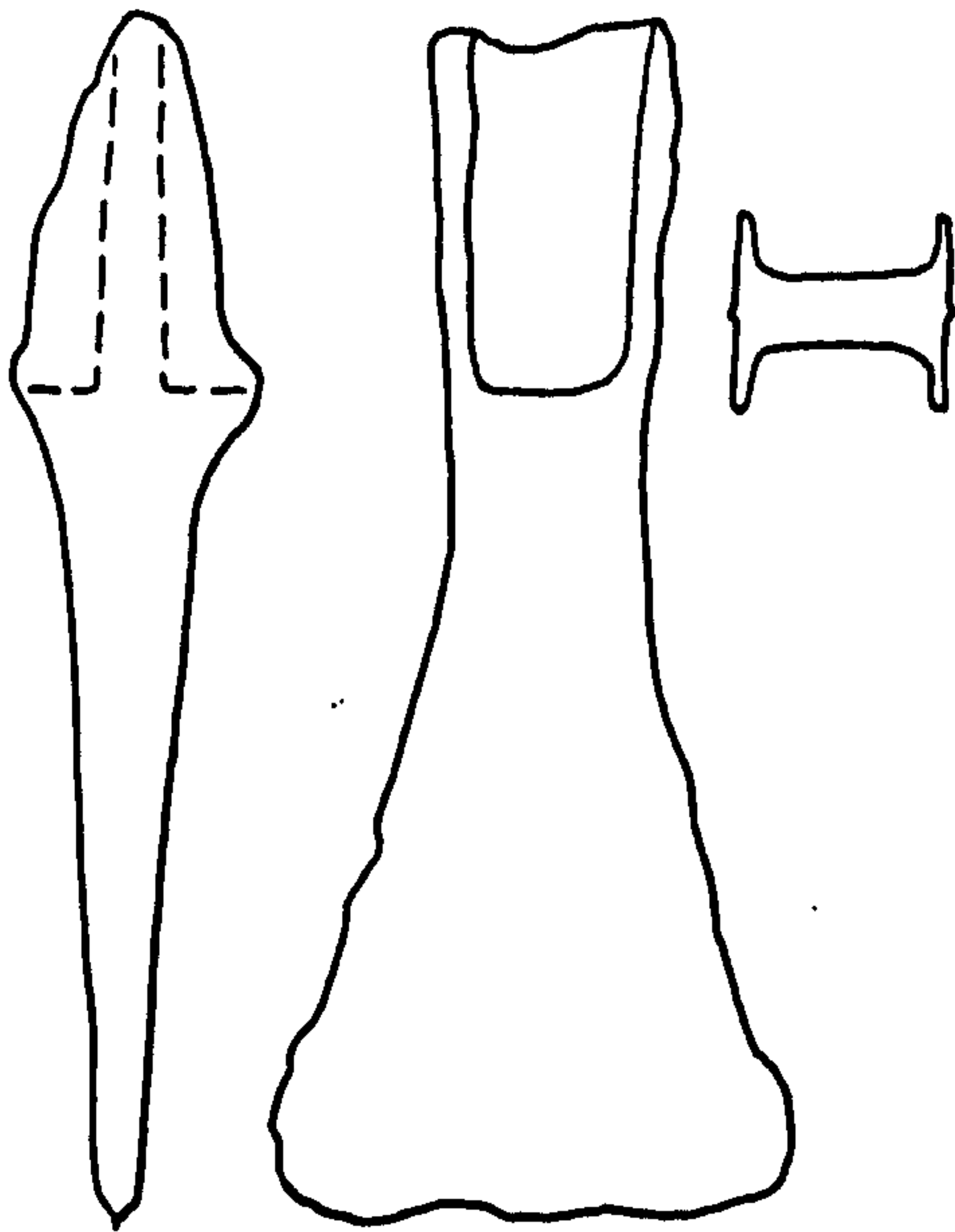
Fig. 2



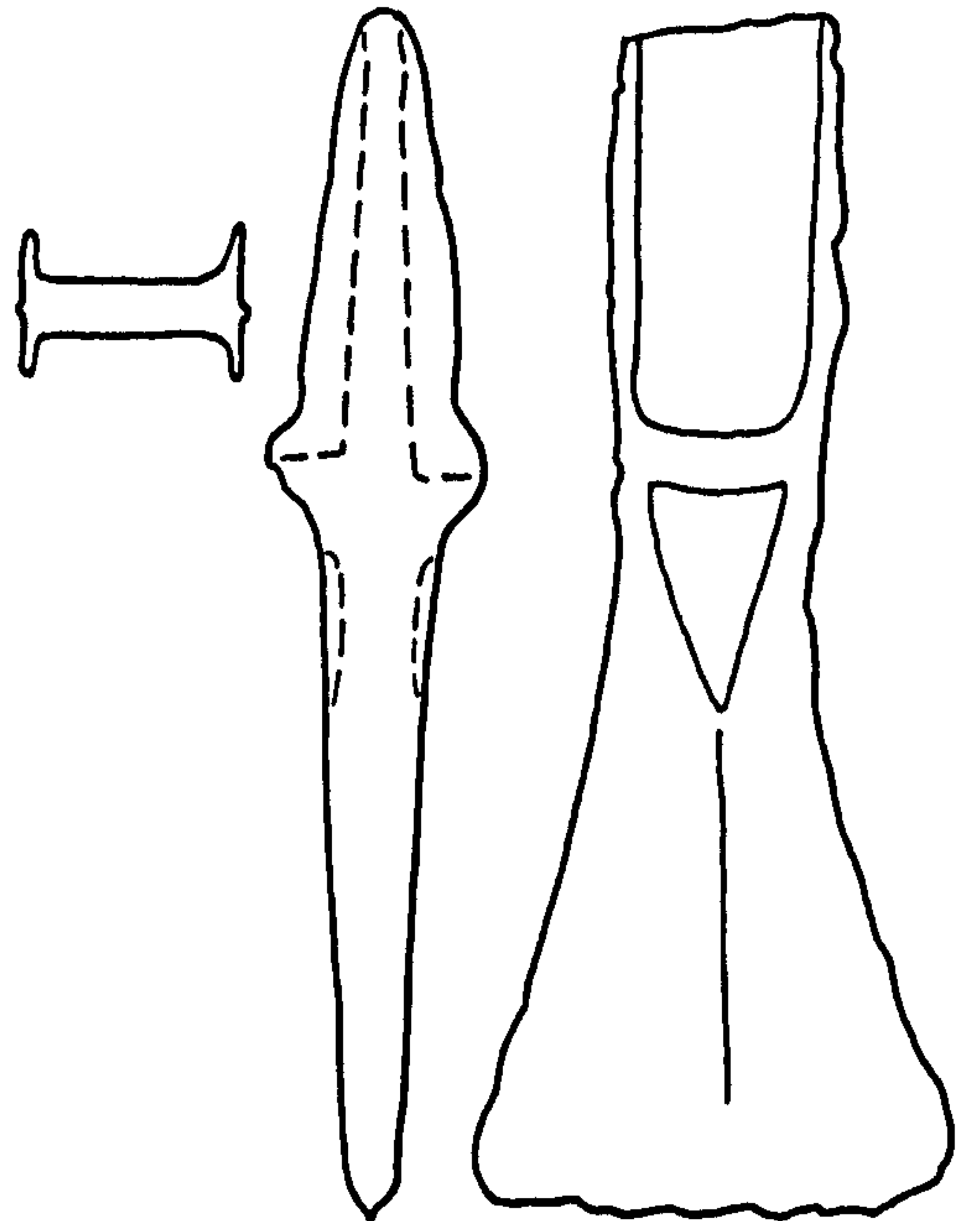
H3.1



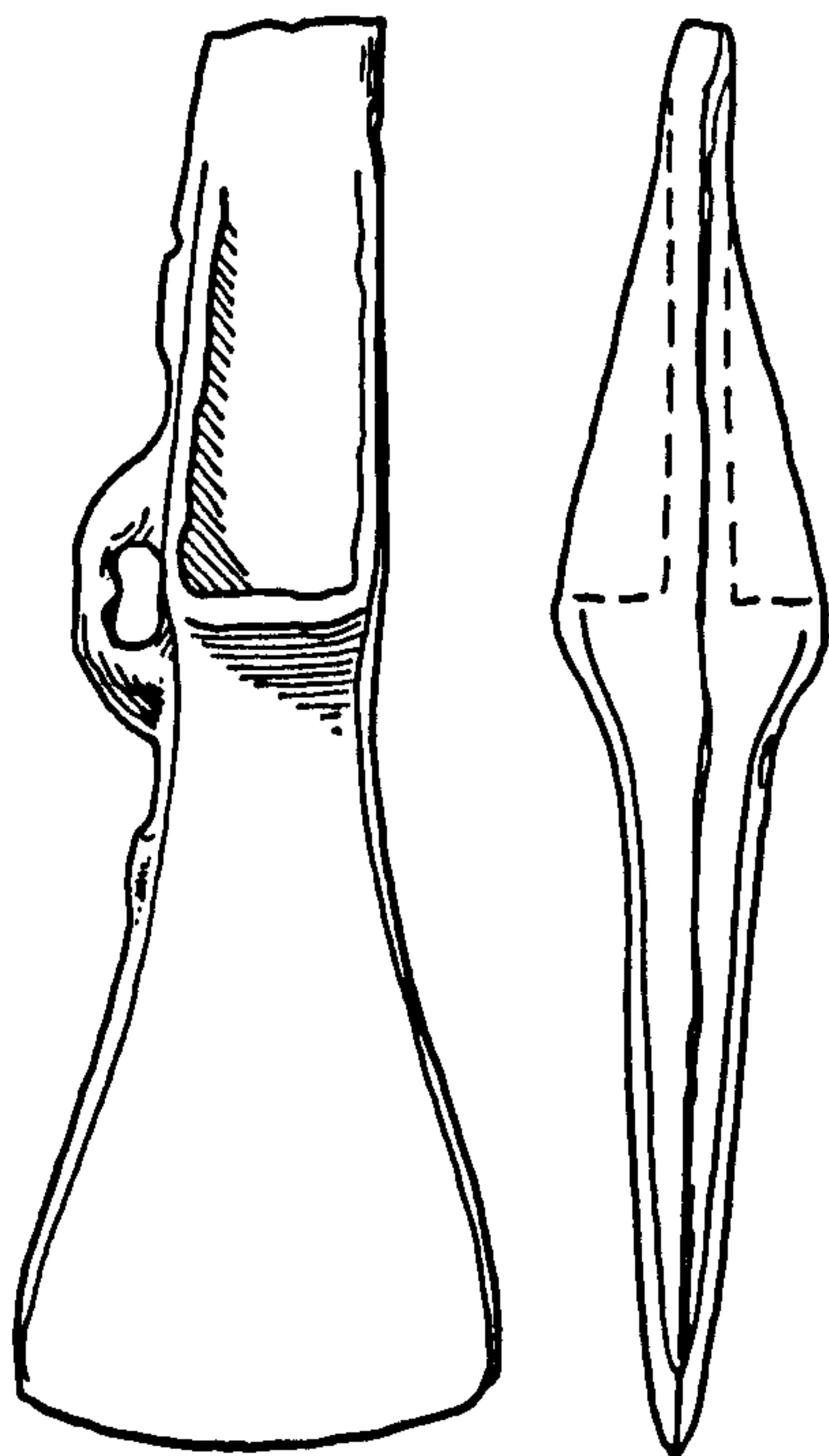
H3.2



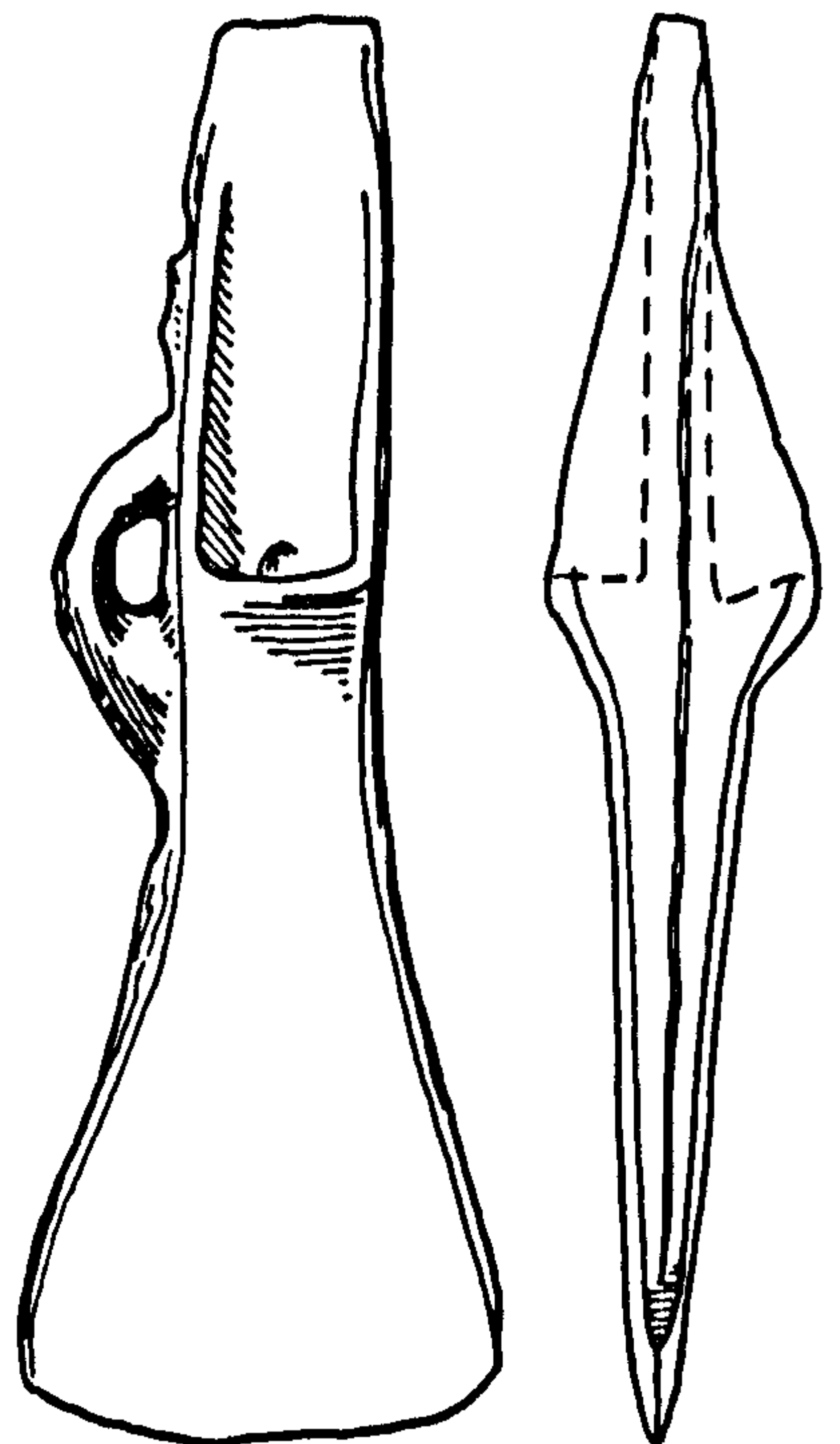
H3.4



H3.5



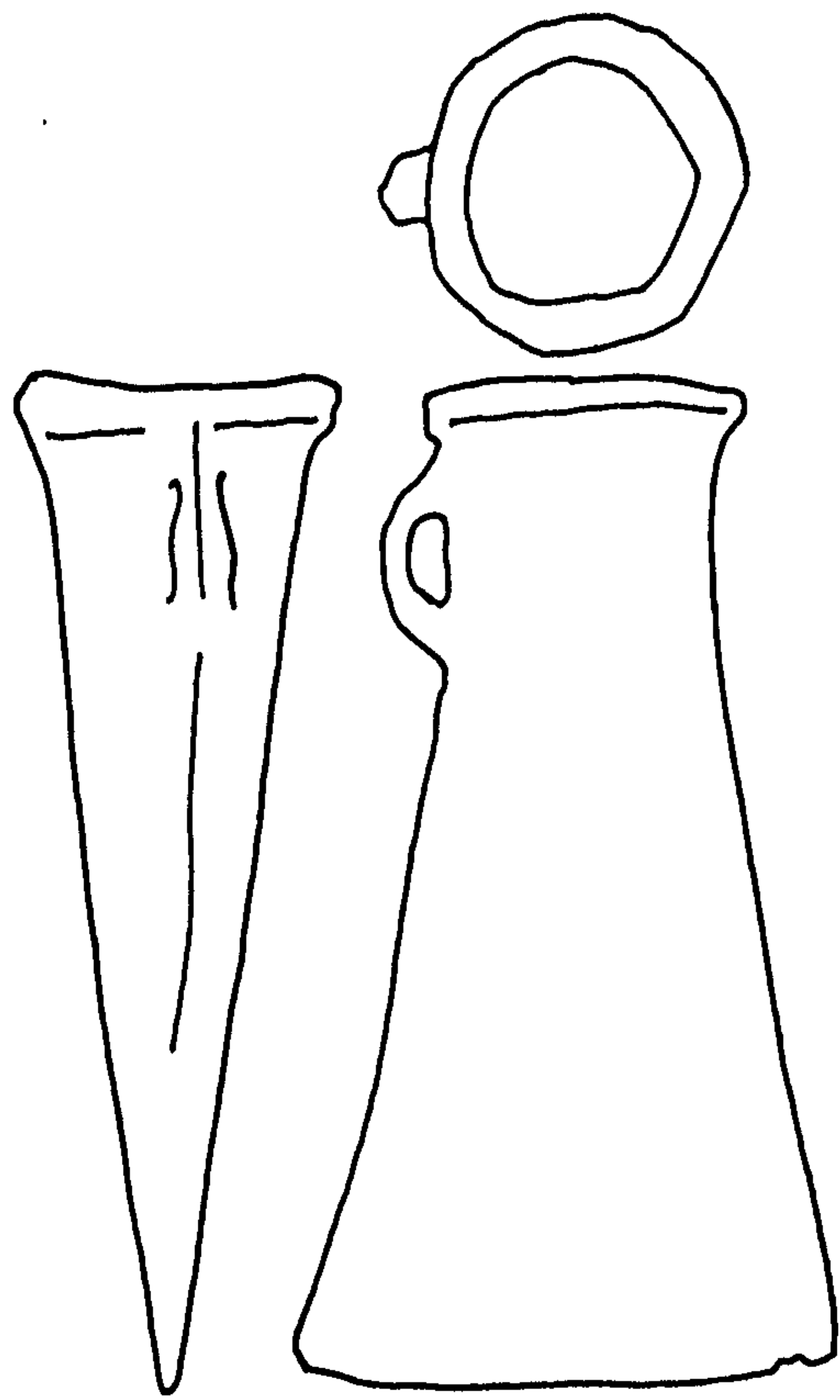
H3.7



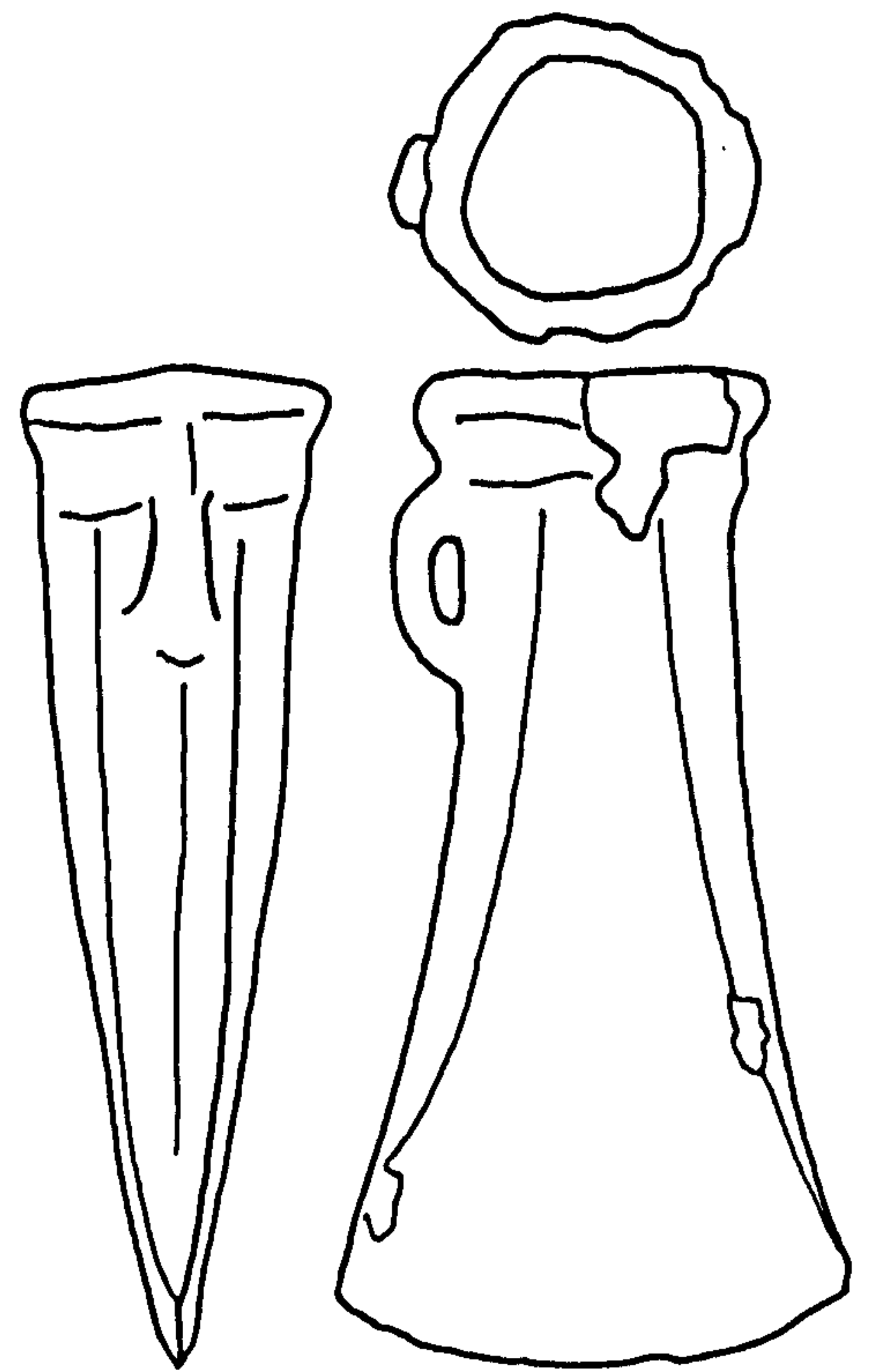
H3.6



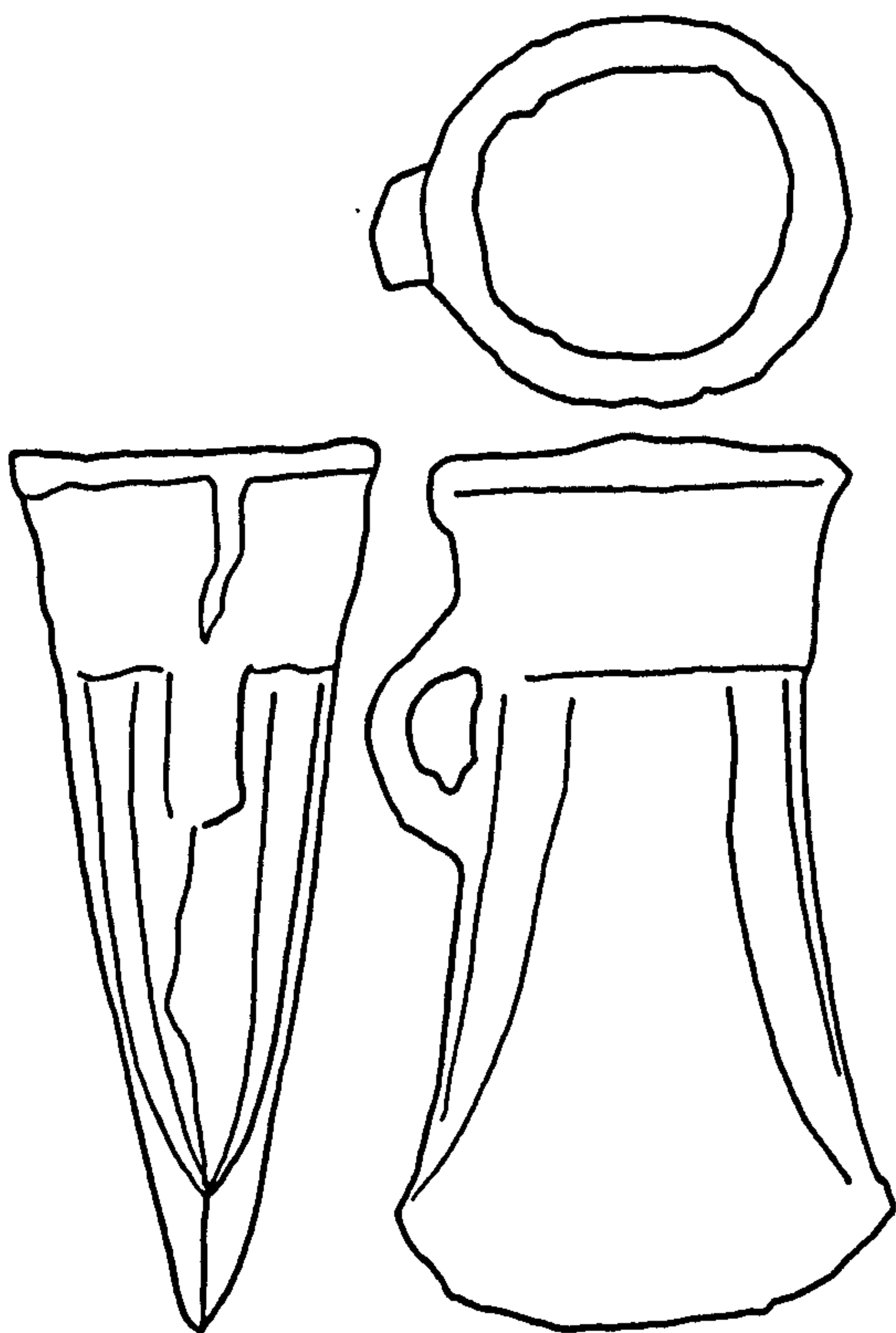
Fig. 3



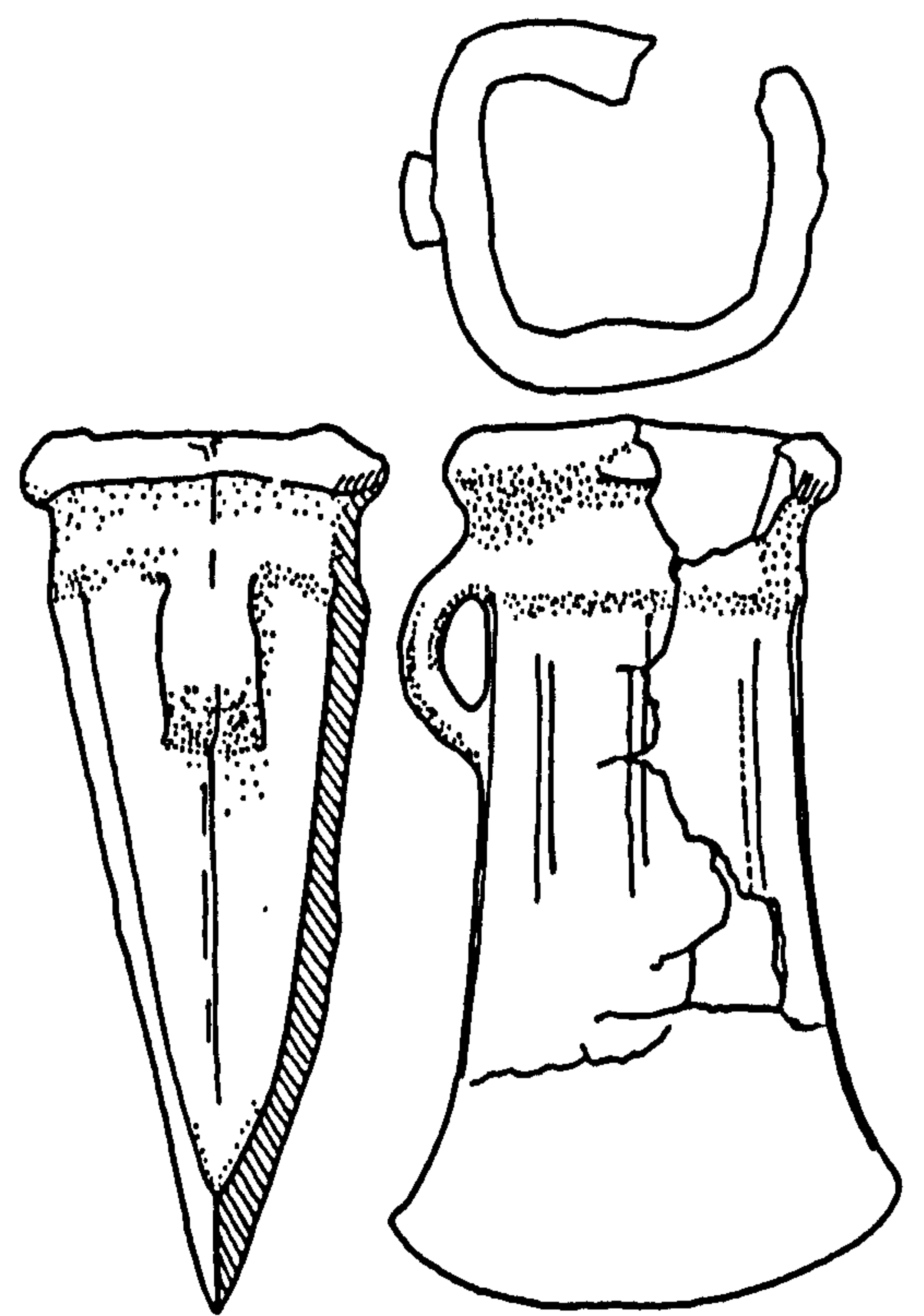
H4.2



H4.3



H4.1



H5.2



Fig. 4

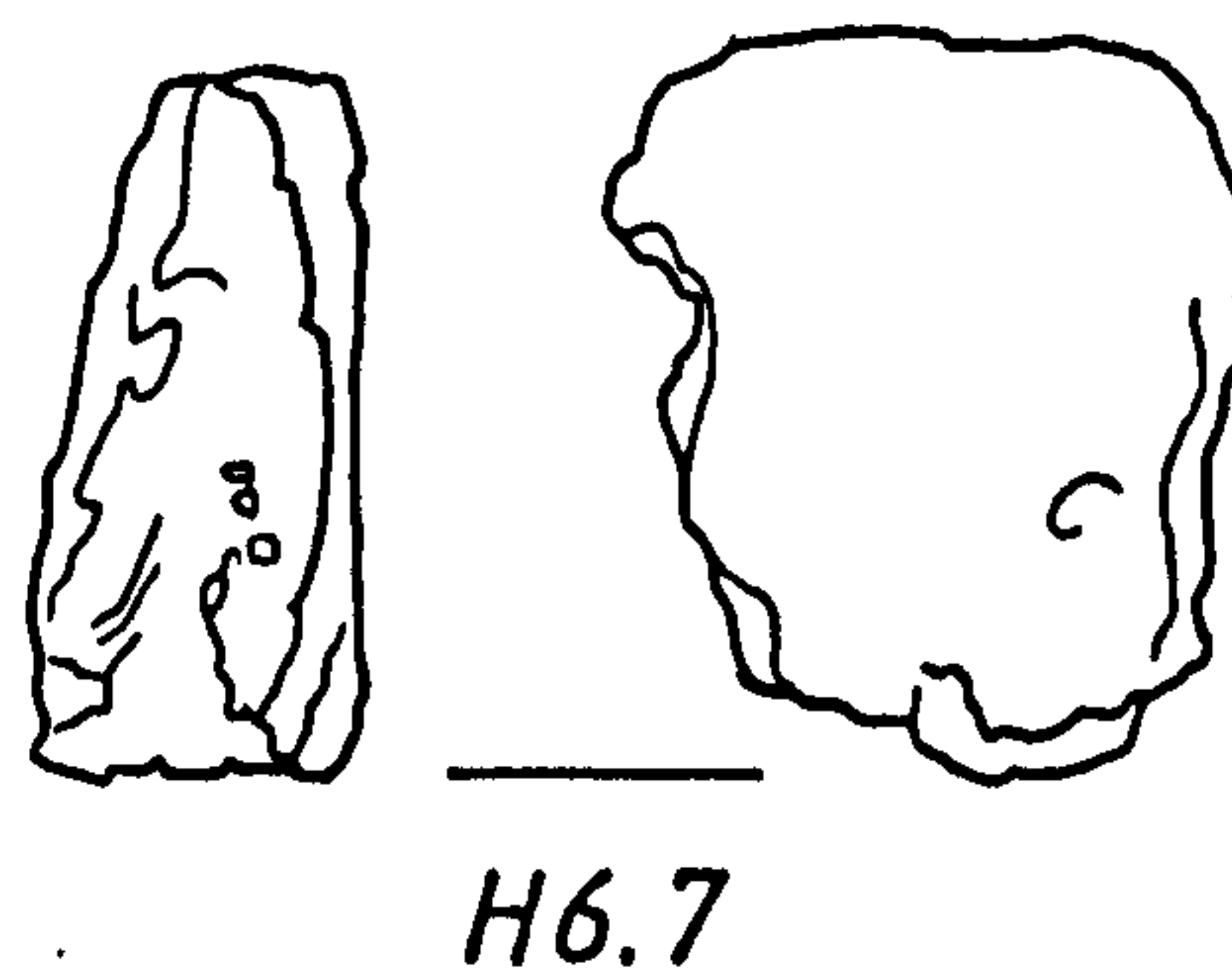
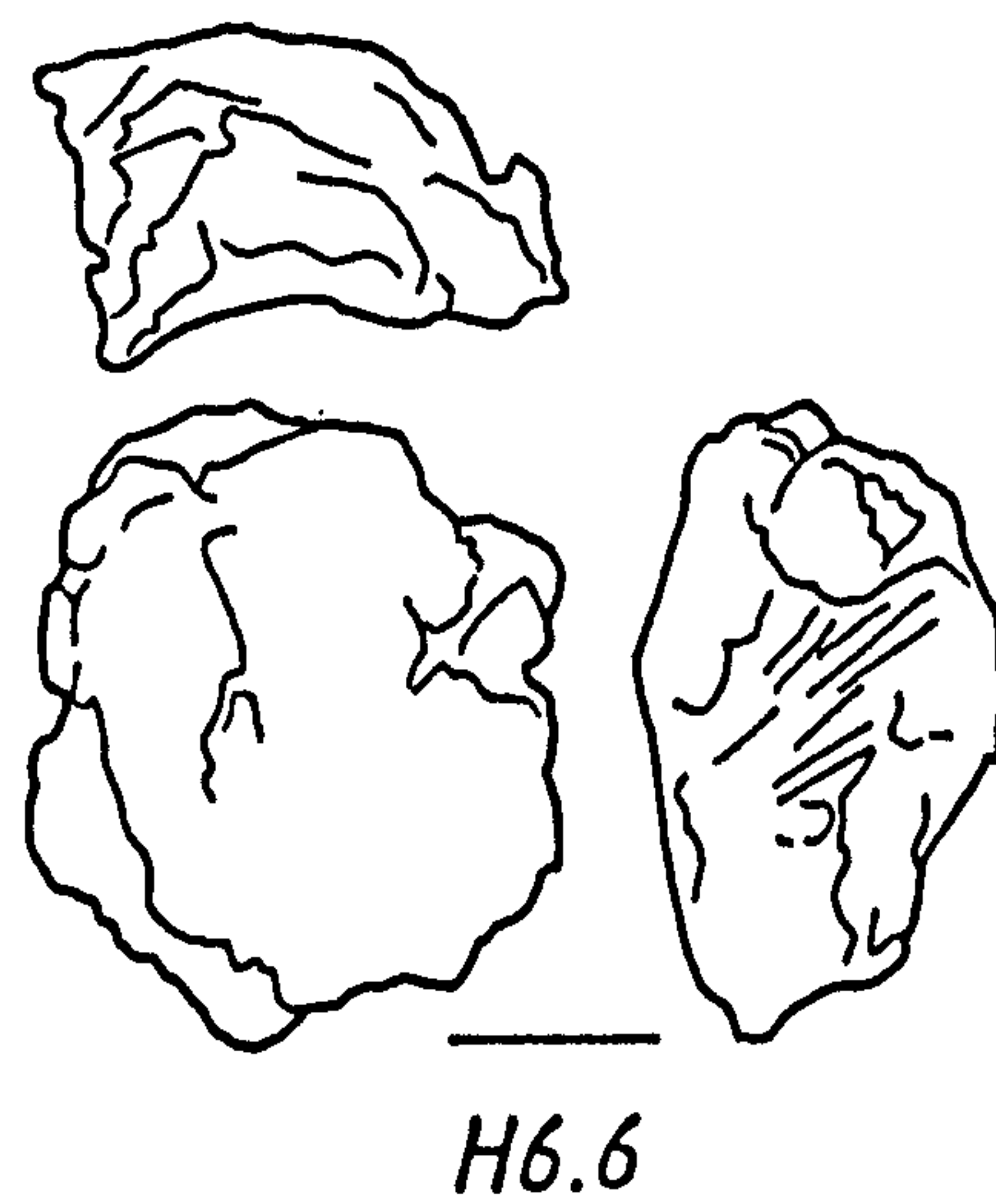
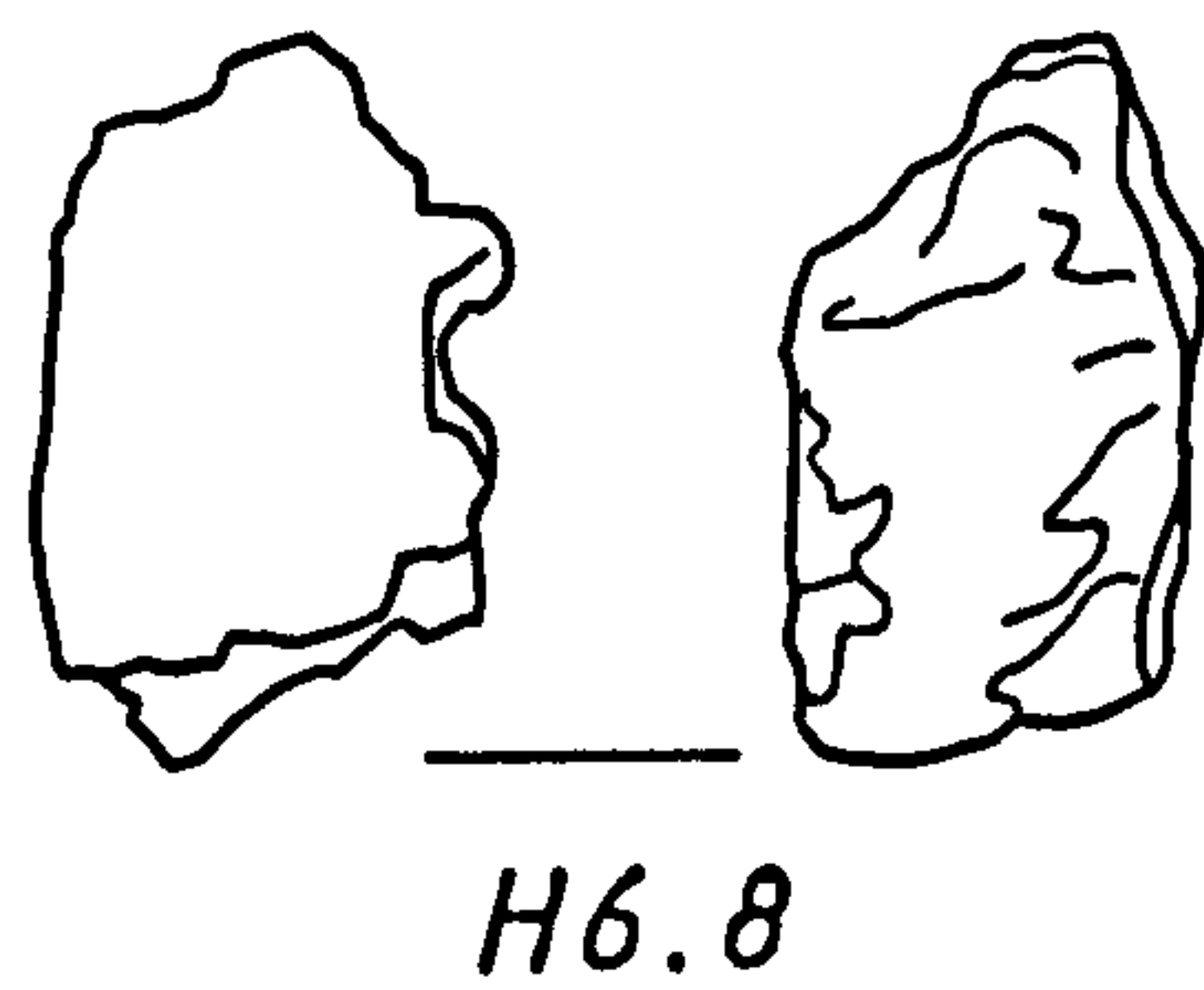
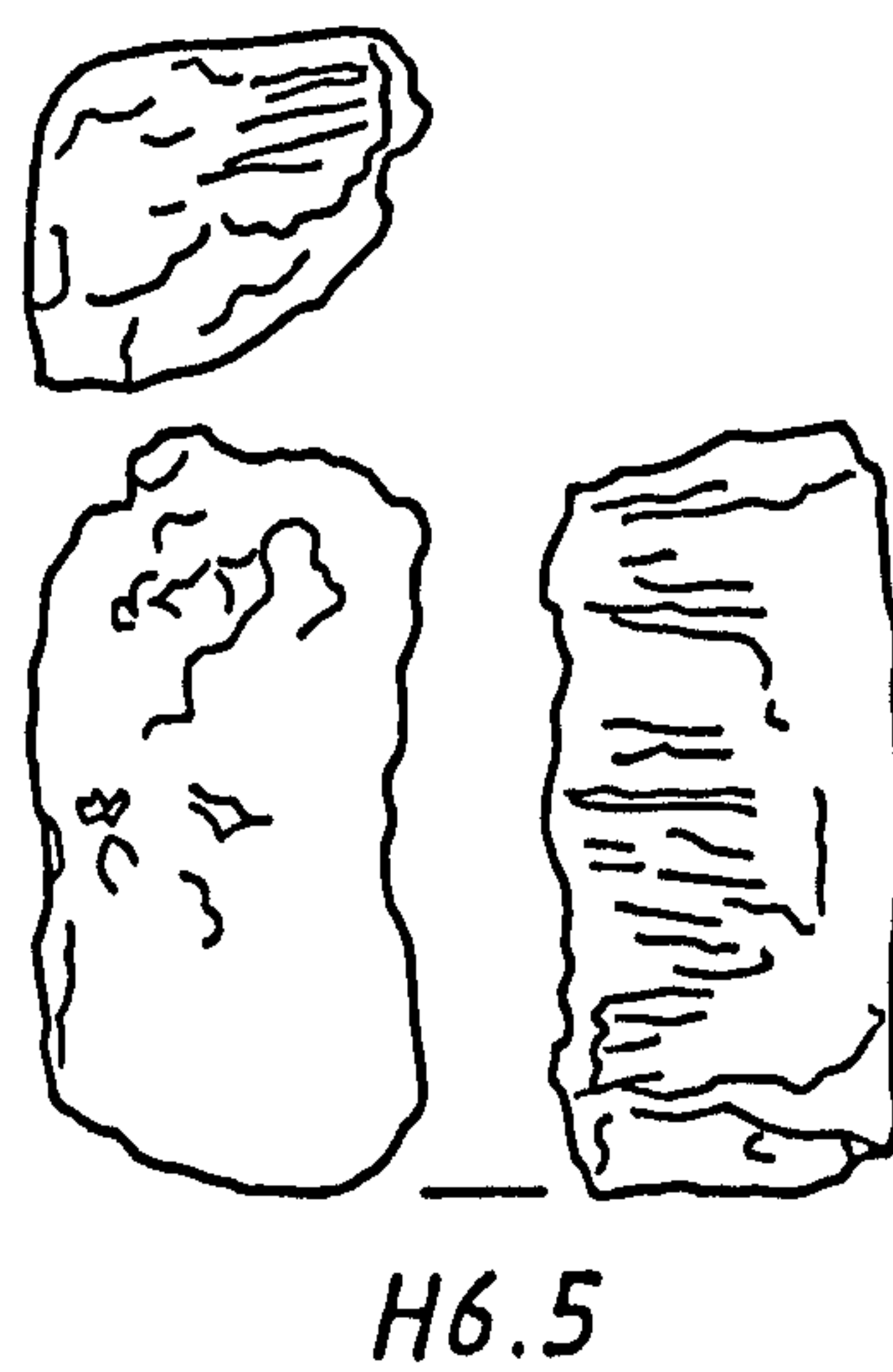
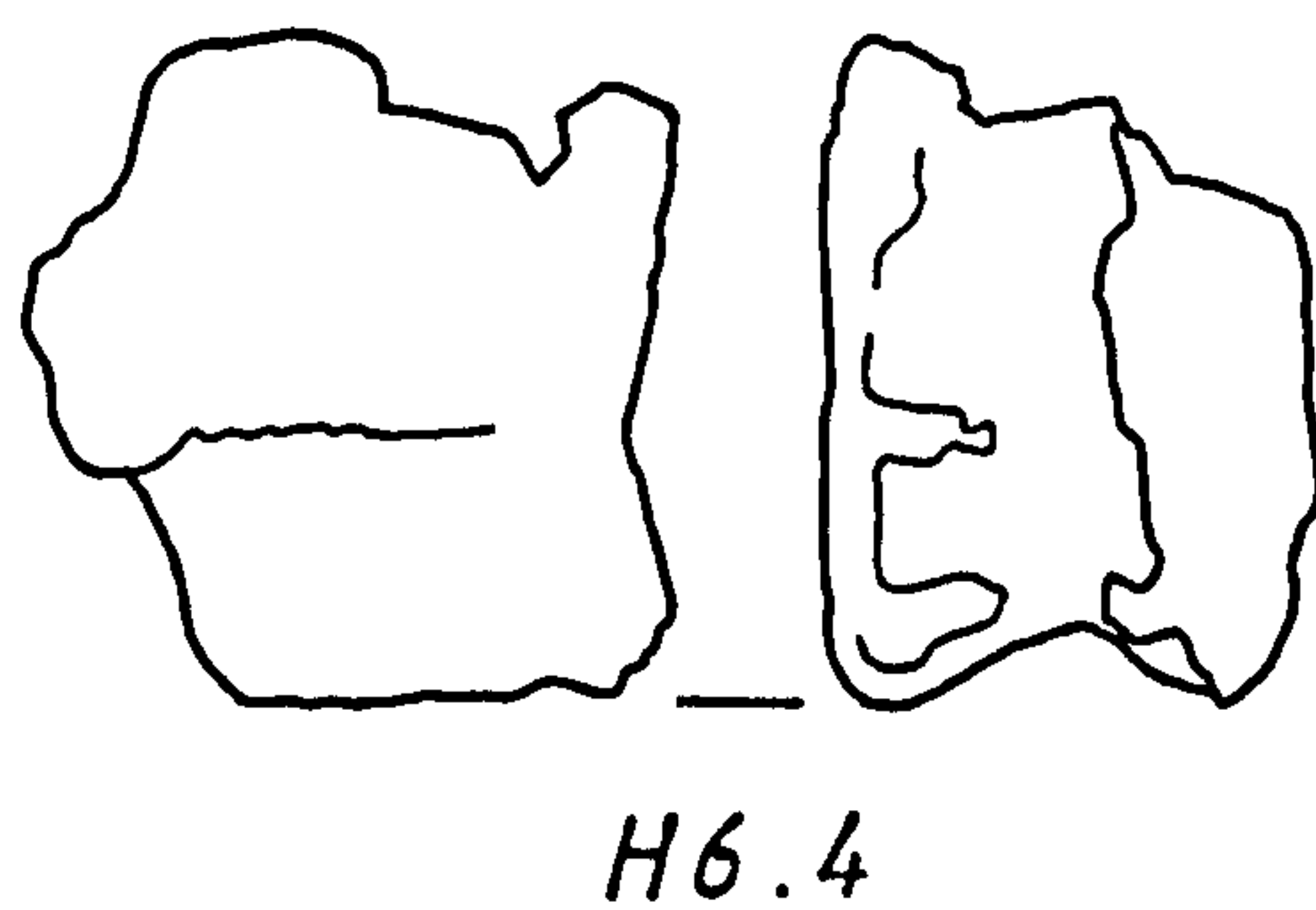
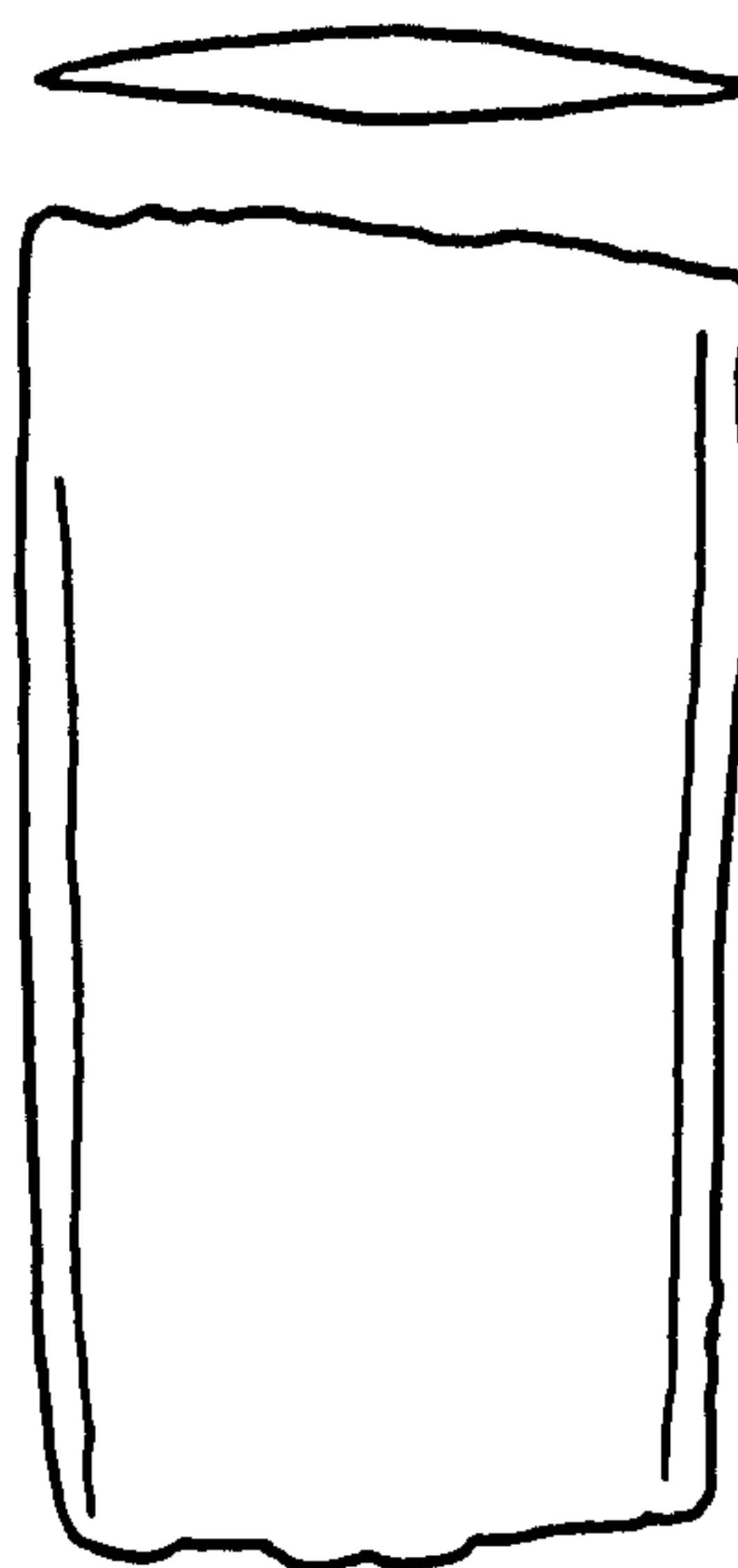
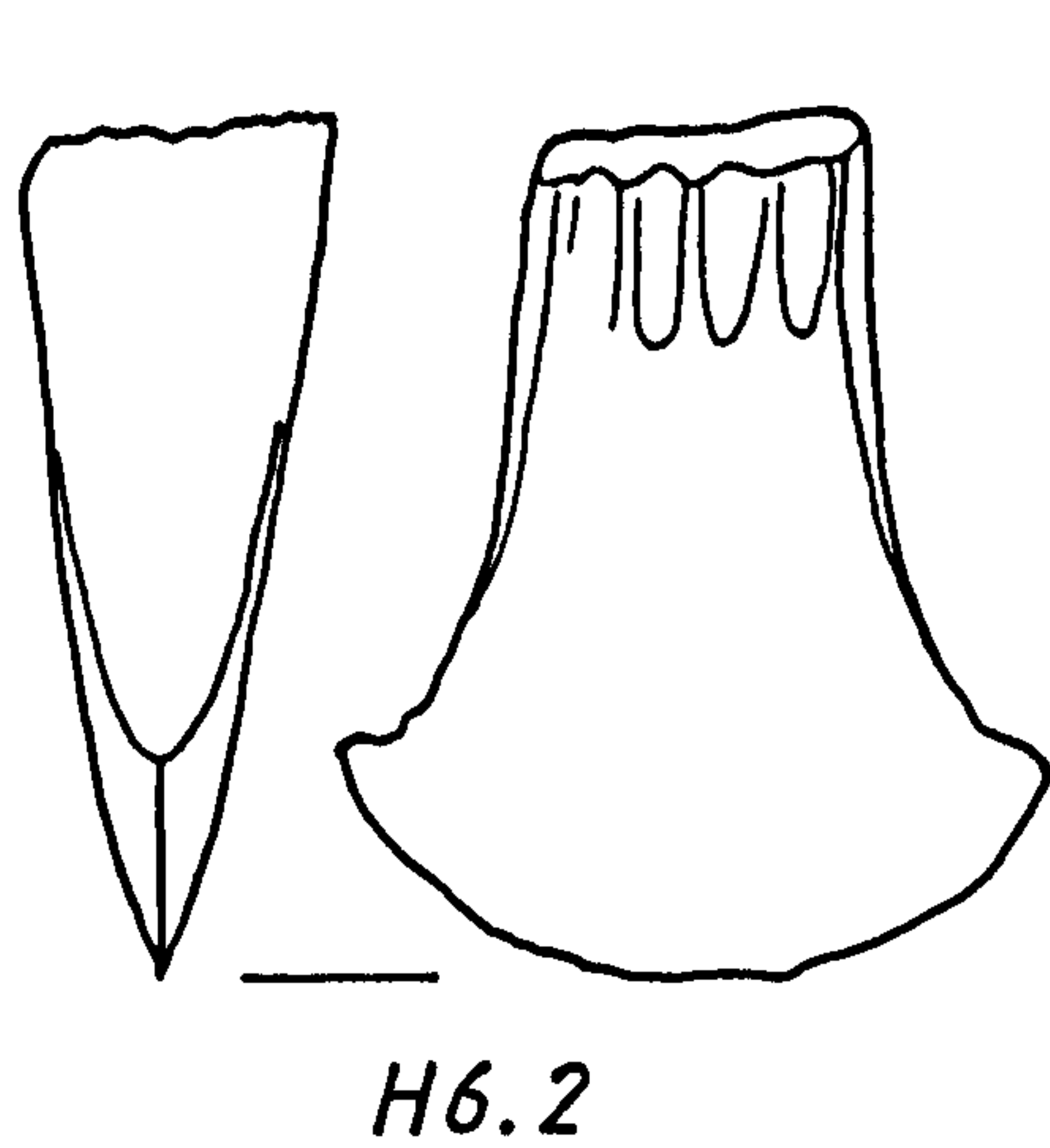
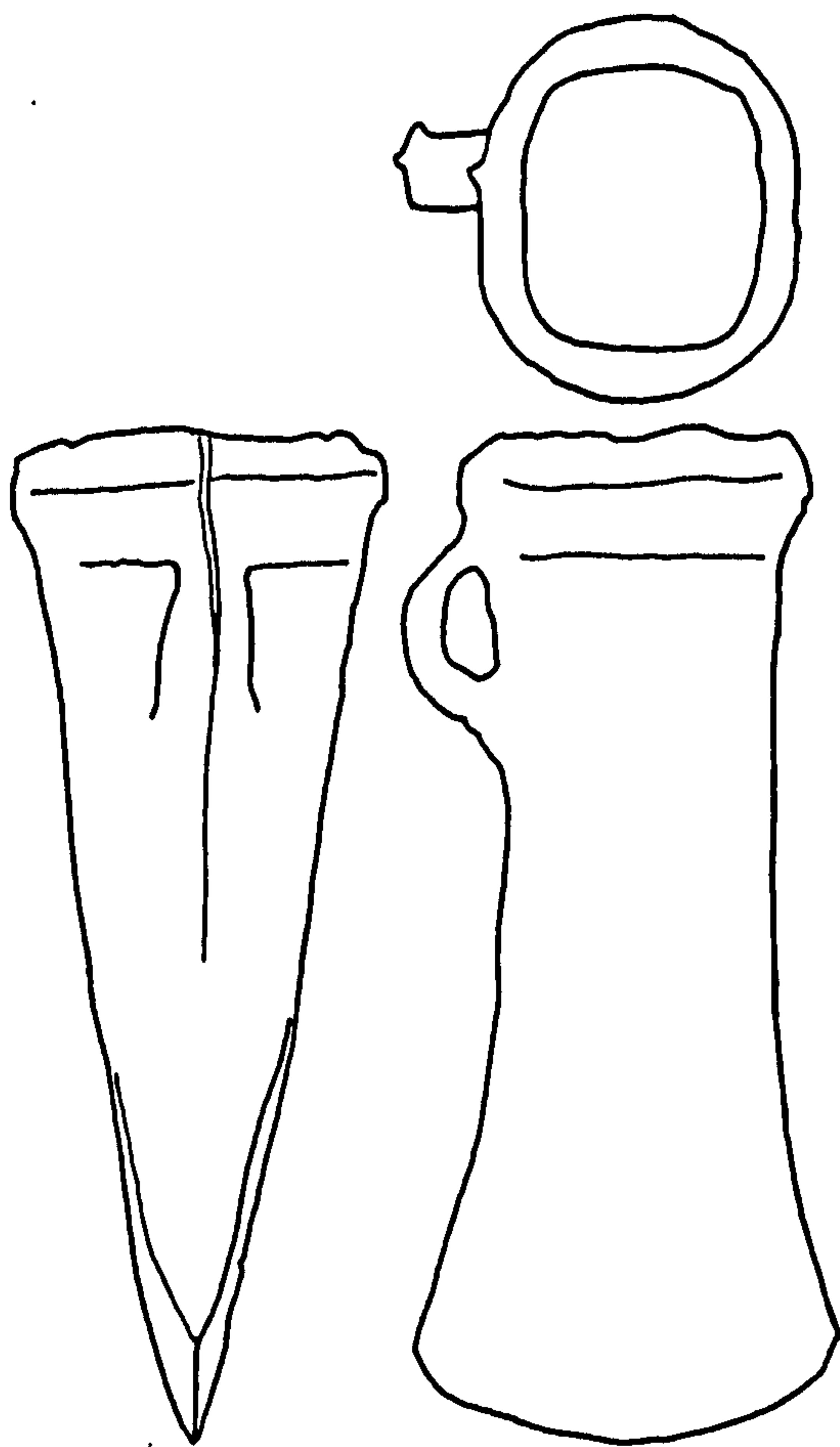
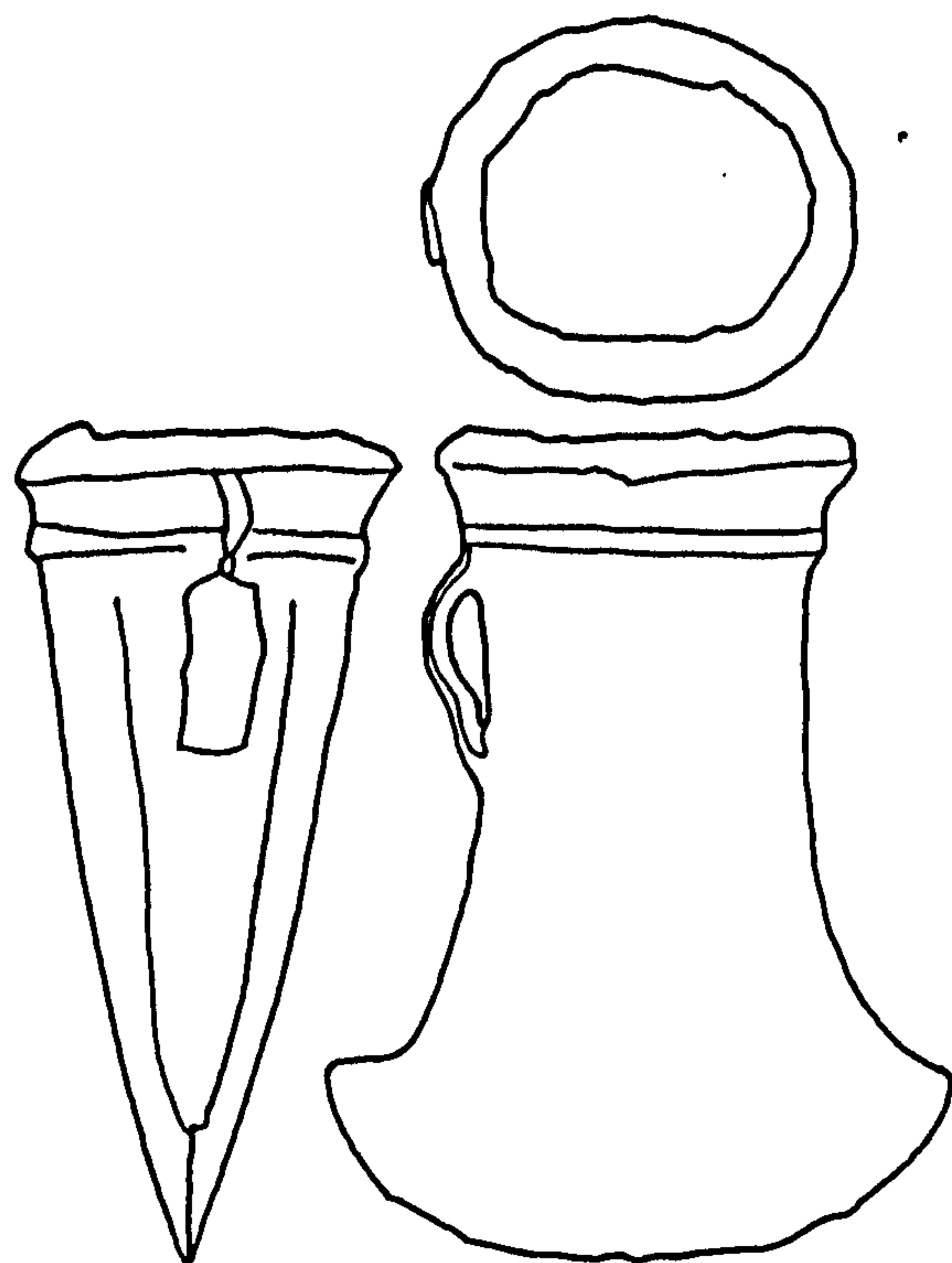


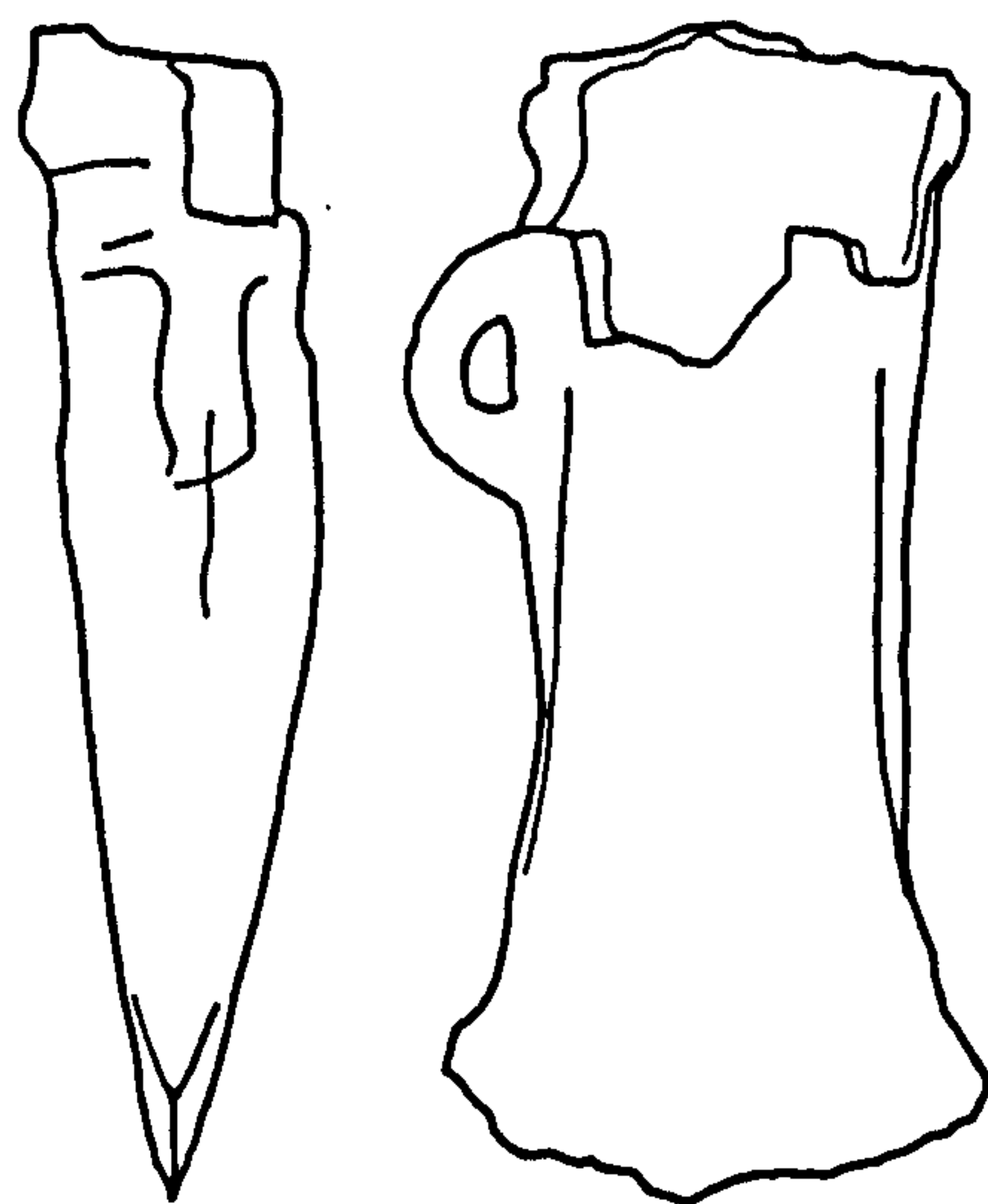
Fig. 5



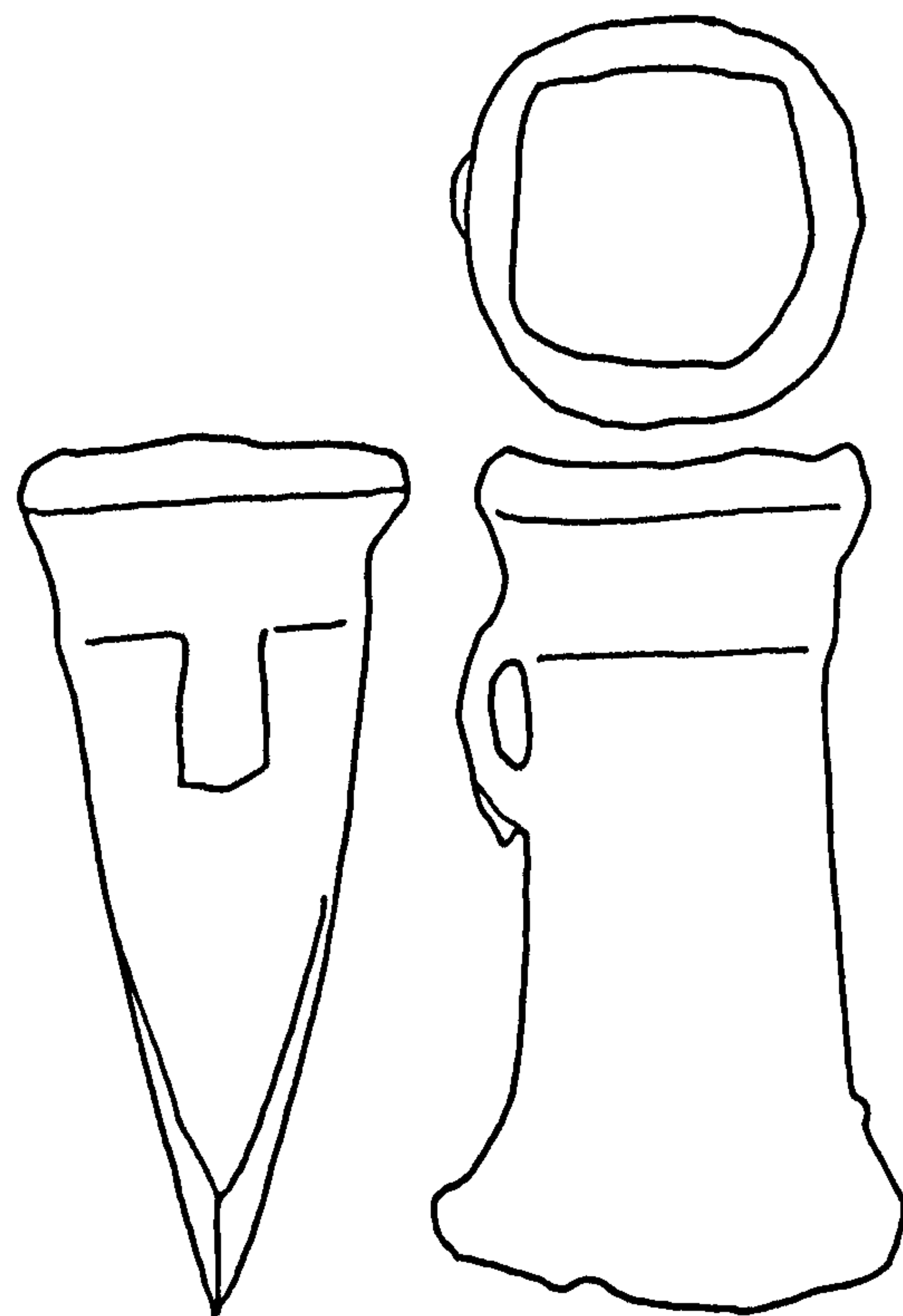
H7.6



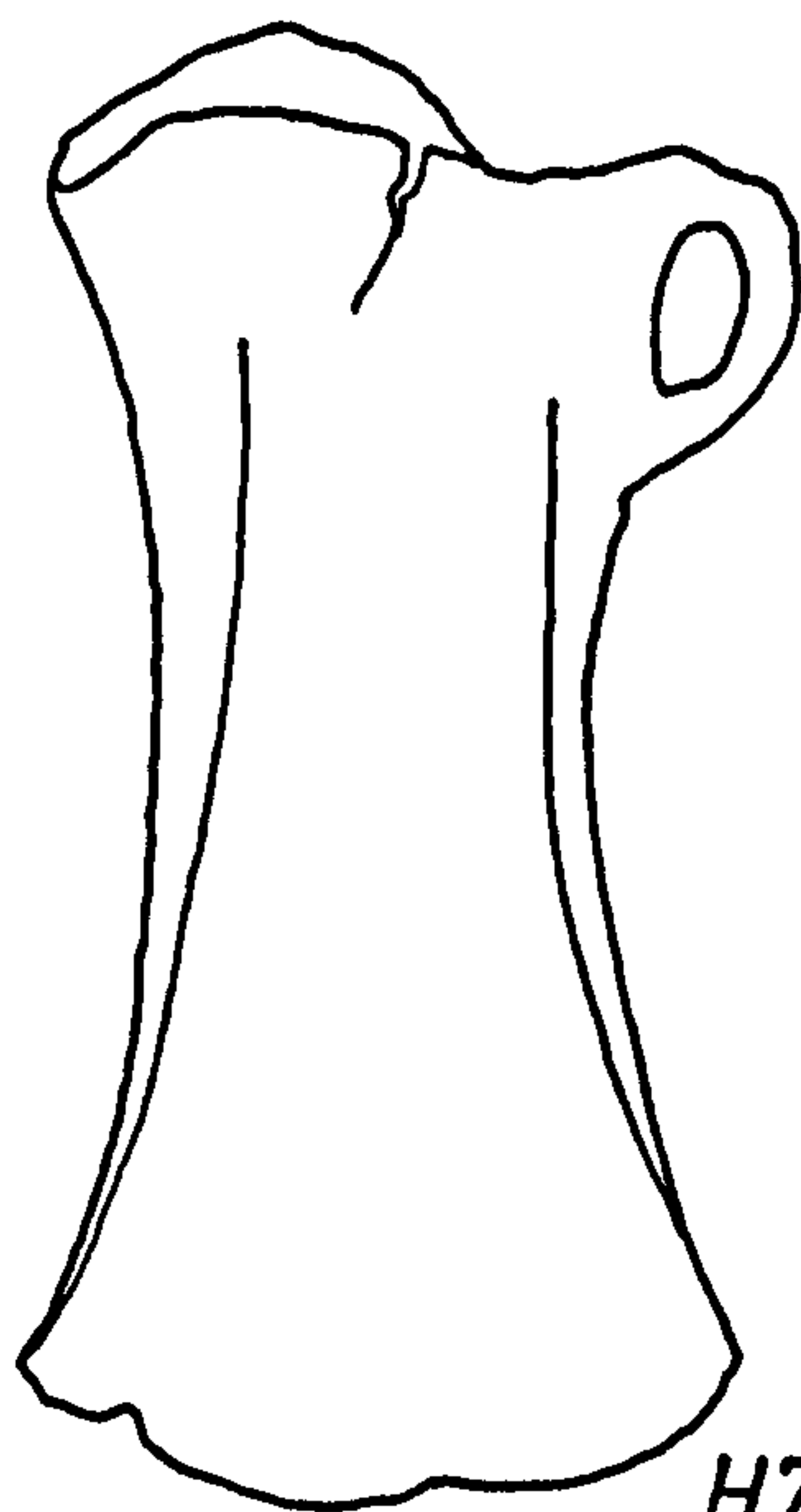
H7.22



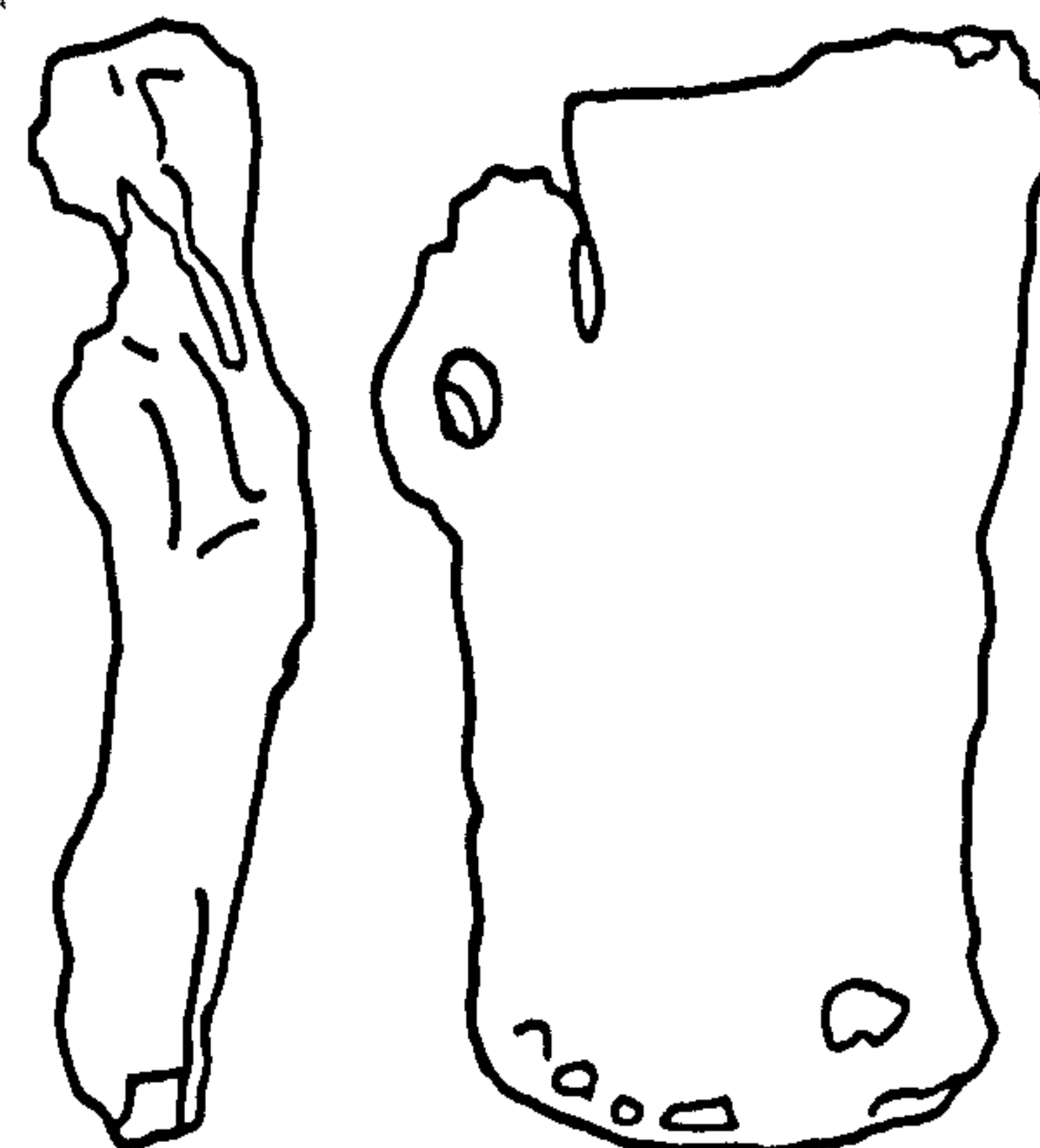
H7.4



H7.18

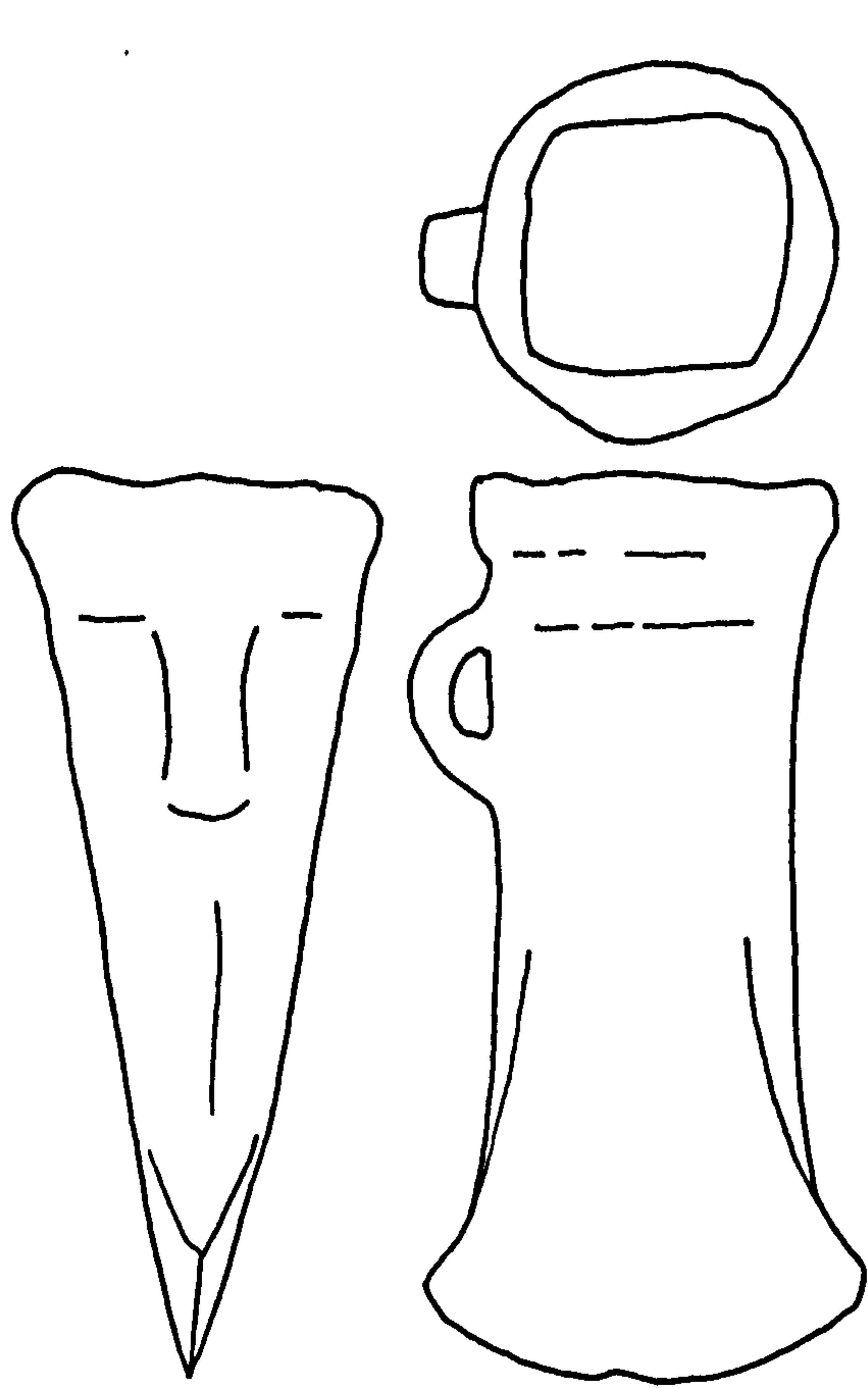


H7.13

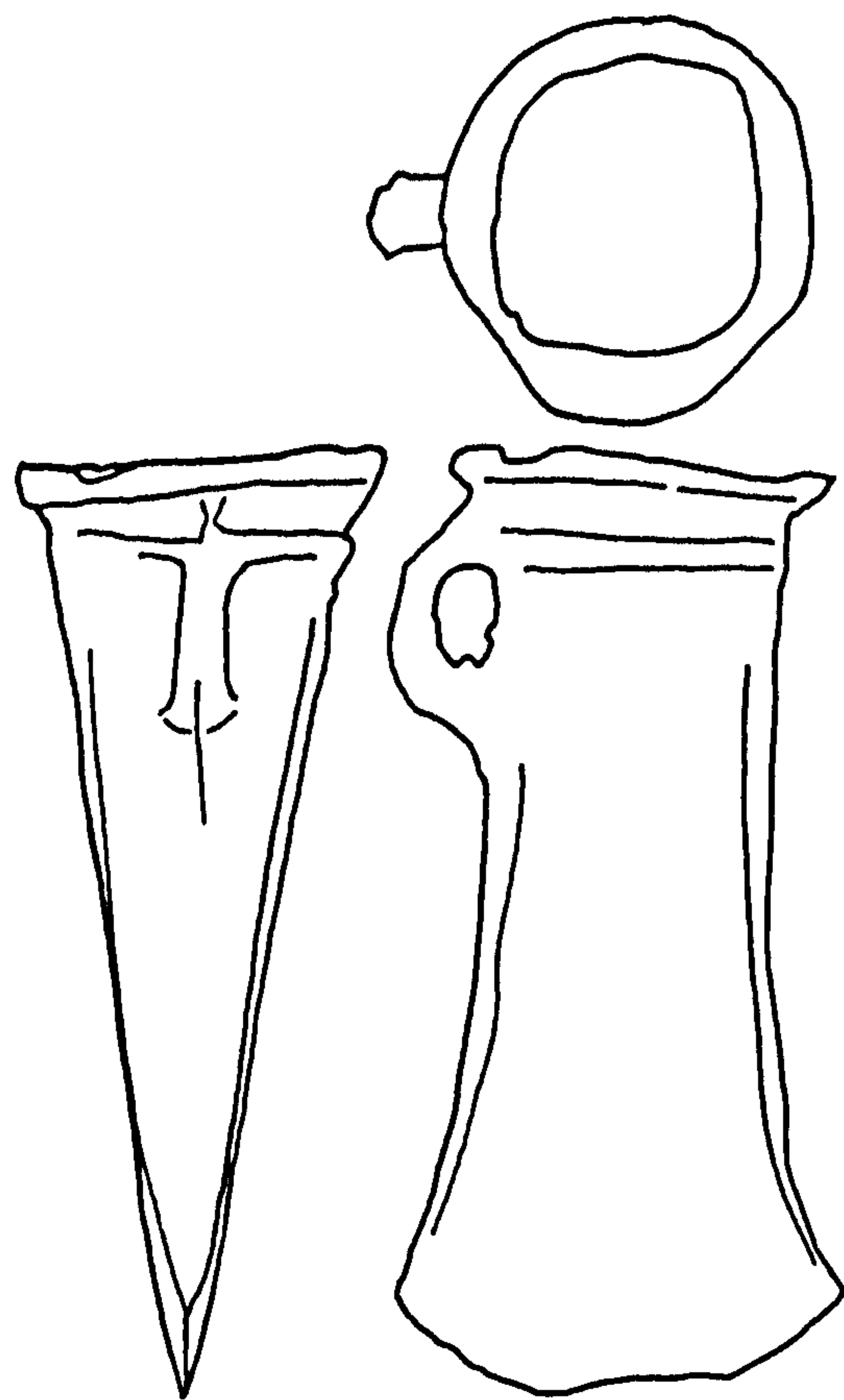


H7.7

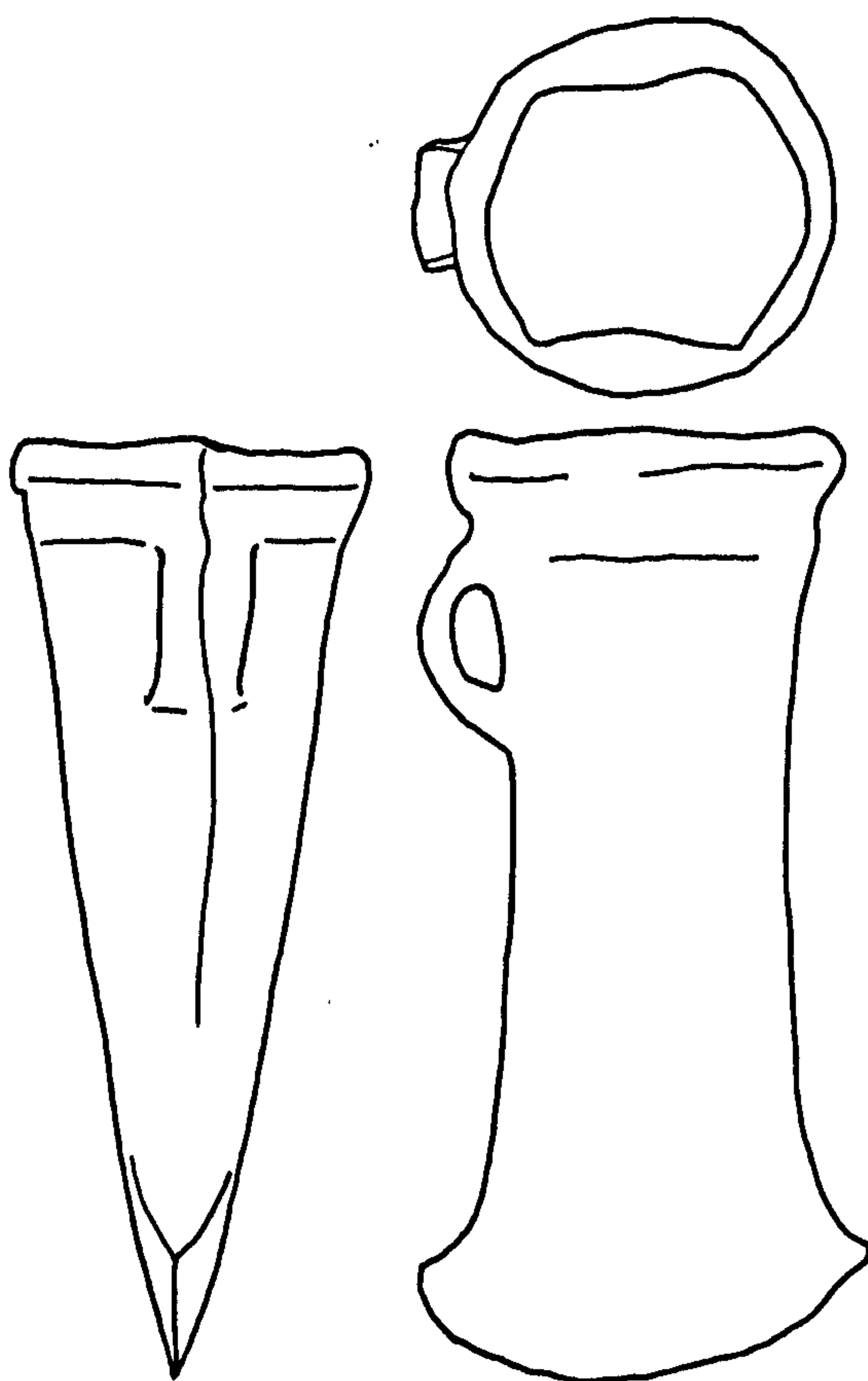
Fig. 6



H7.11



H7.12



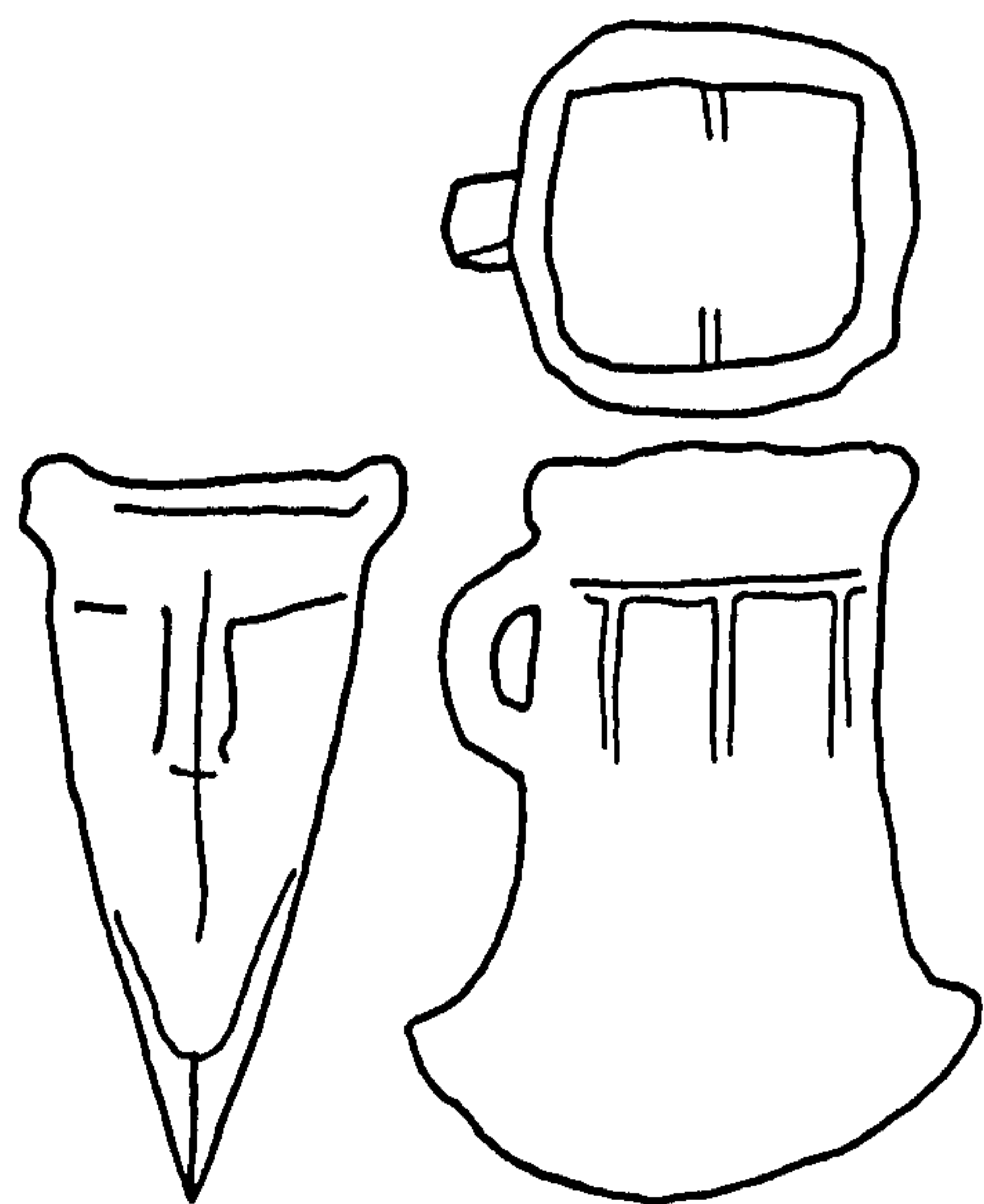
H7.10



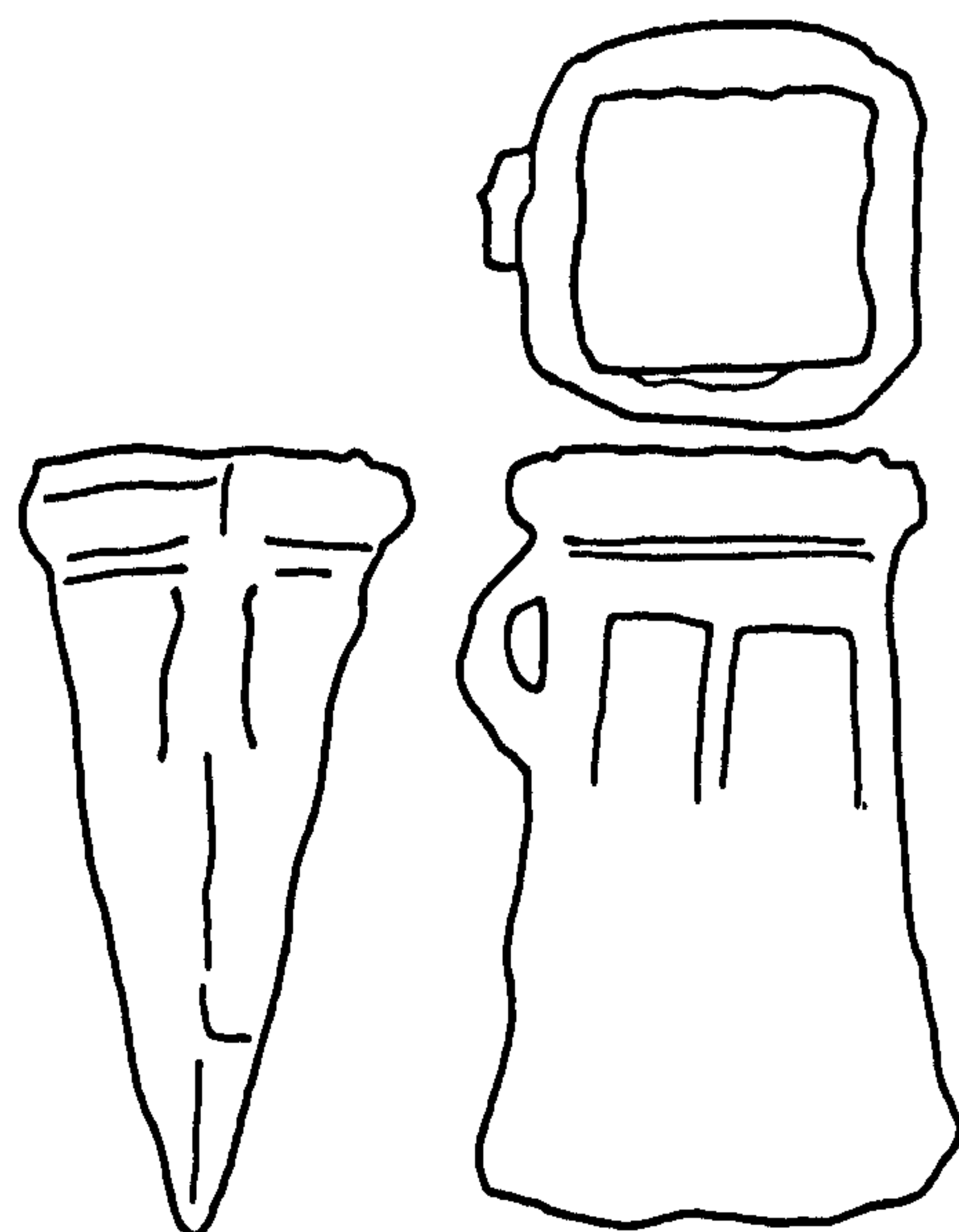
H7.17



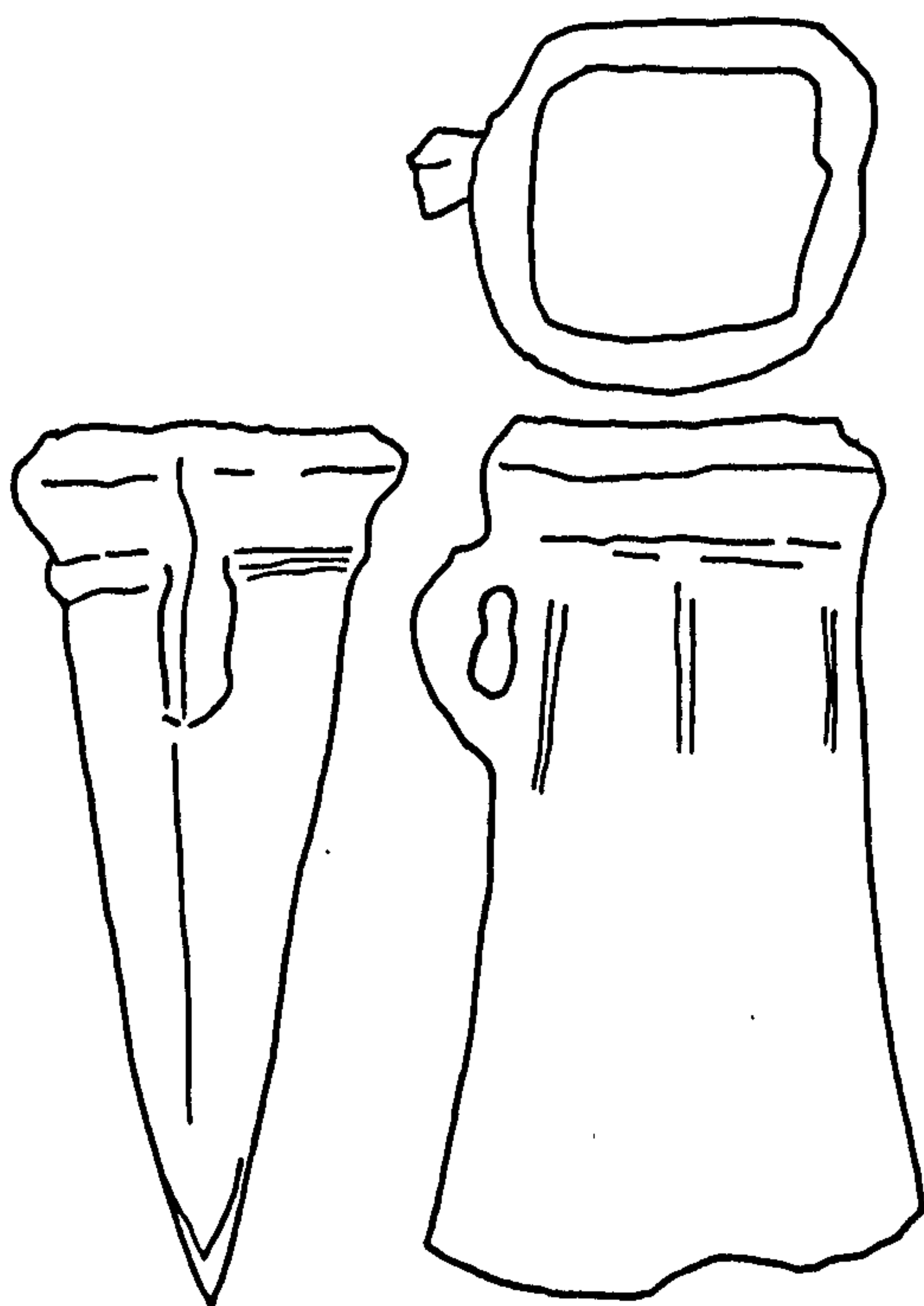
Fig. 7



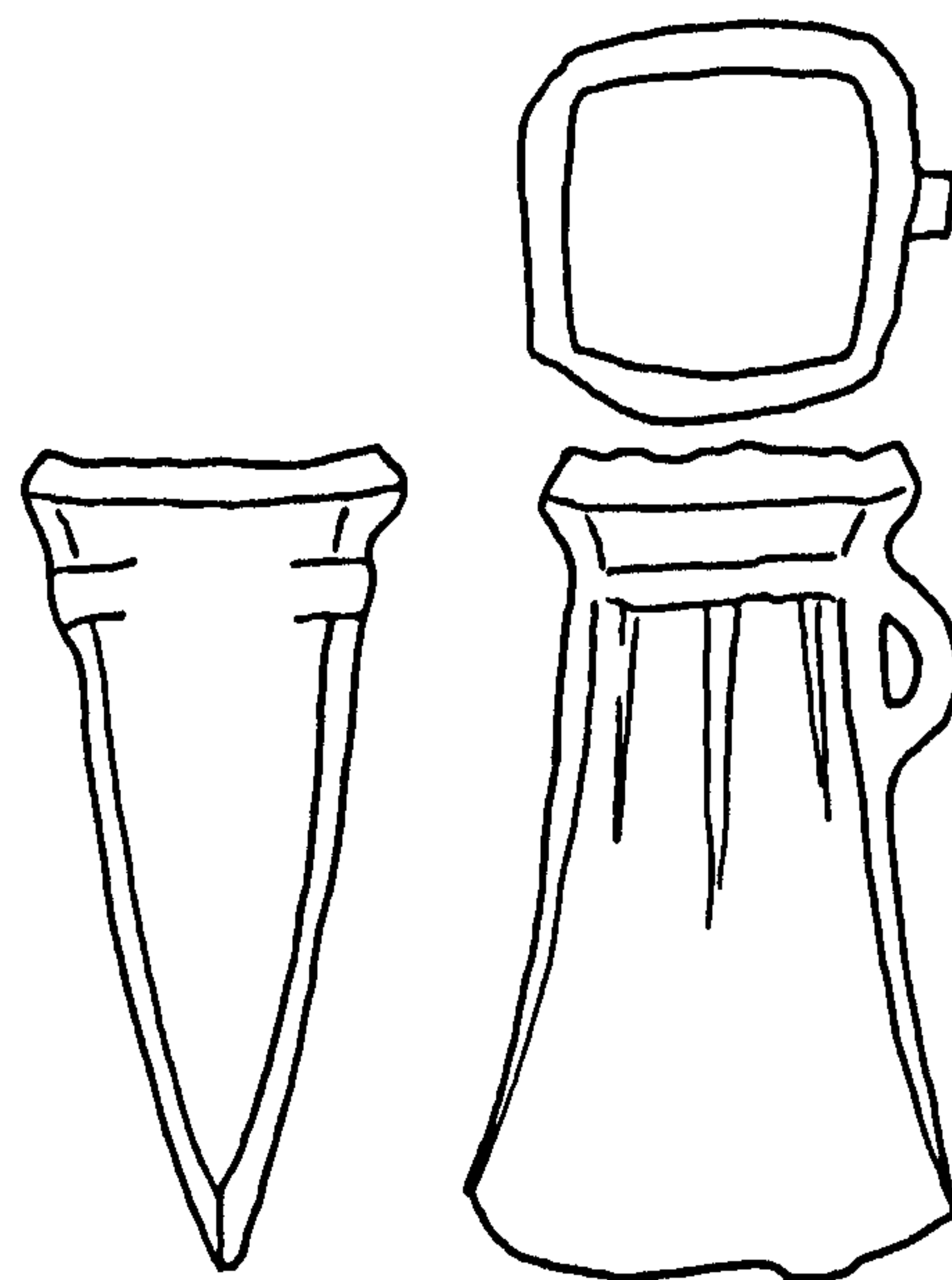
H7.23



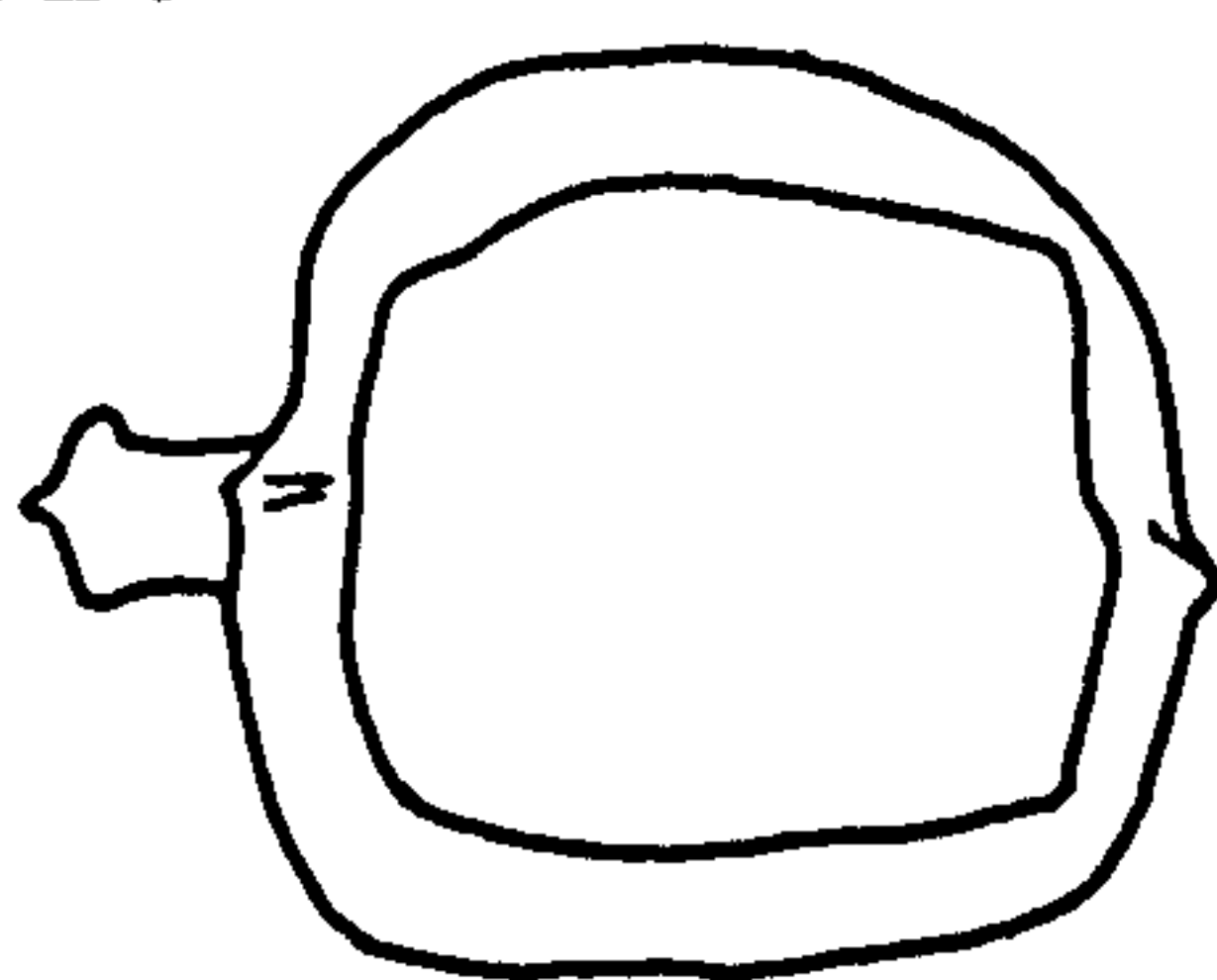
H7.9



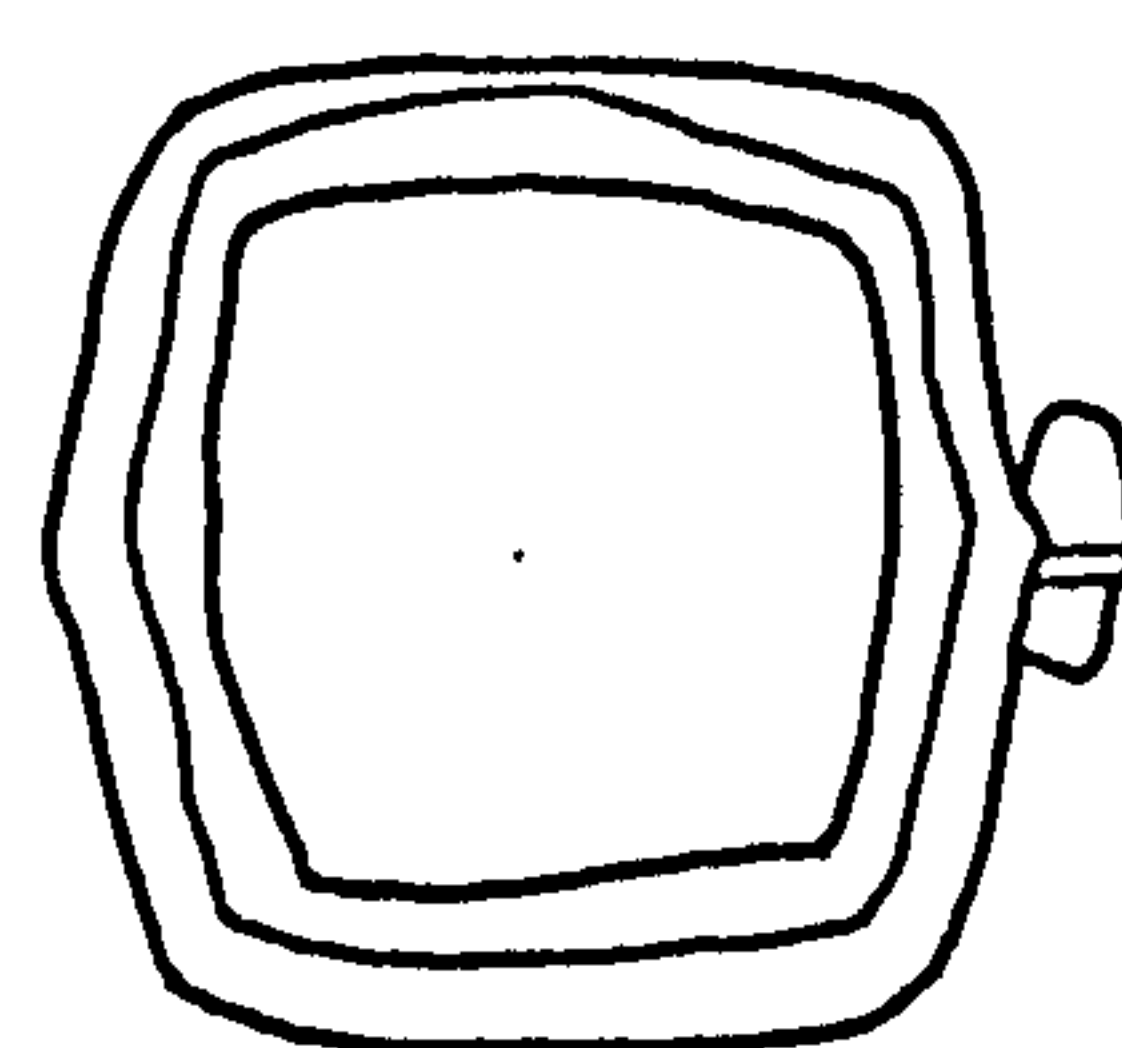
H7.20



H7.8



H7.5



H7.21

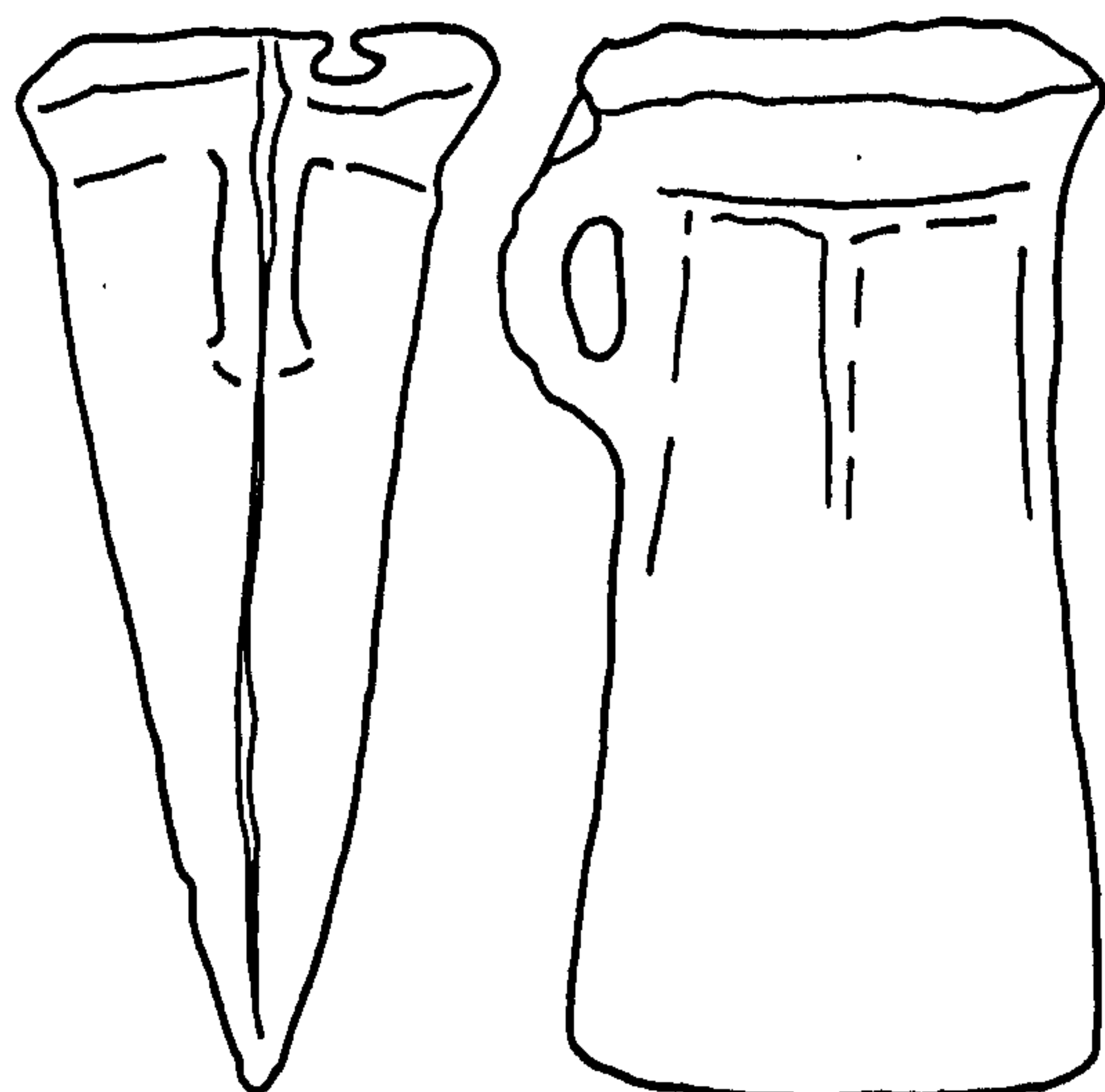


Fig. 8



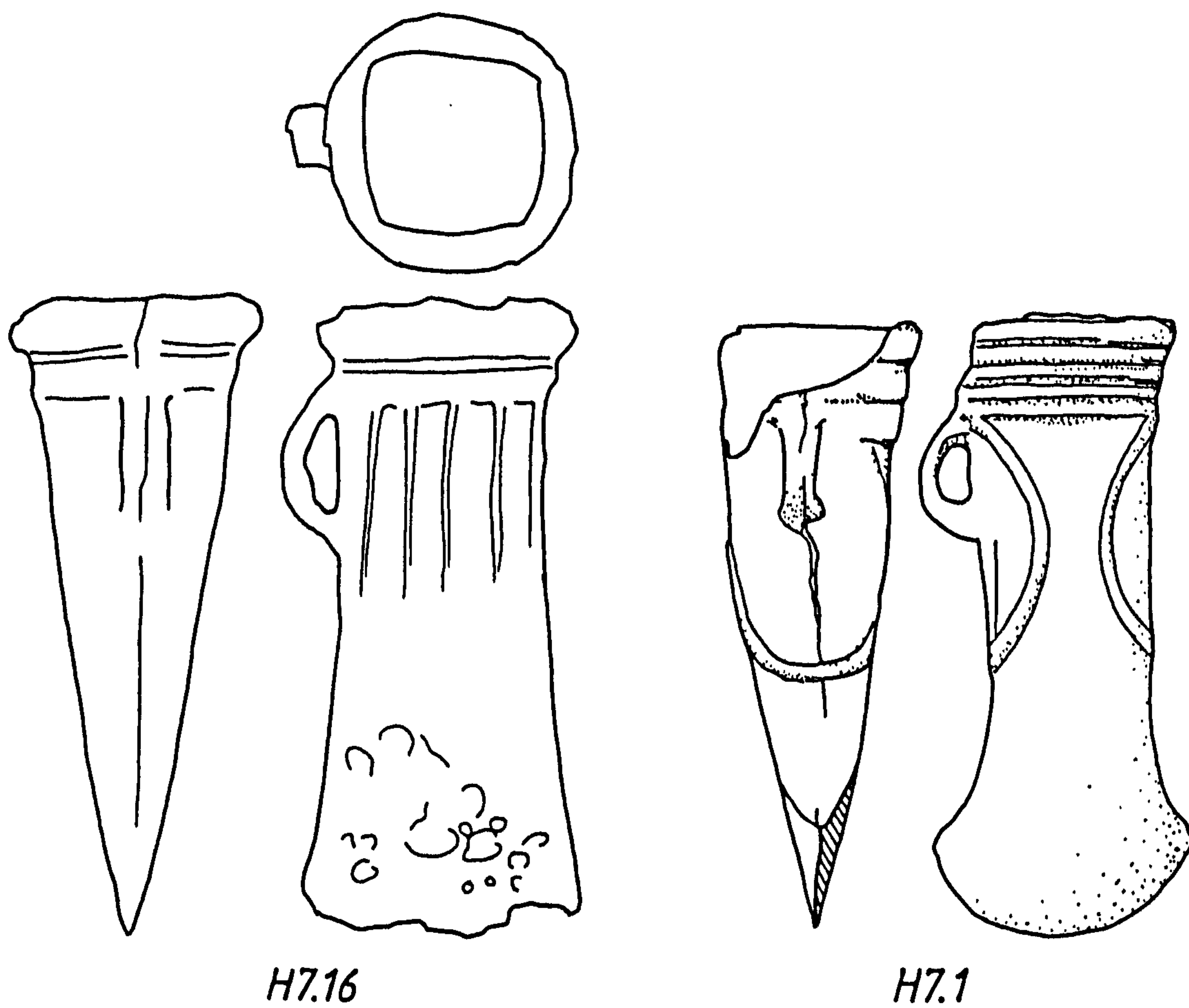
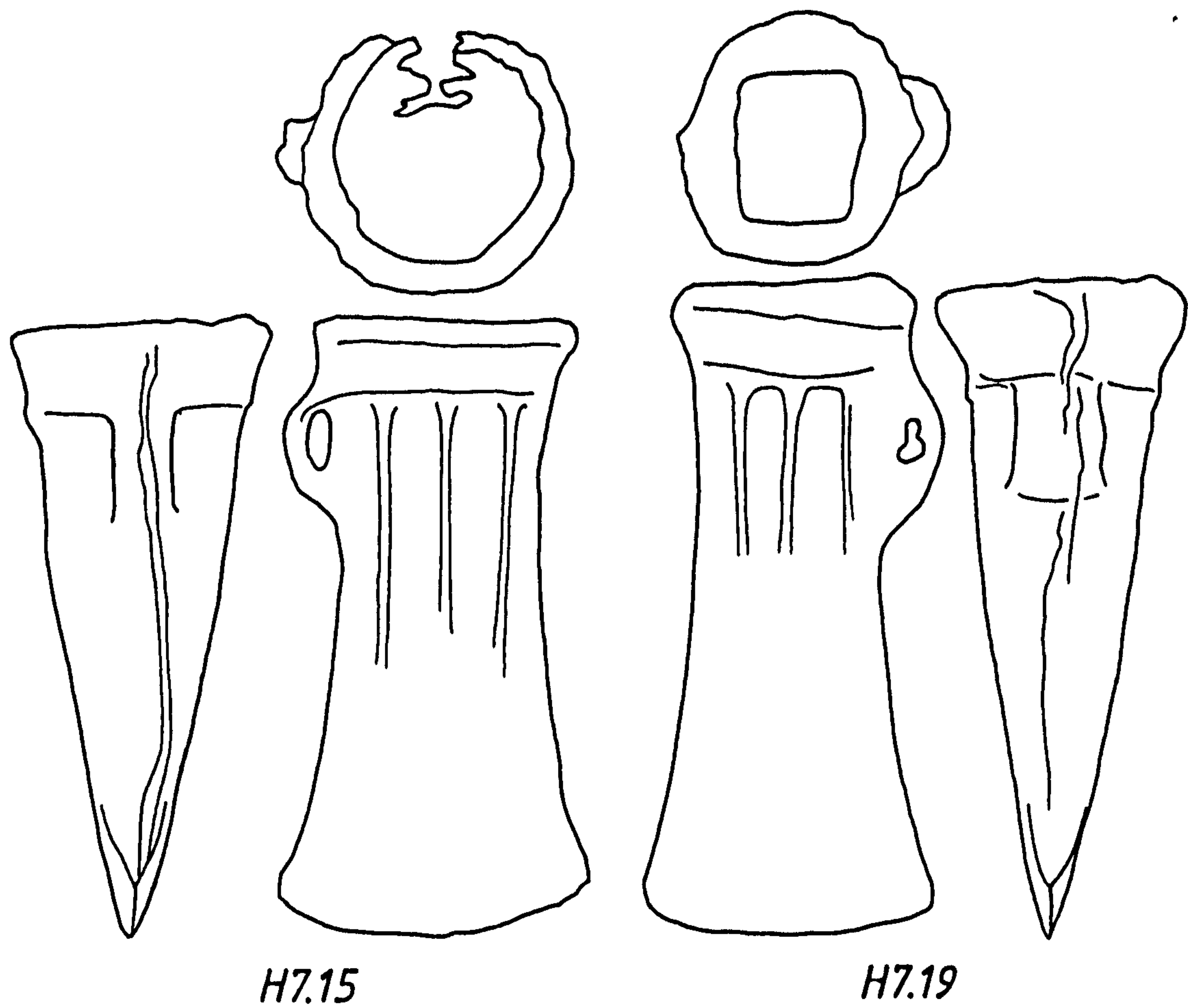
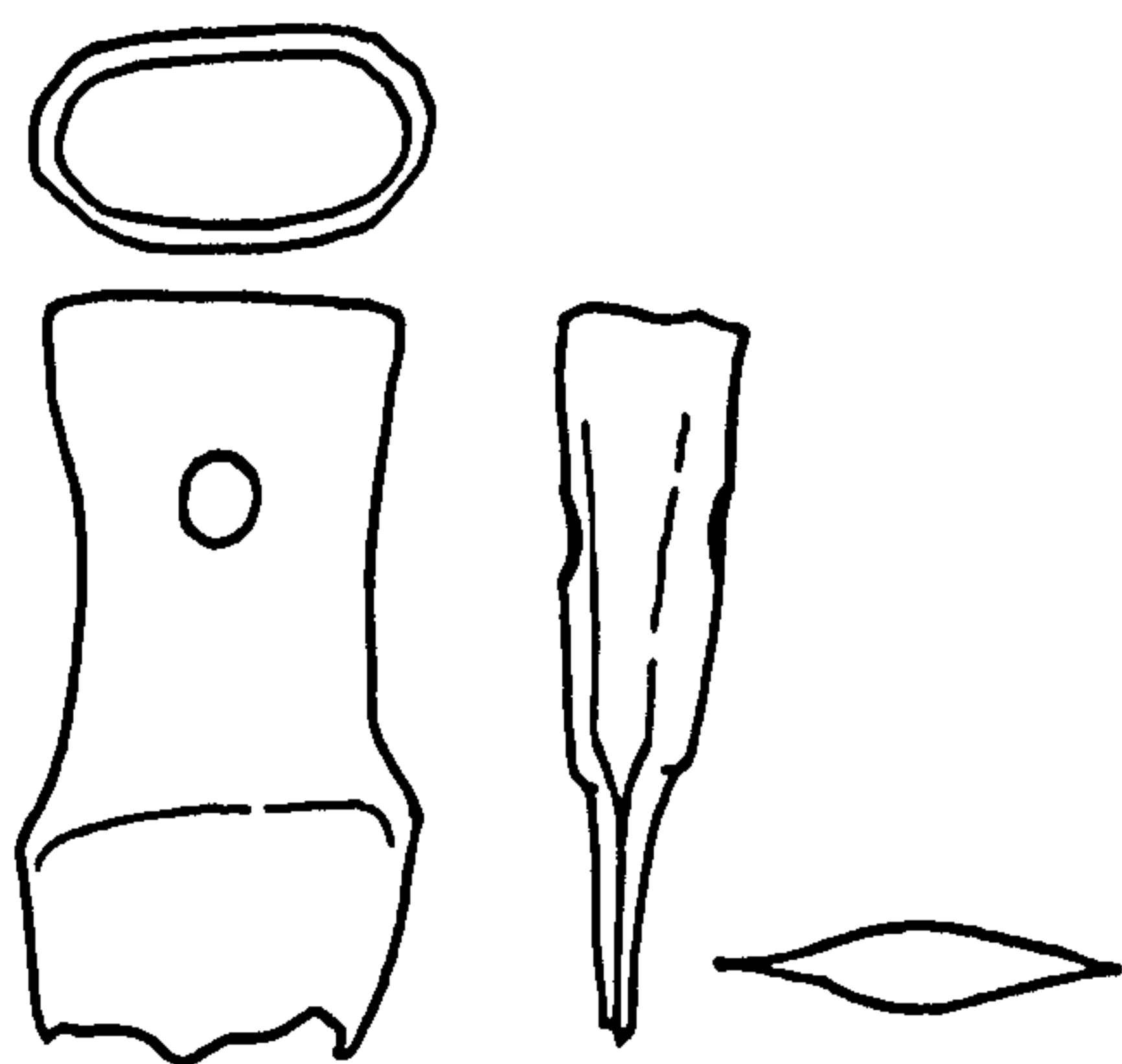
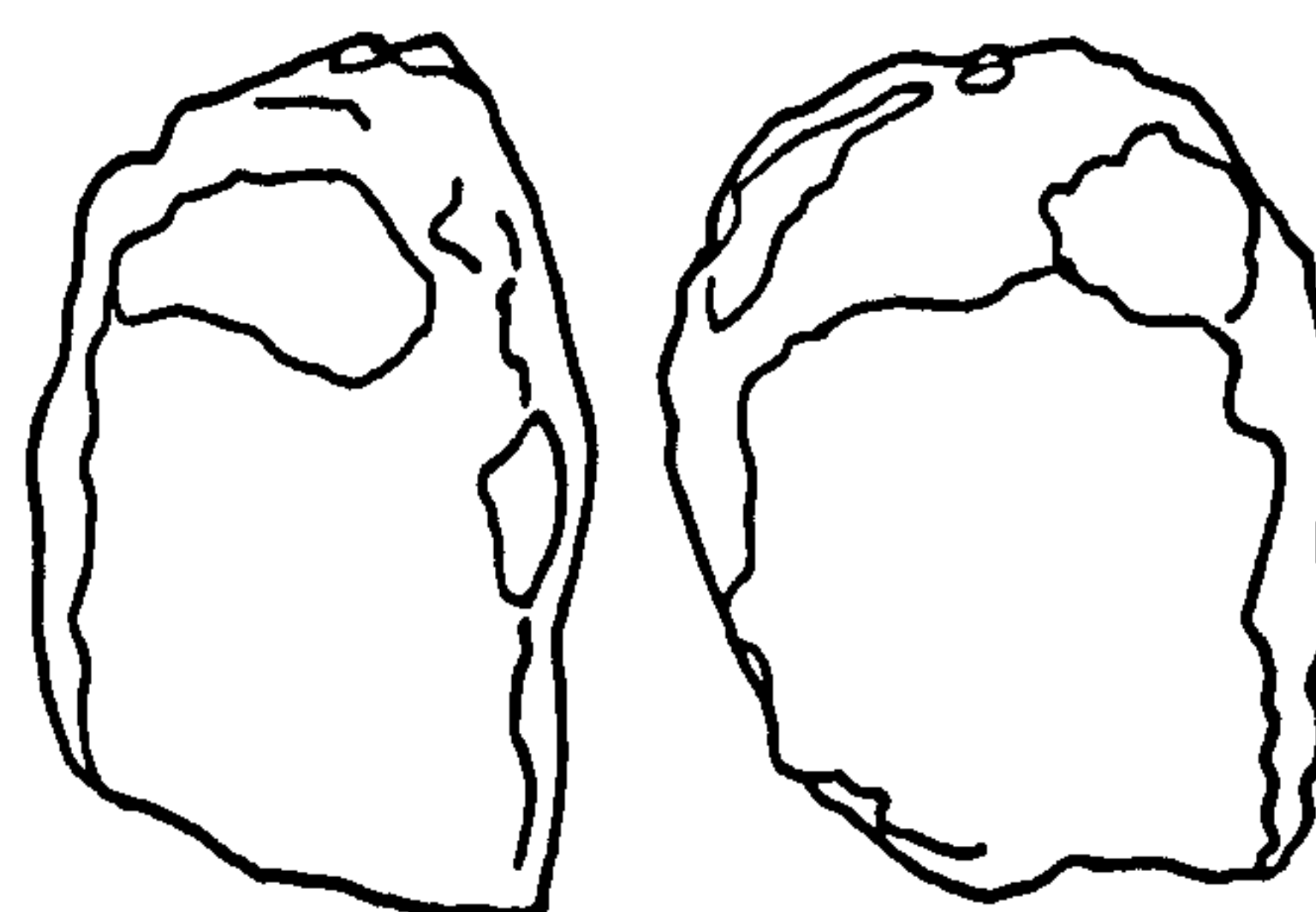


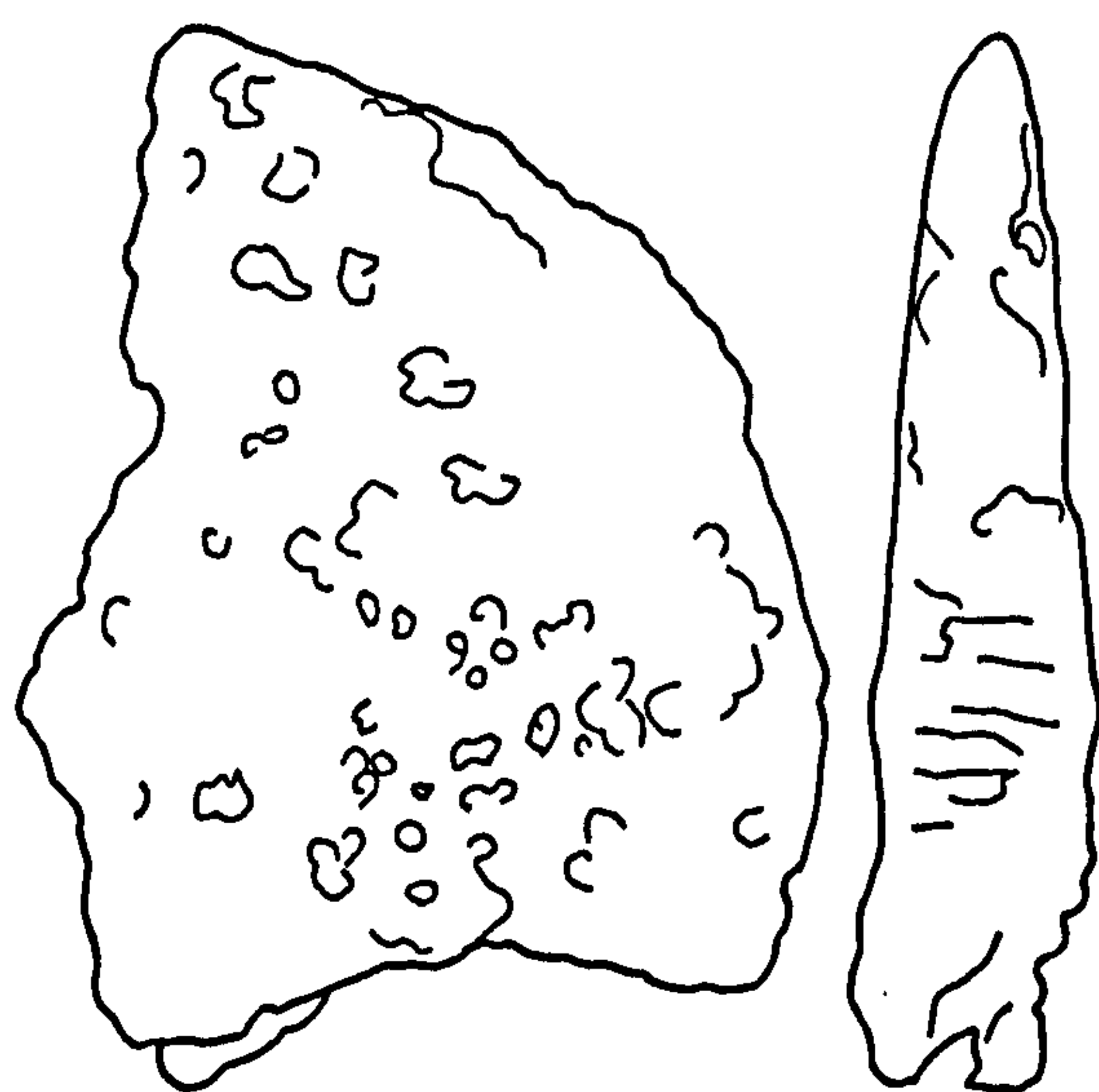
Fig. 9



H7.14

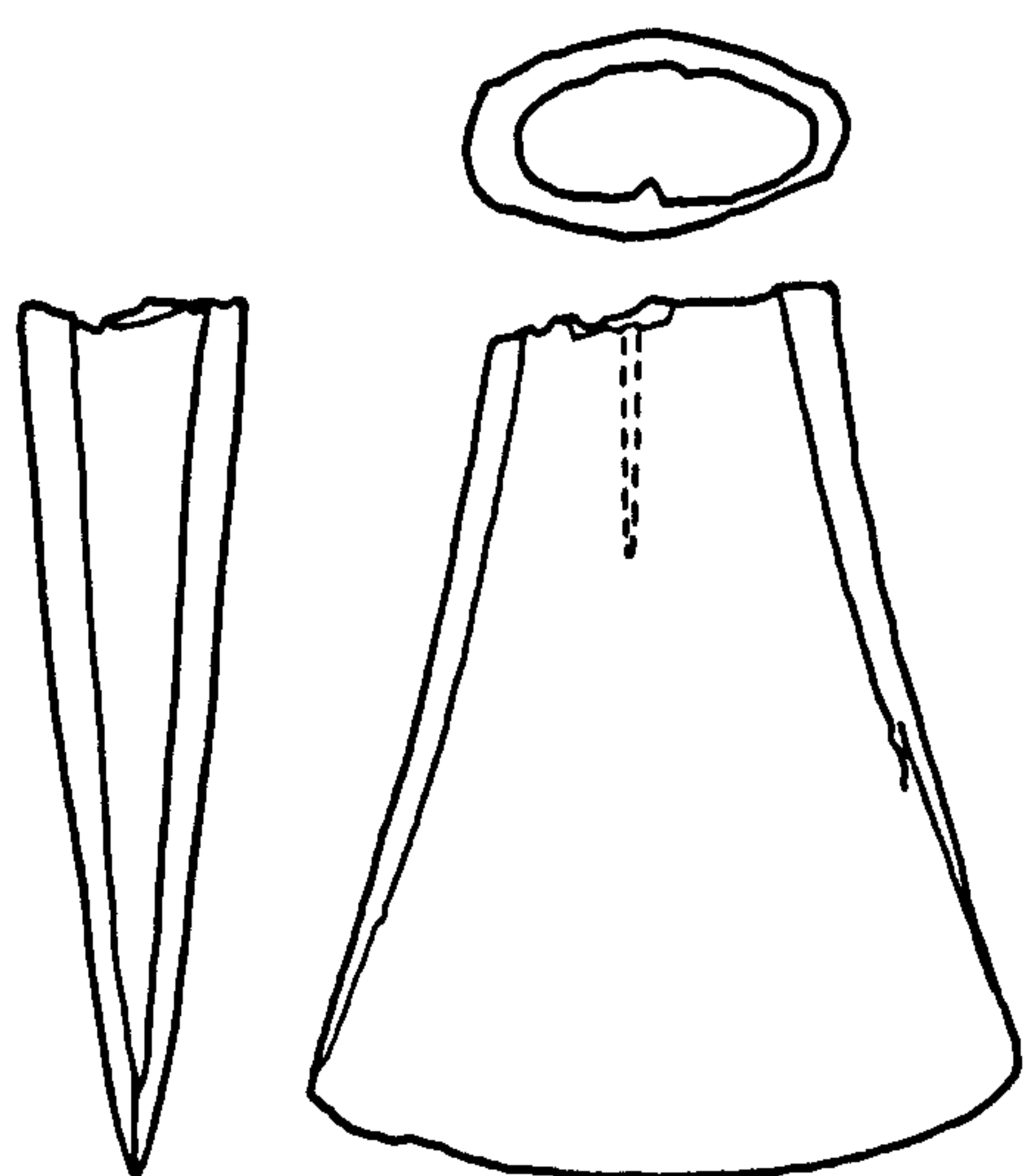


H7.2

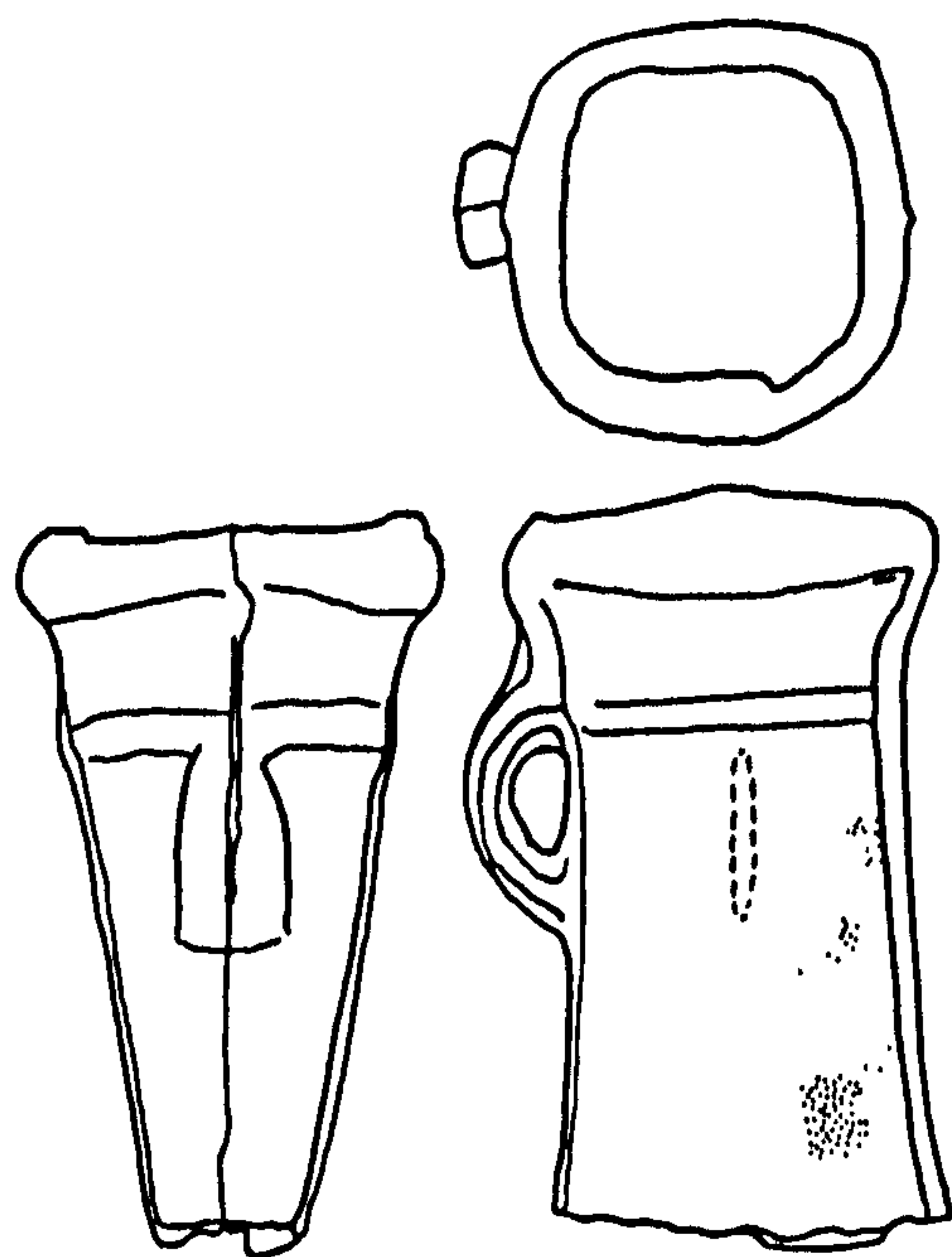


H7.3

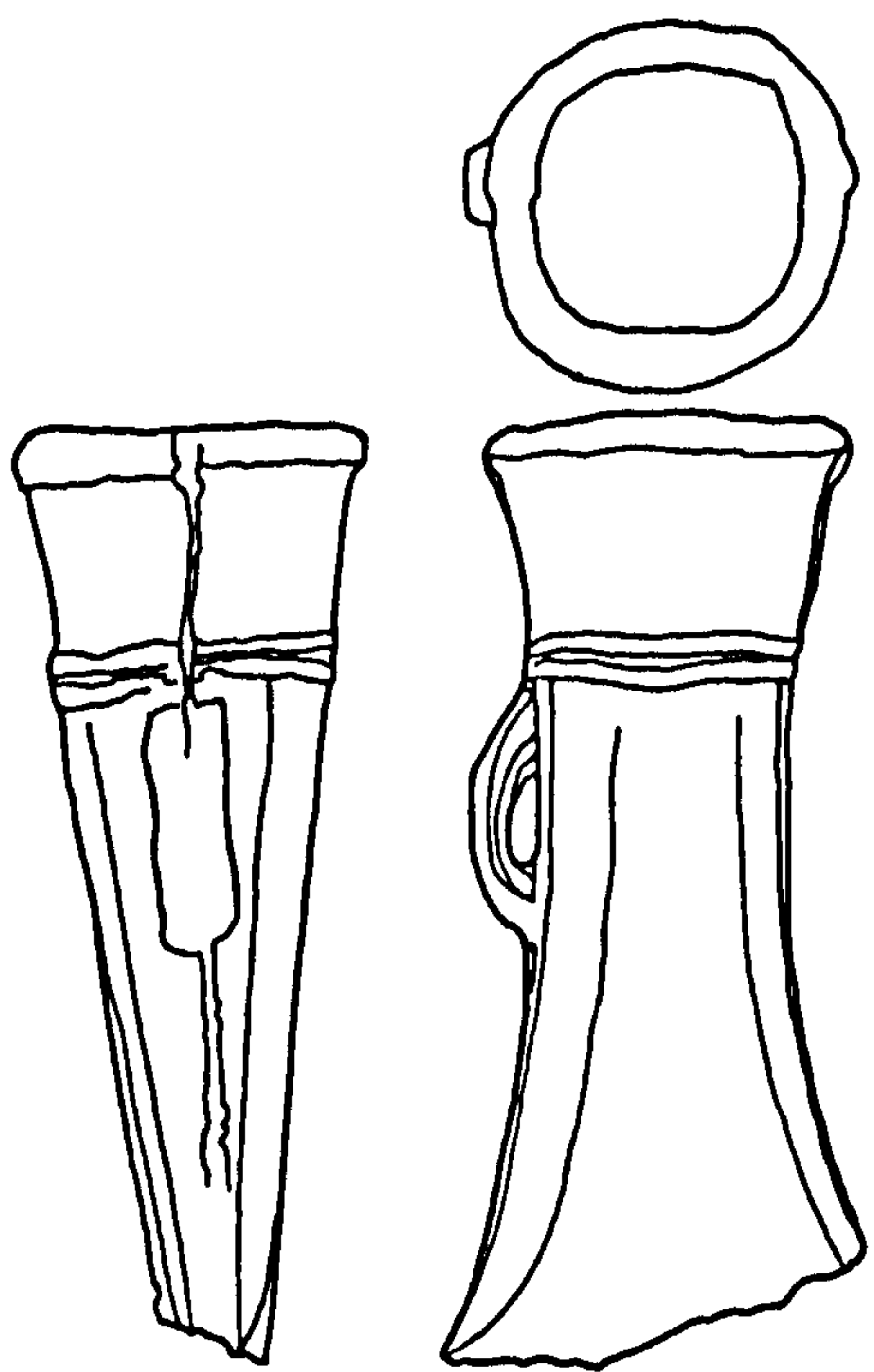
Fig. 10



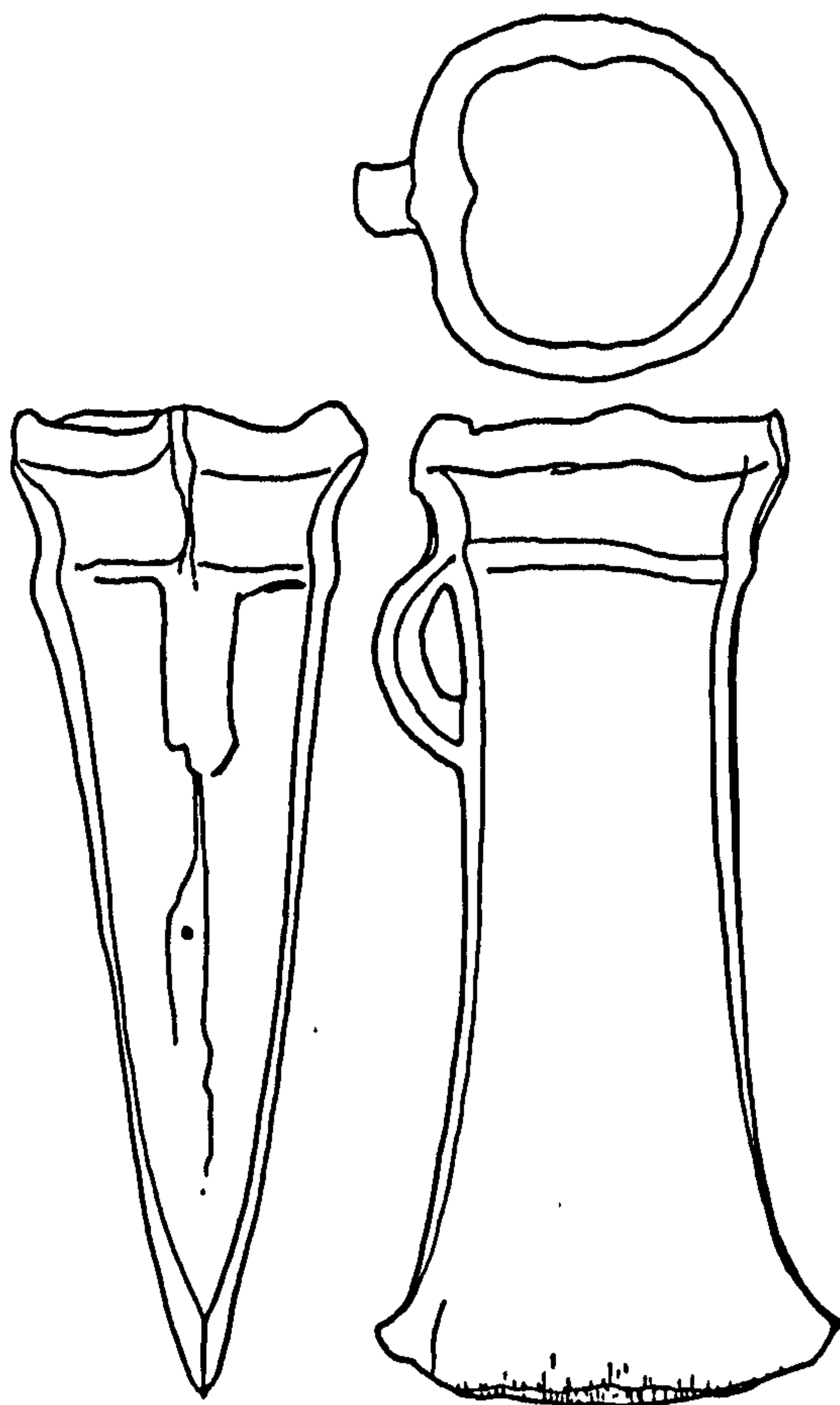
H8.1



H8.3



H8.2



H8.4



Fig. 11

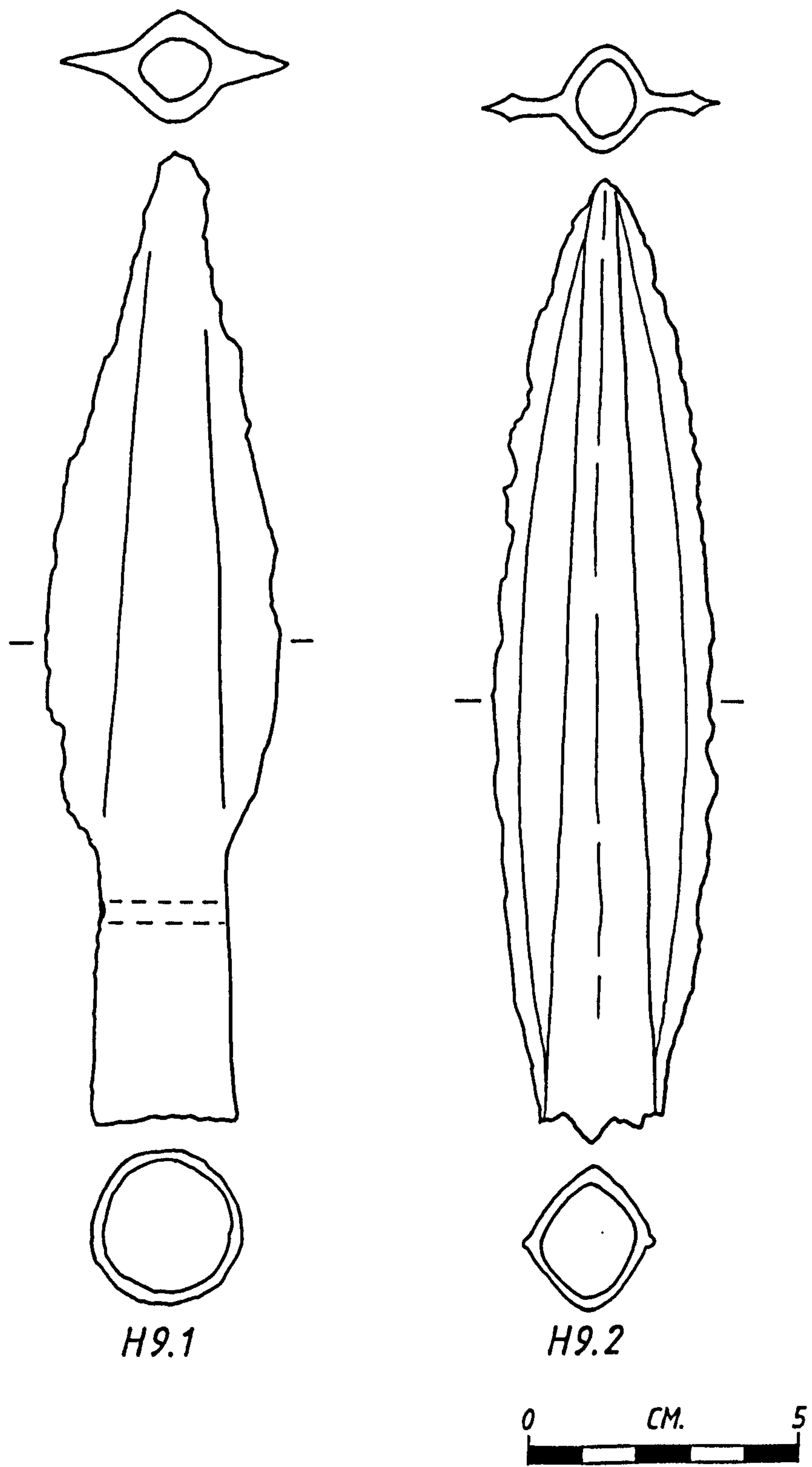
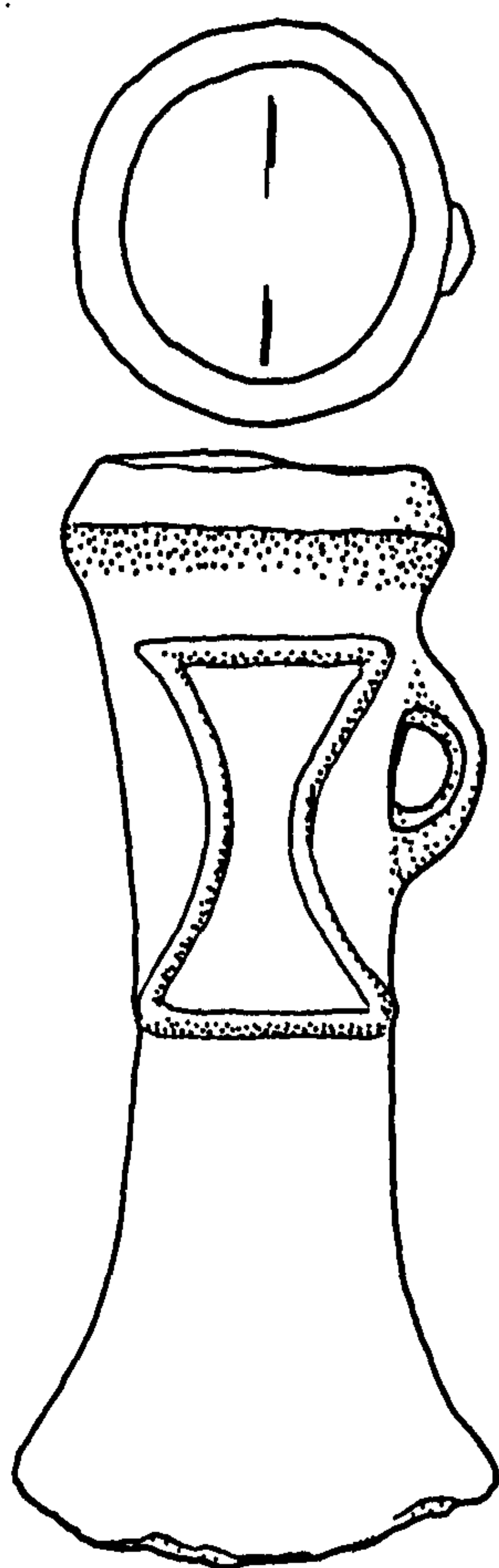
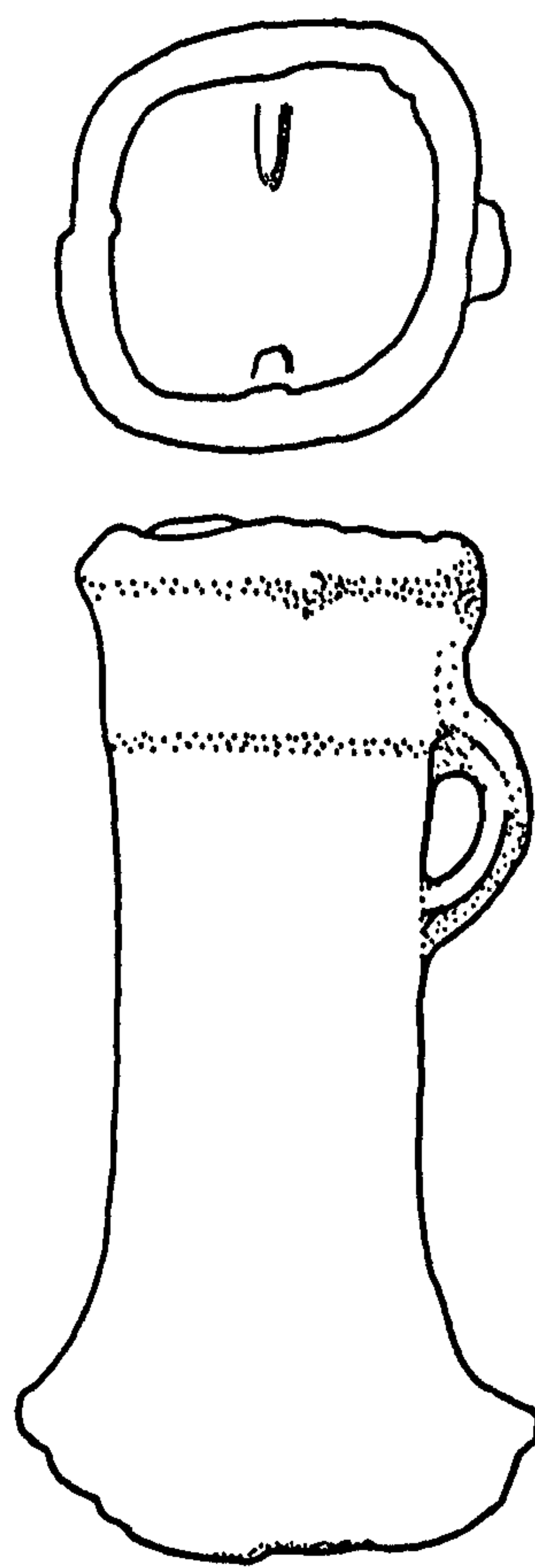


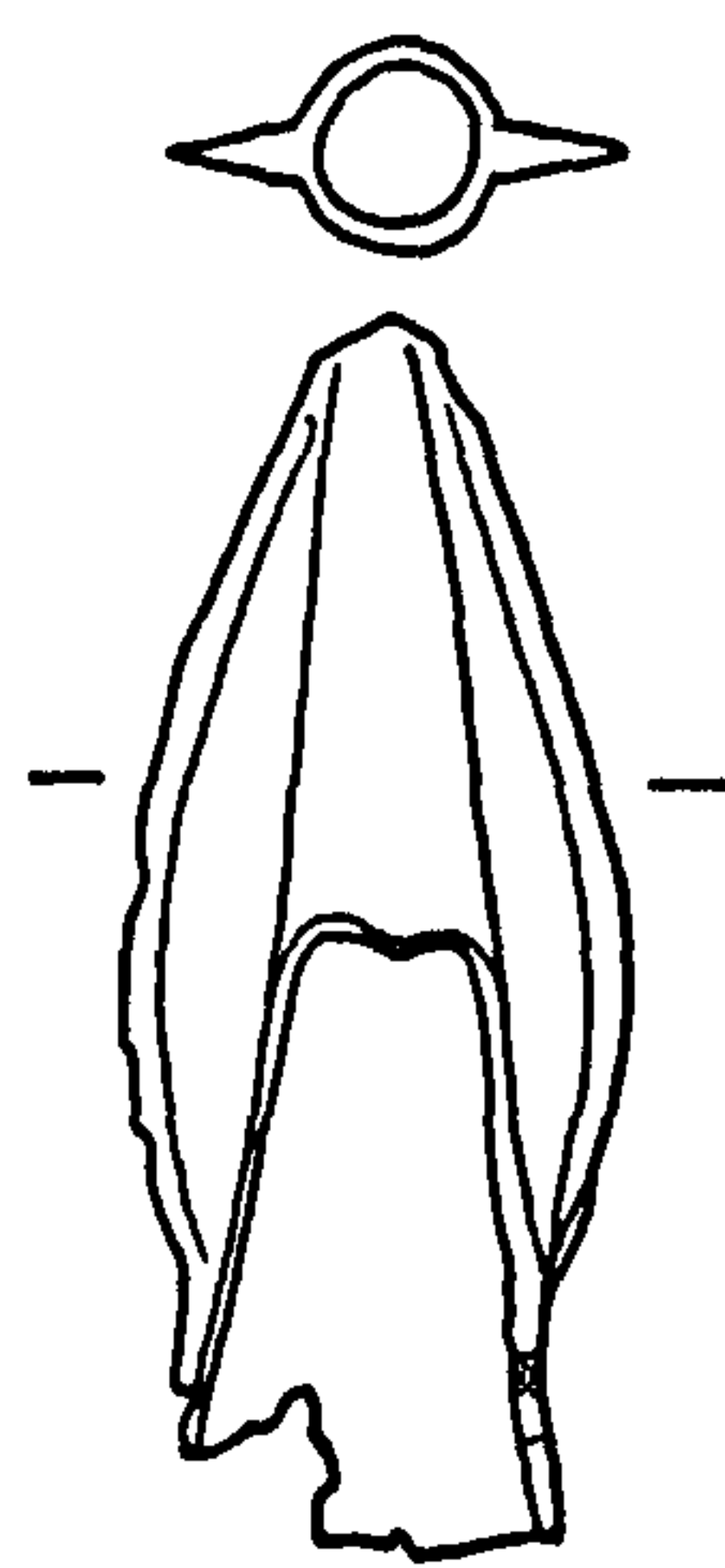
Fig. 12



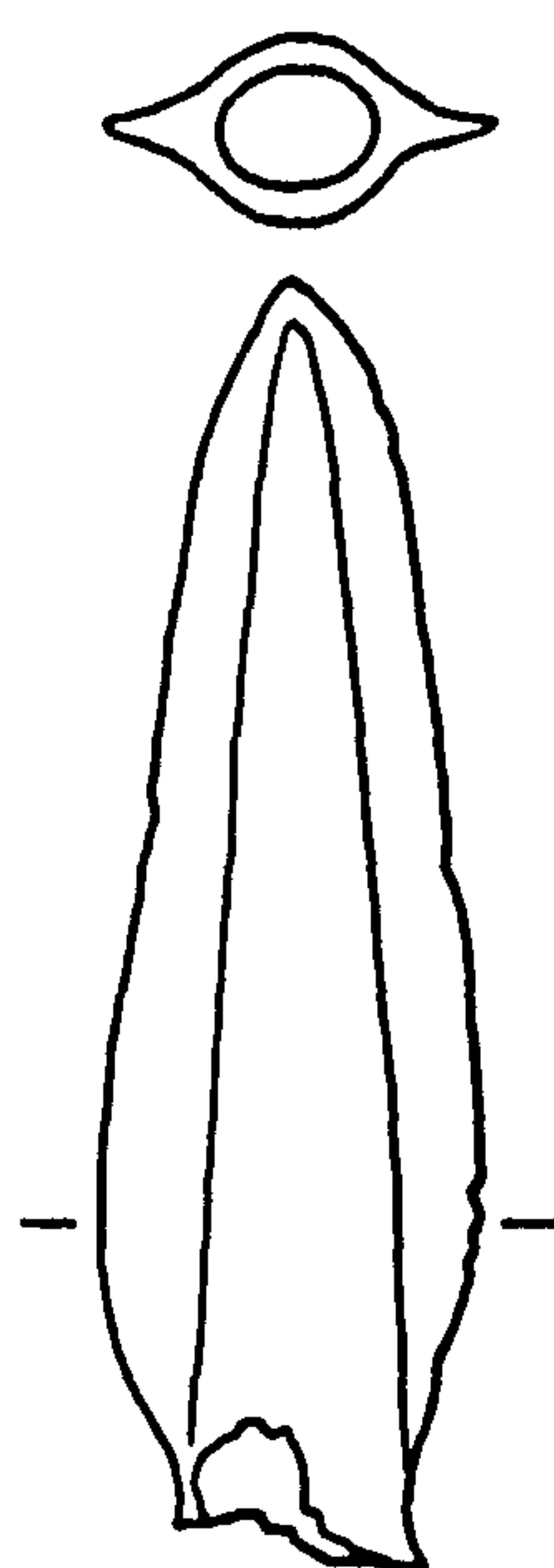
H10.1



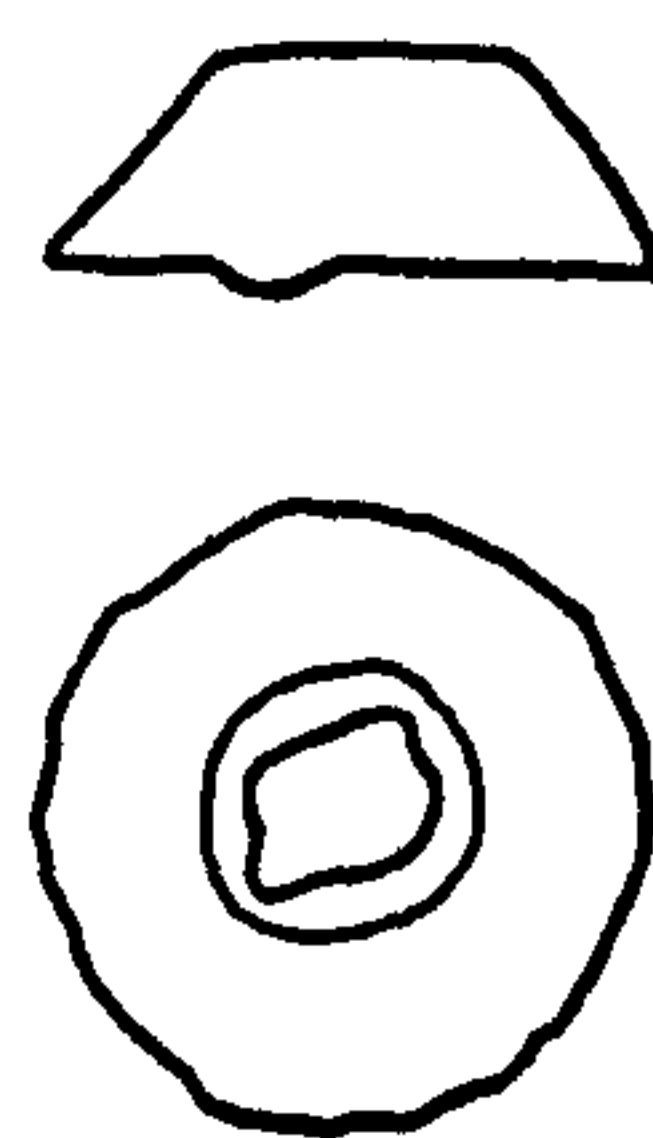
H10.2



H11.1



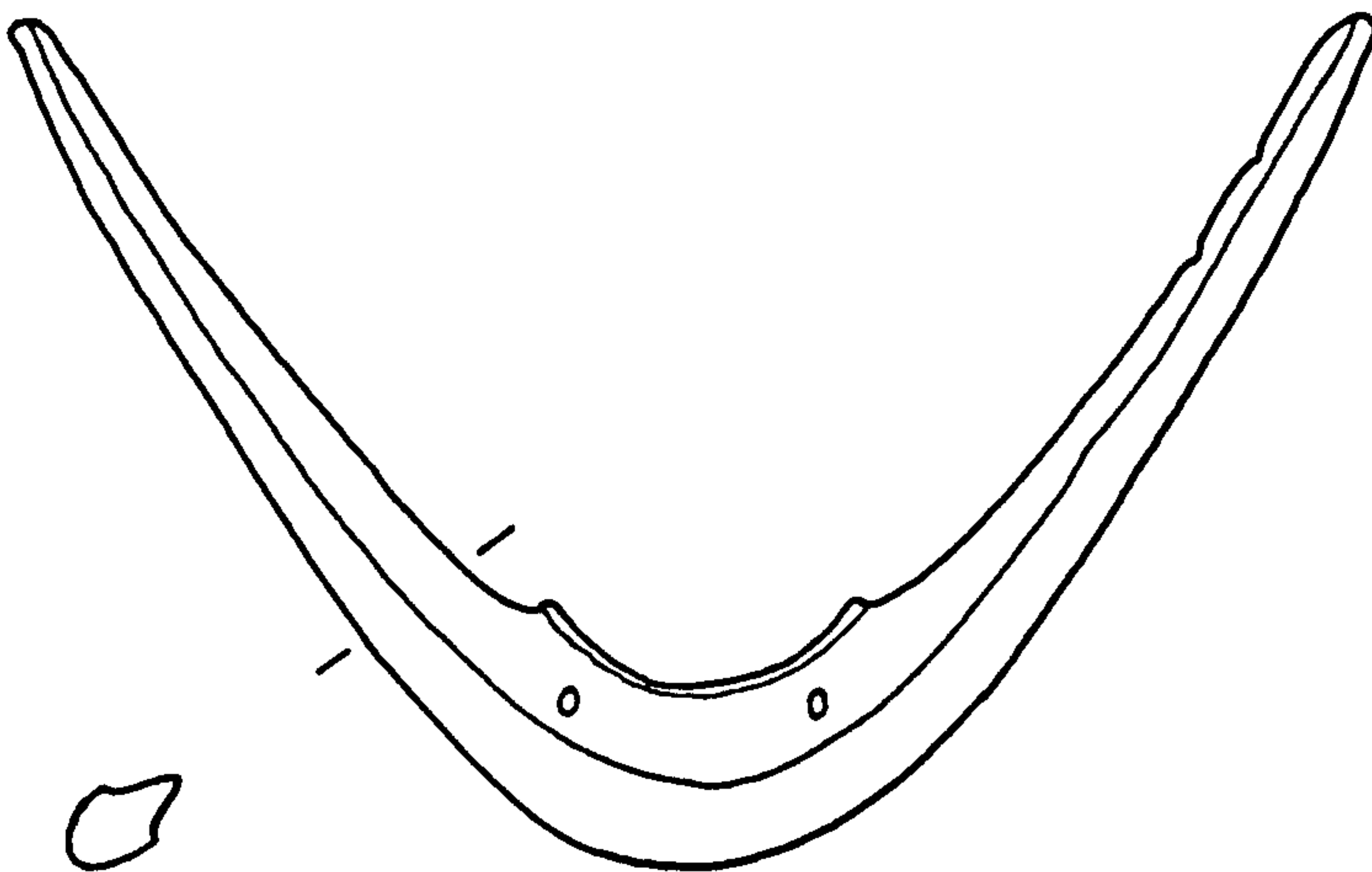
H14.1



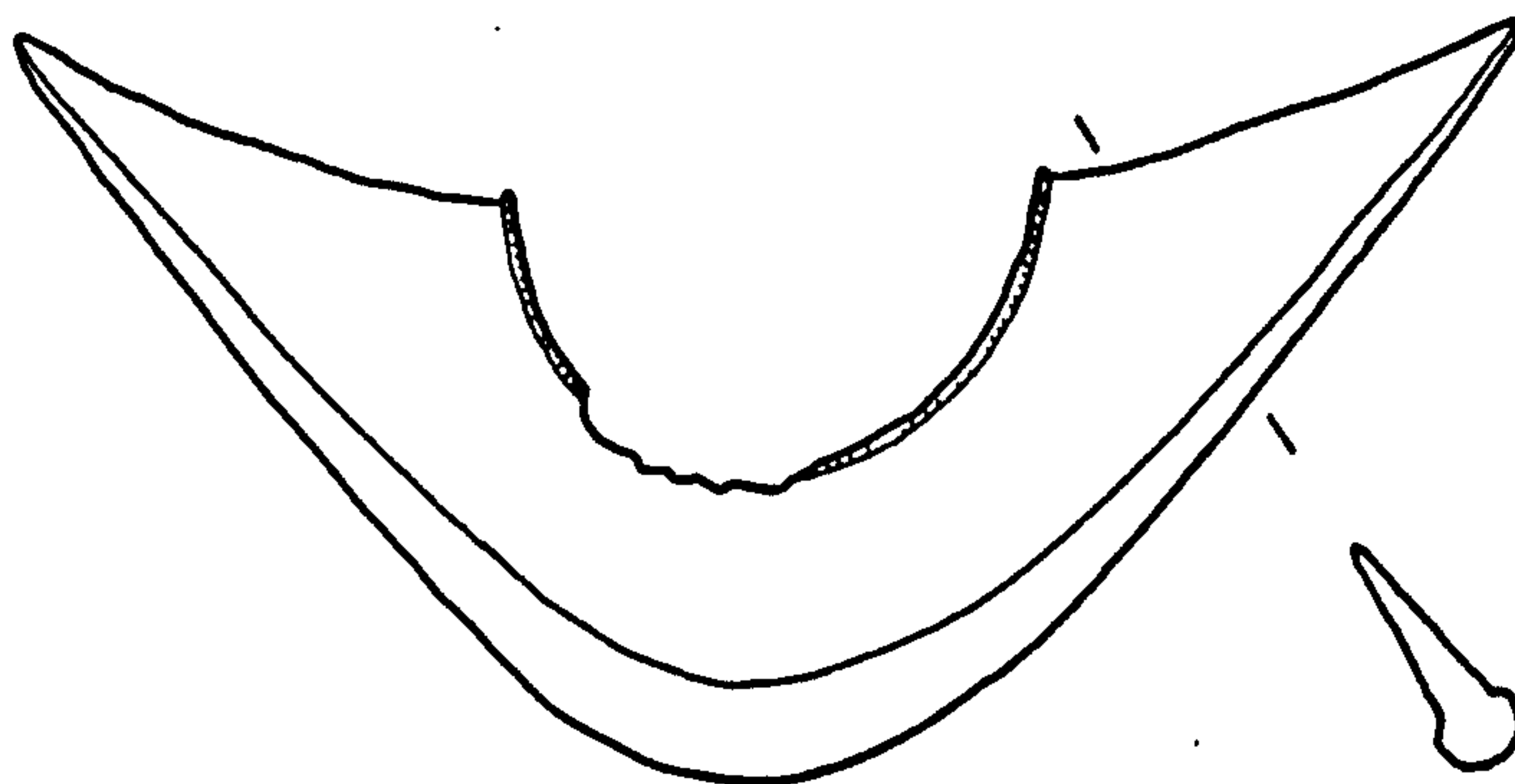
H14.2



Fig. 13



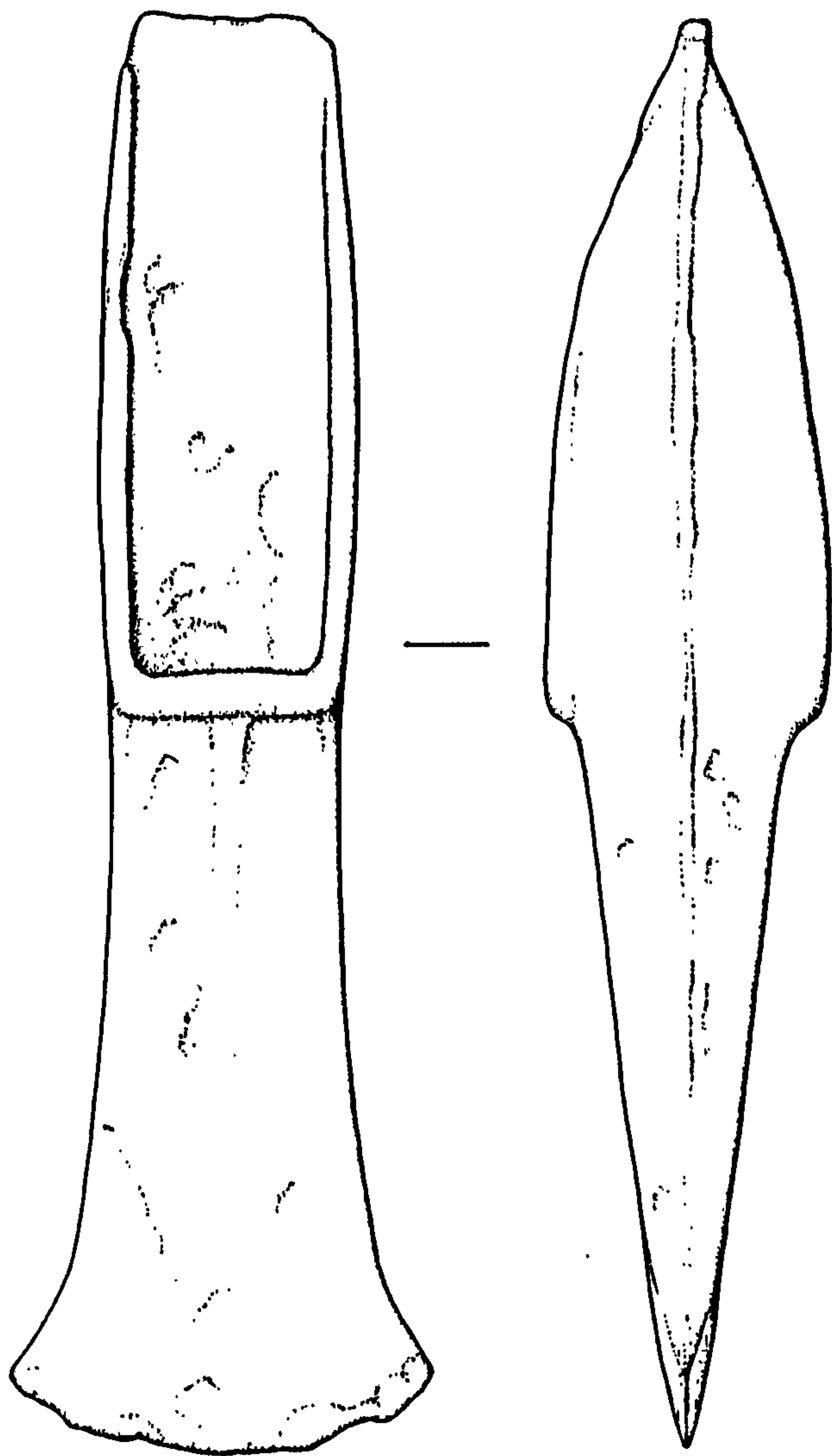
H16.2



H16.1

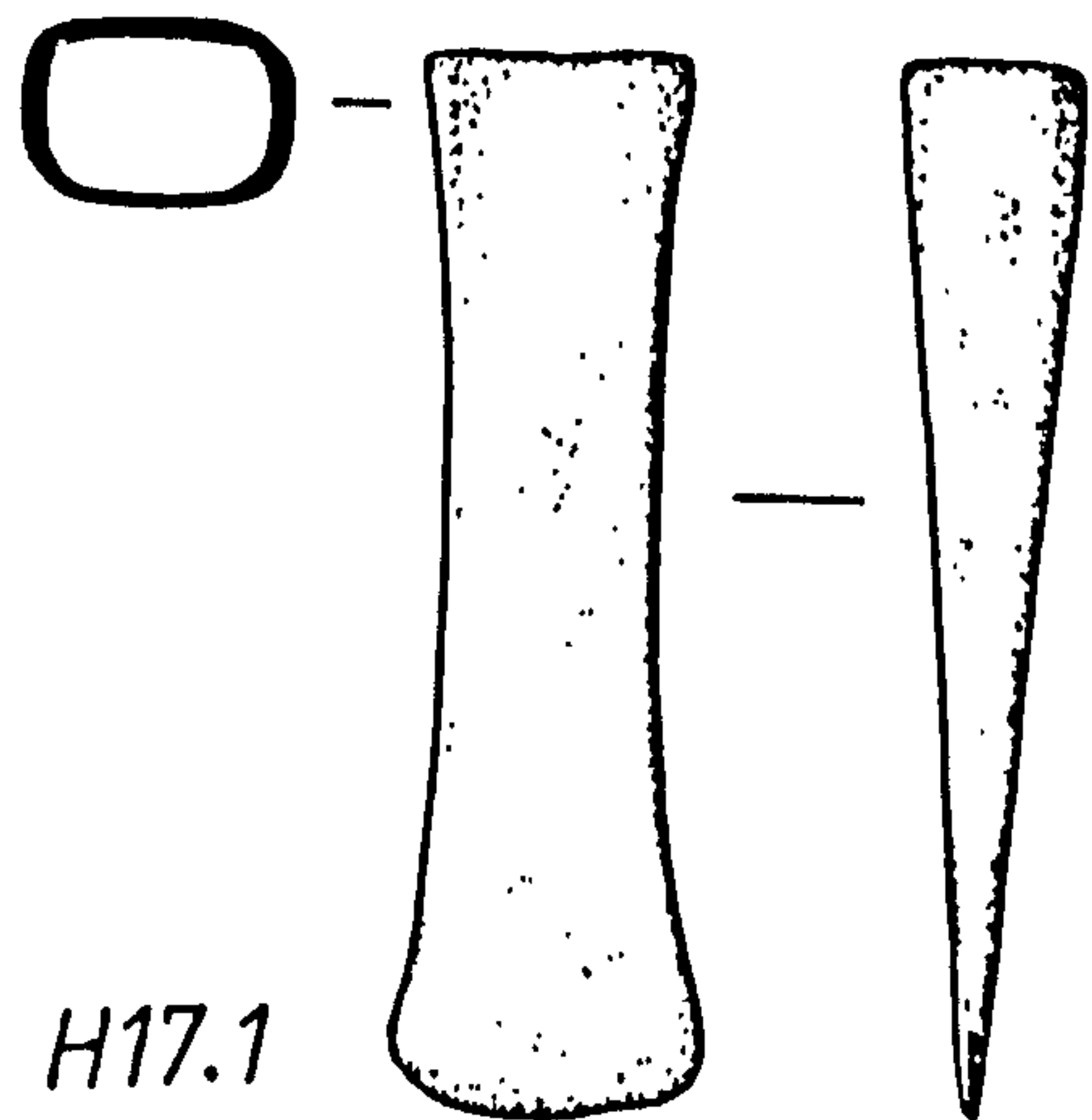
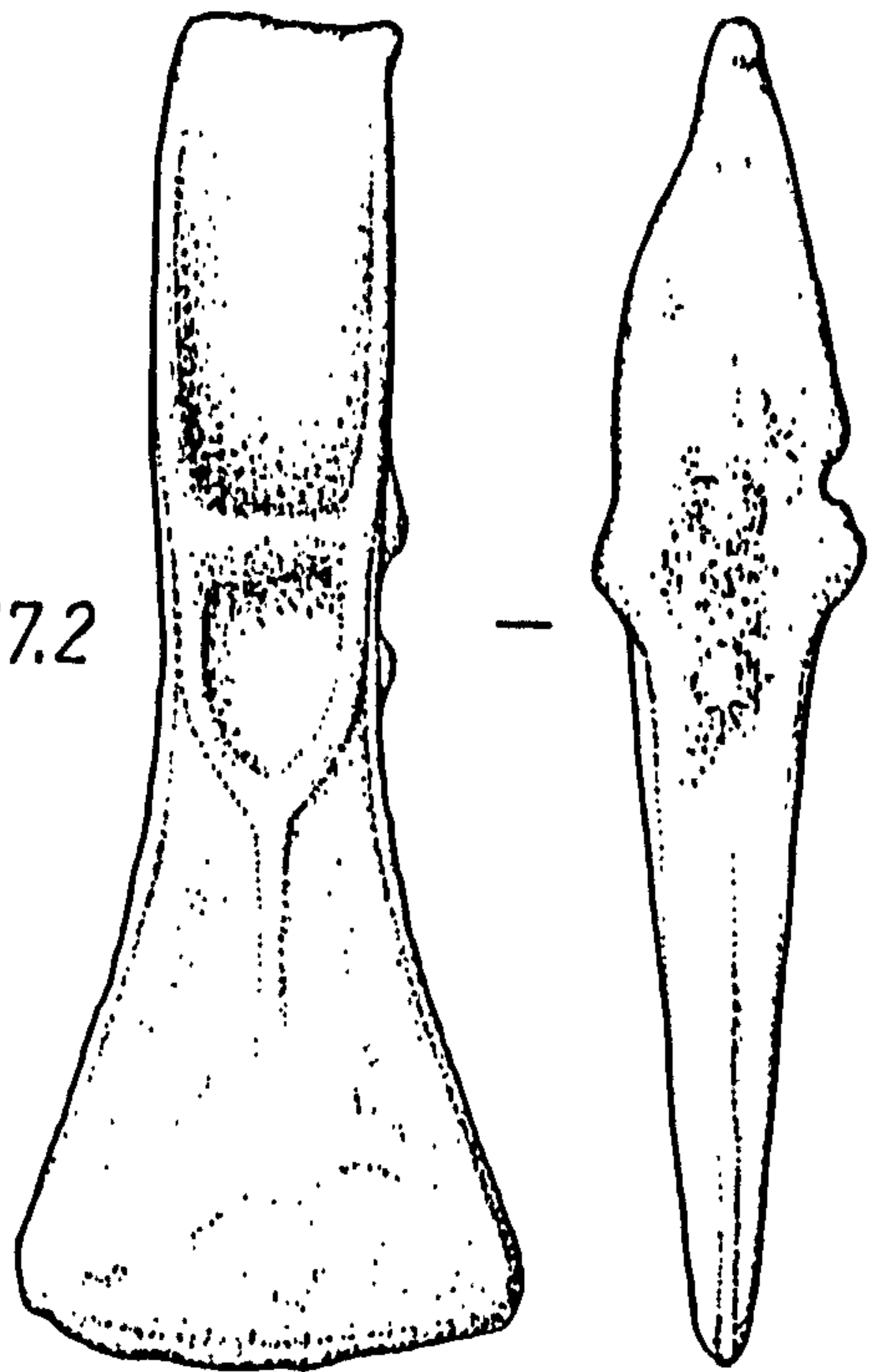


Fig. 14

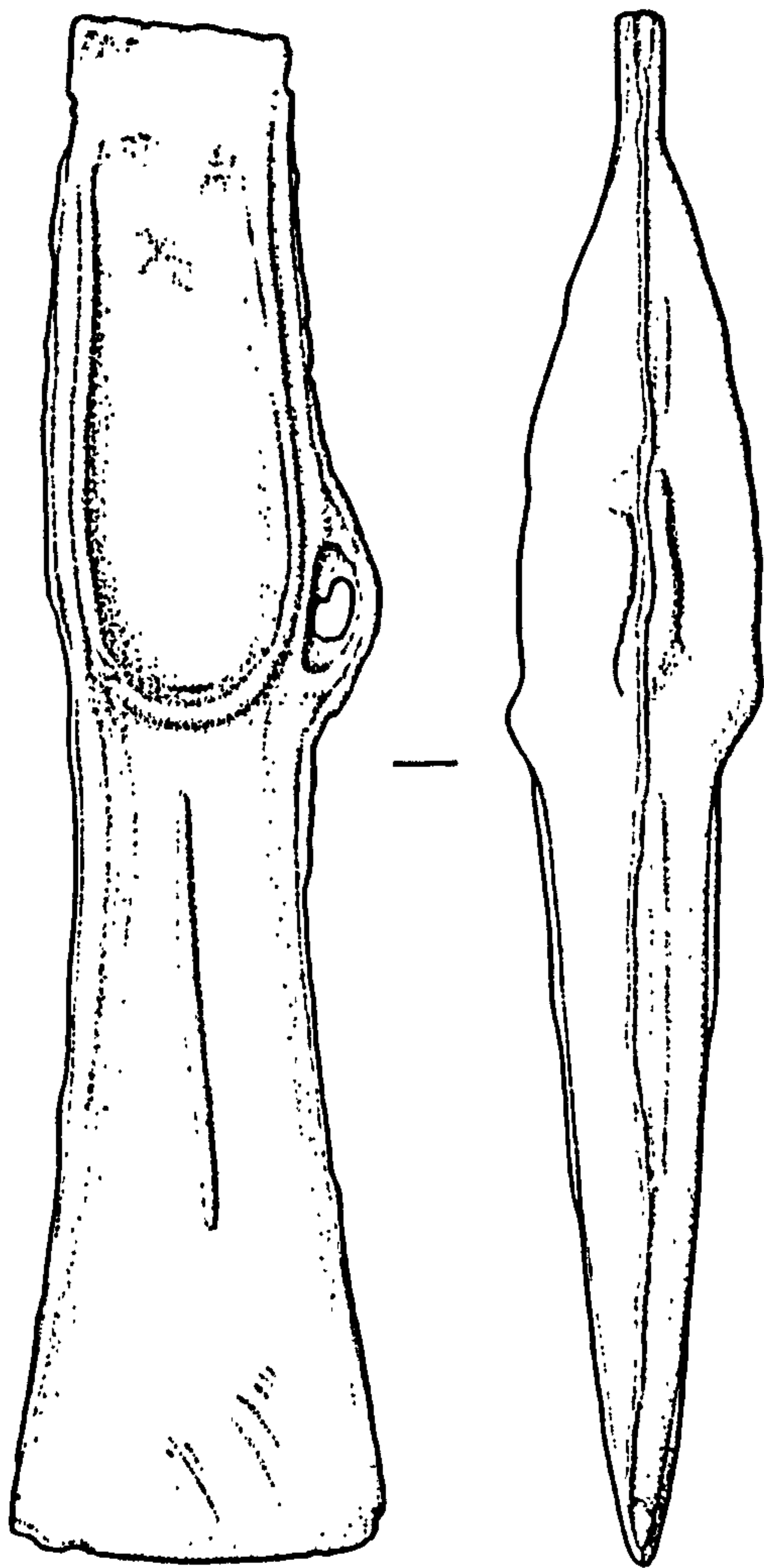


H18.1

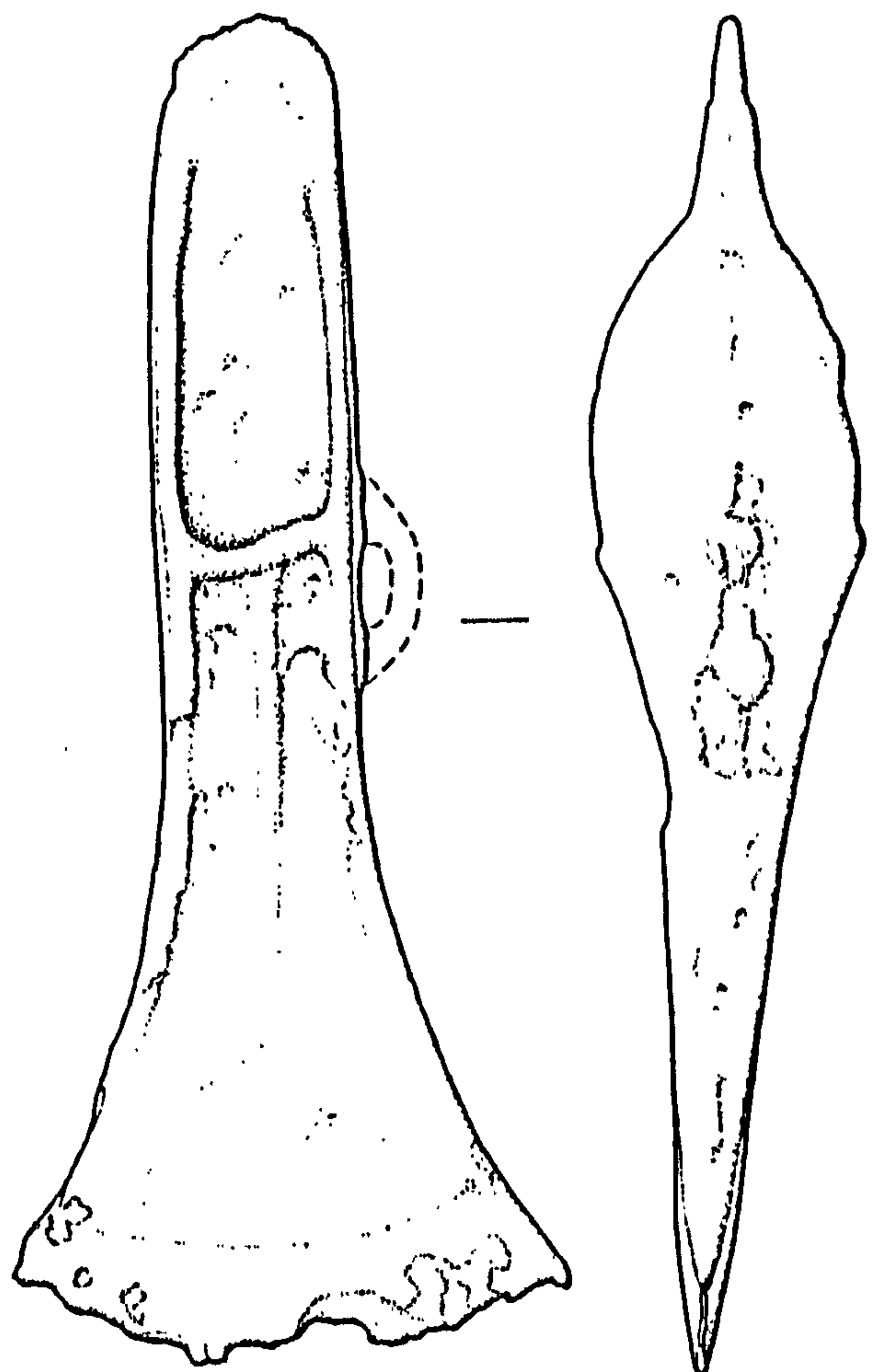
H17.2



H17.1



H18.3



H18.2

Fig. 15



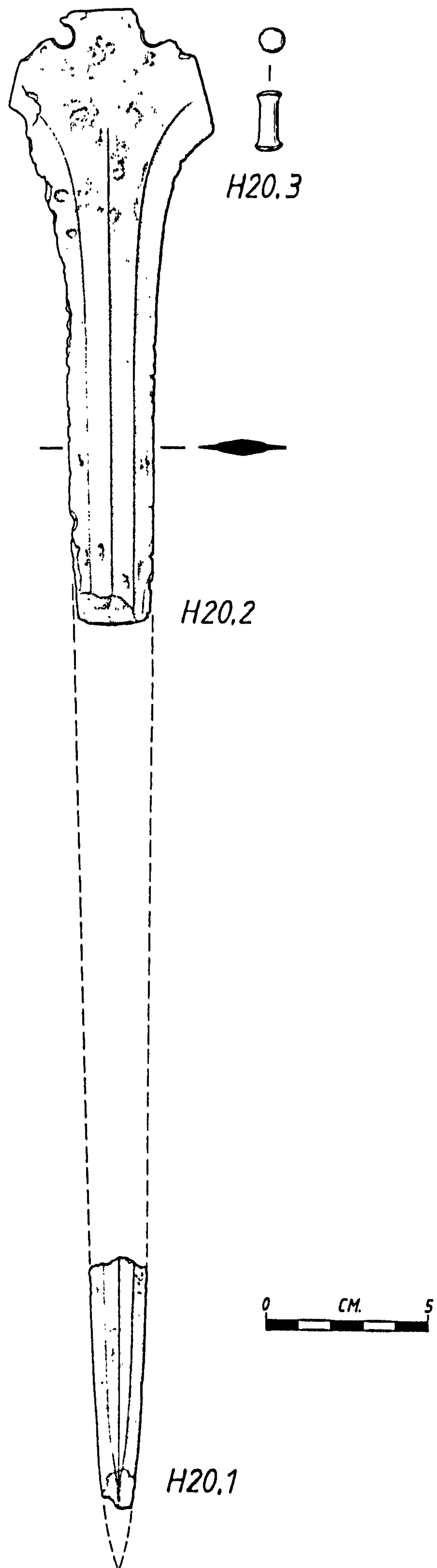


Fig. 16

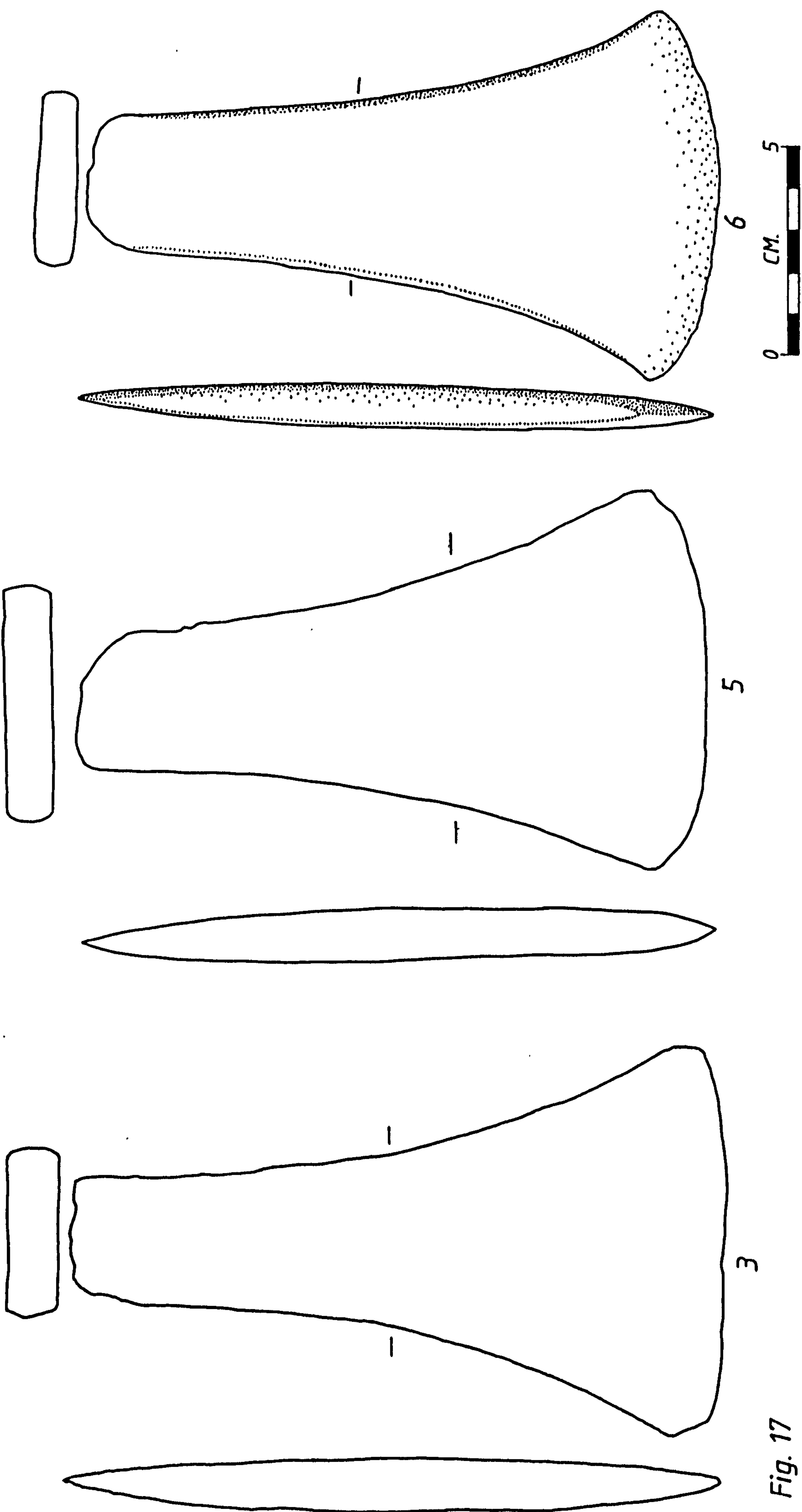
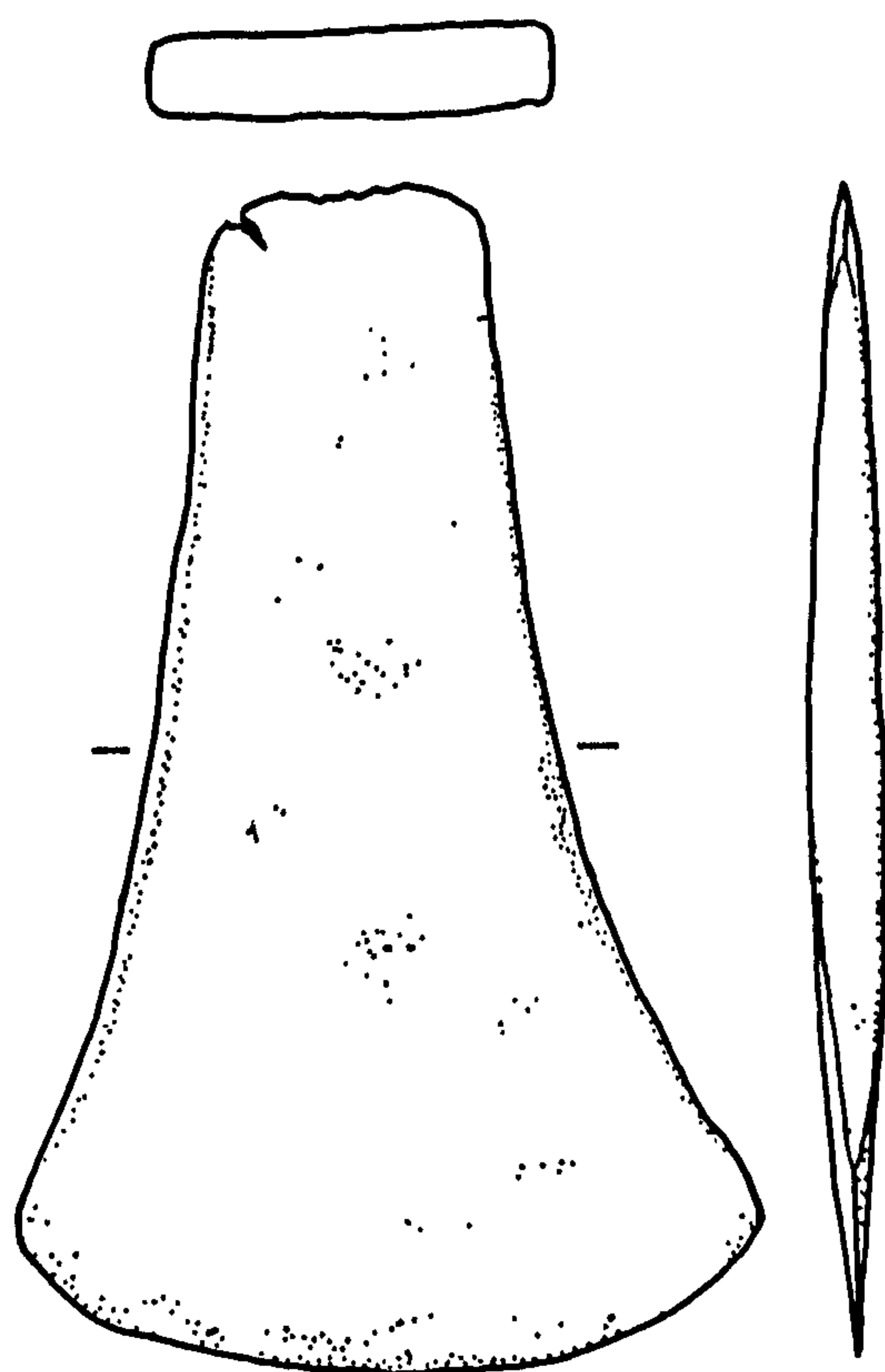
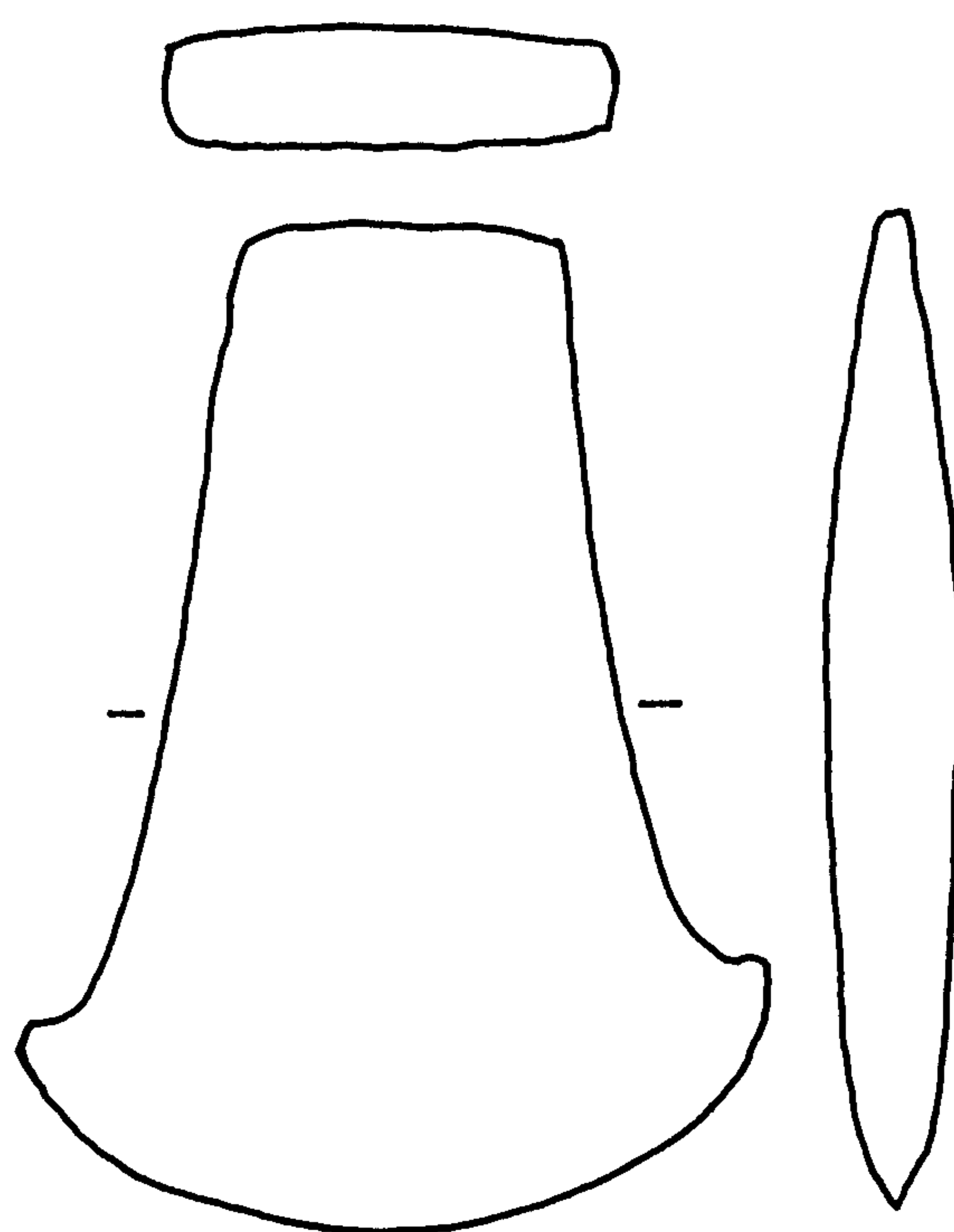


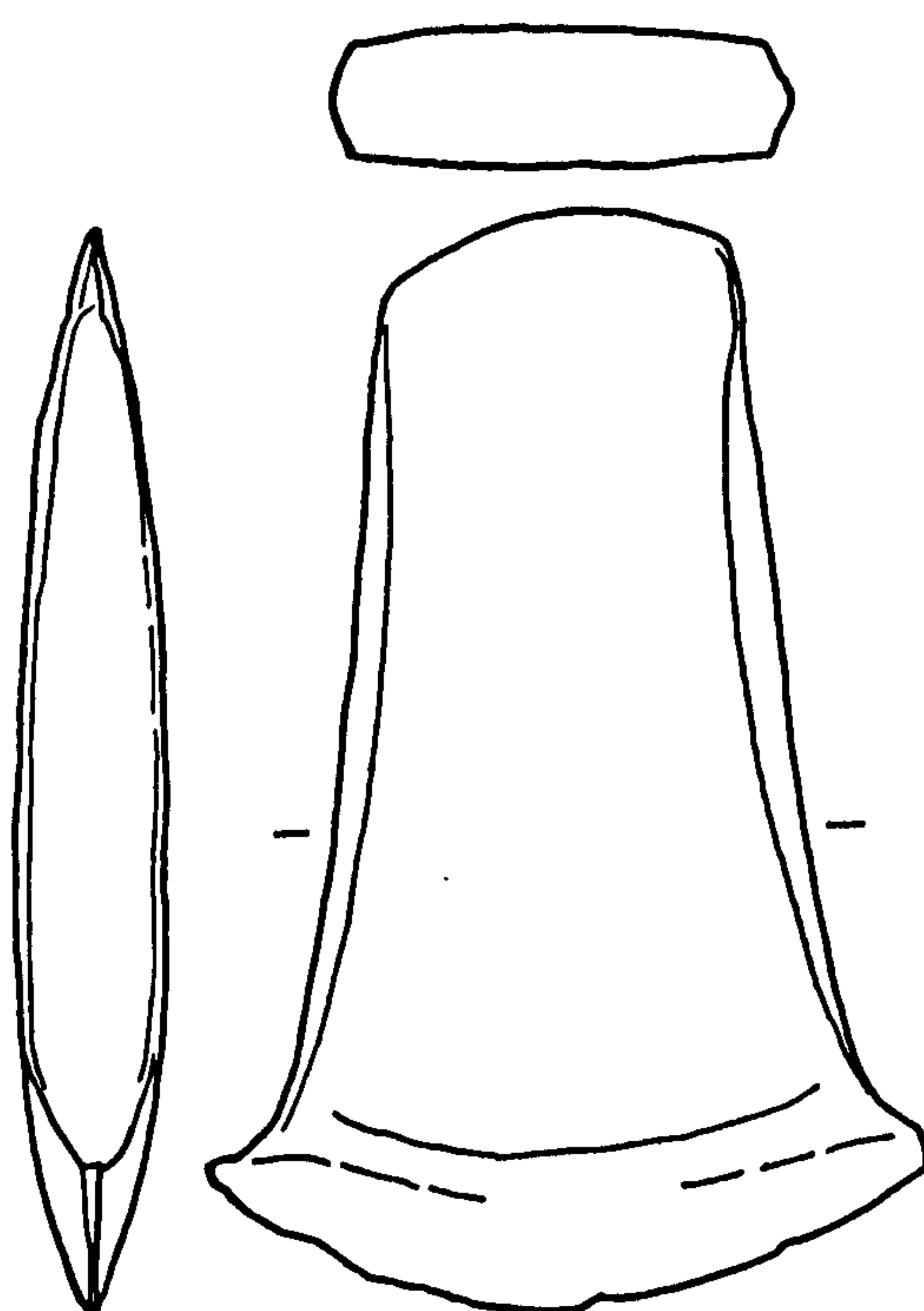
Fig. 17



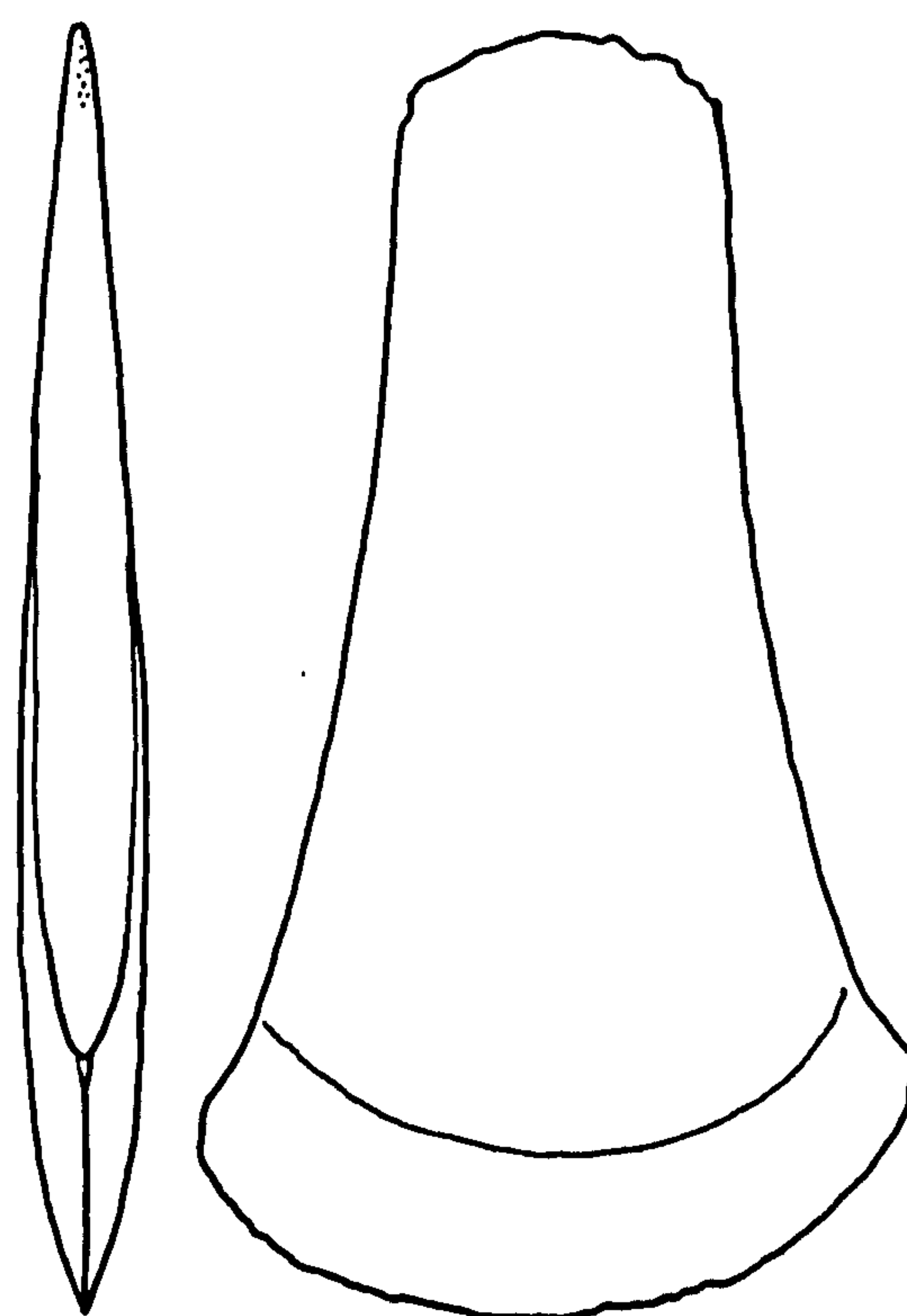
4



13



14



15



Fig. 18

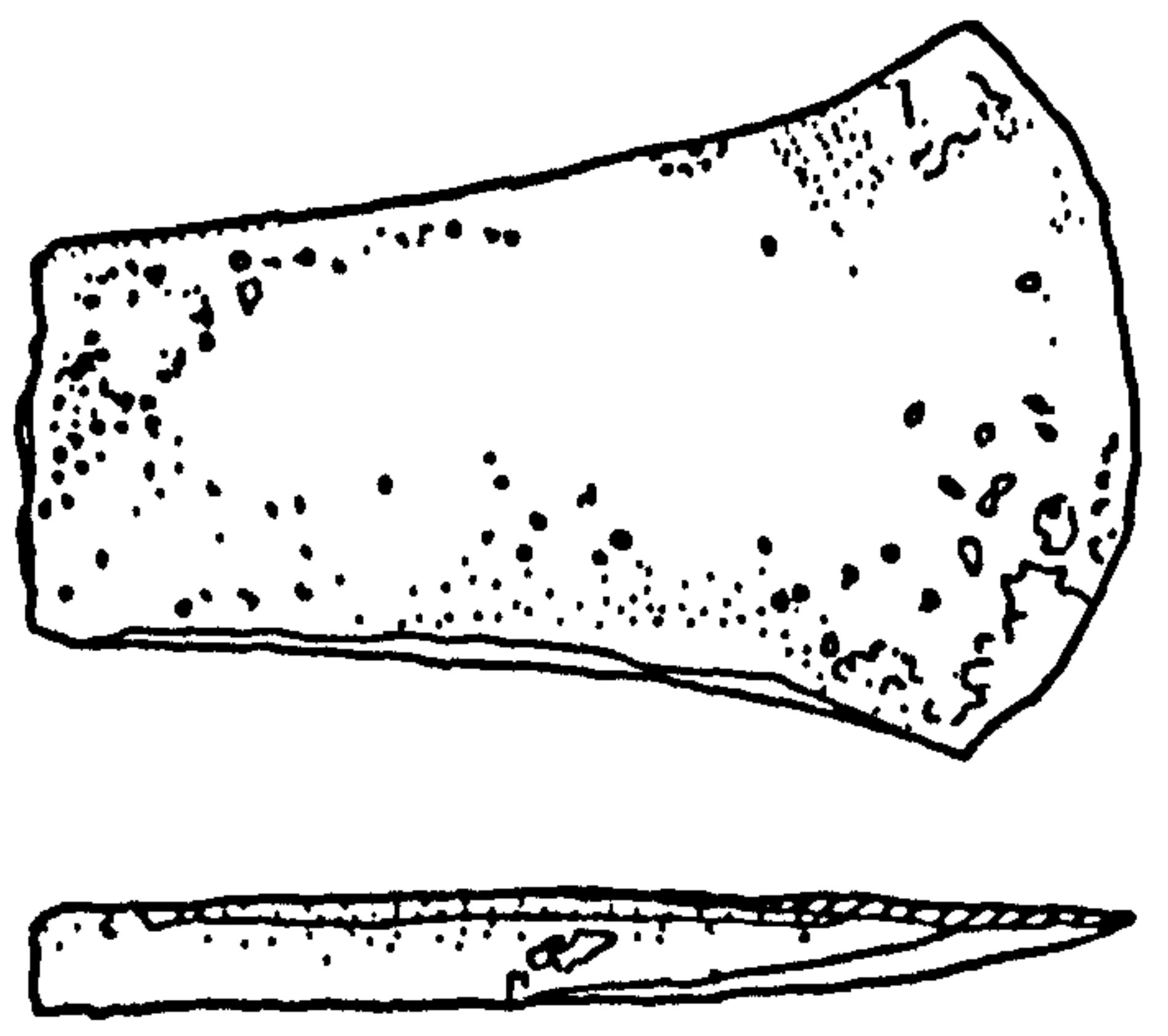
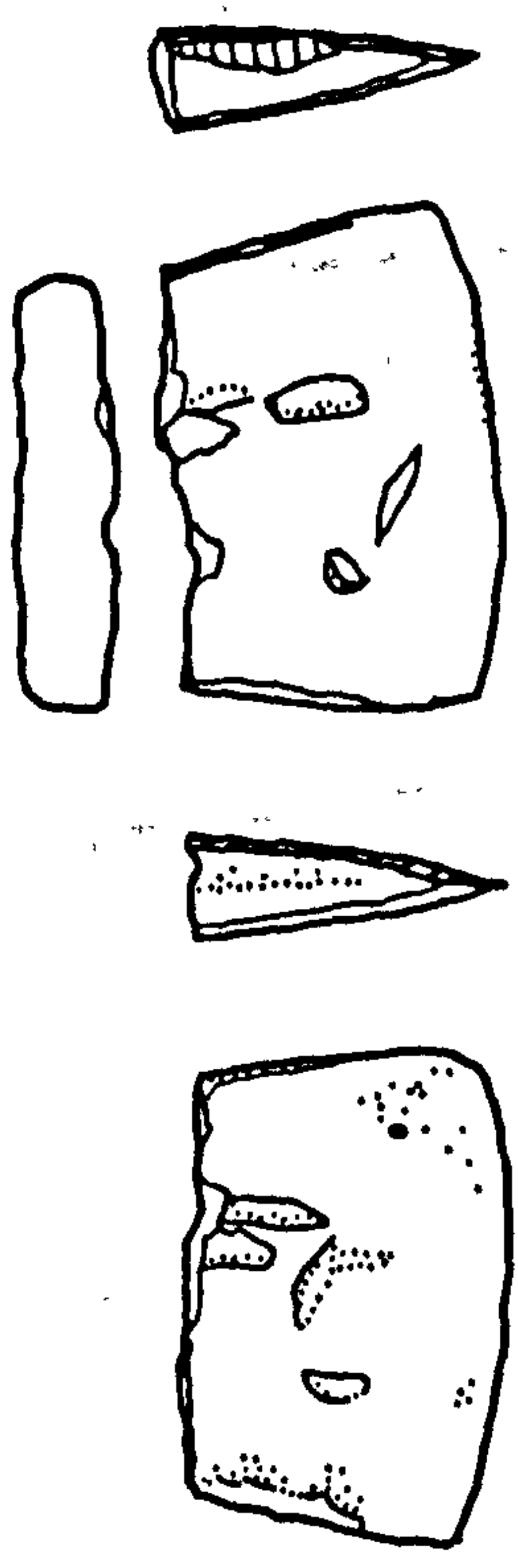
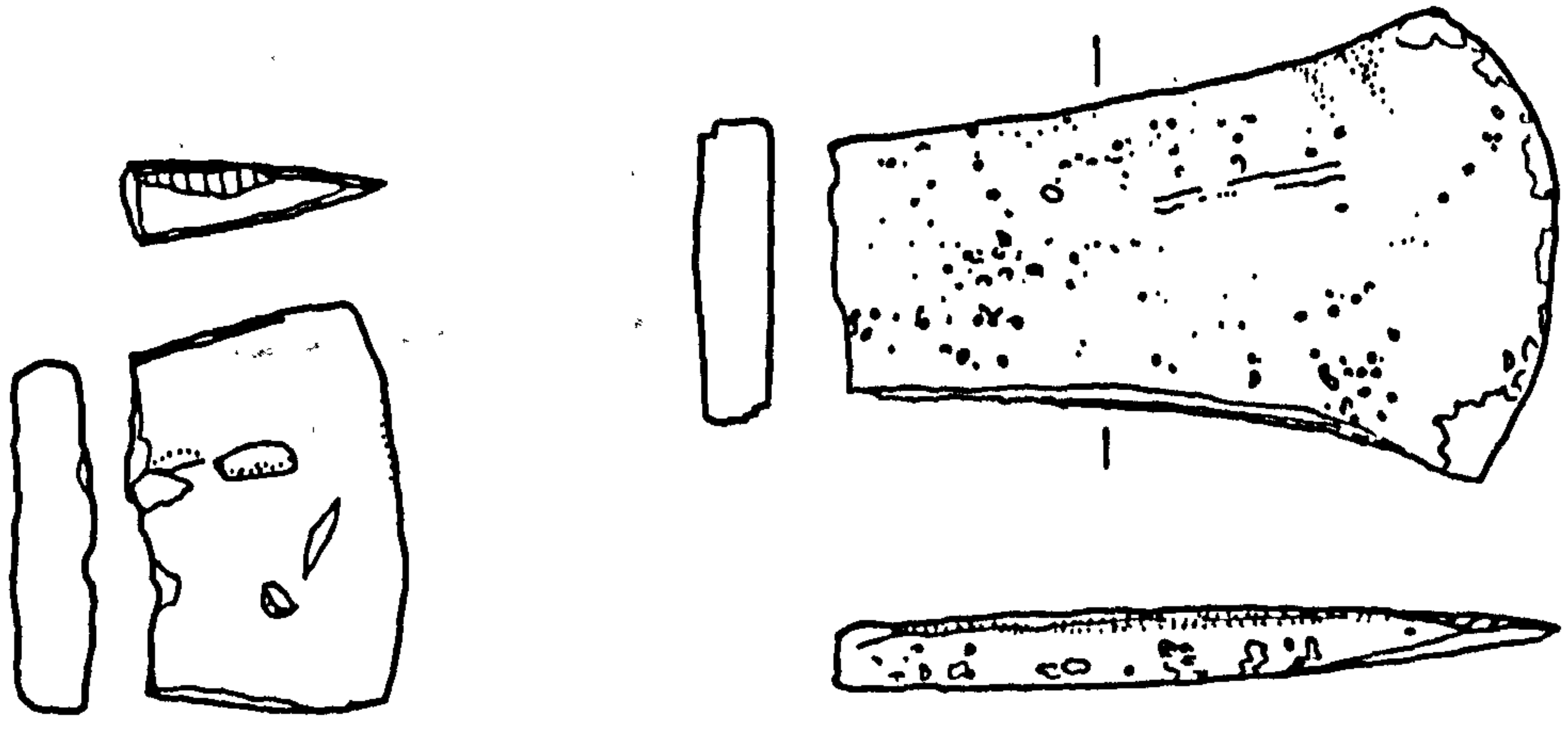
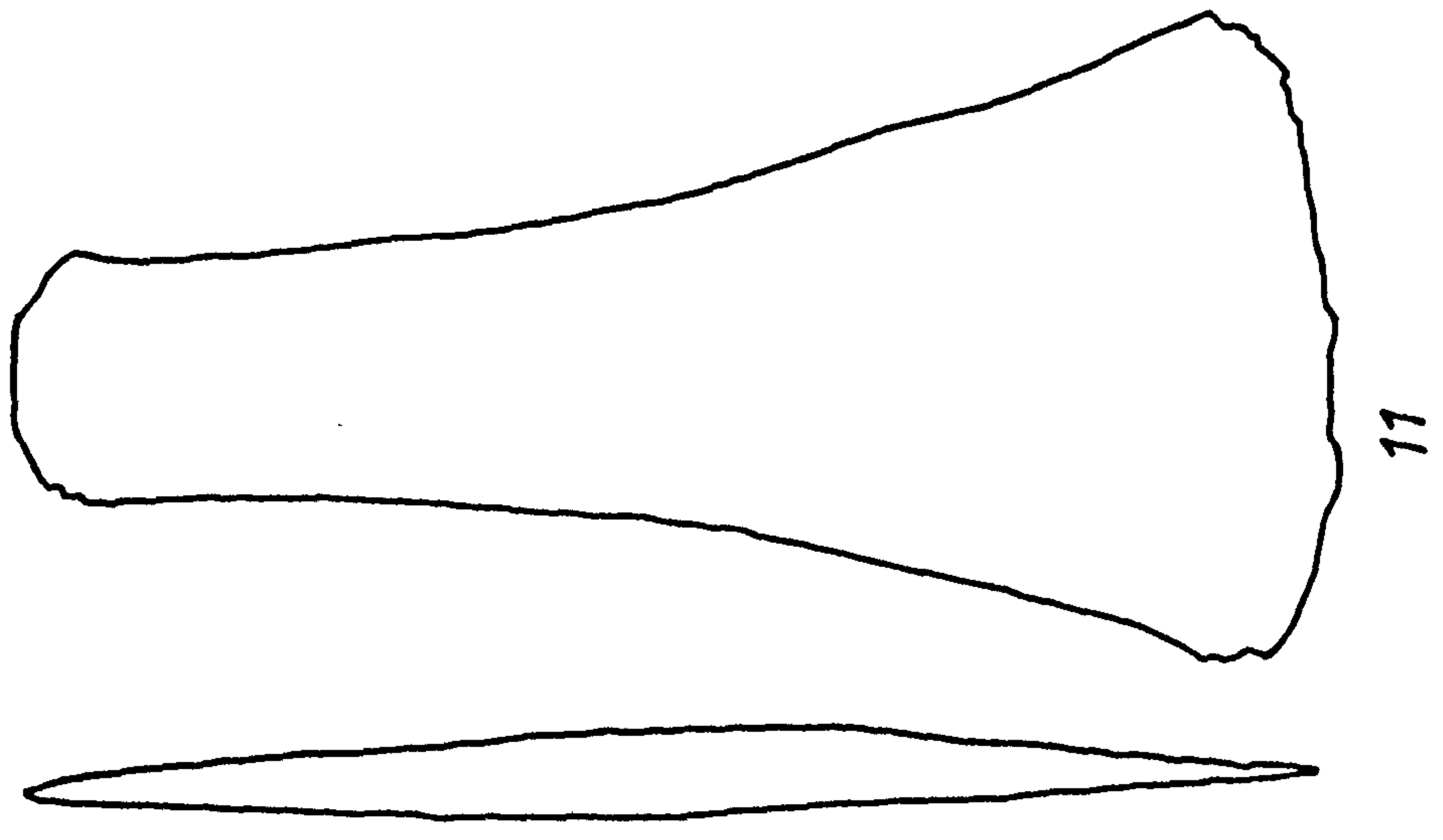
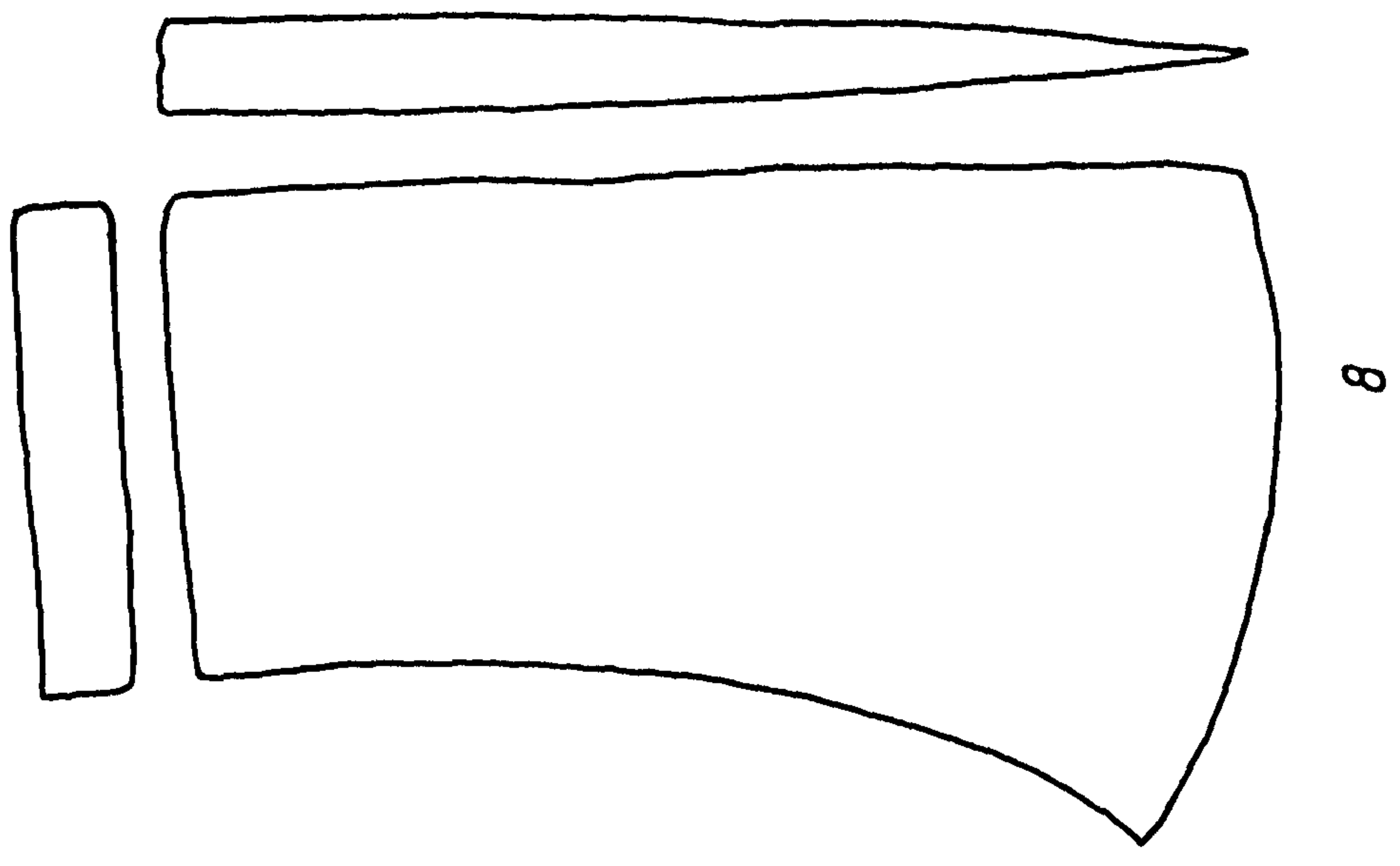
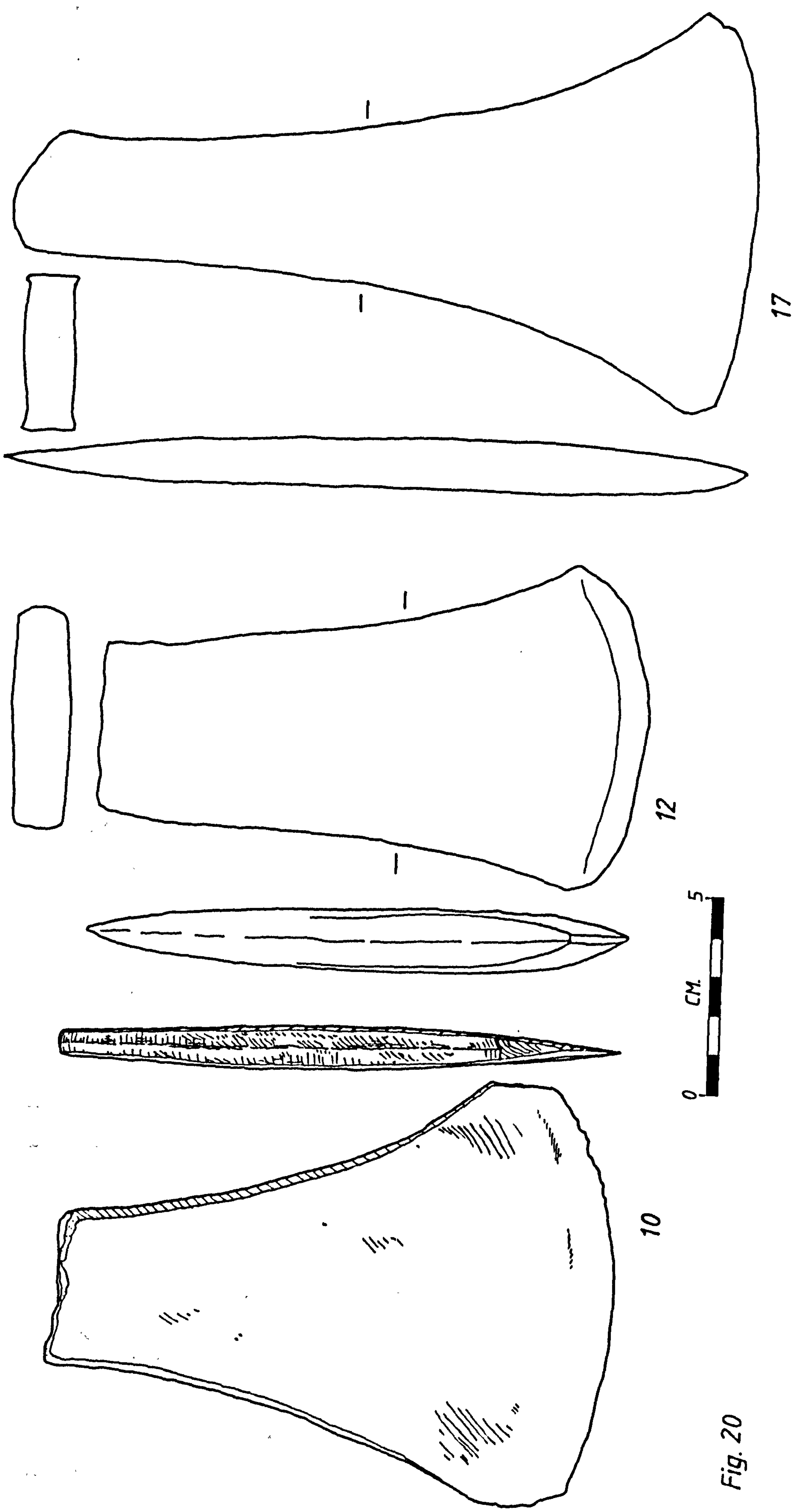
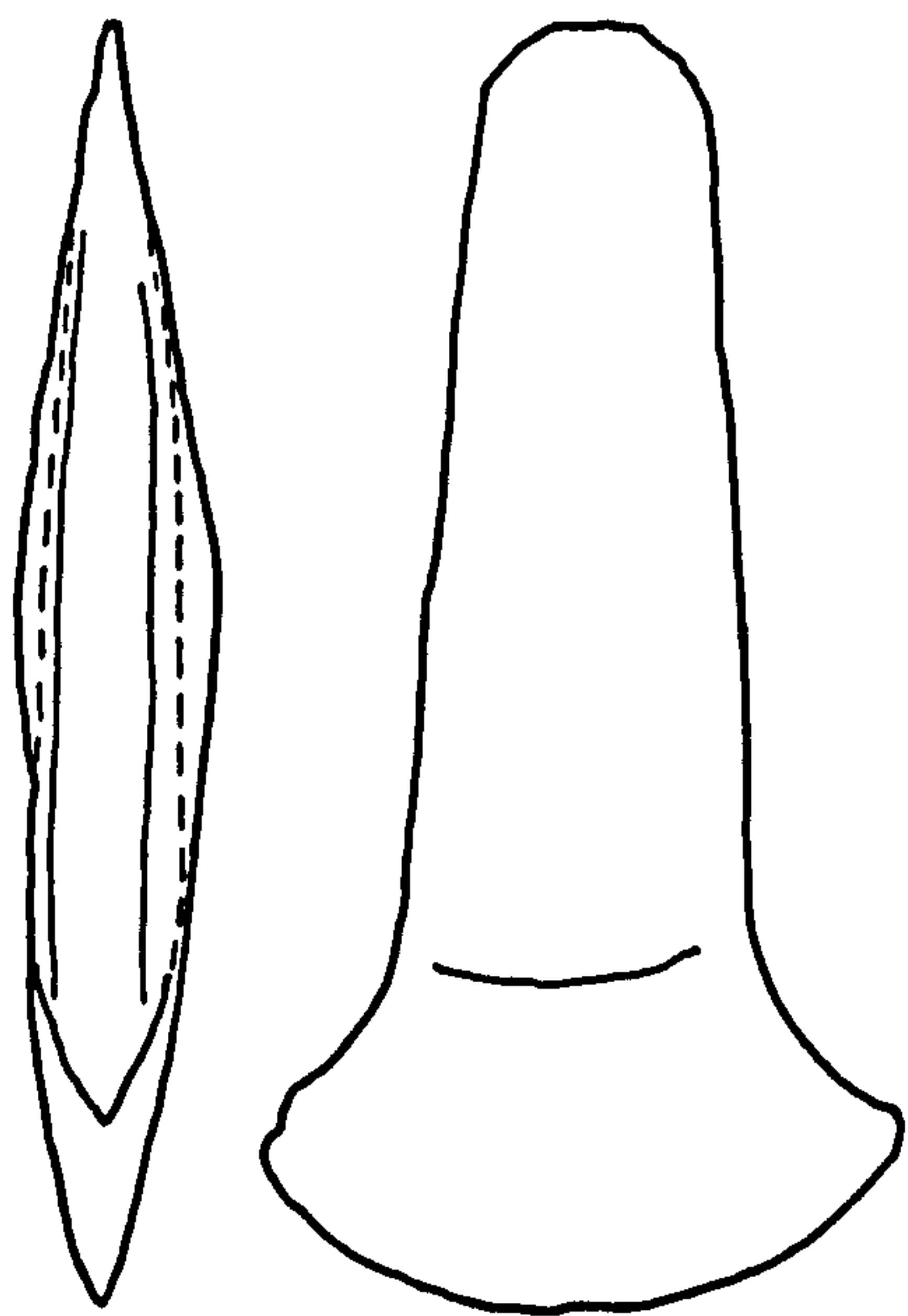
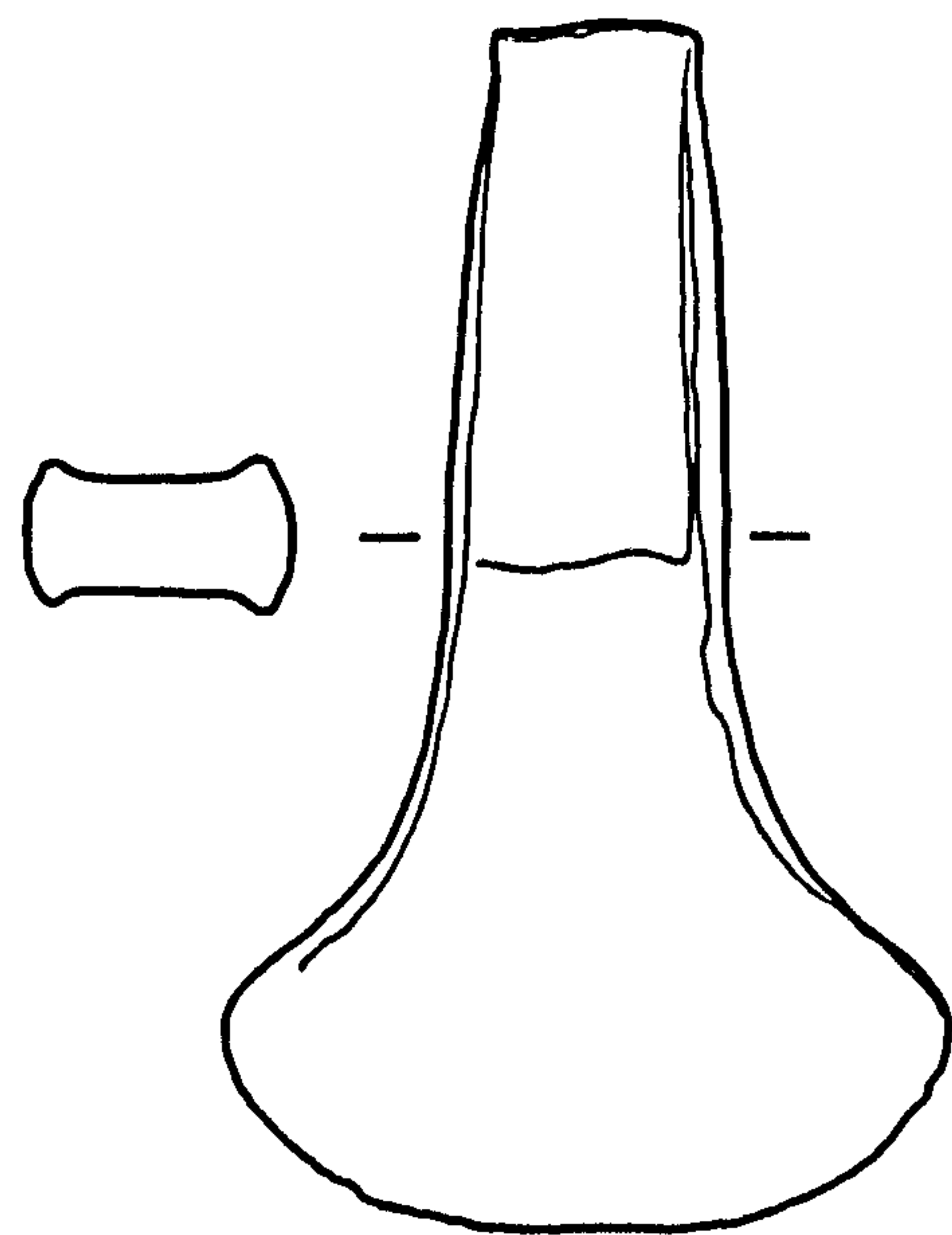


Fig. 19

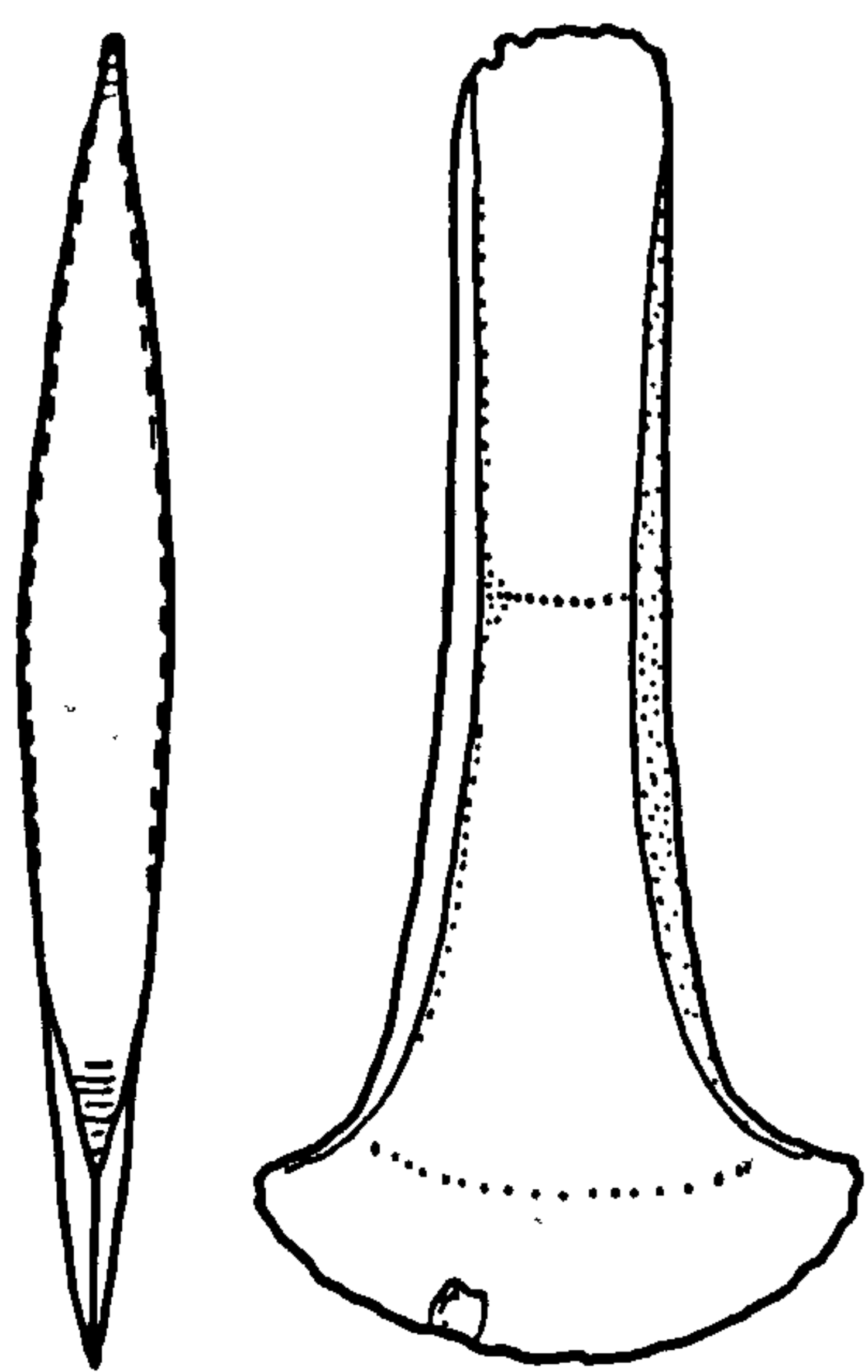




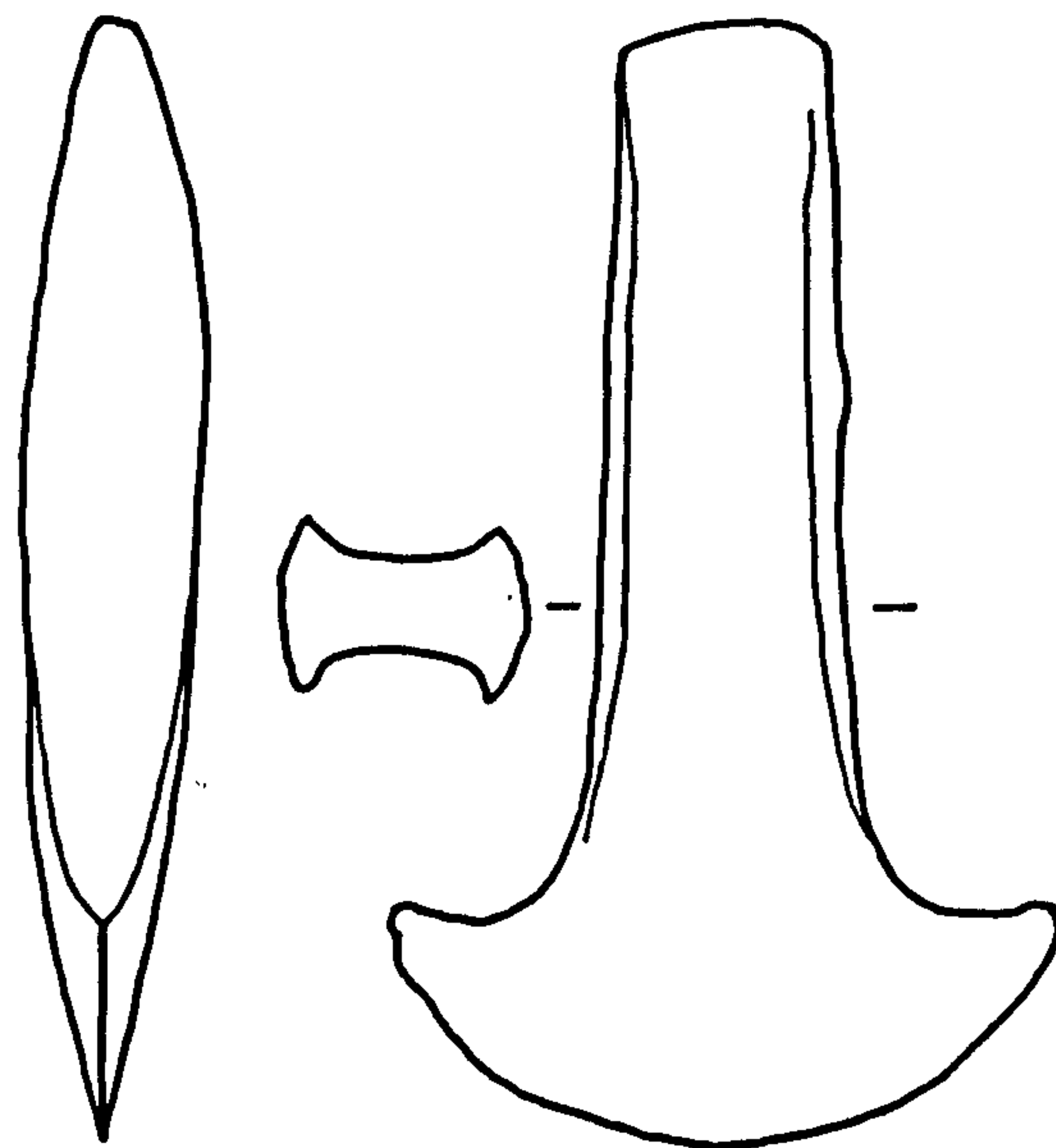
24



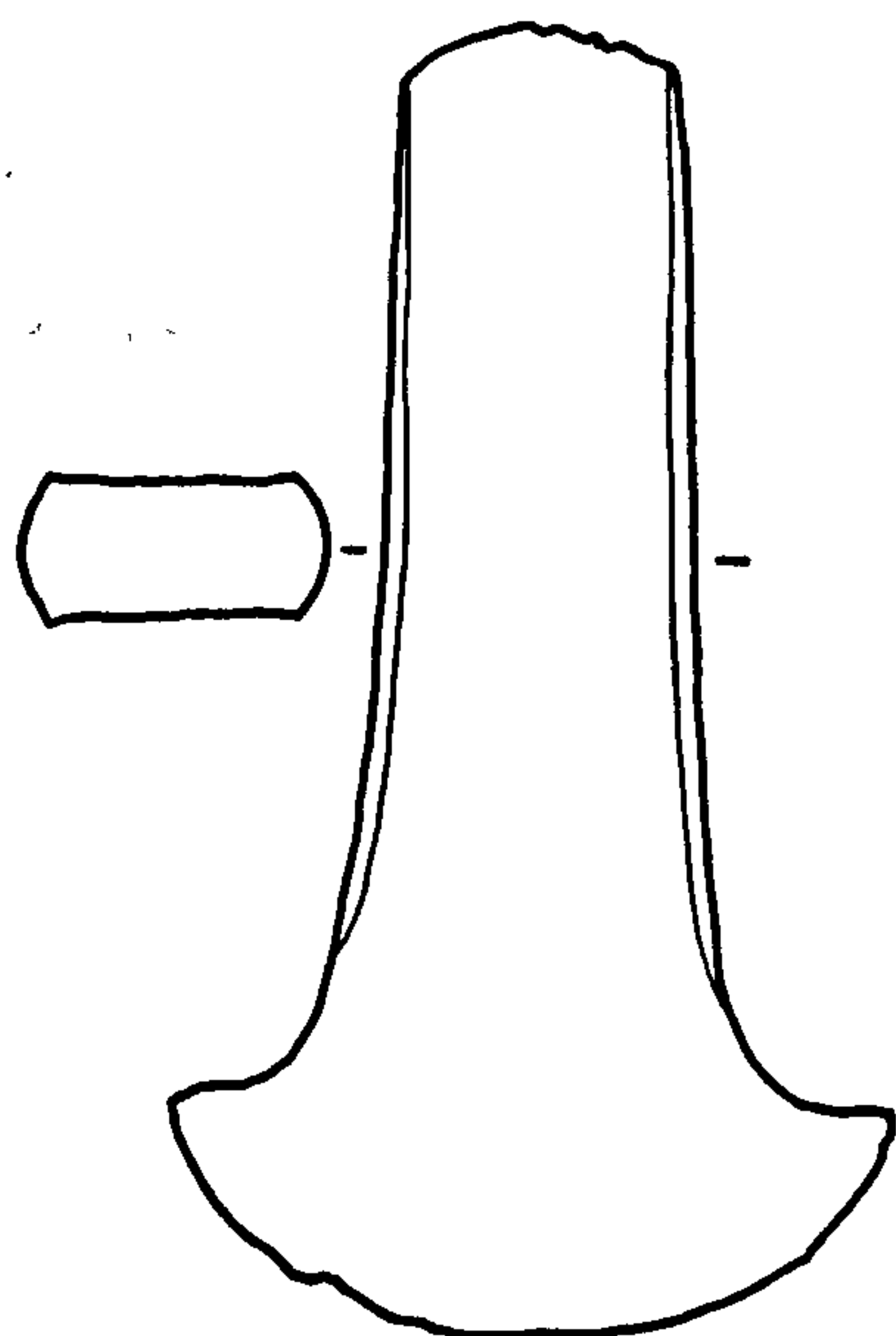
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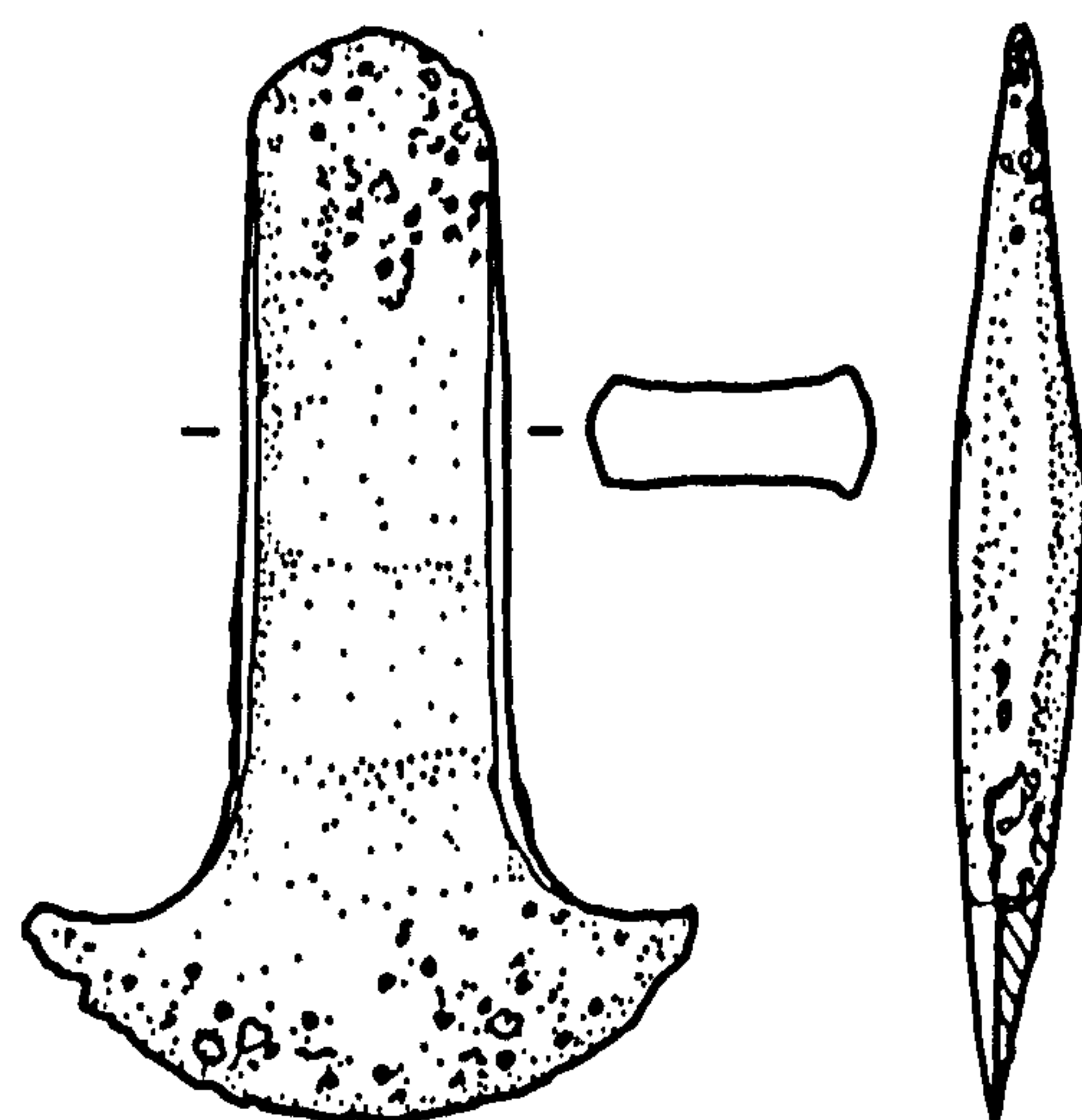
21



25



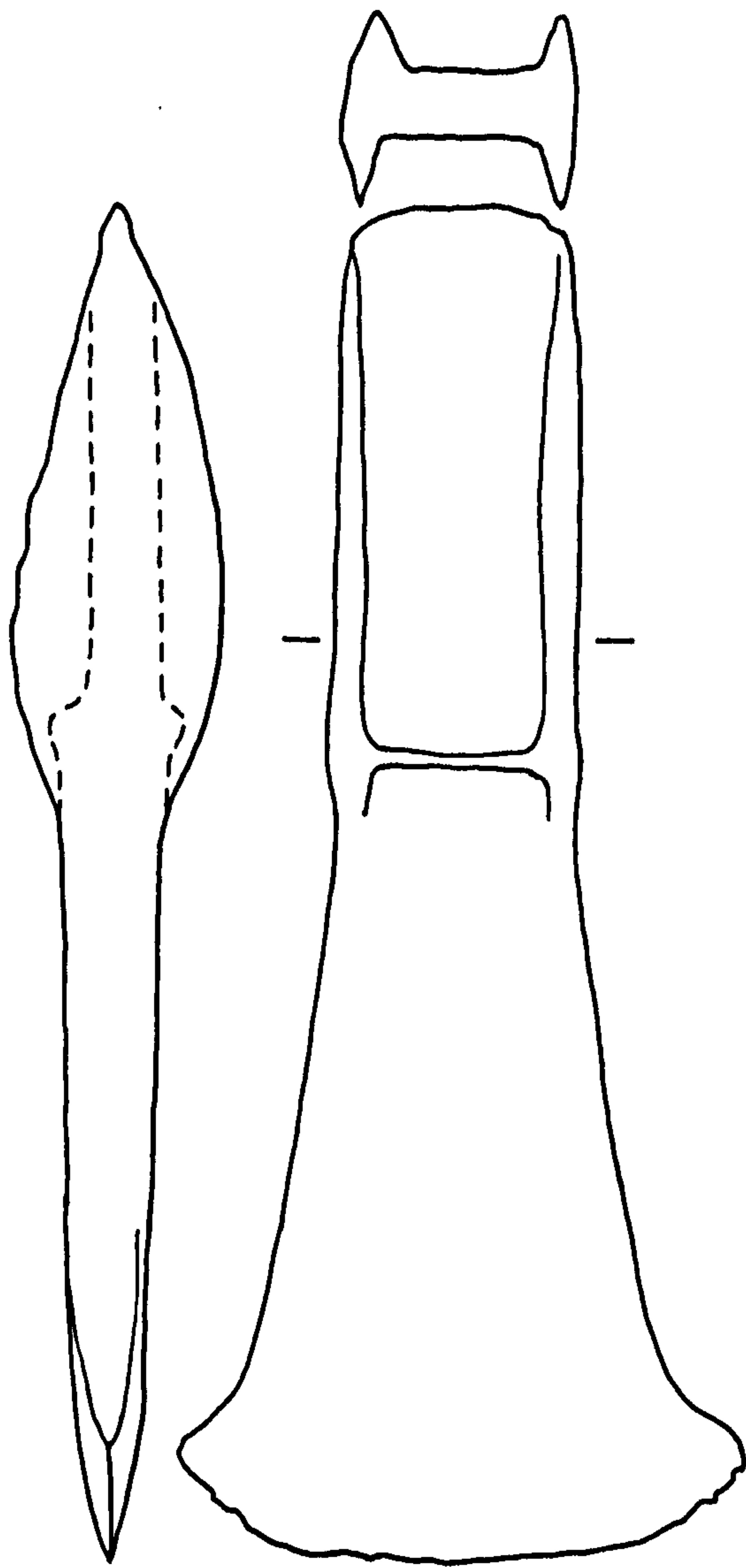
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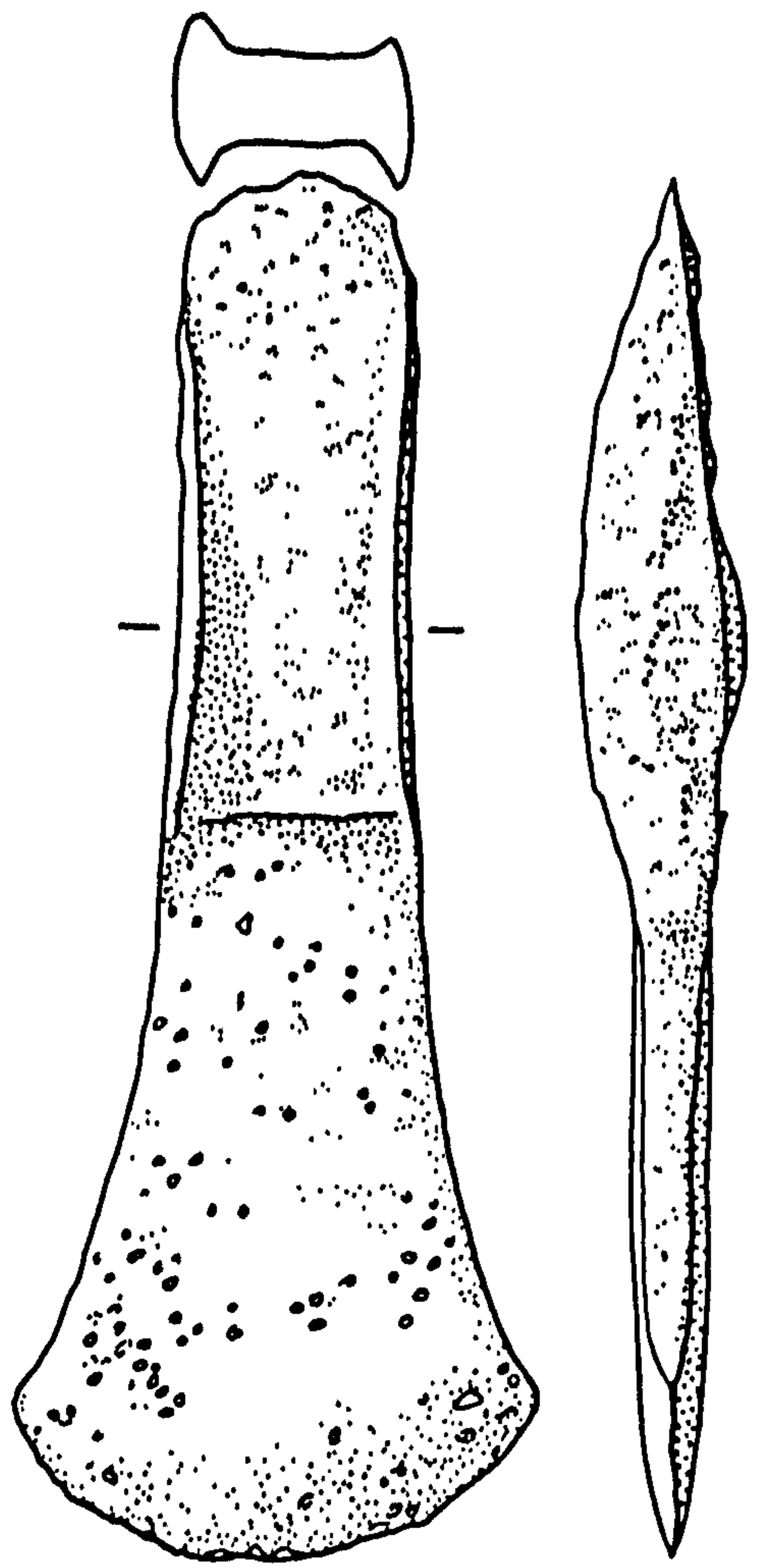
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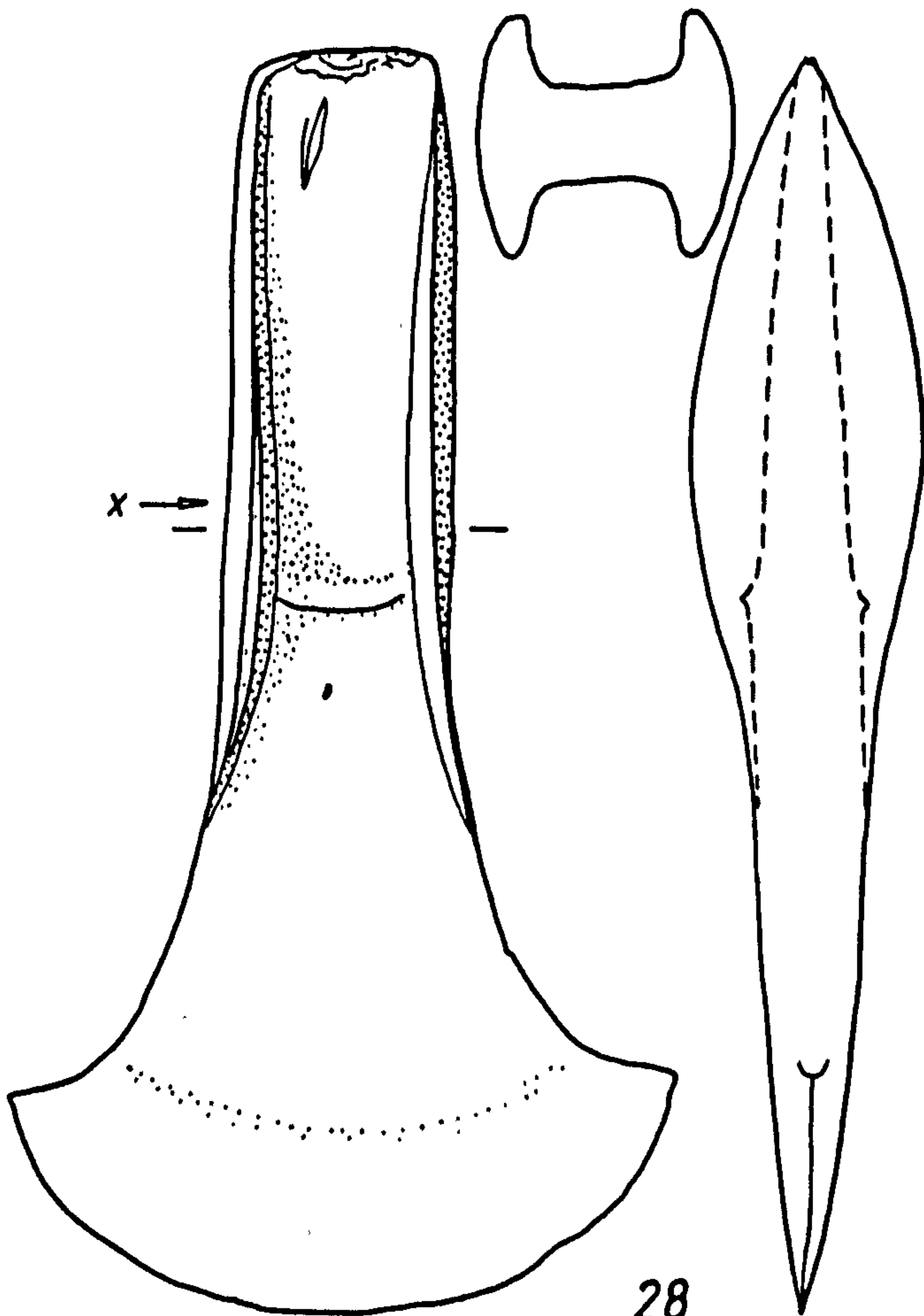
Fig. 21



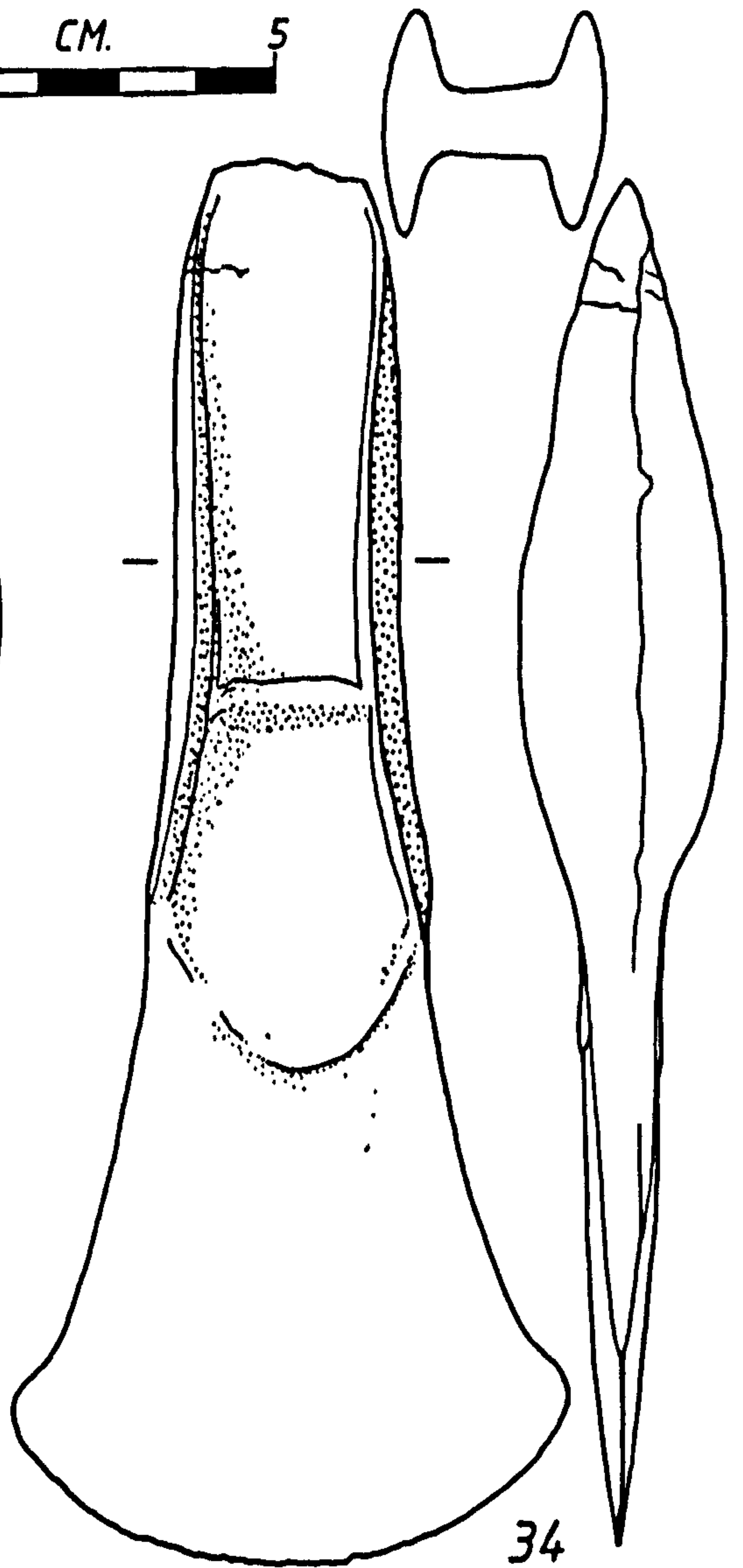
29



32

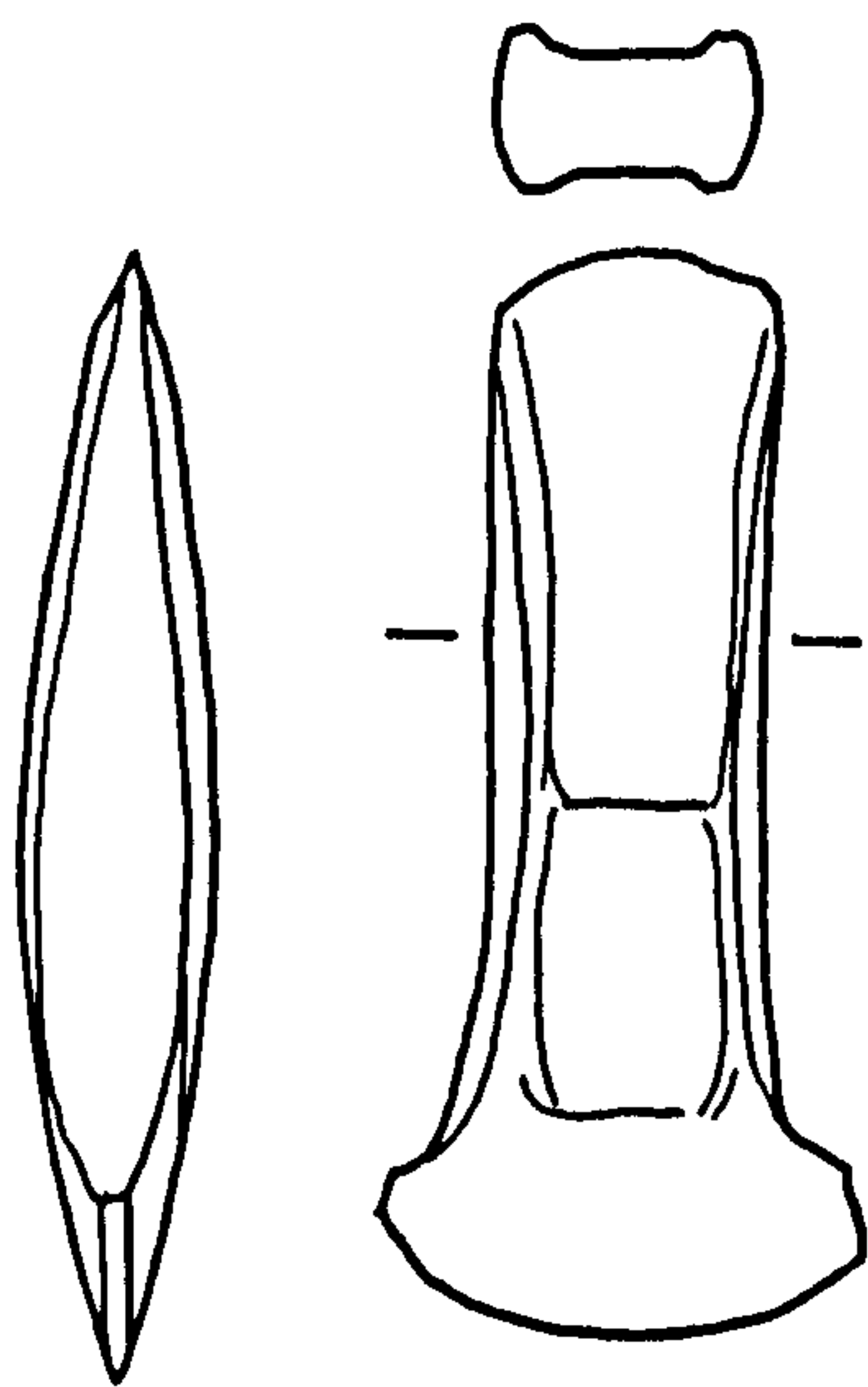


28

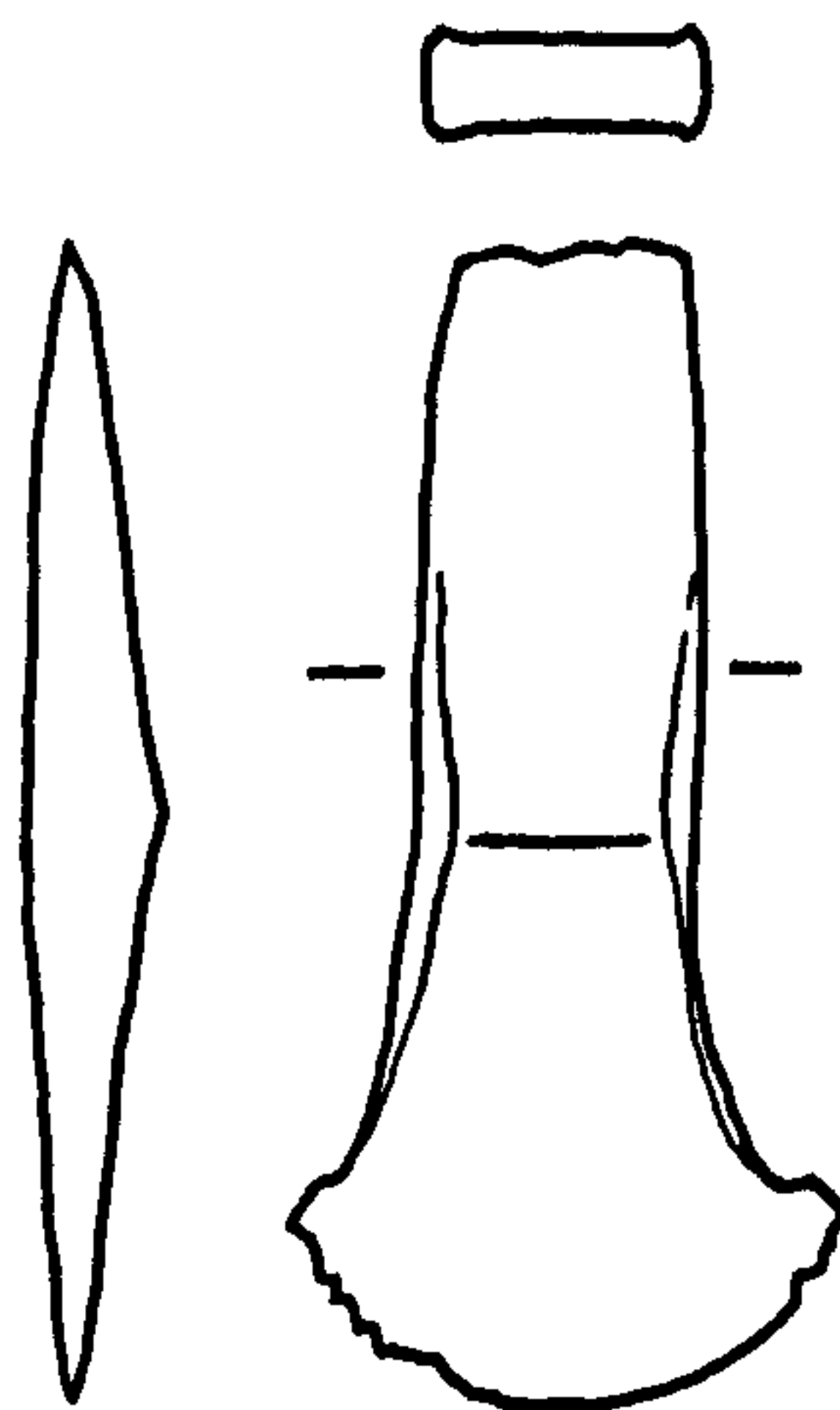


34

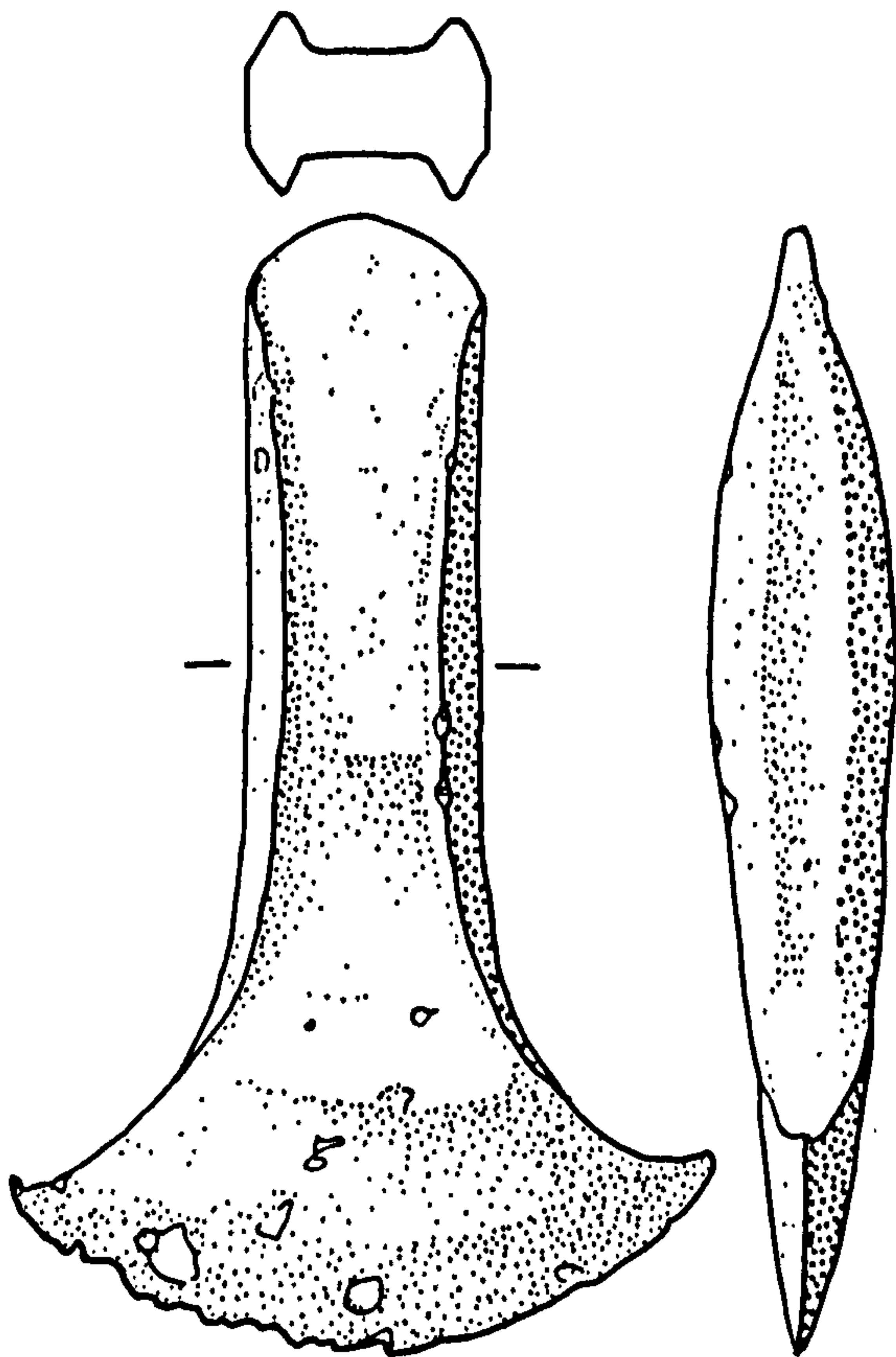
Fig. 22



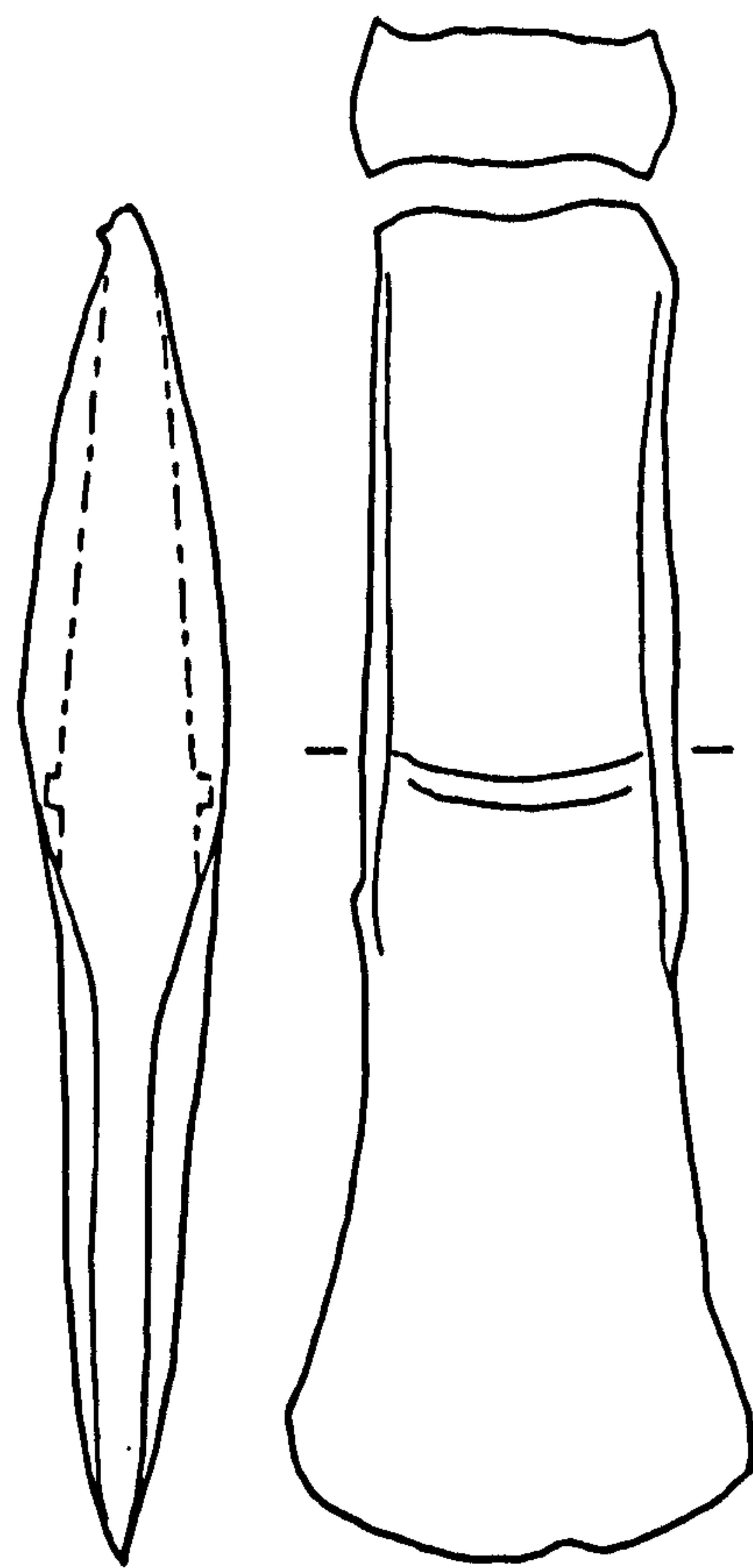
23



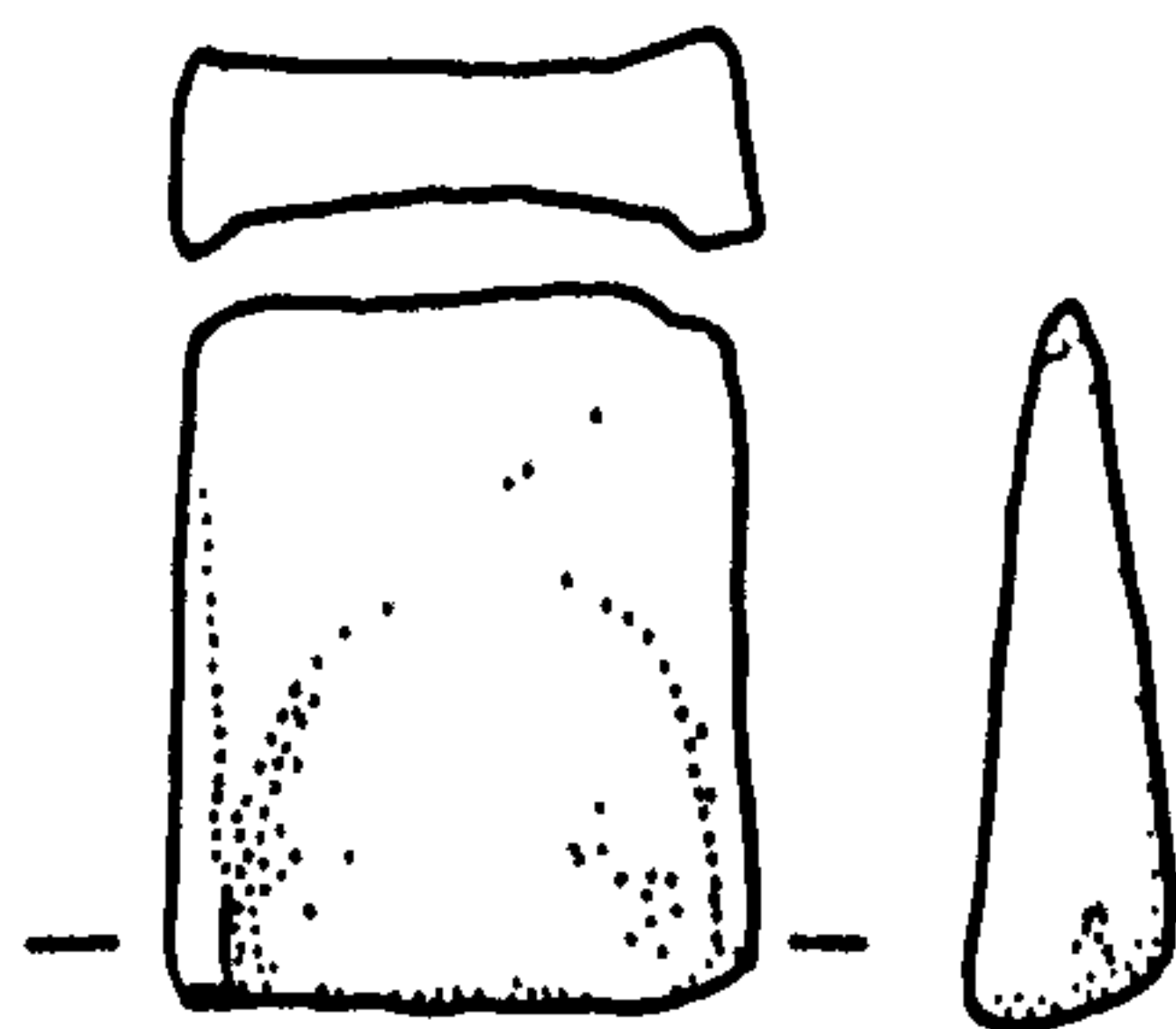
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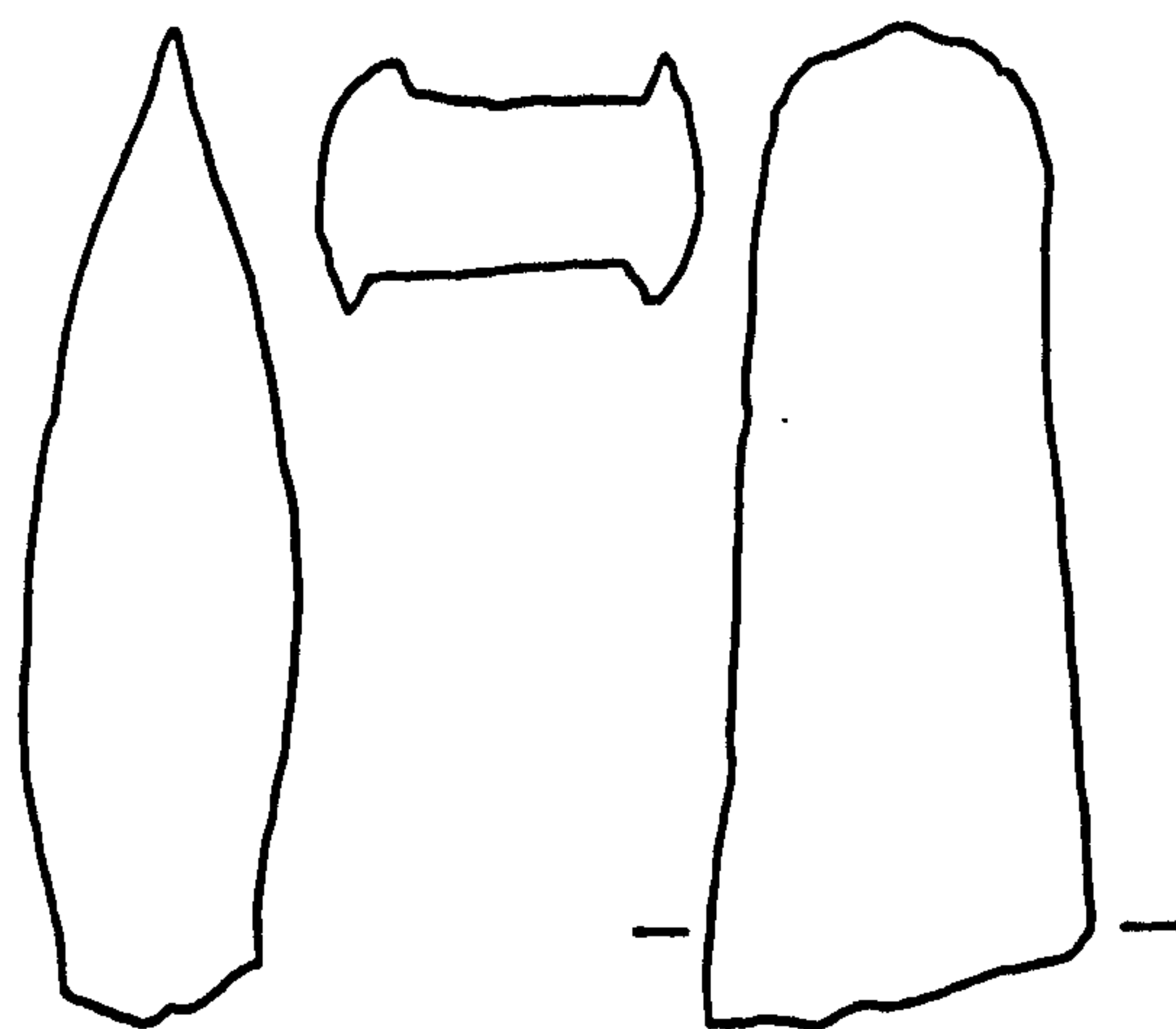
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30



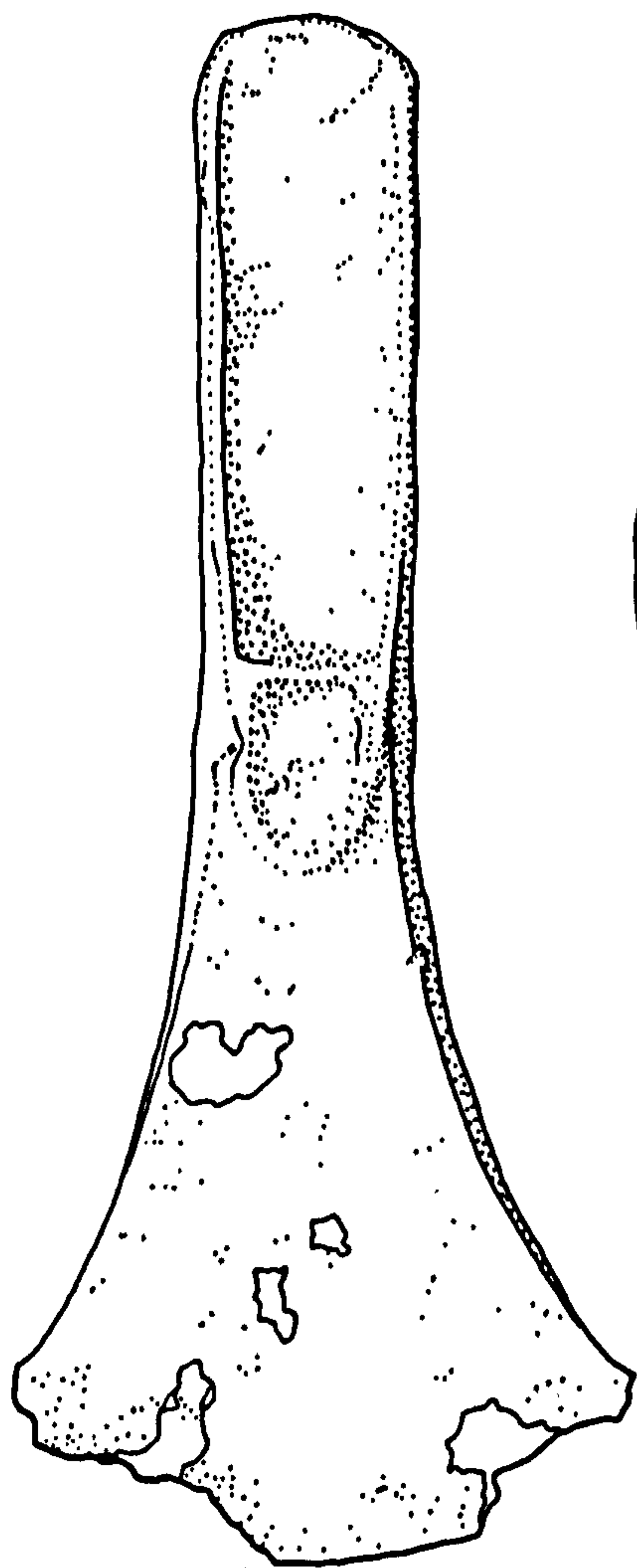
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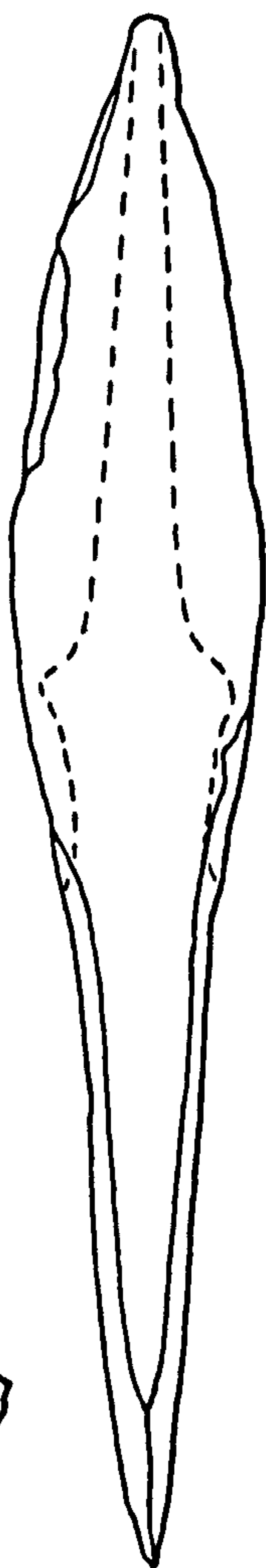
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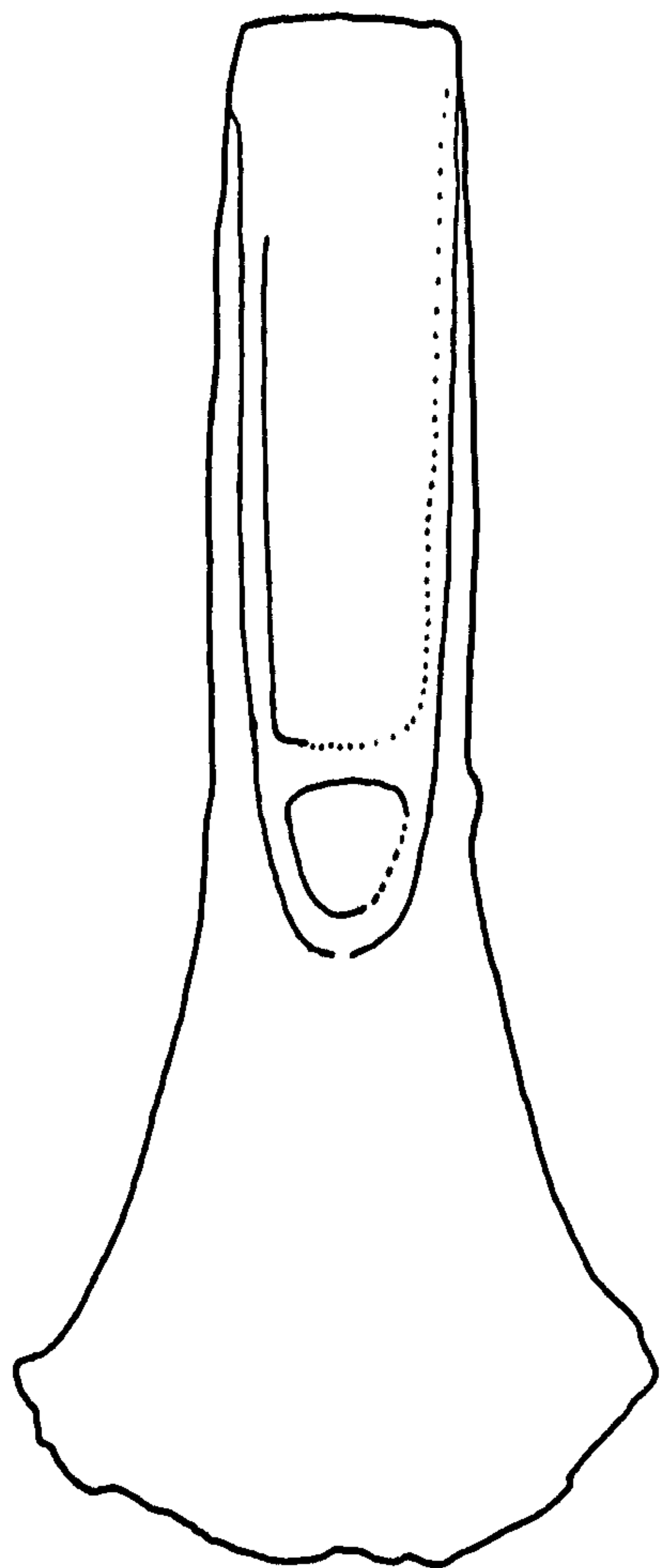
Fig. 23



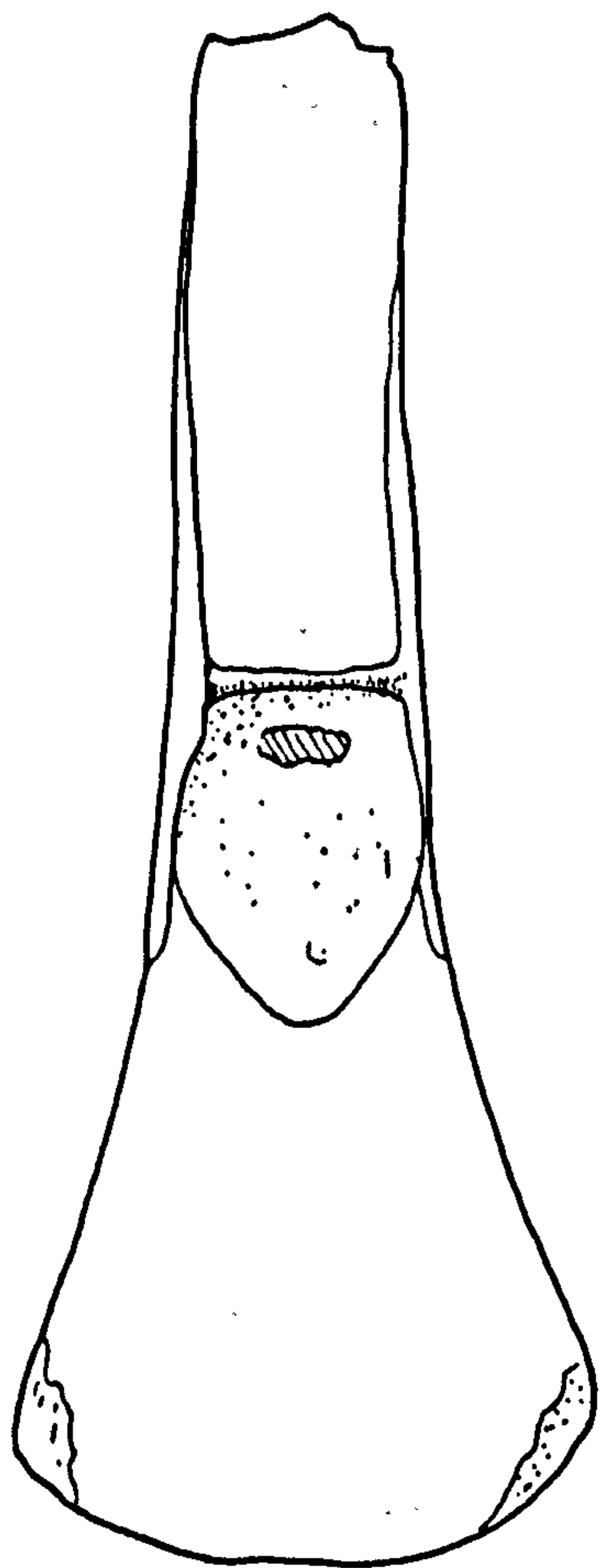
56



39



54



60

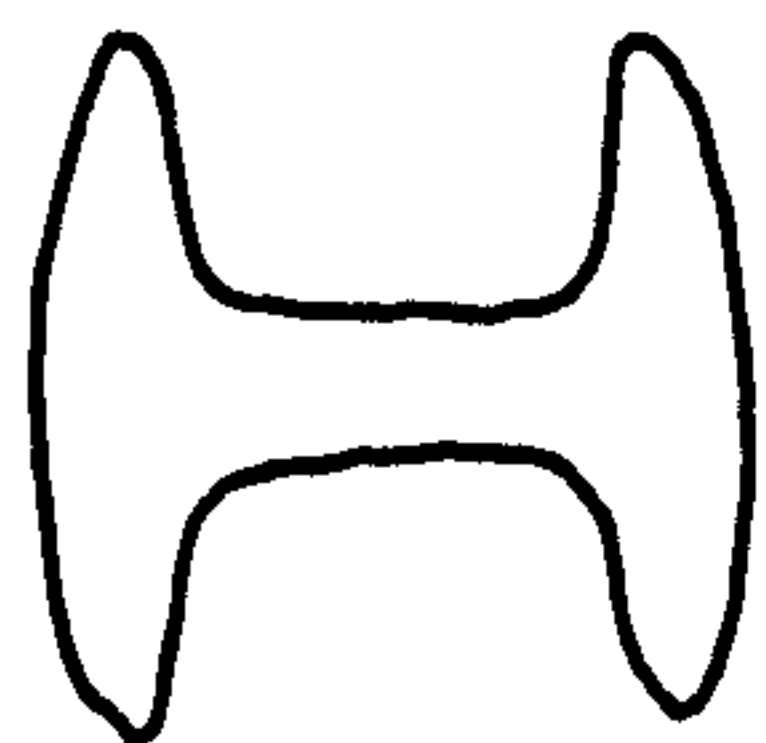
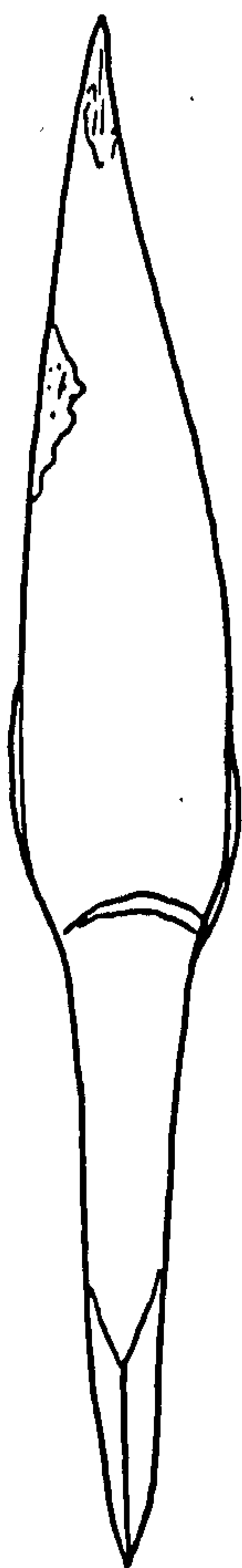
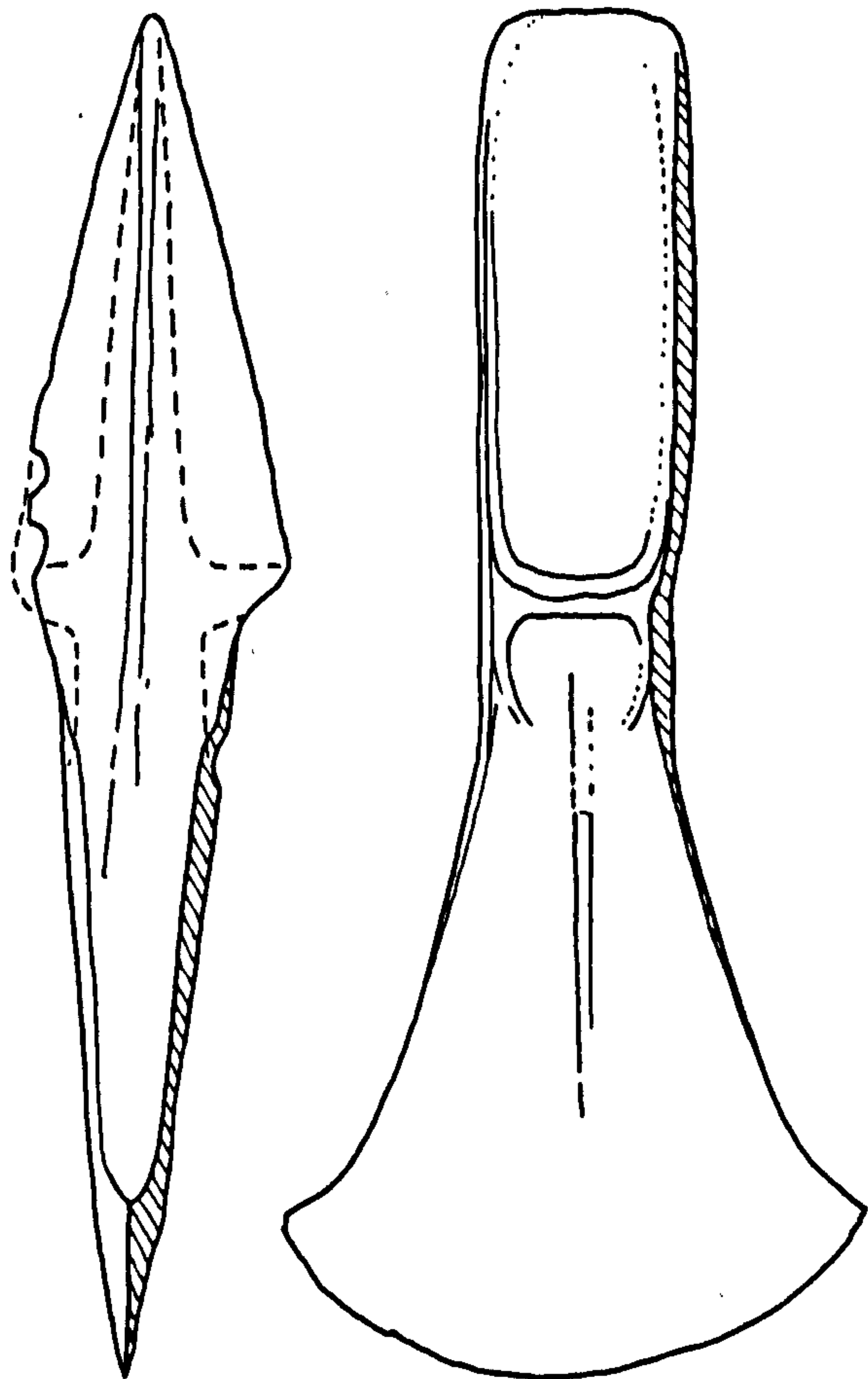
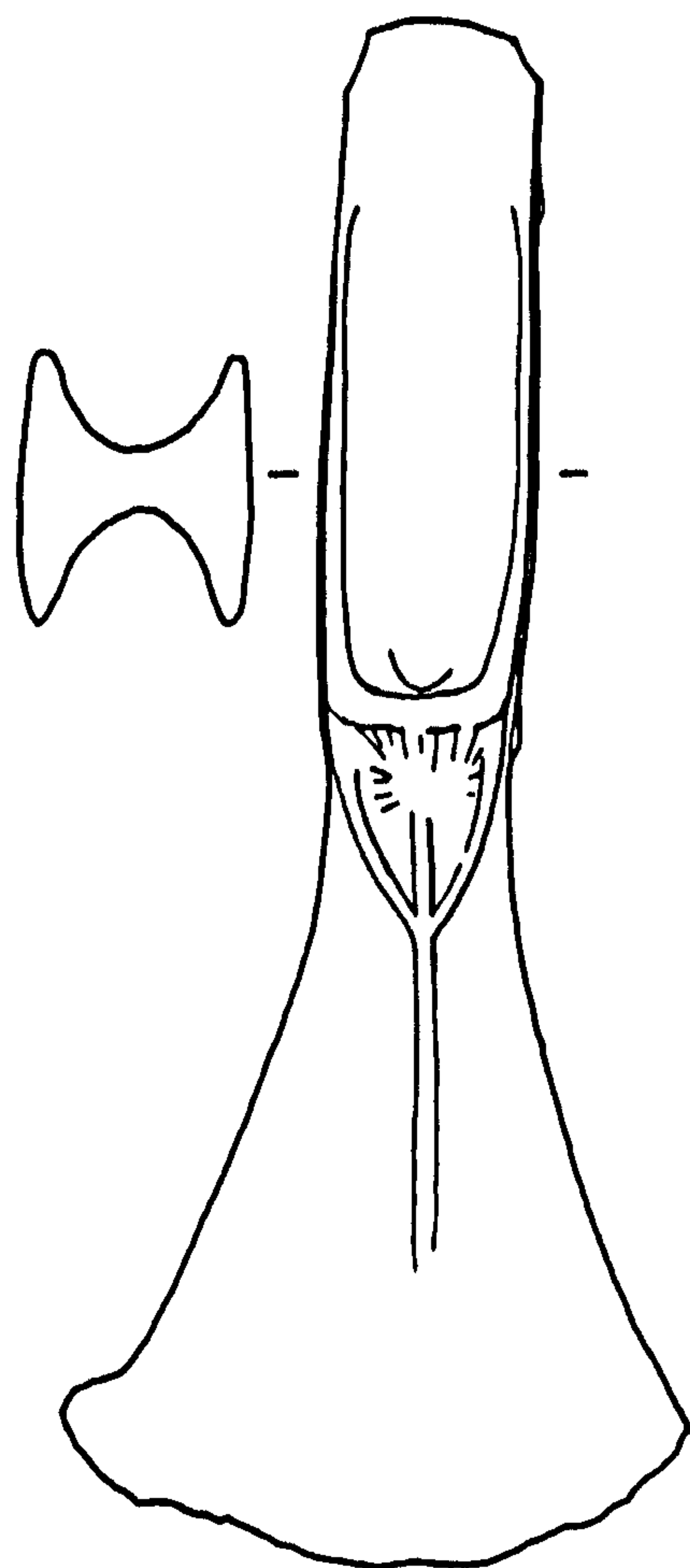


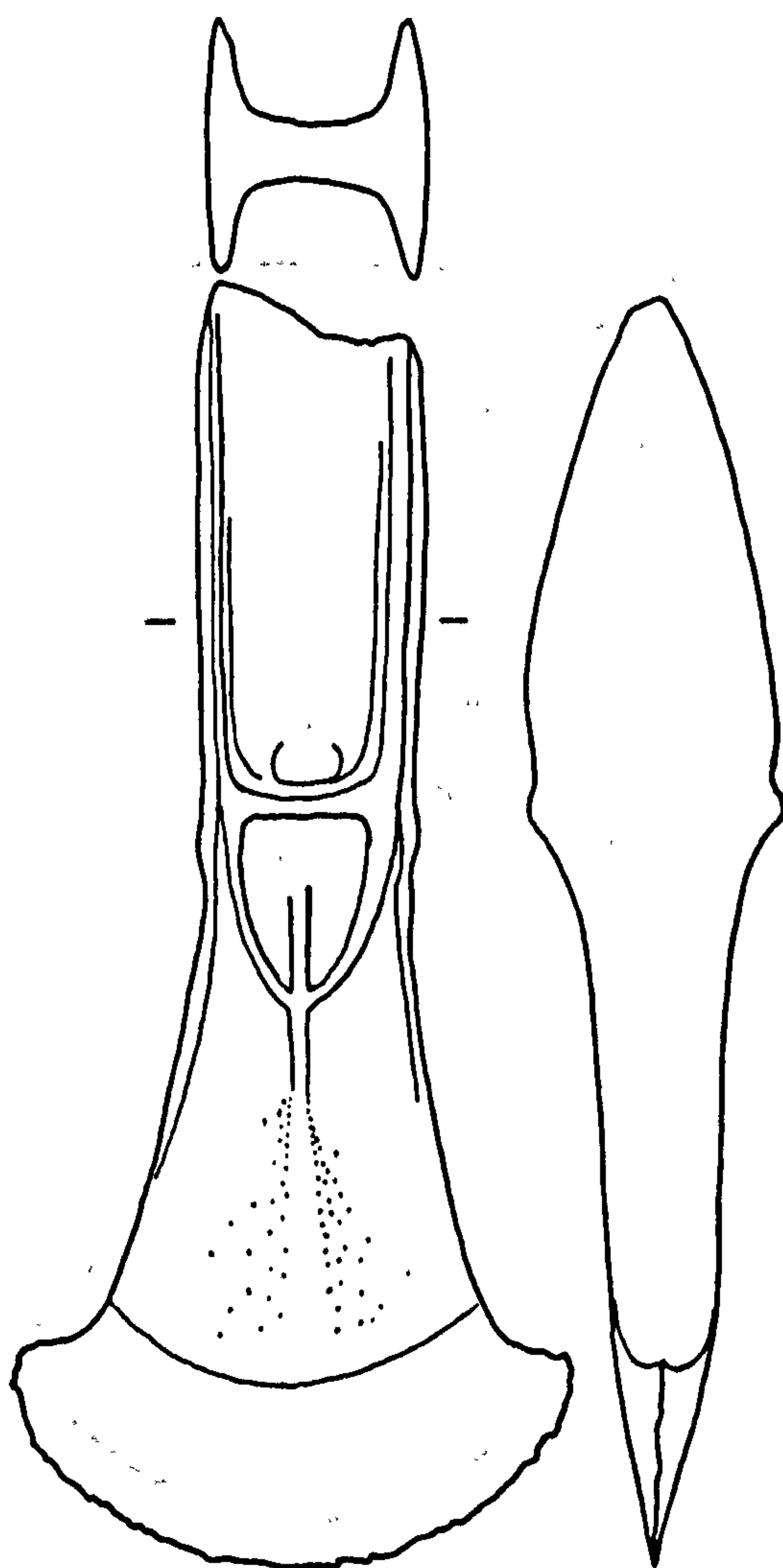
Fig. 24



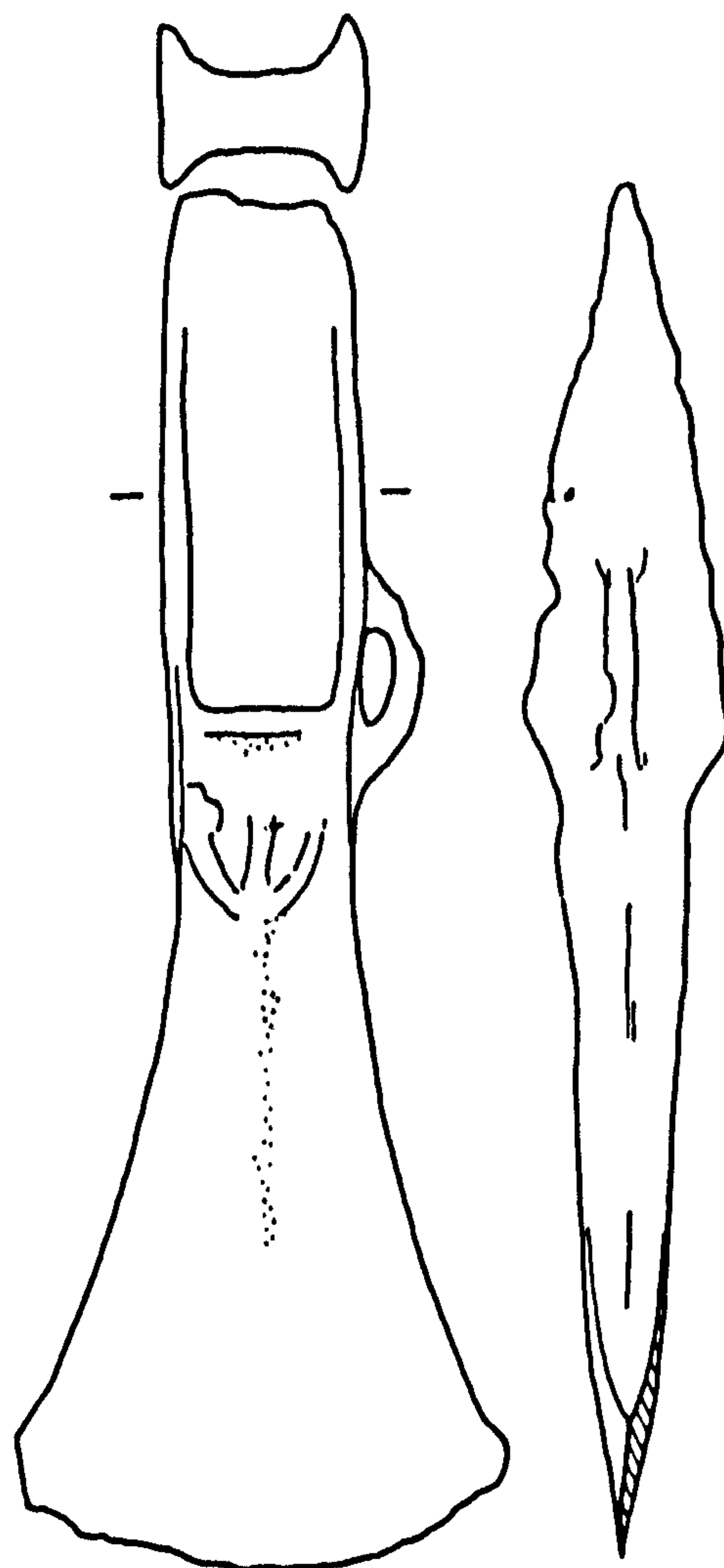
52



55



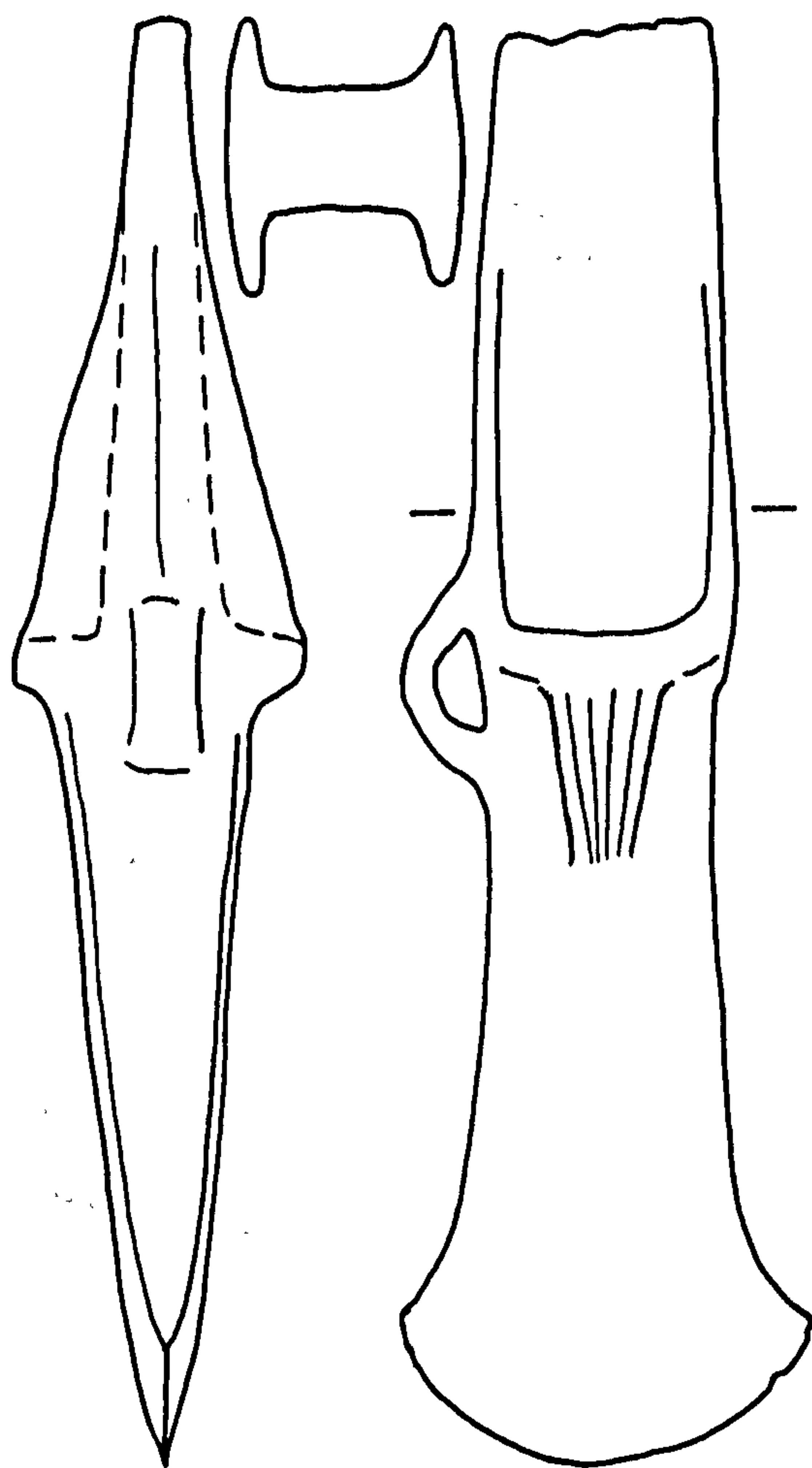
63



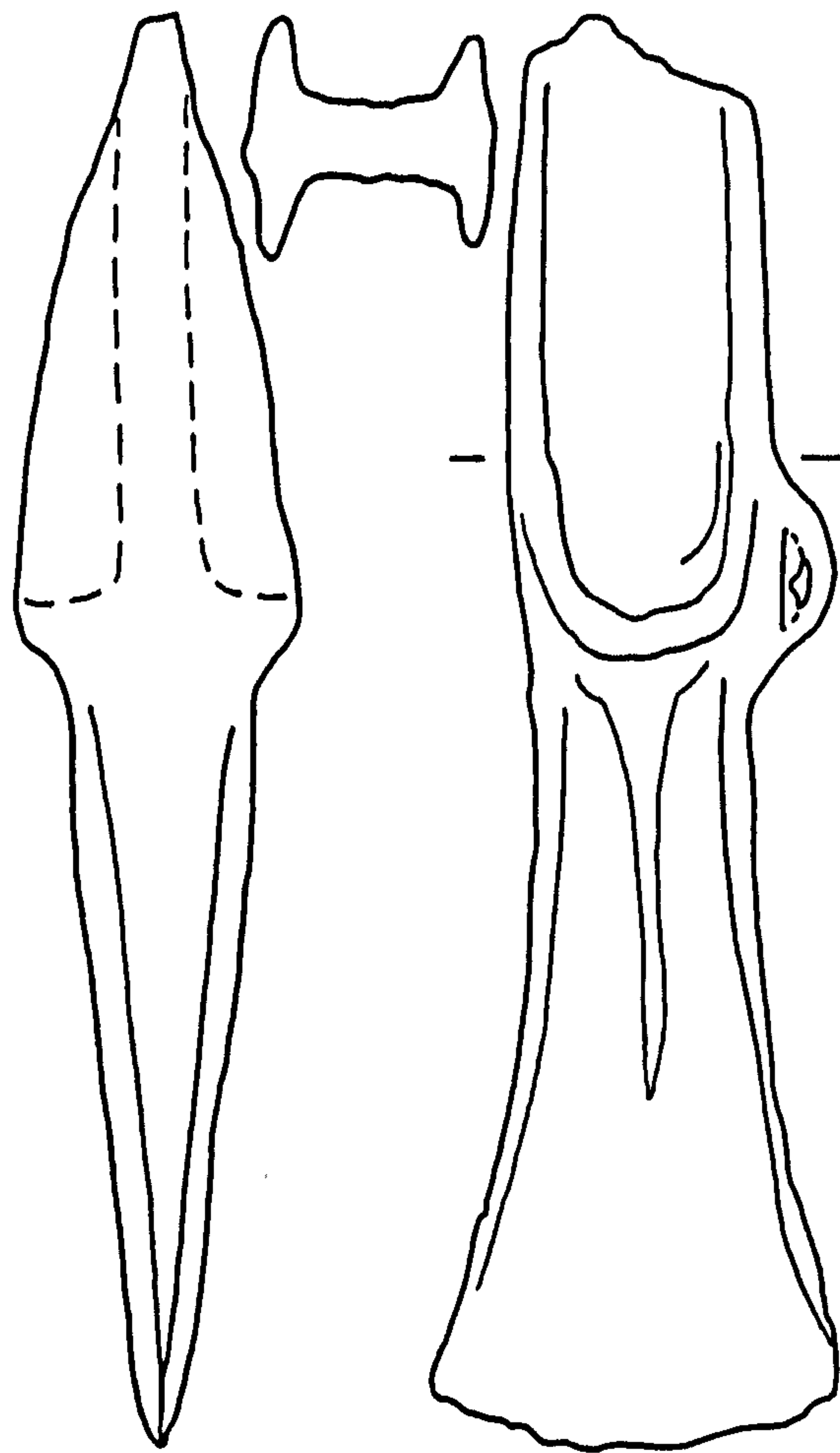
64



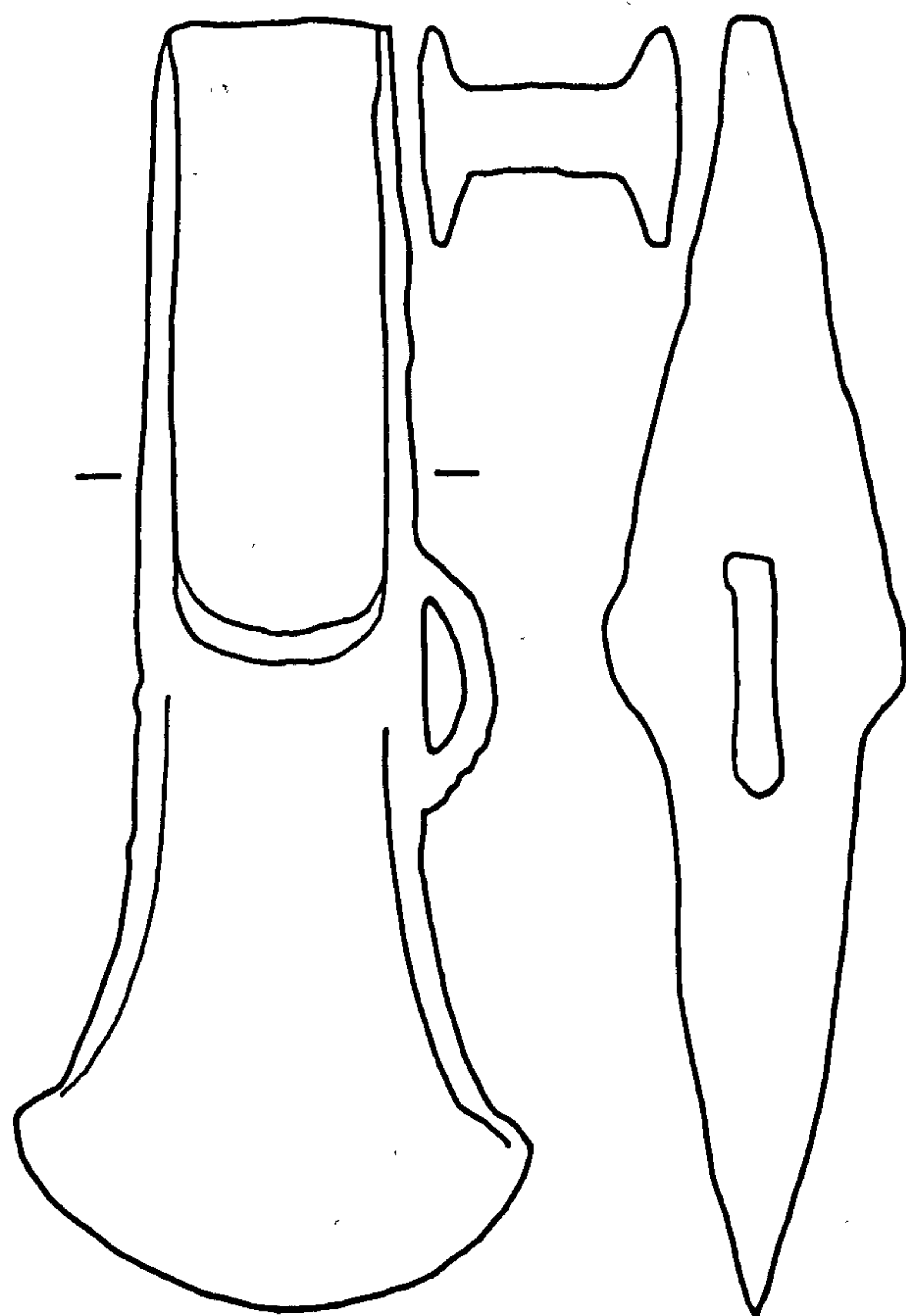
Fig. 25



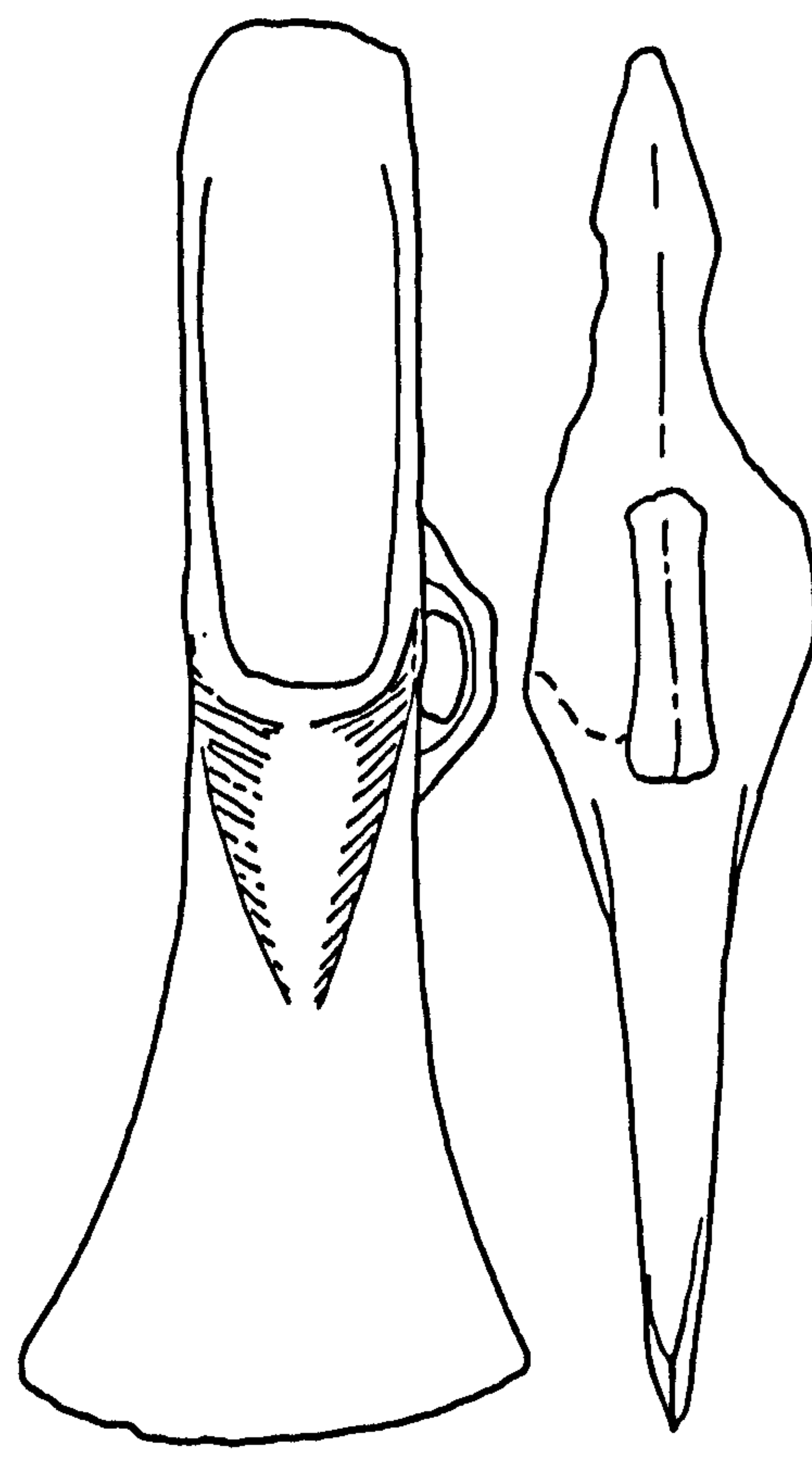
70



40



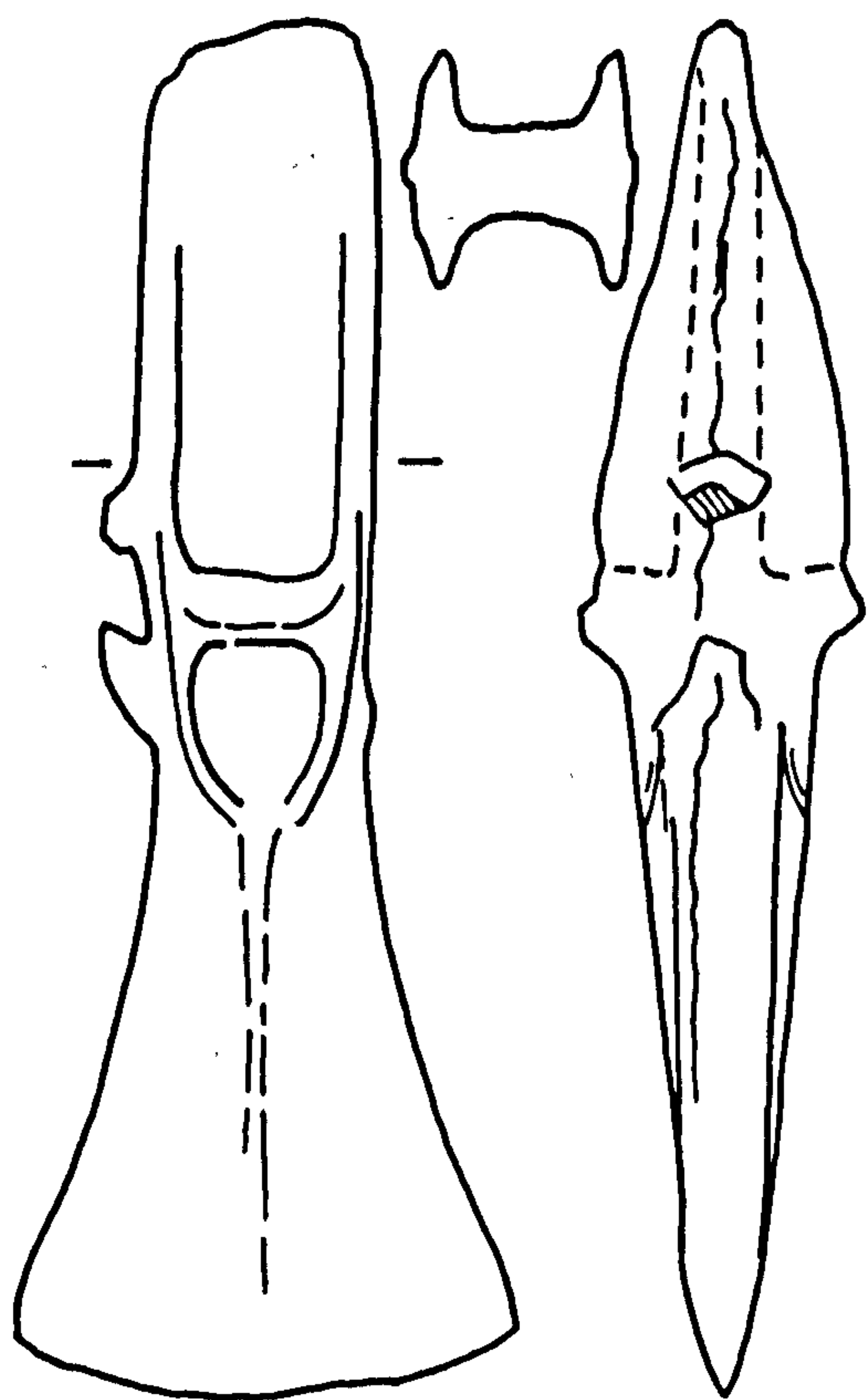
43



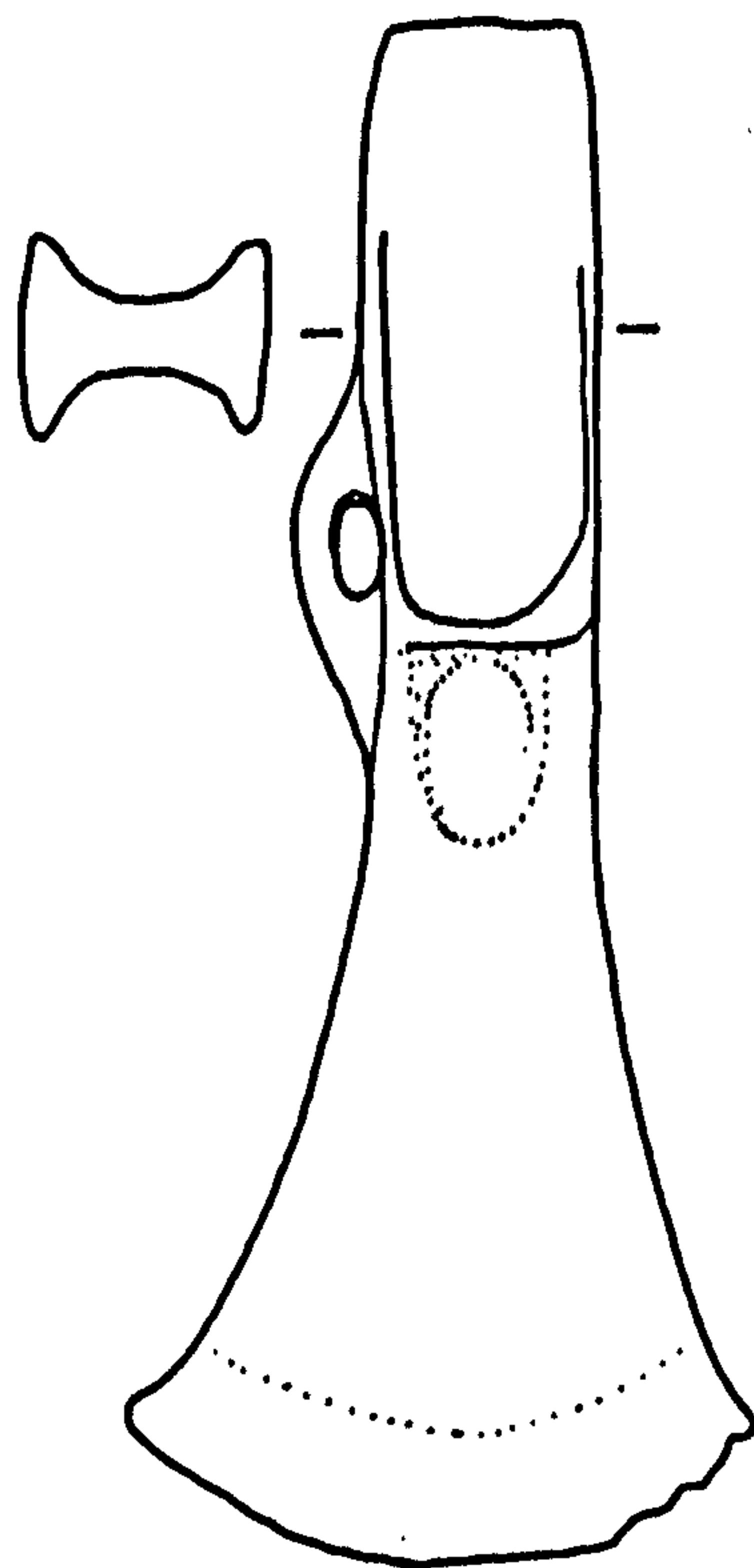
48



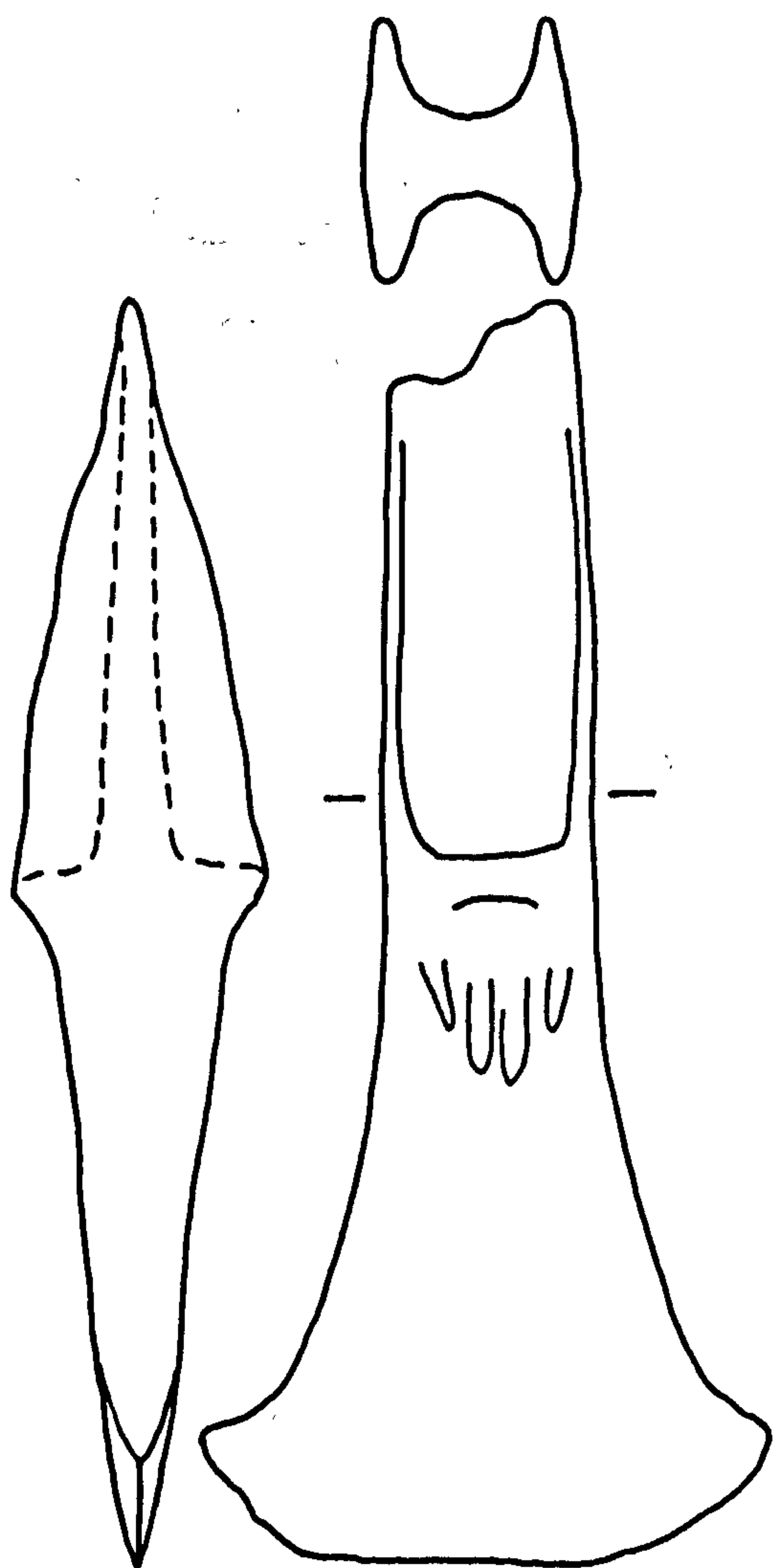
Fig. 26



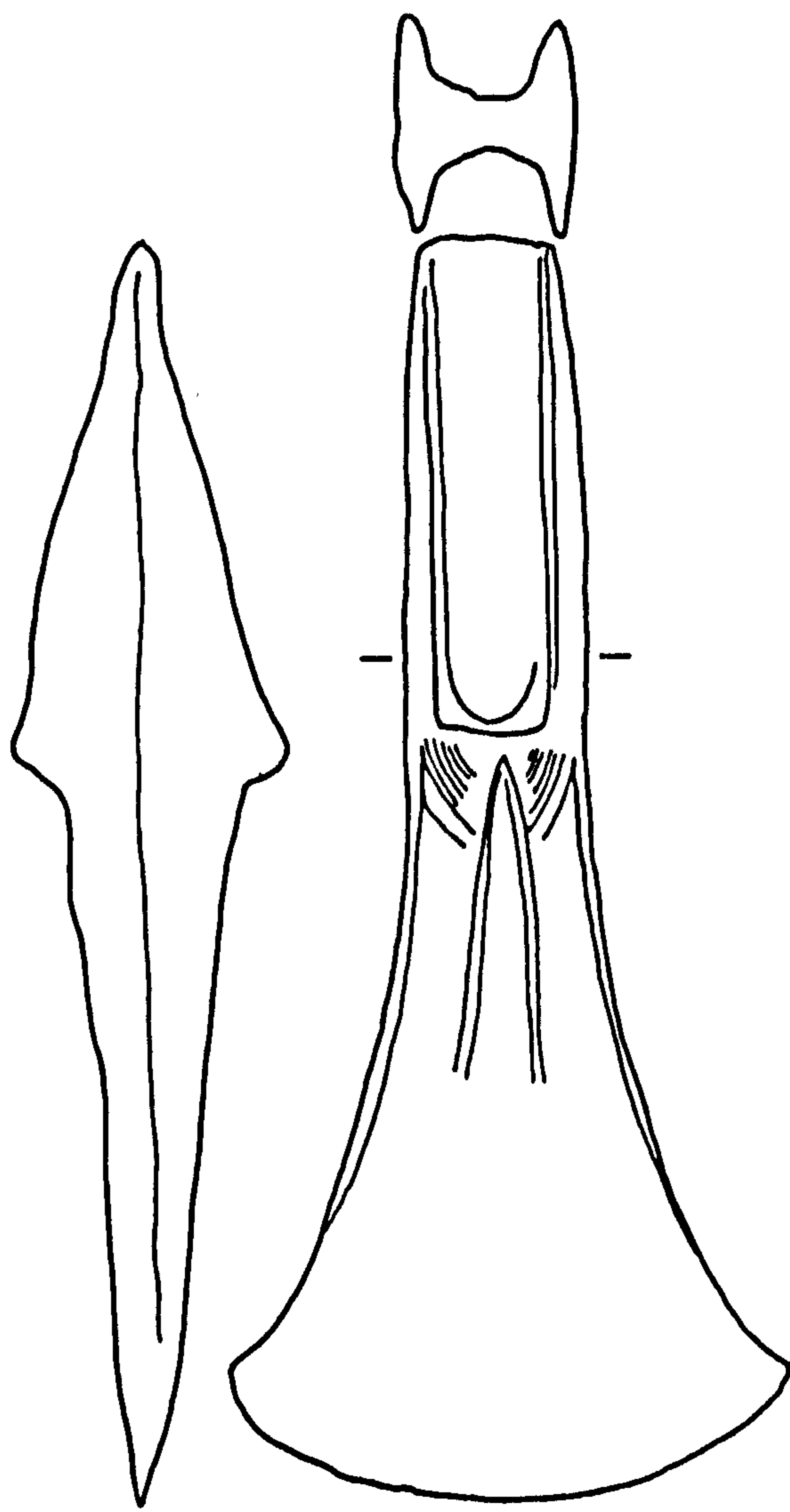
75



47



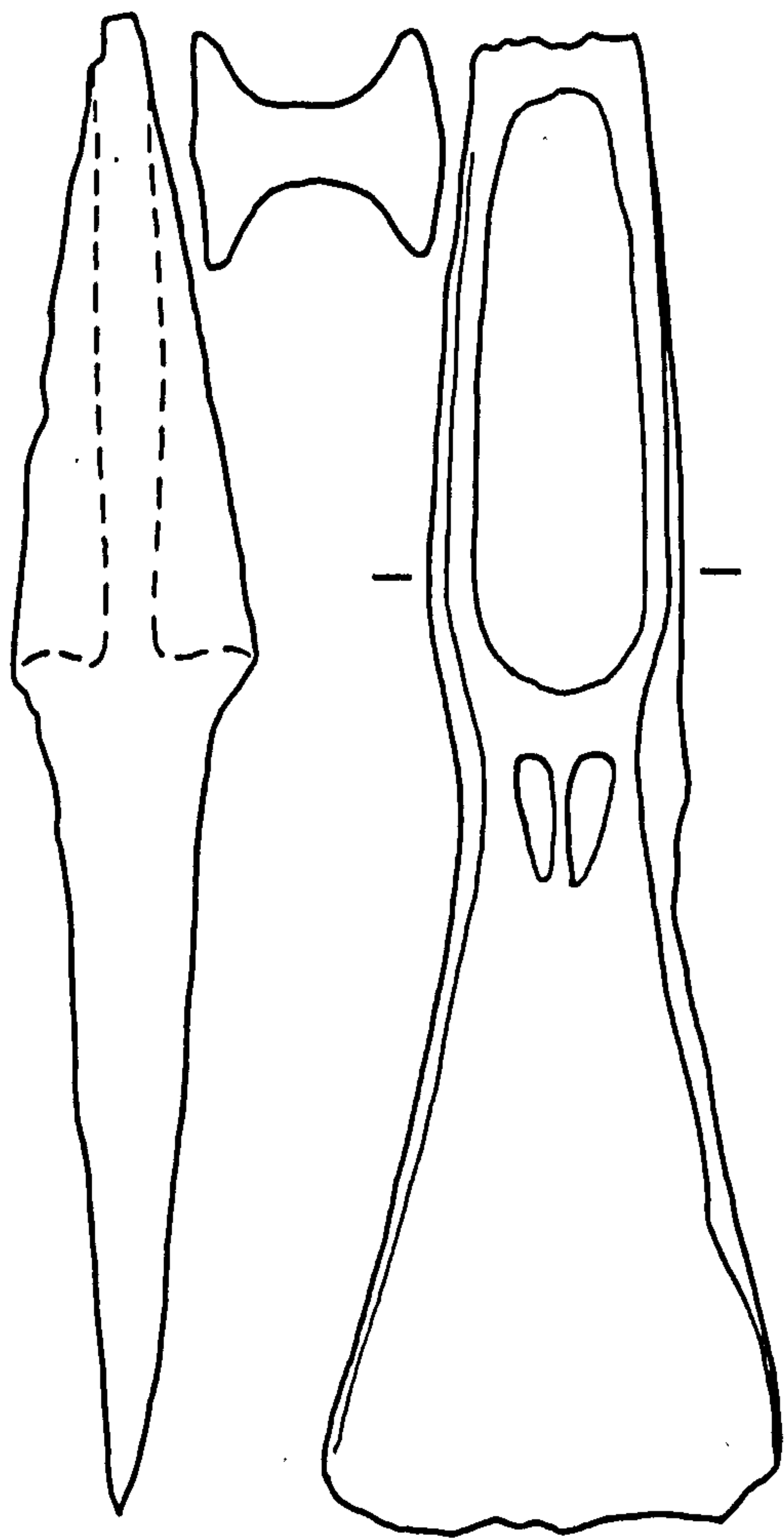
72



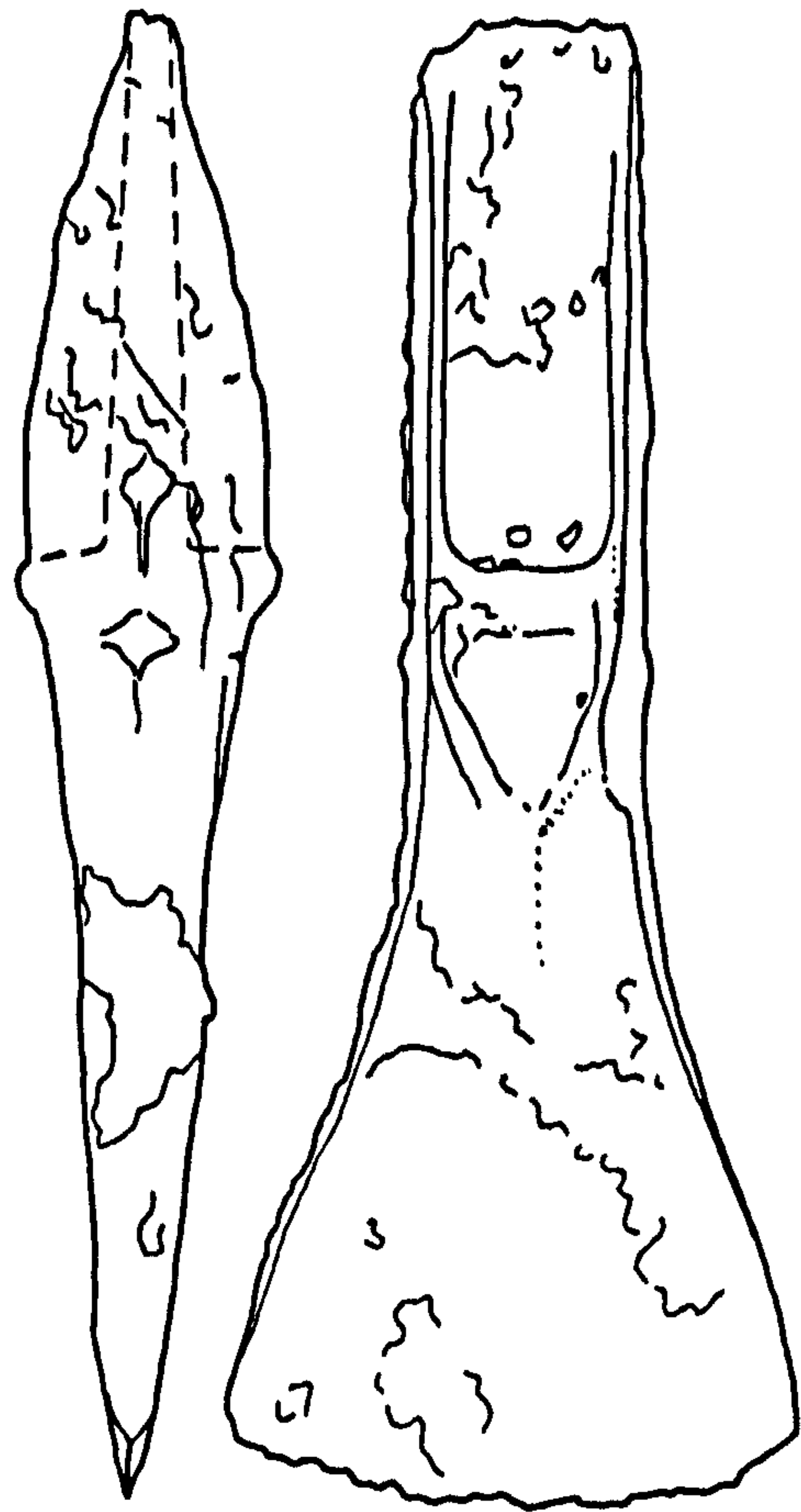
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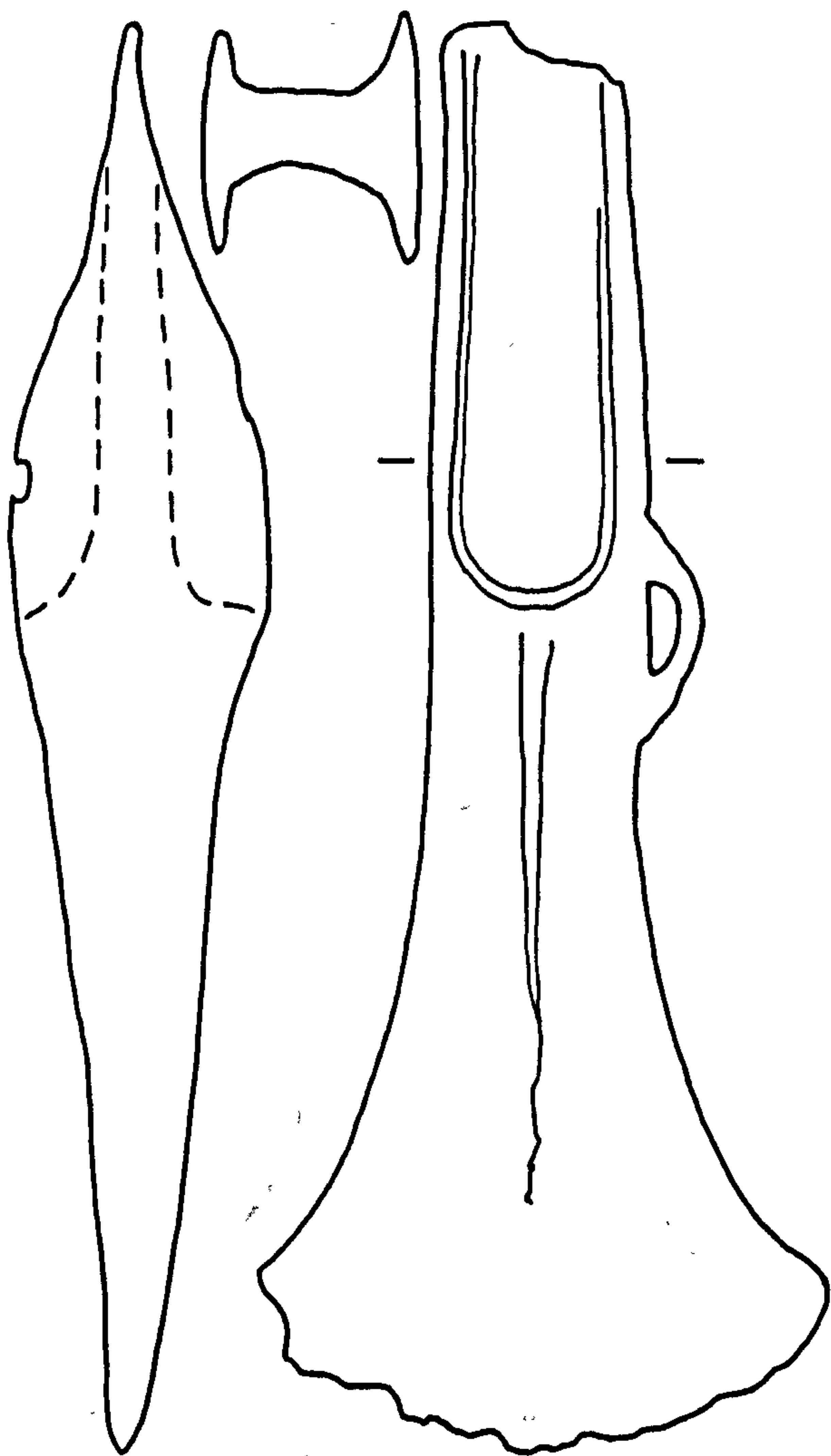
Fig. 27



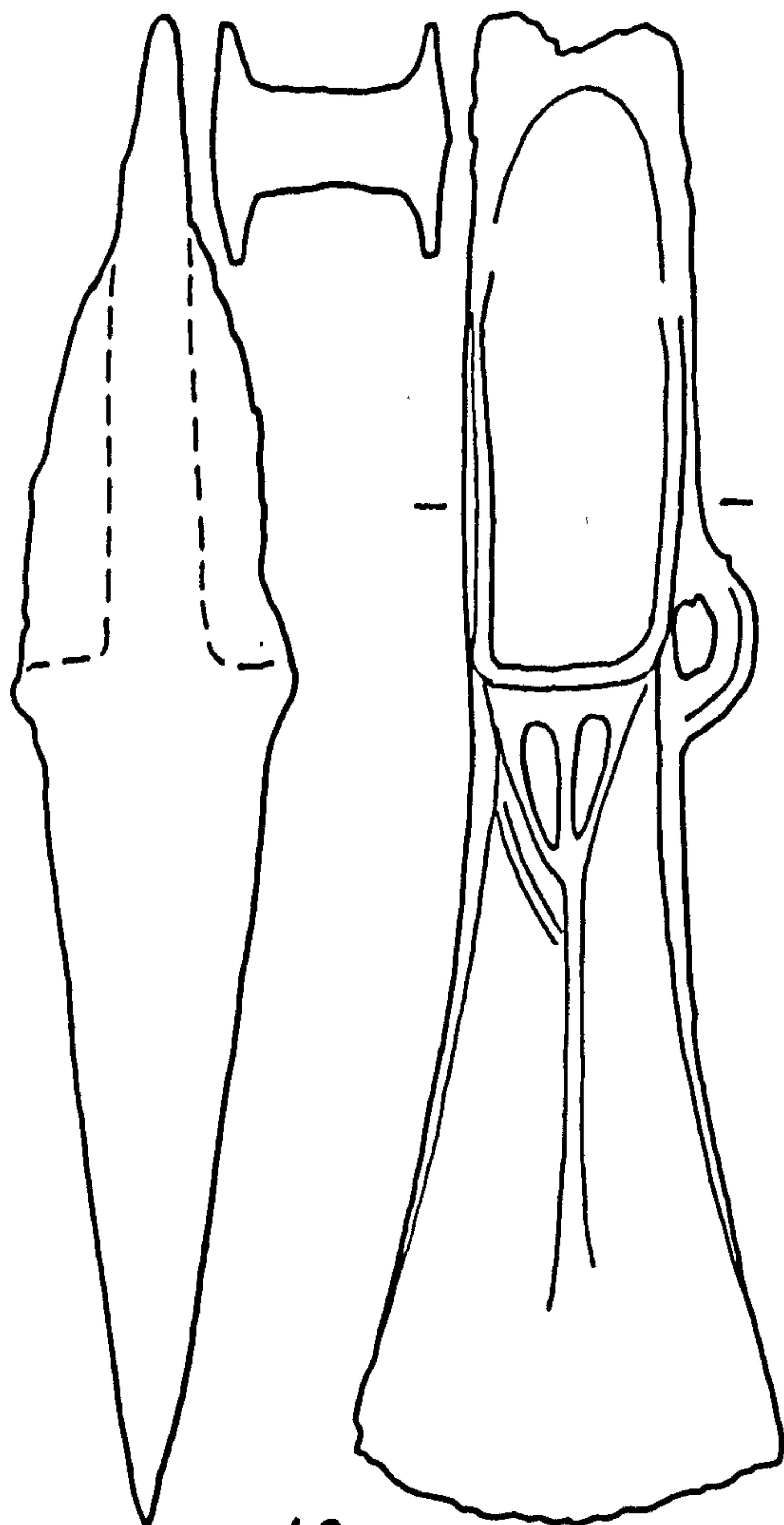
78



66



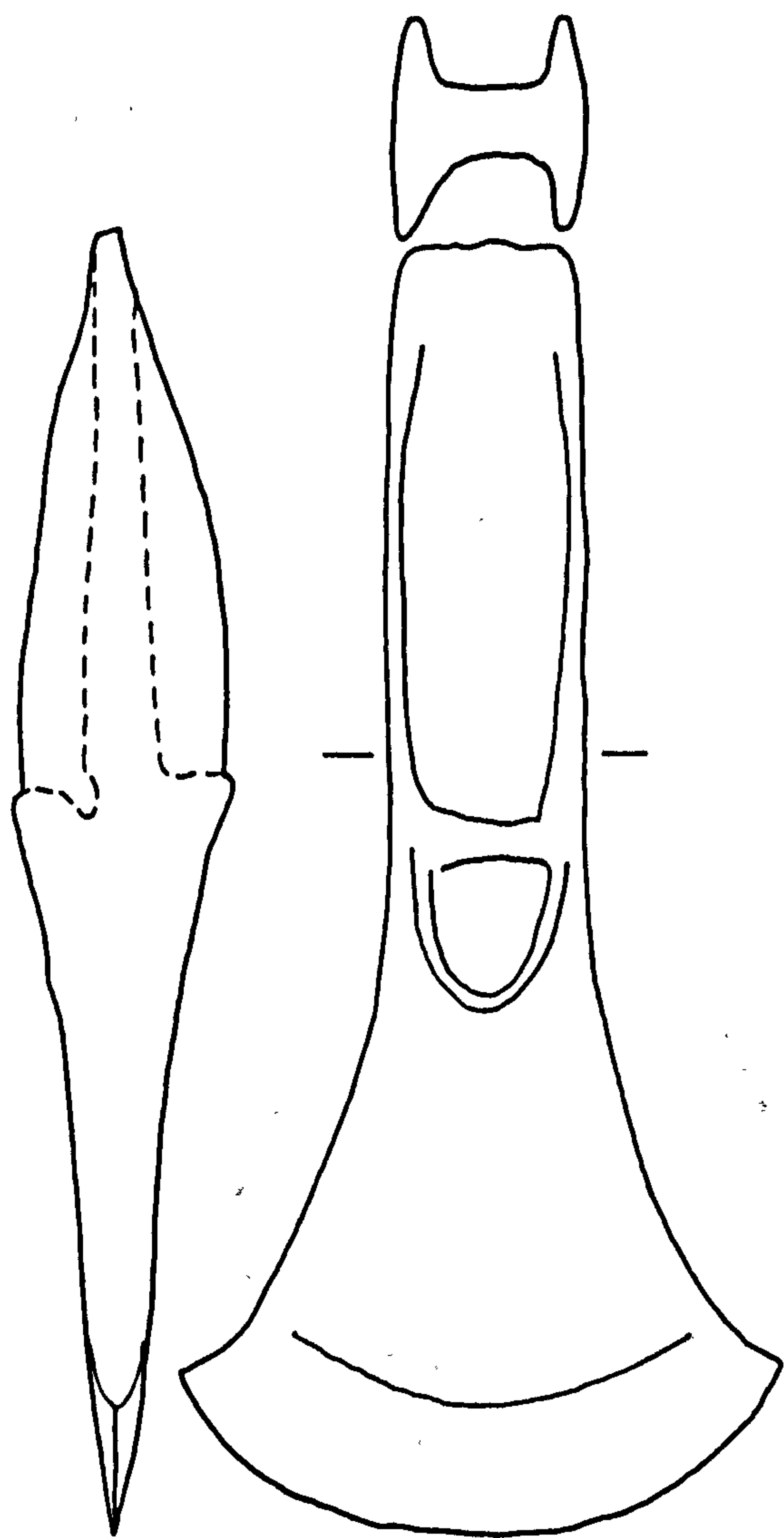
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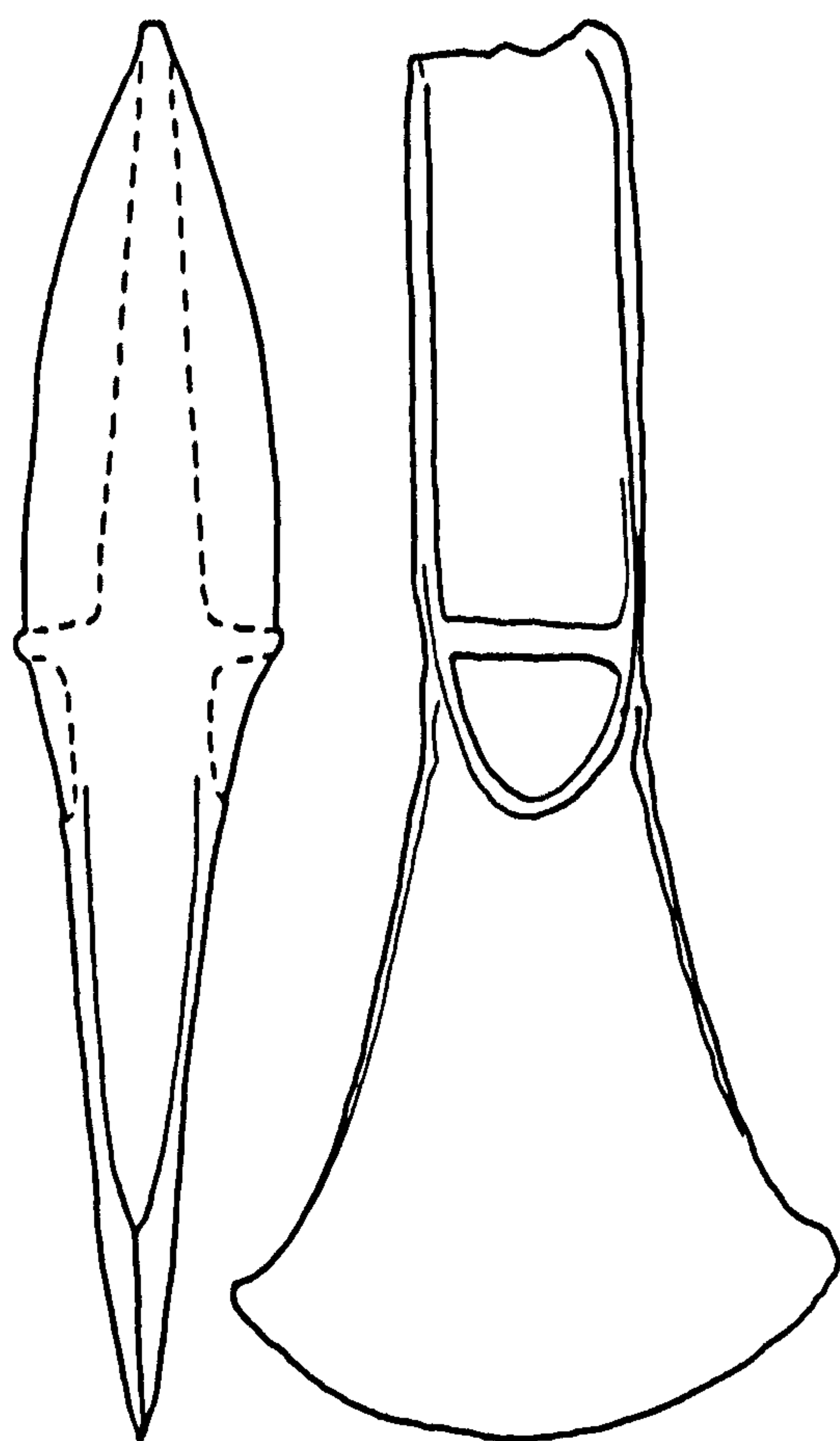
49



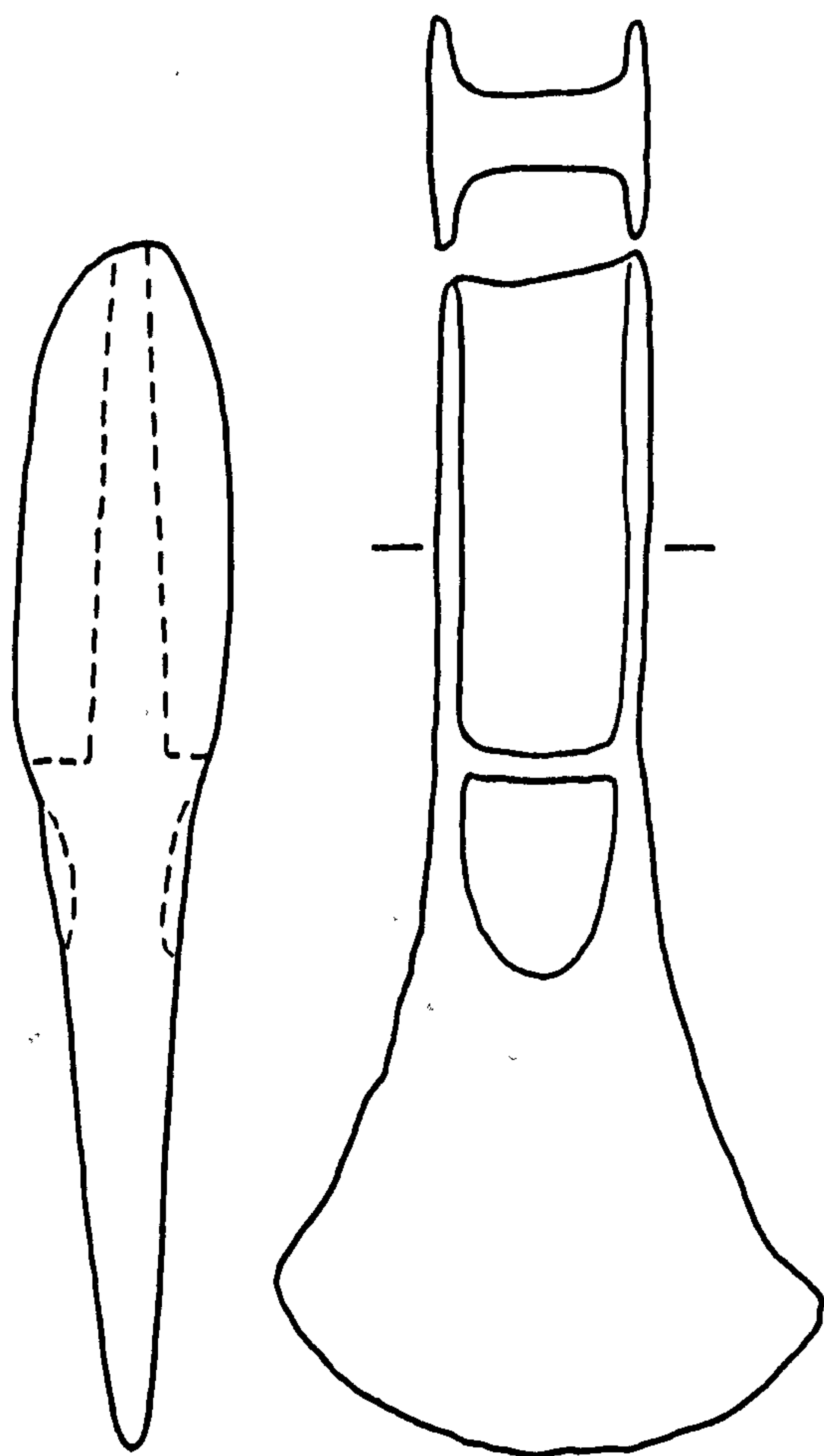
Fig. 28



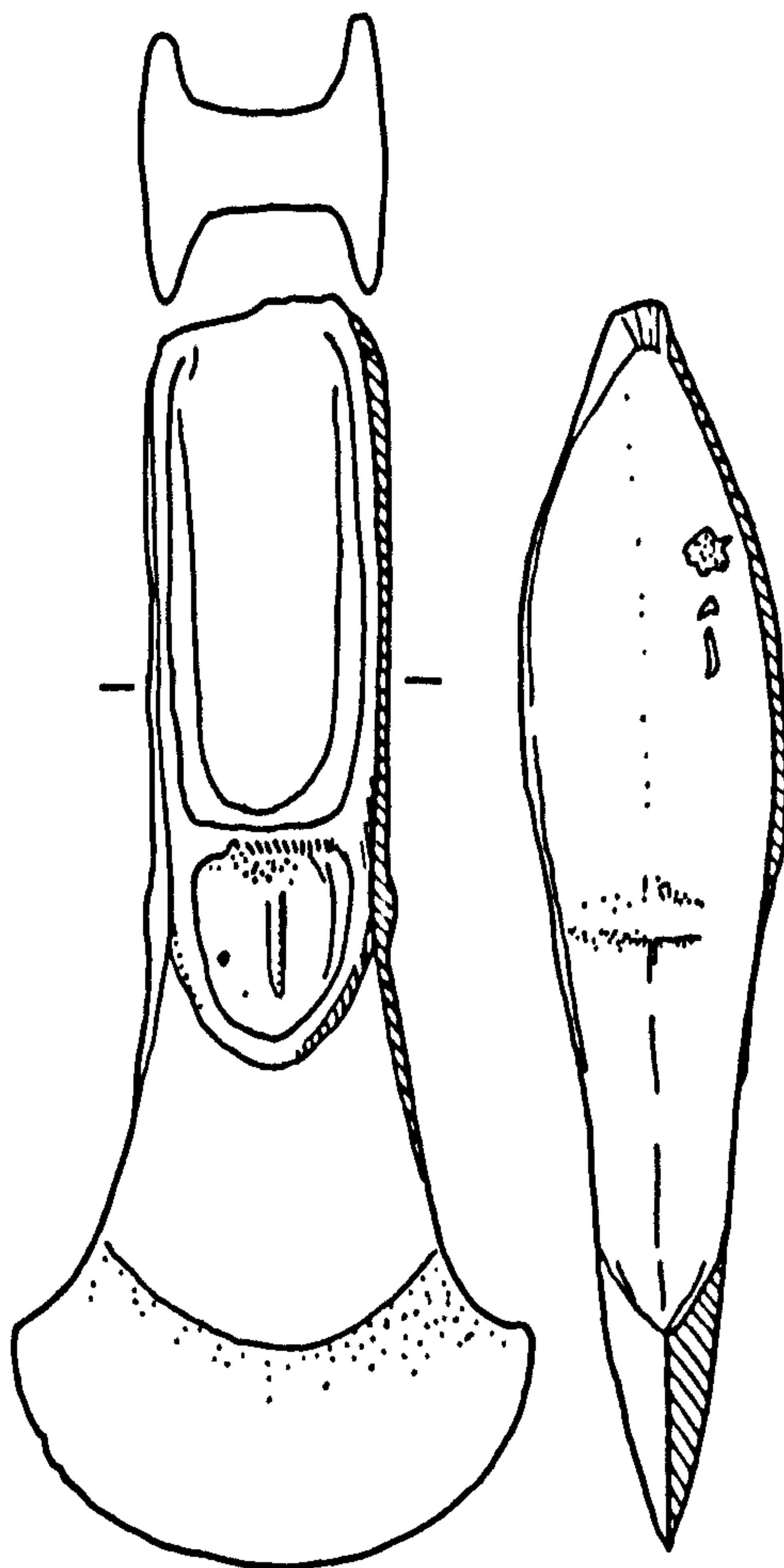
57



51



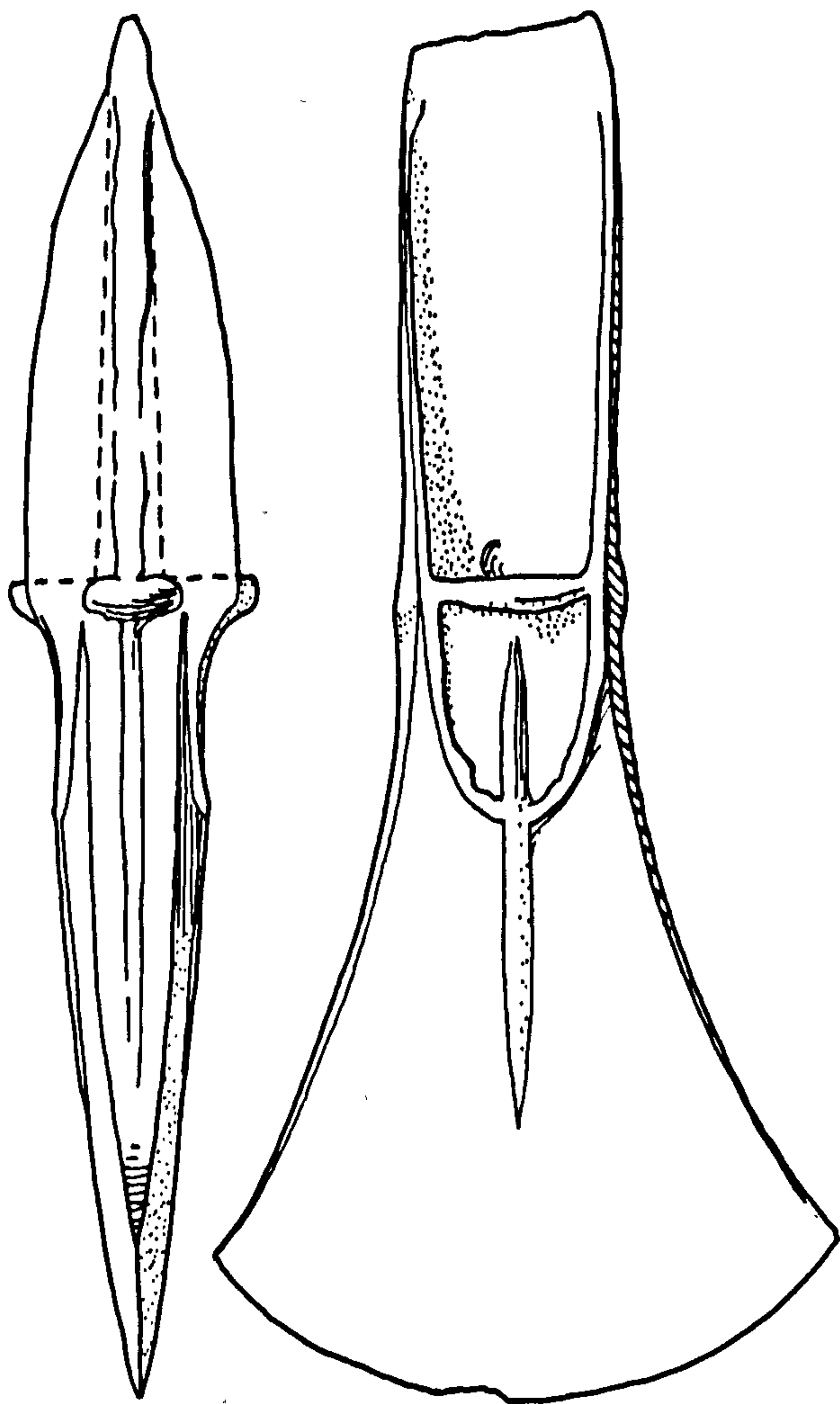
79



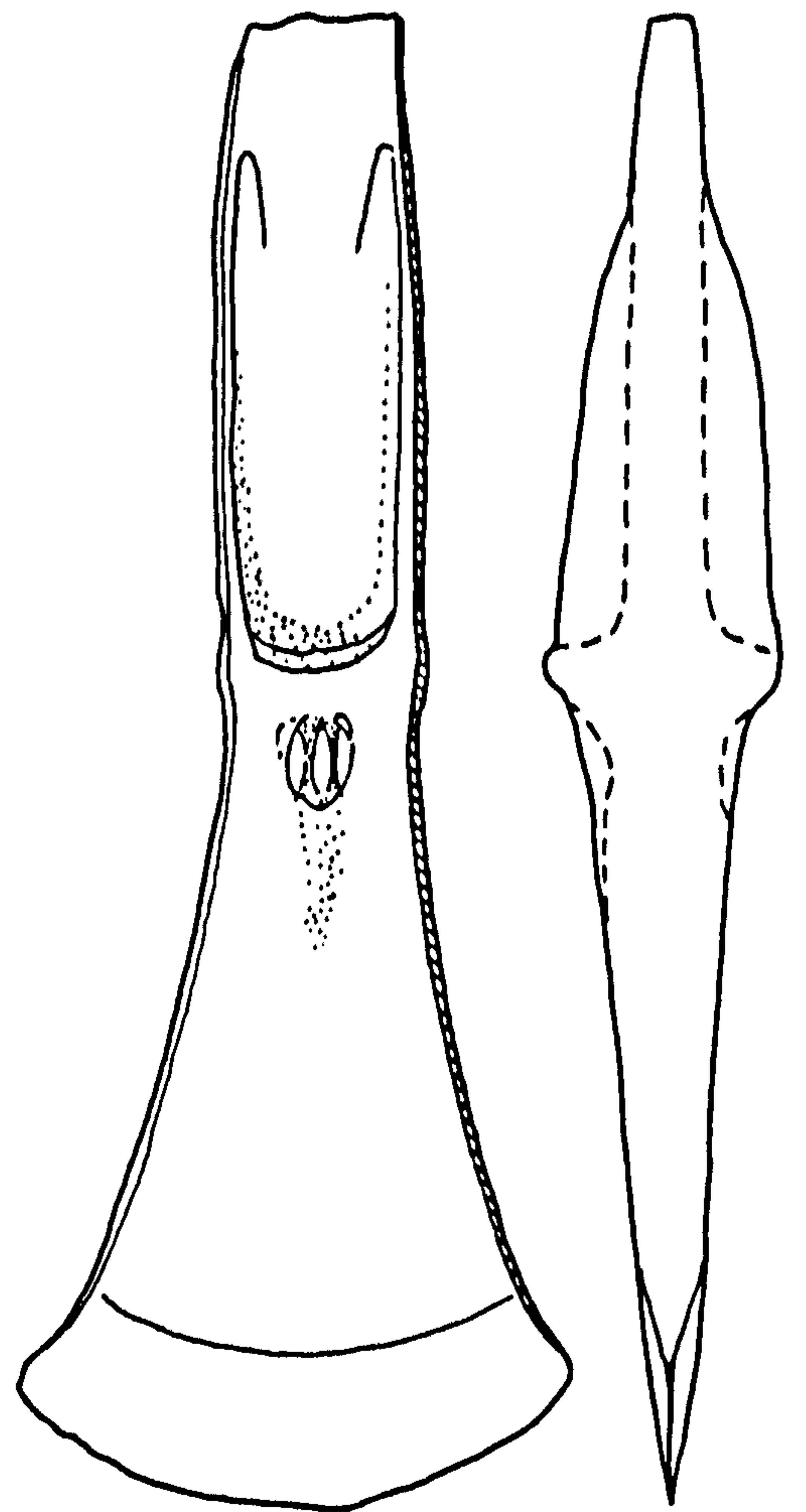
58



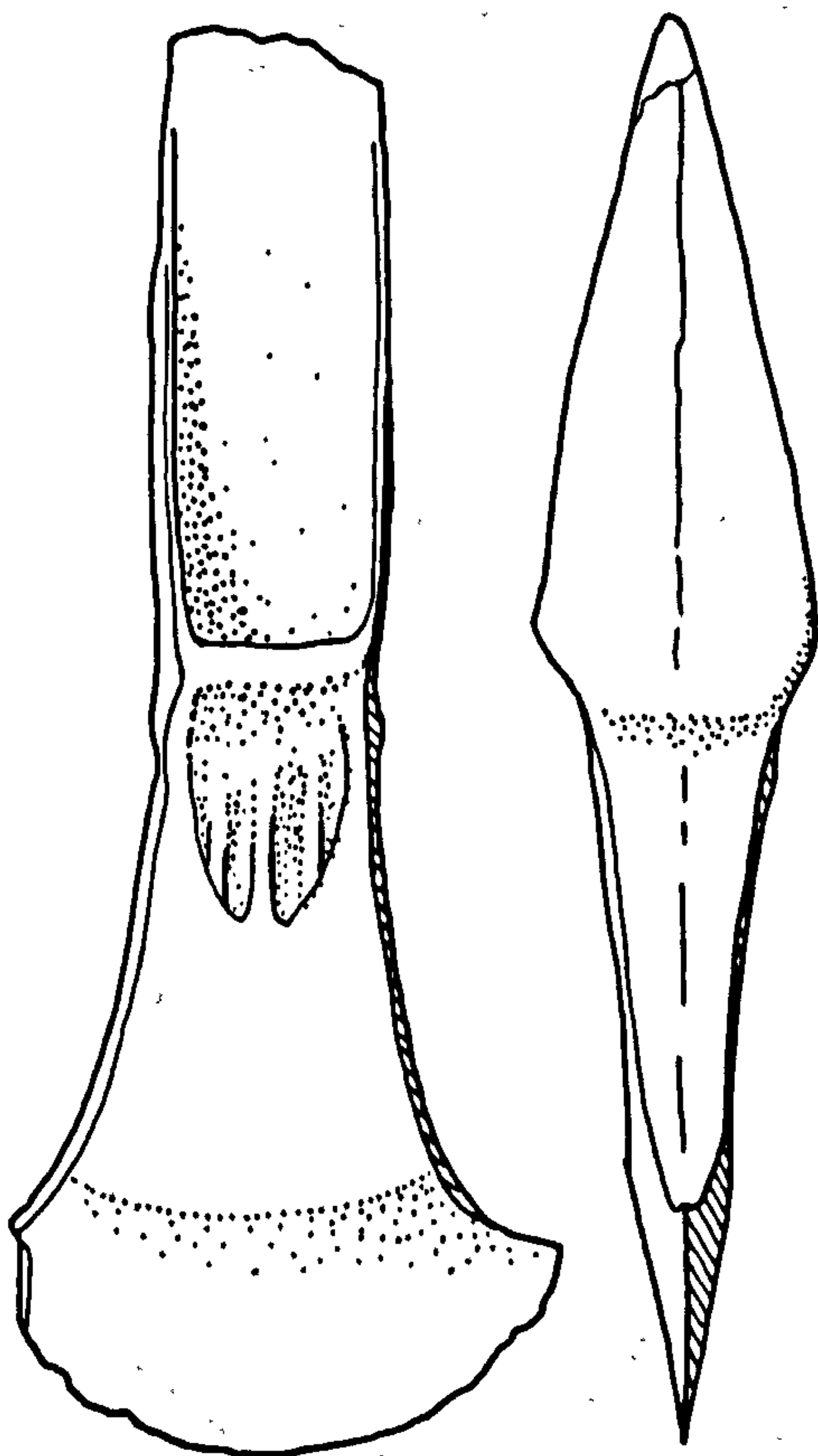
Fig. 29



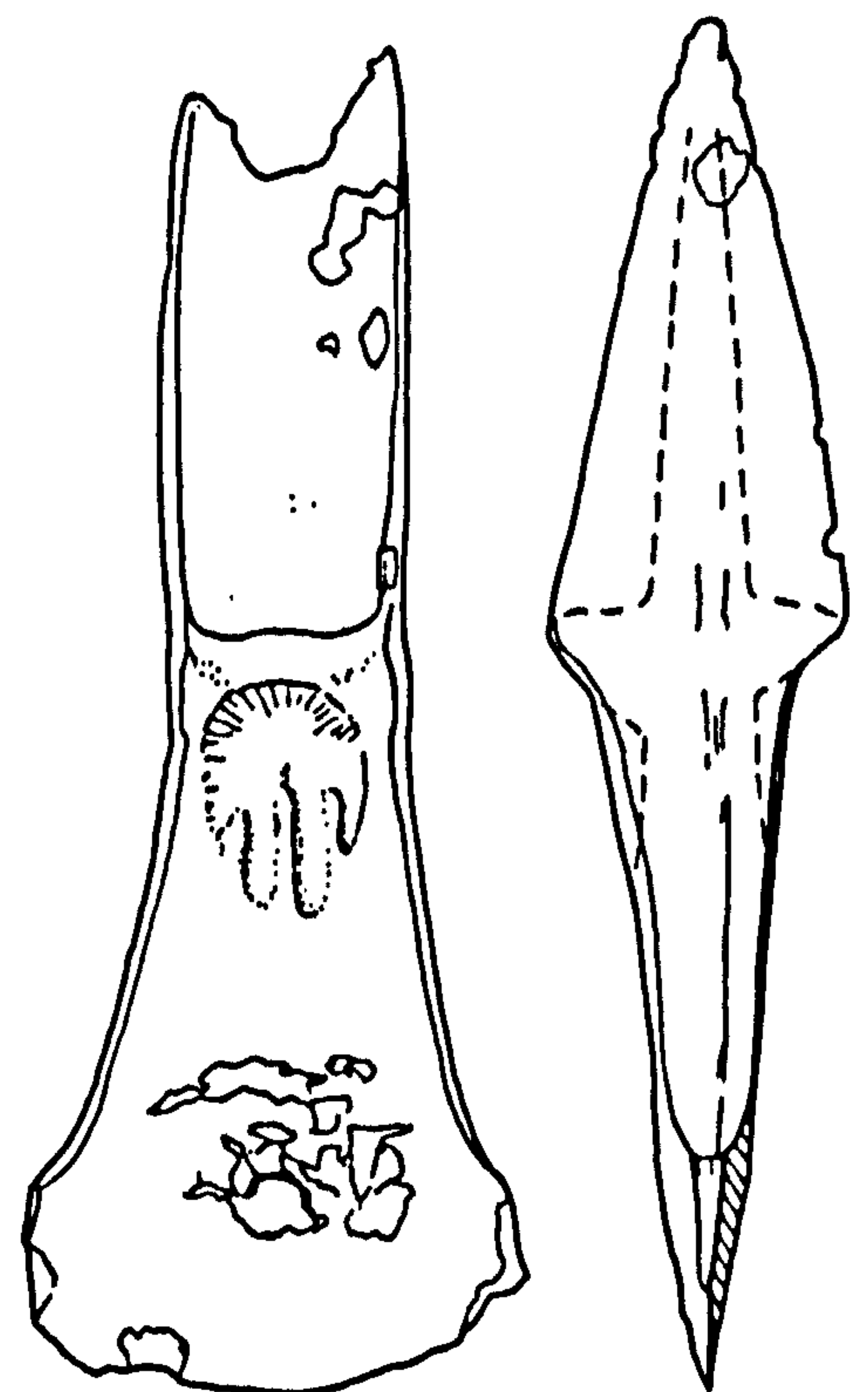
65



84



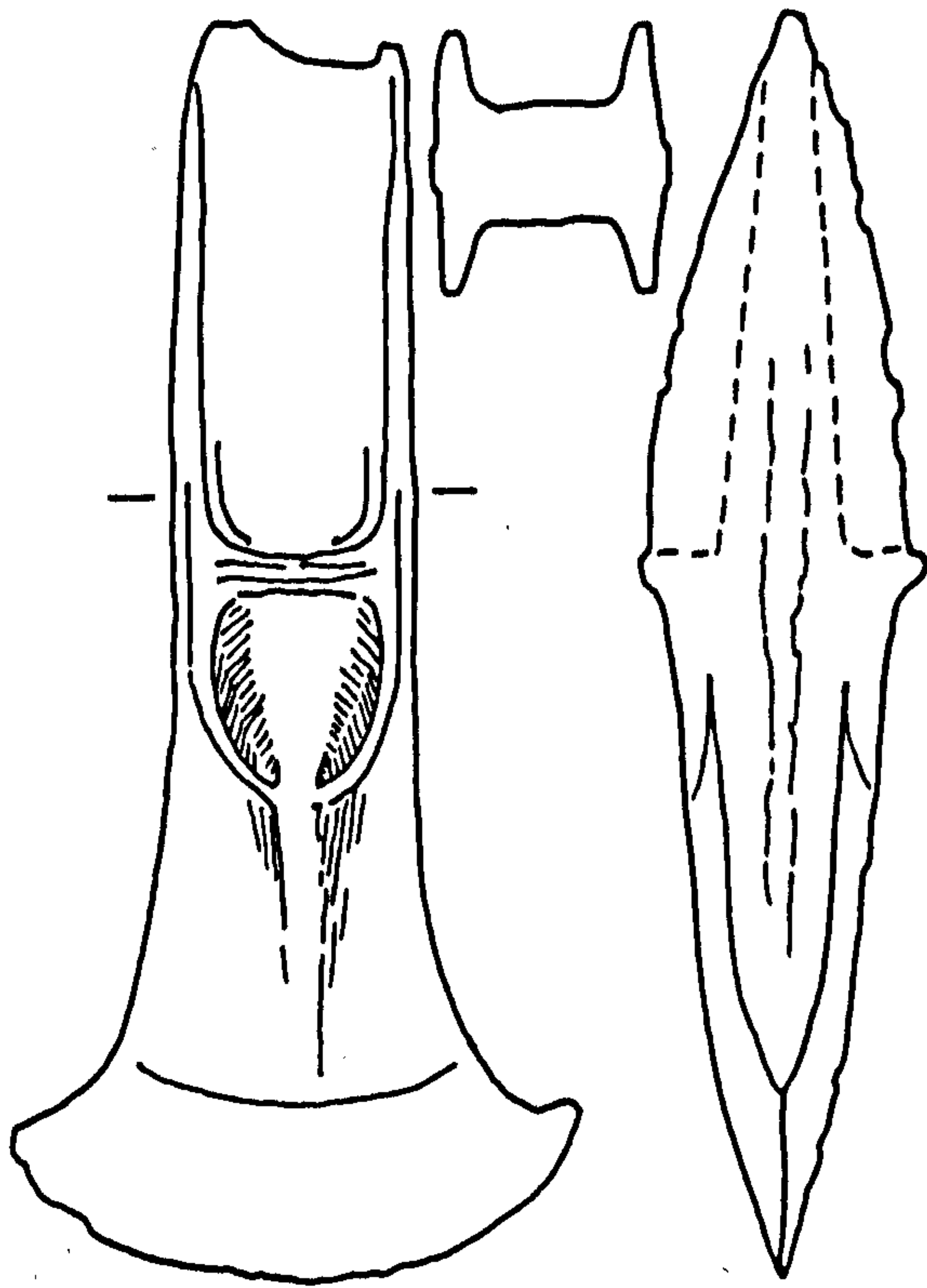
83



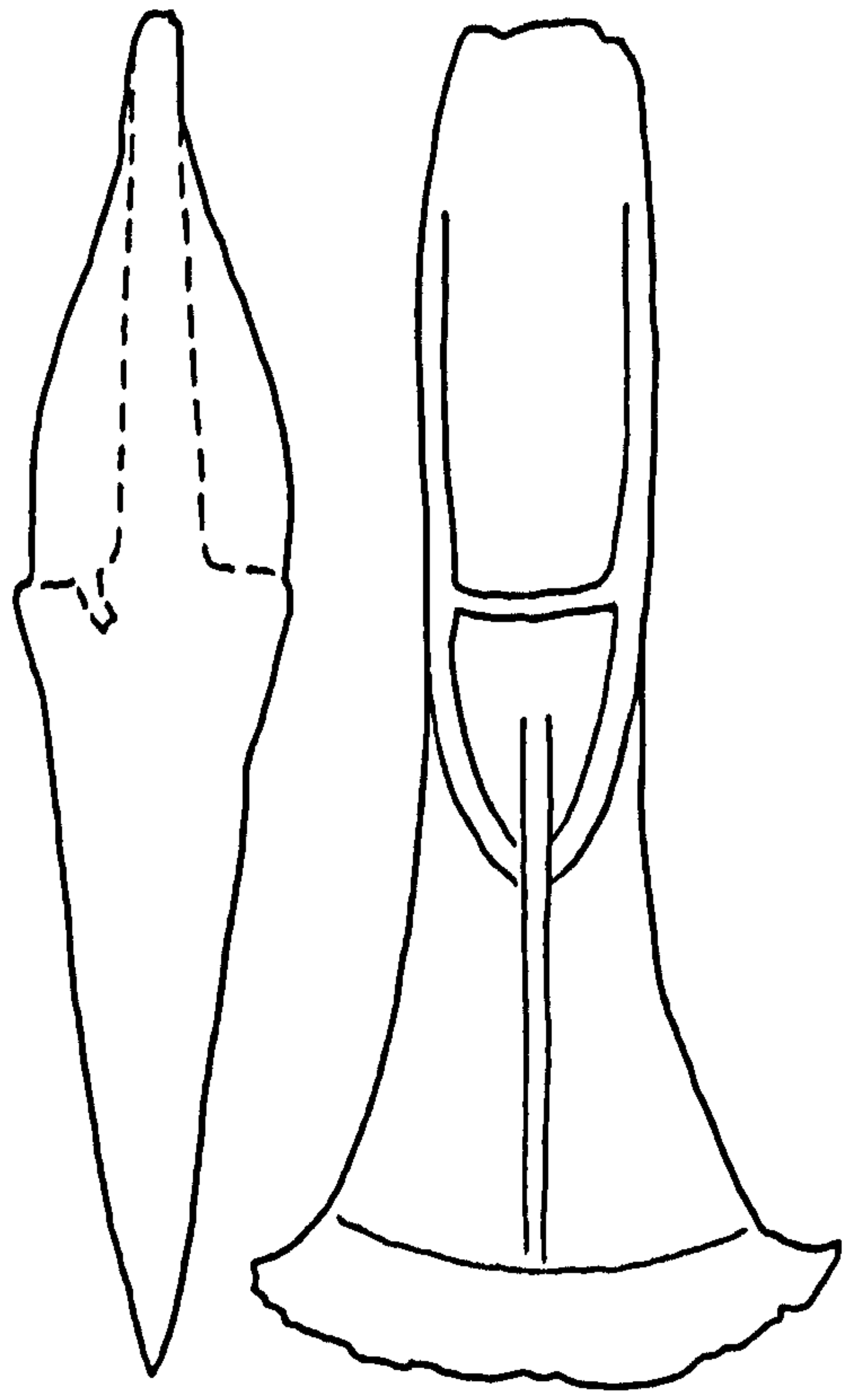
53



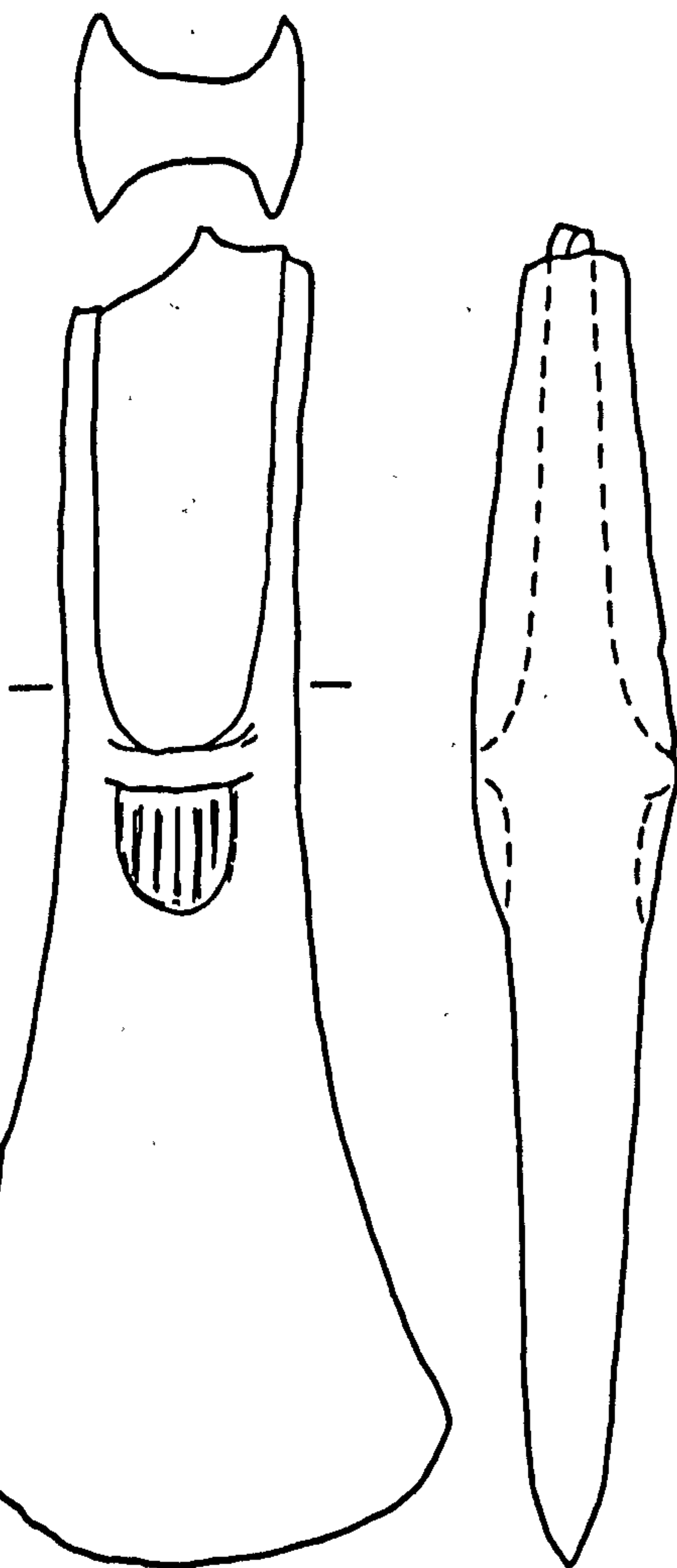
Fig. 30



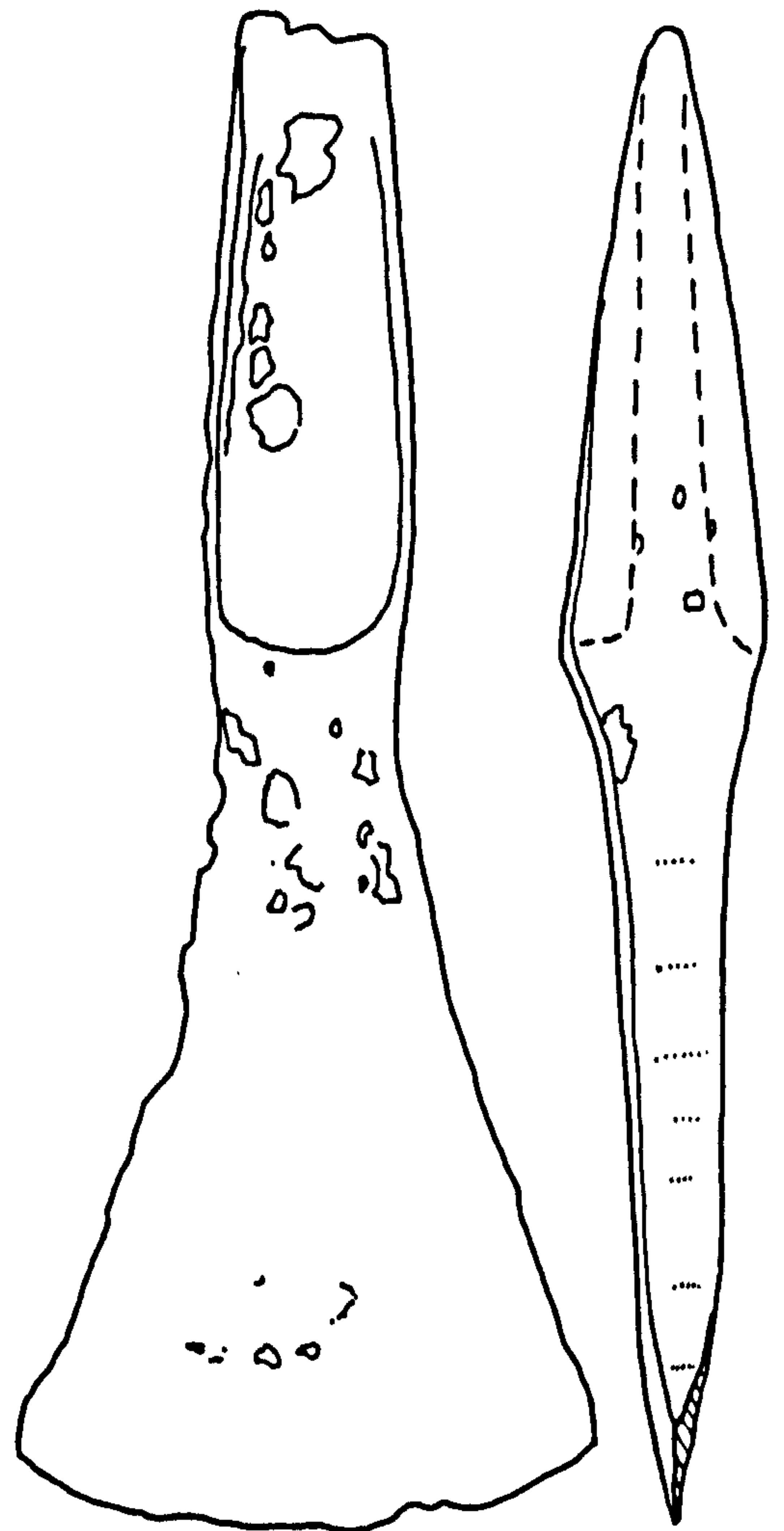
44



45



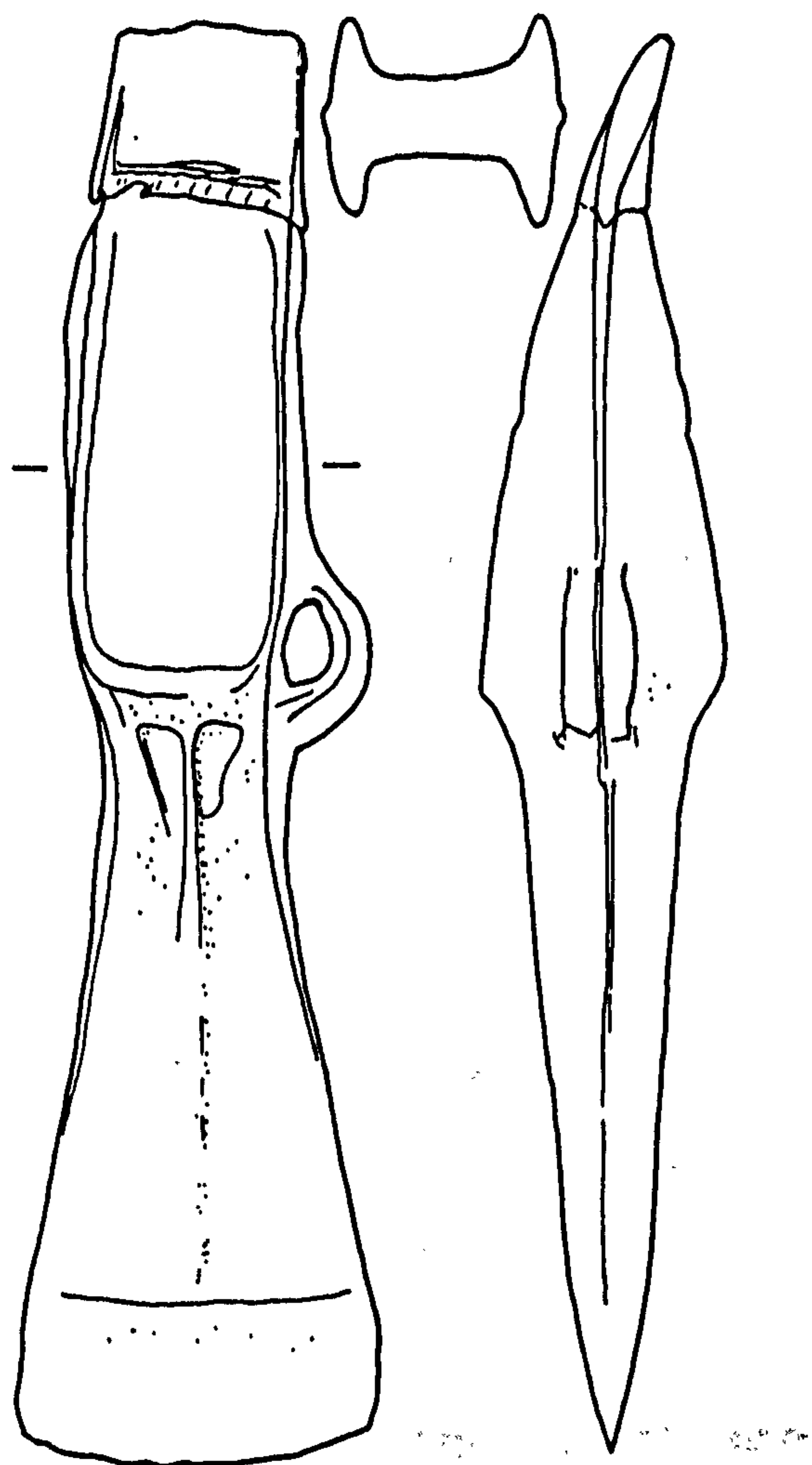
74



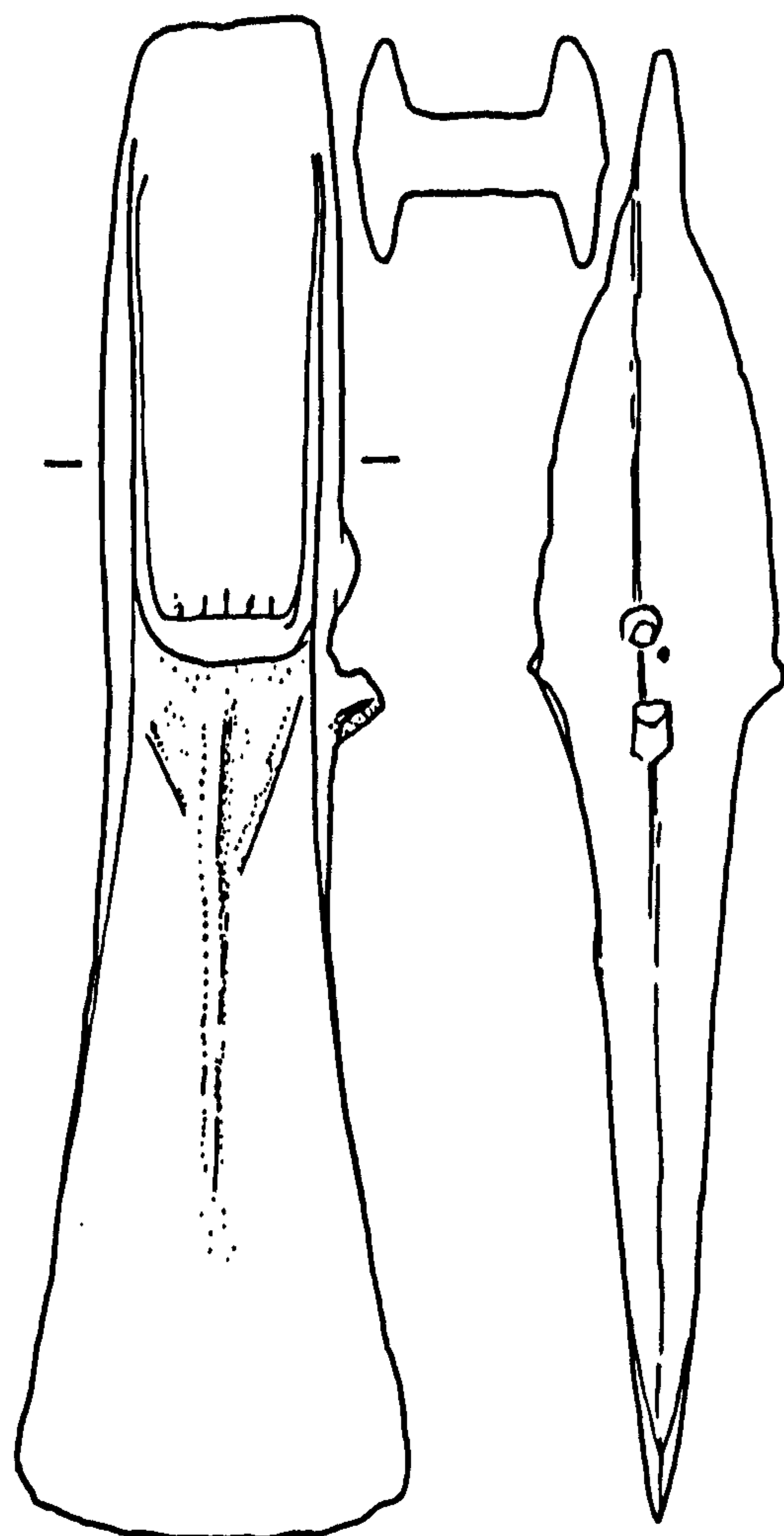
82



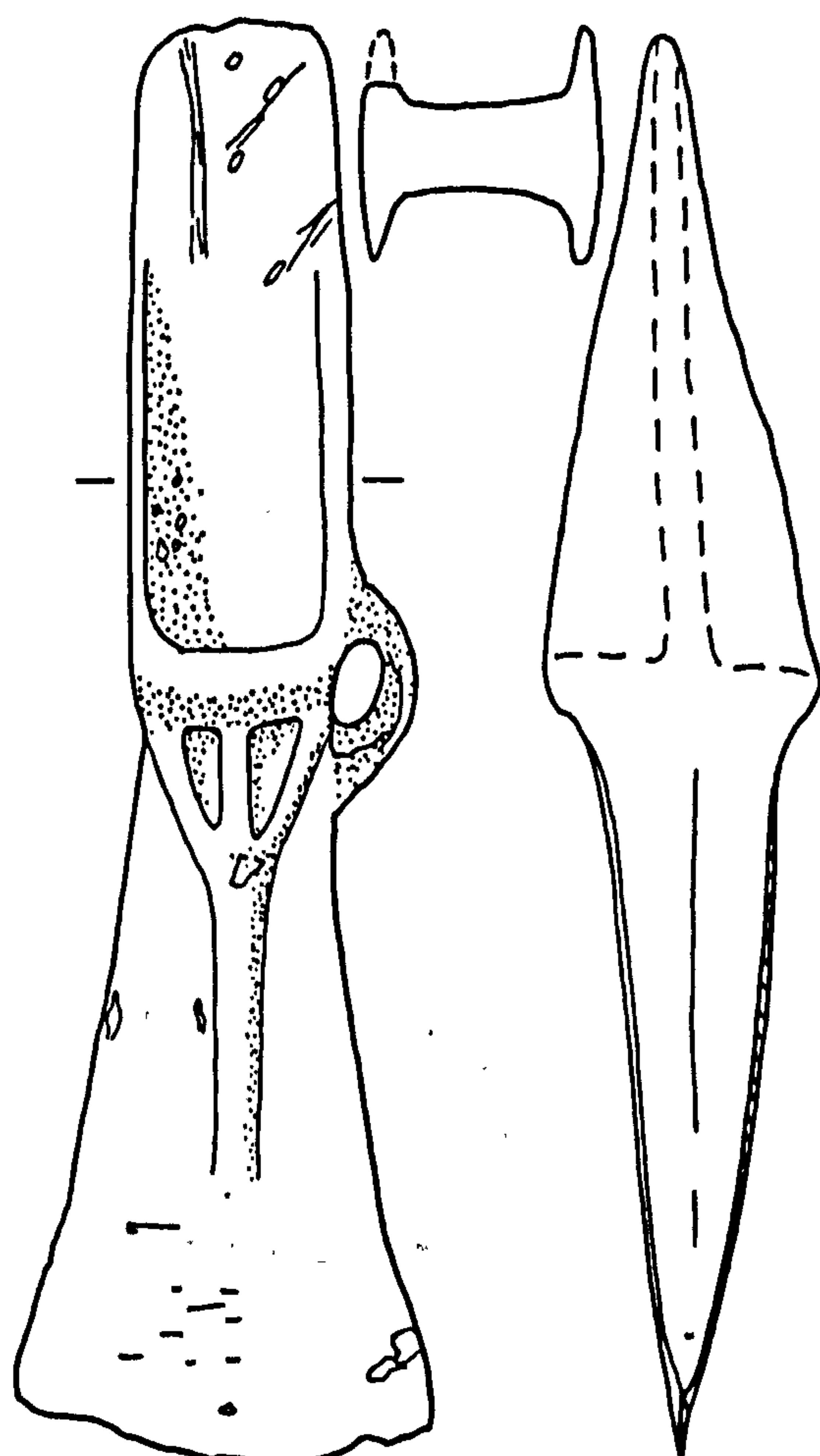
Fig. 31



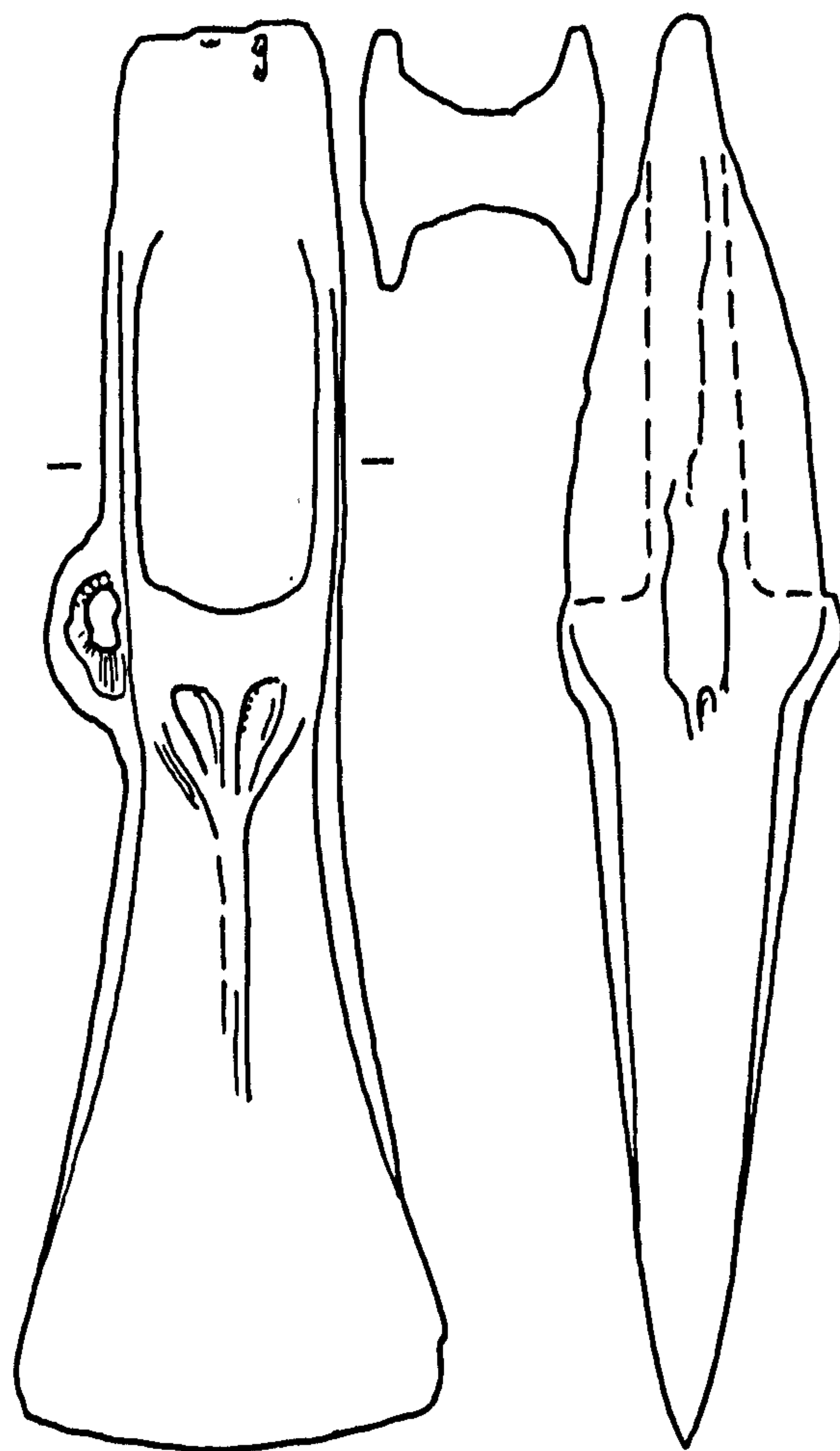
76



62



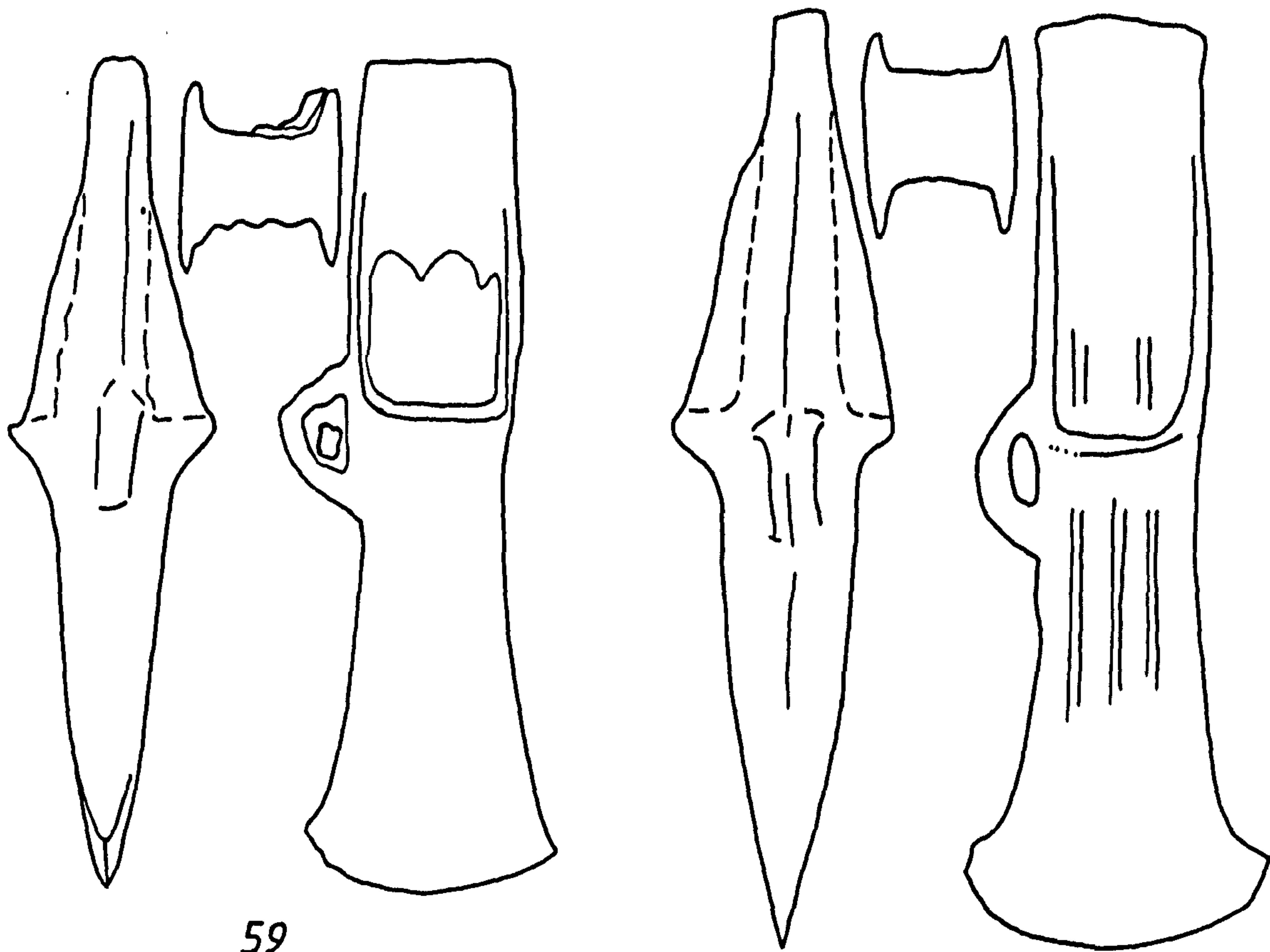
77



68

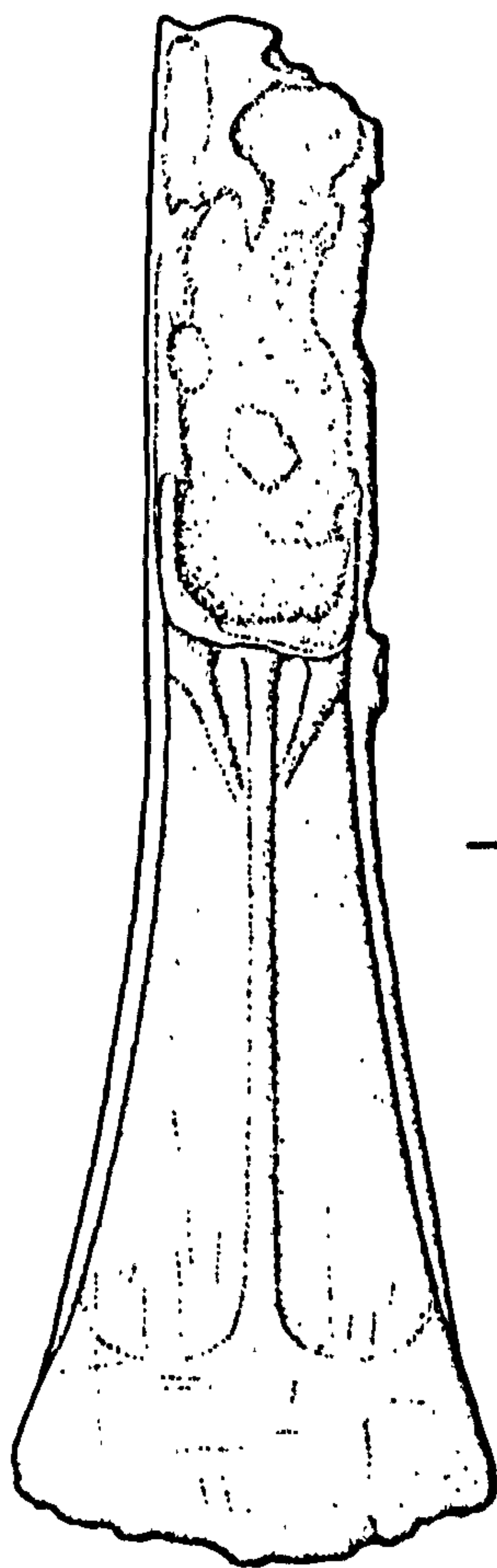


Fig. 32

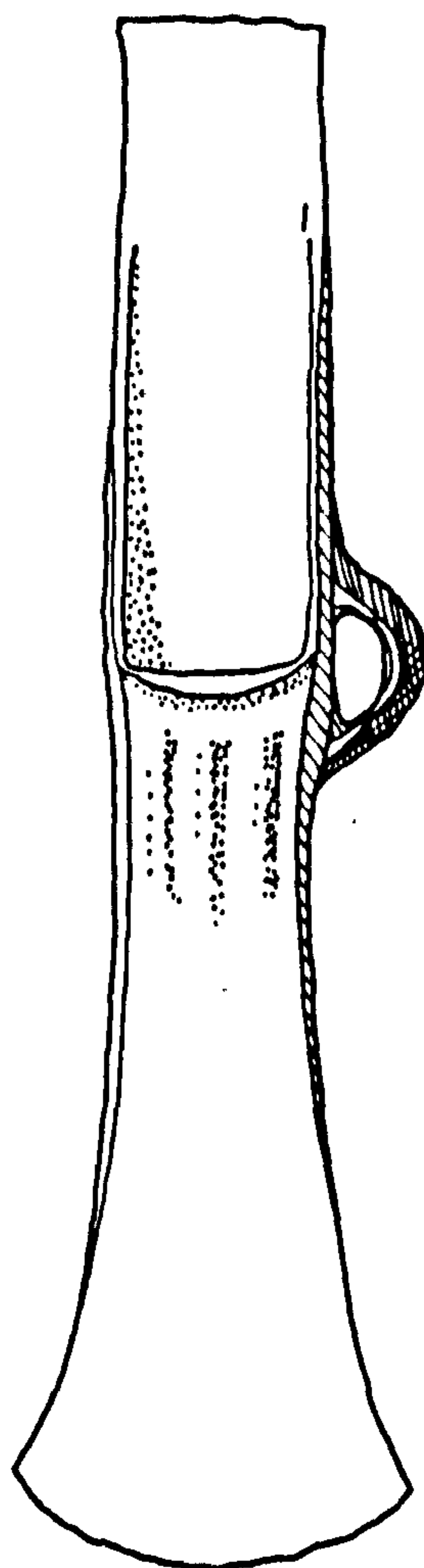
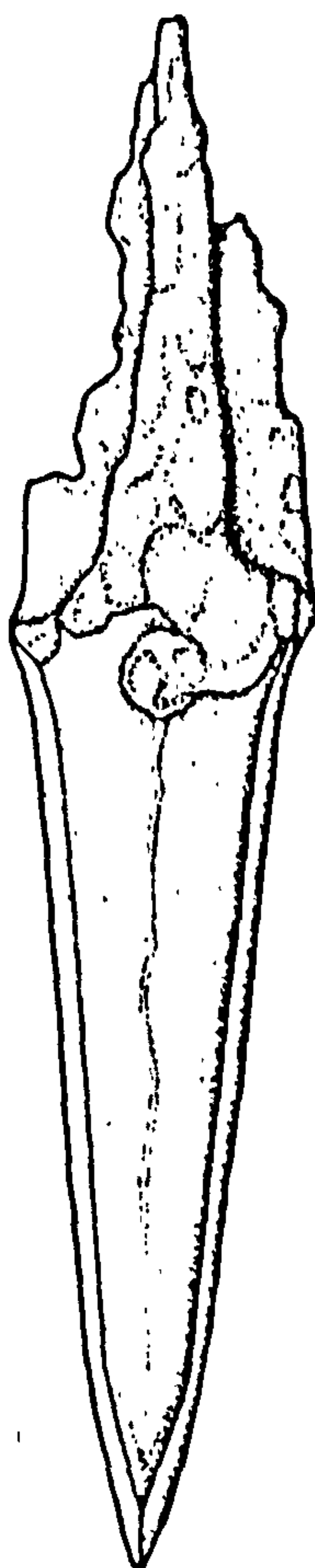


59

Cranwich hoard, Norfolk.



67



61

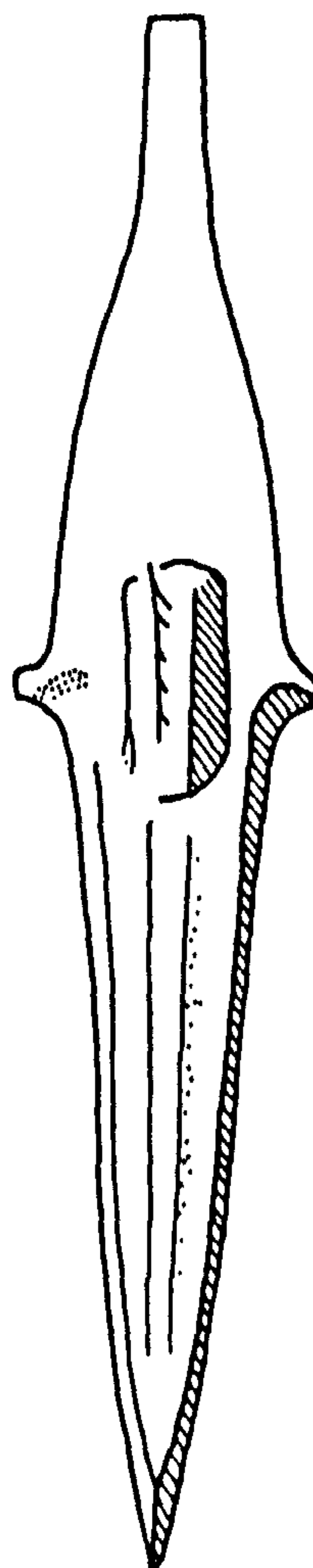
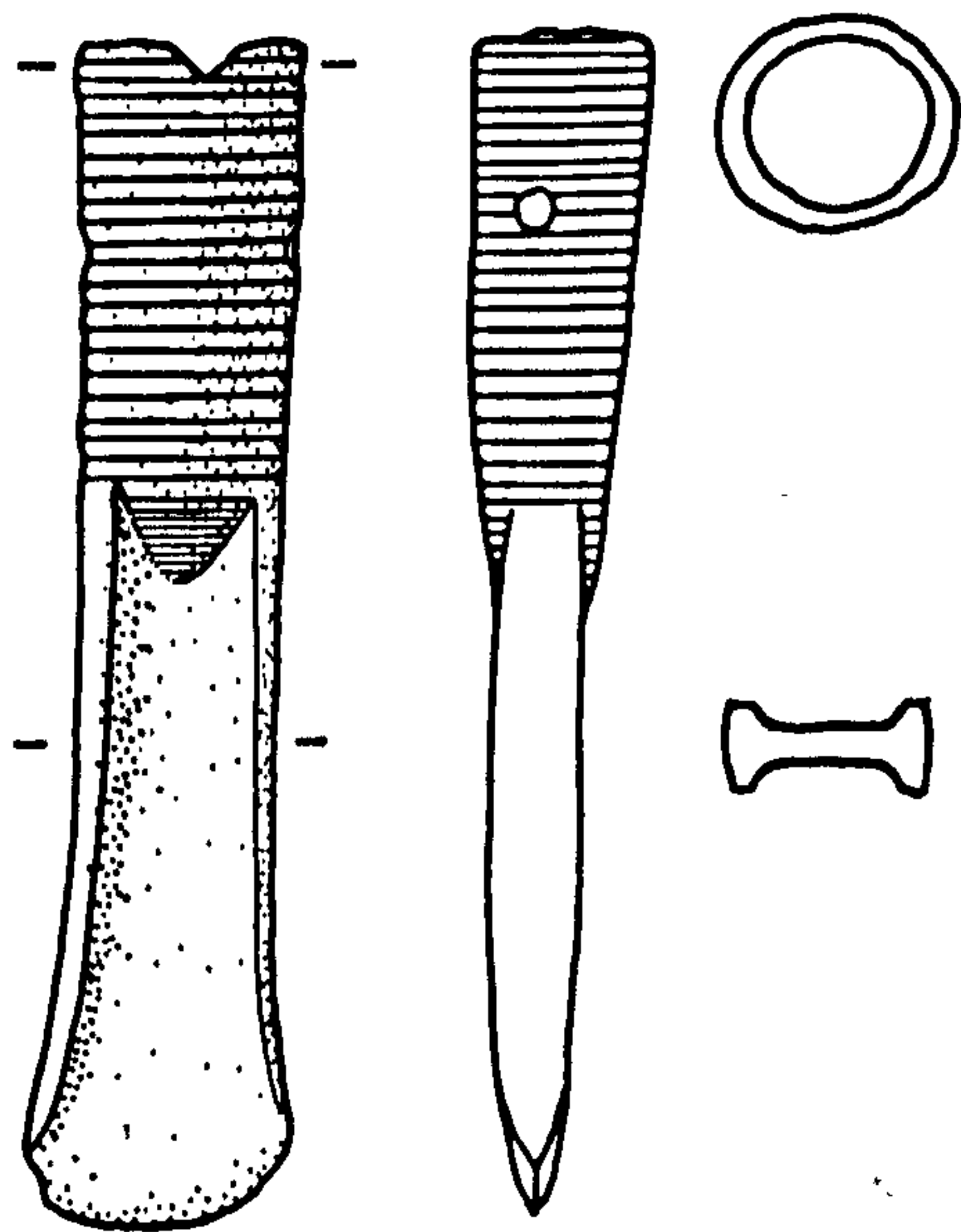
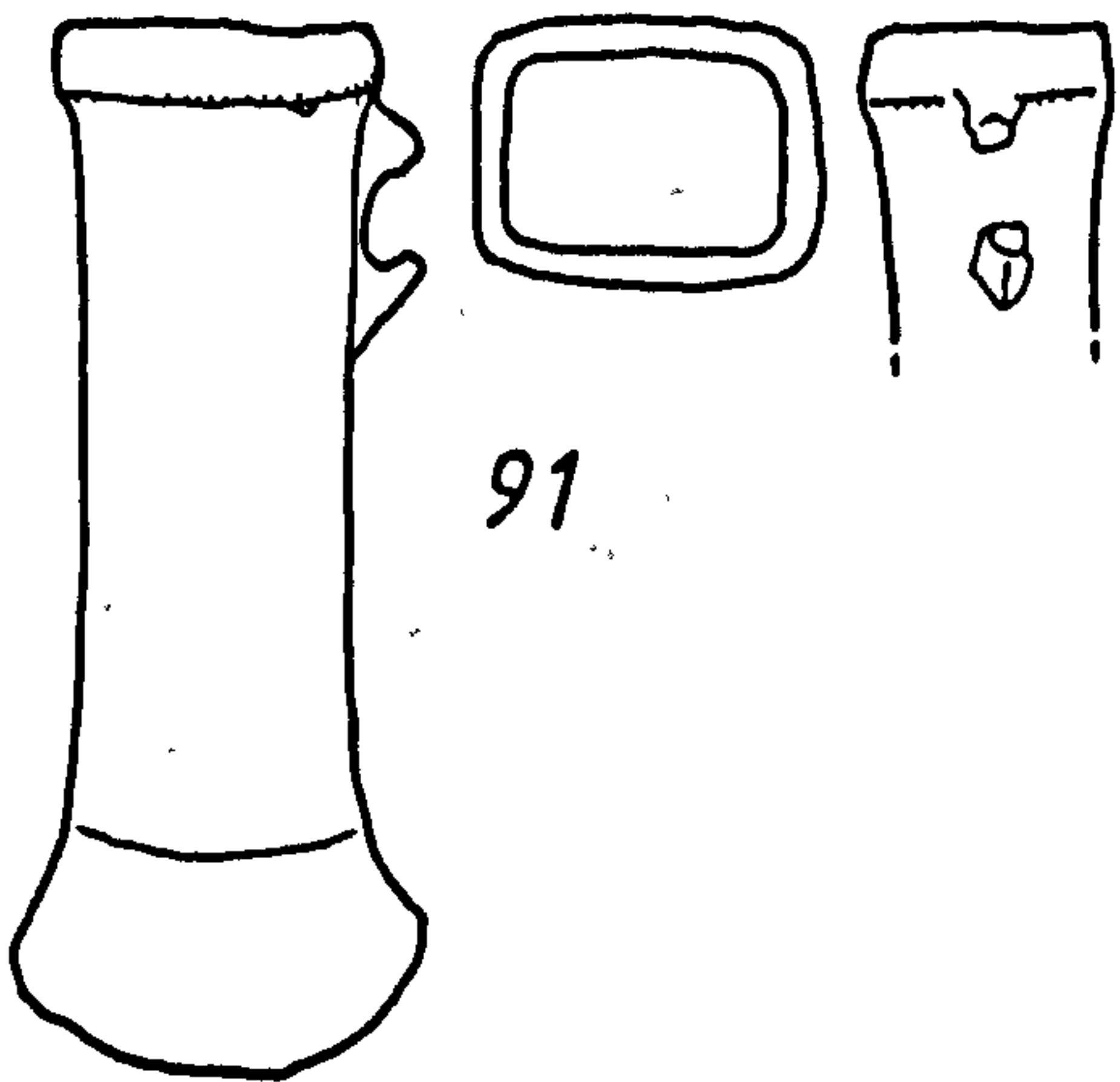


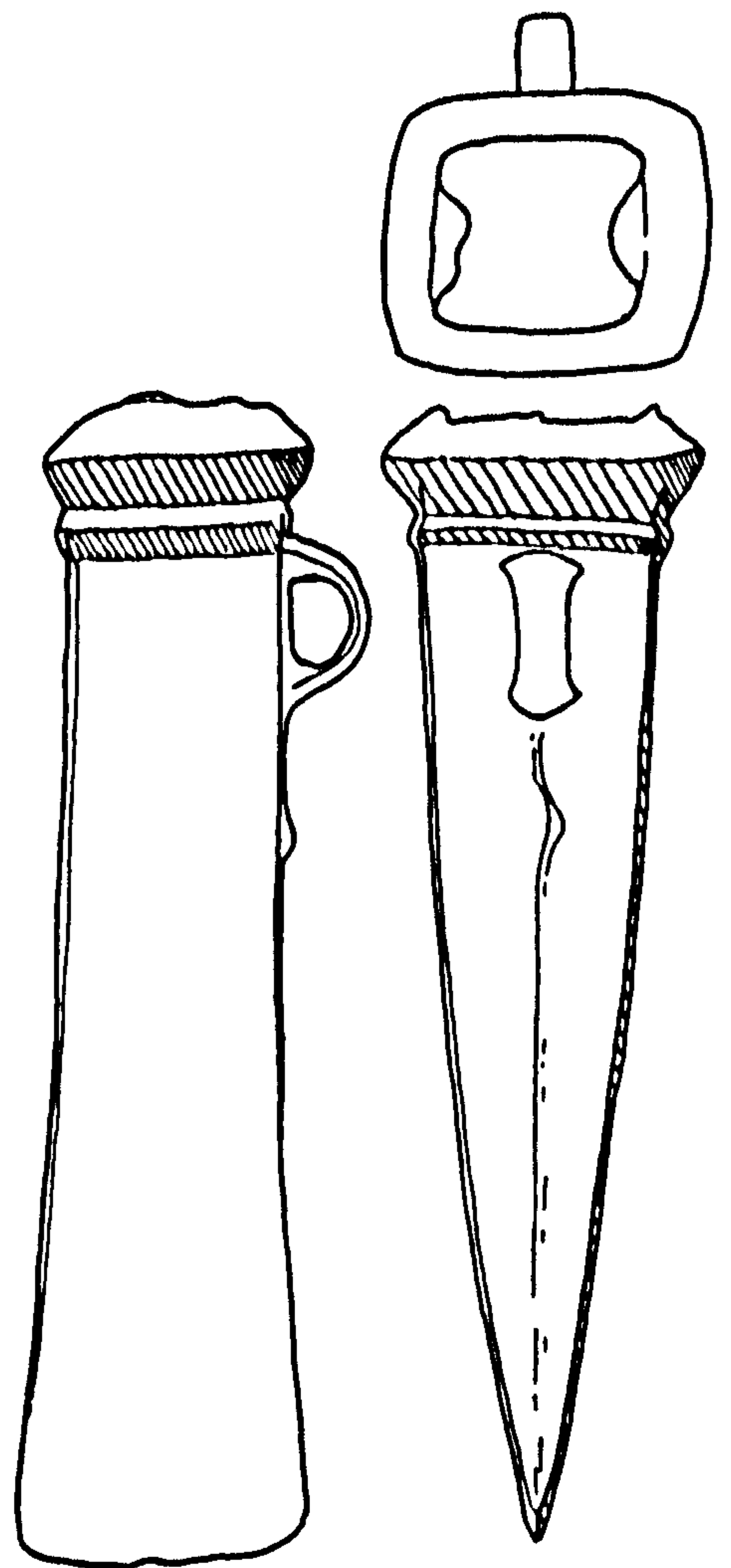
Fig. 33



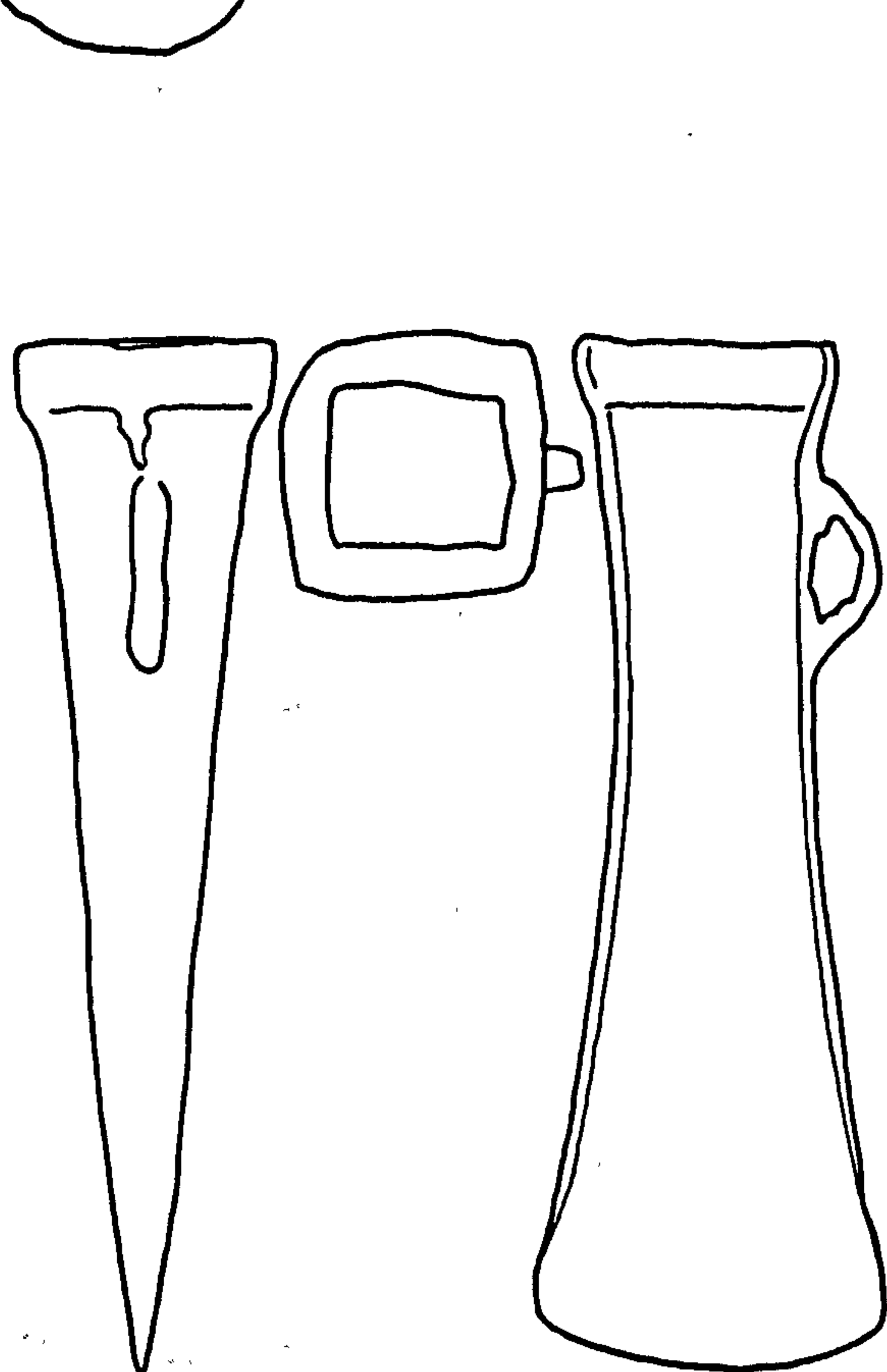
85



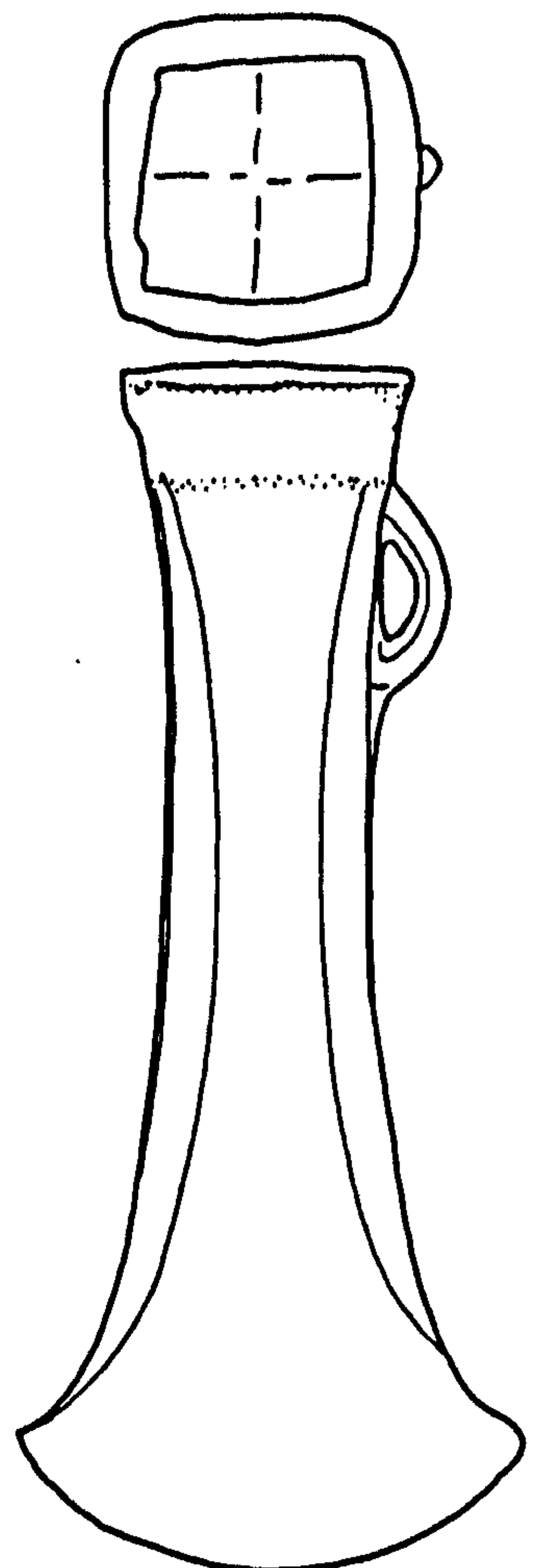
91



Wicken, Cambridgeshire.



89



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Fig. 34

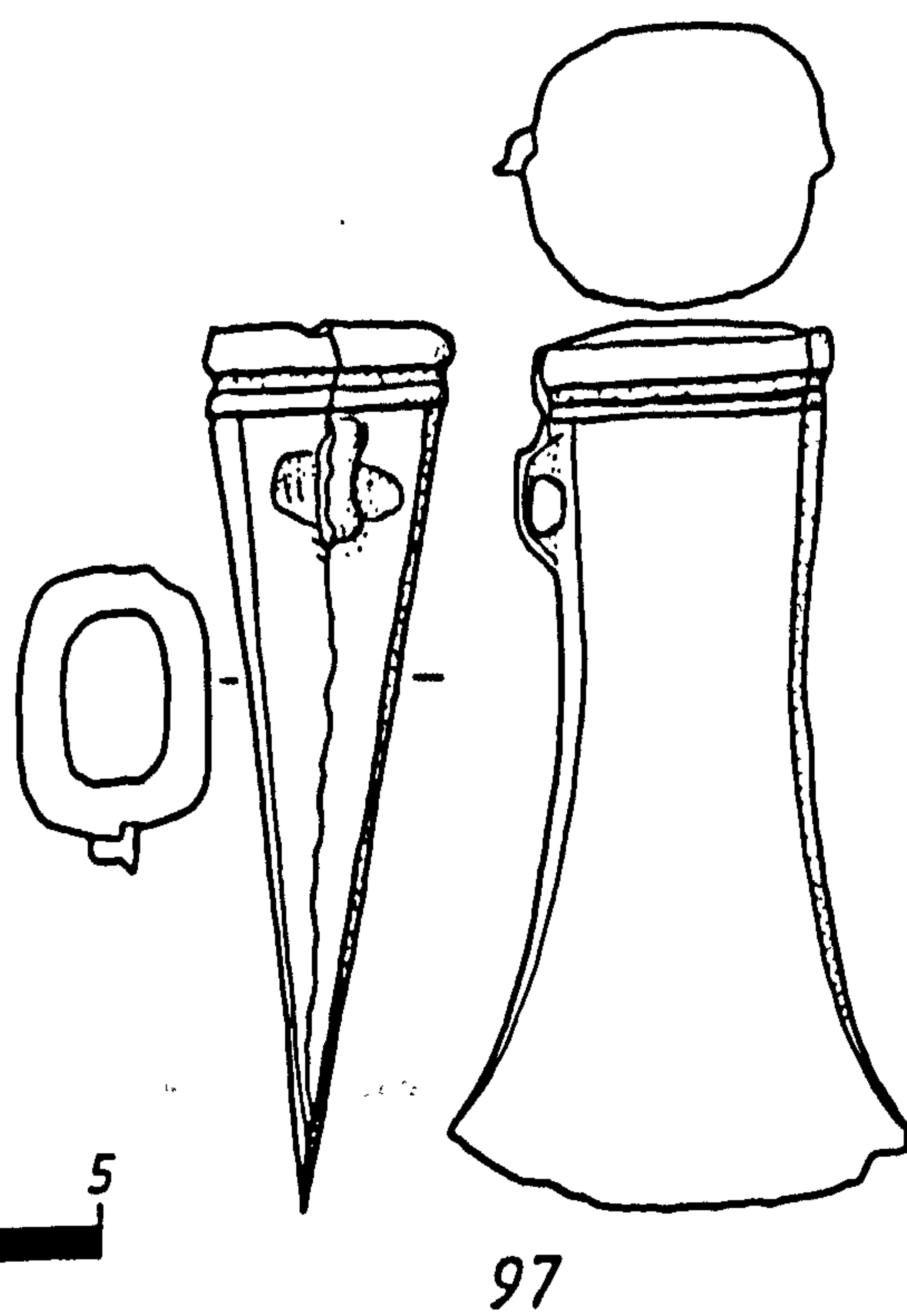
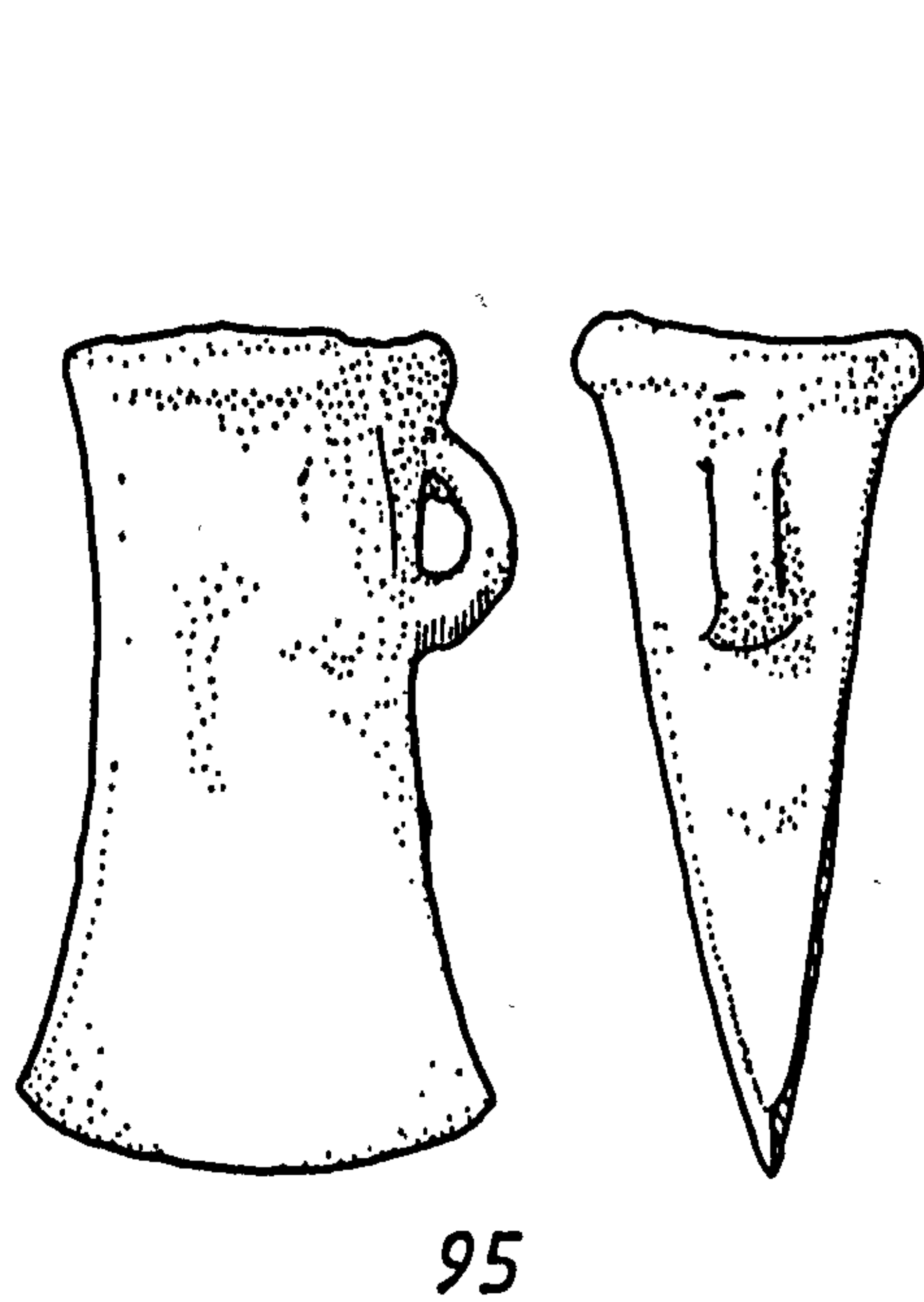
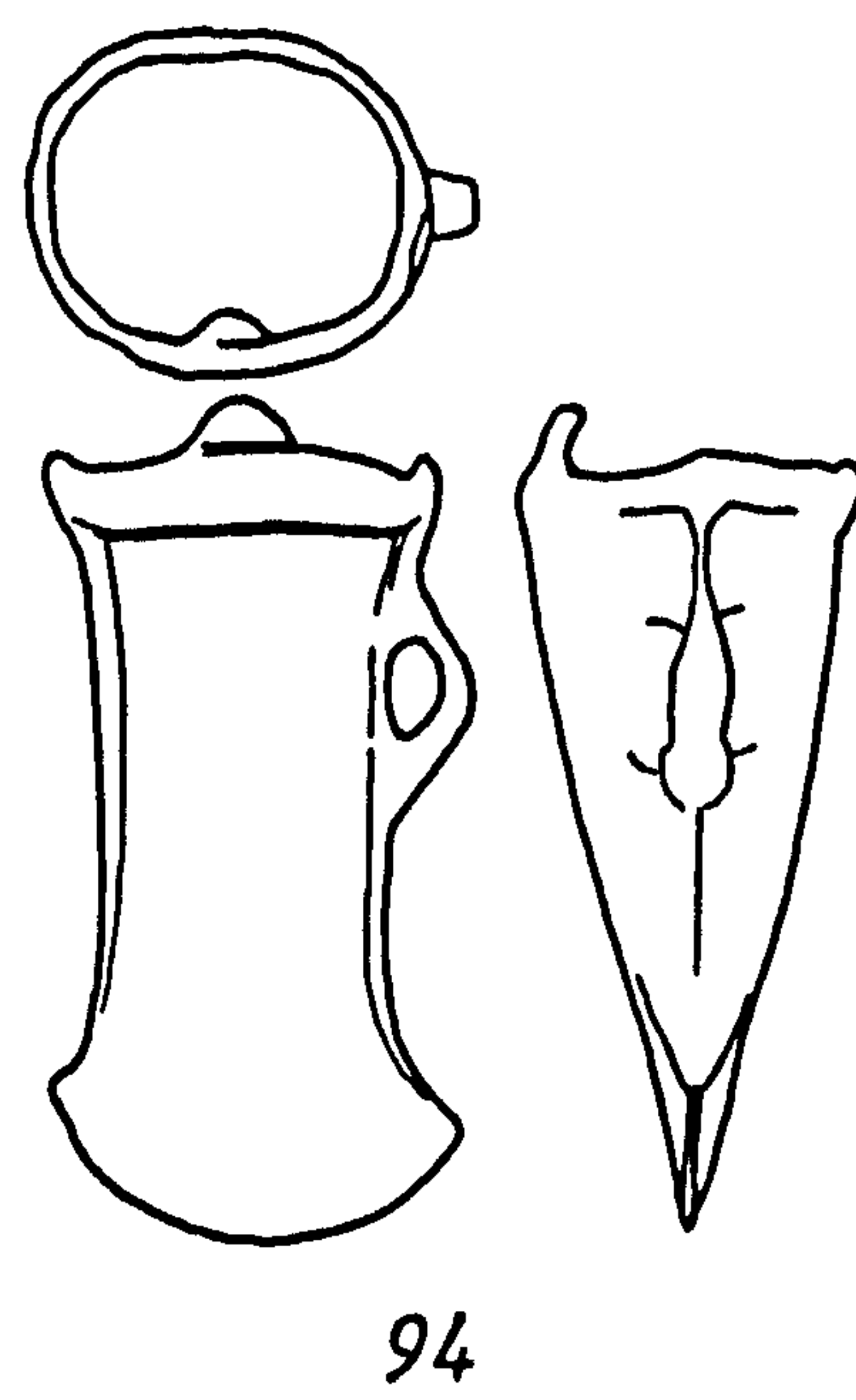
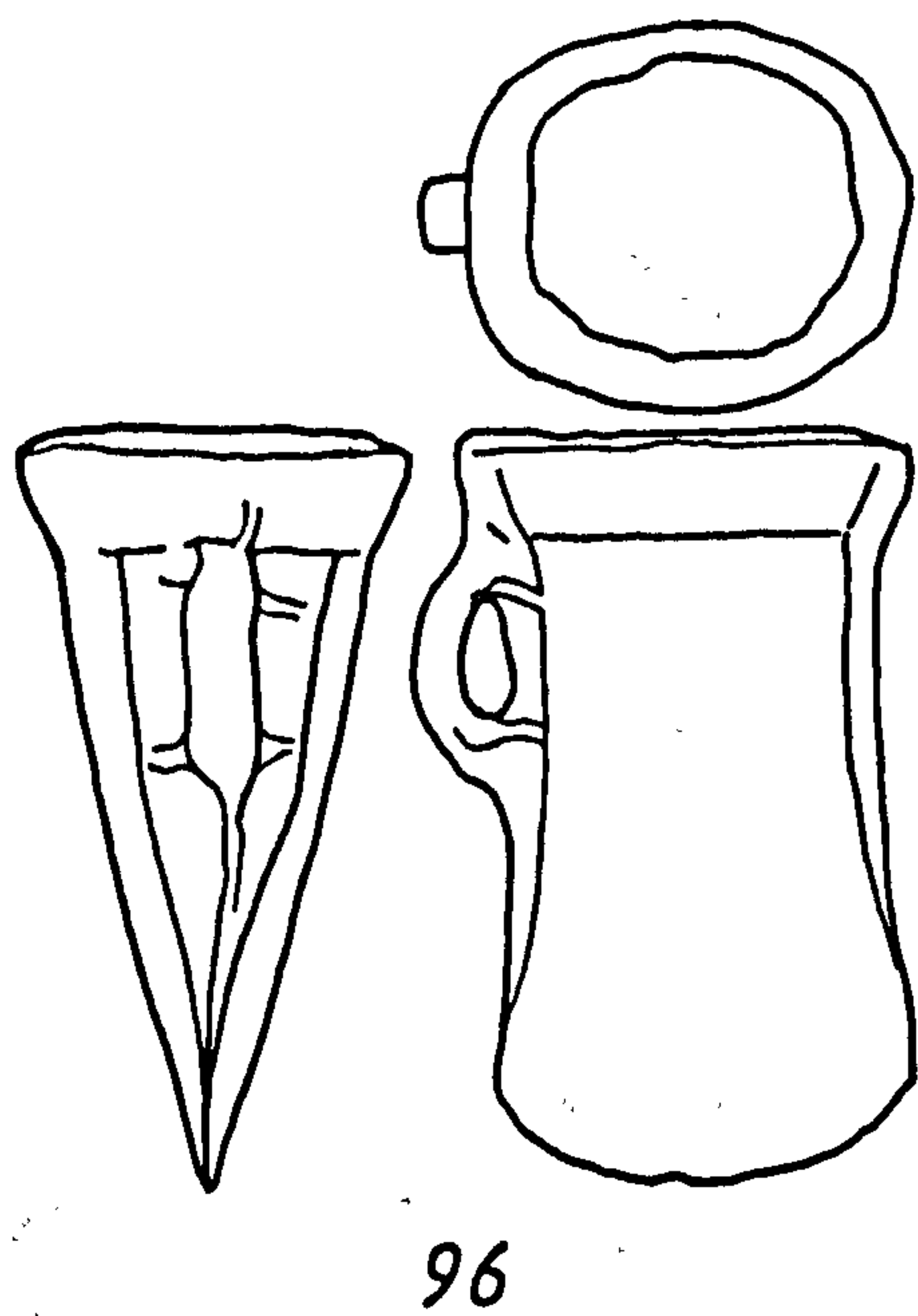
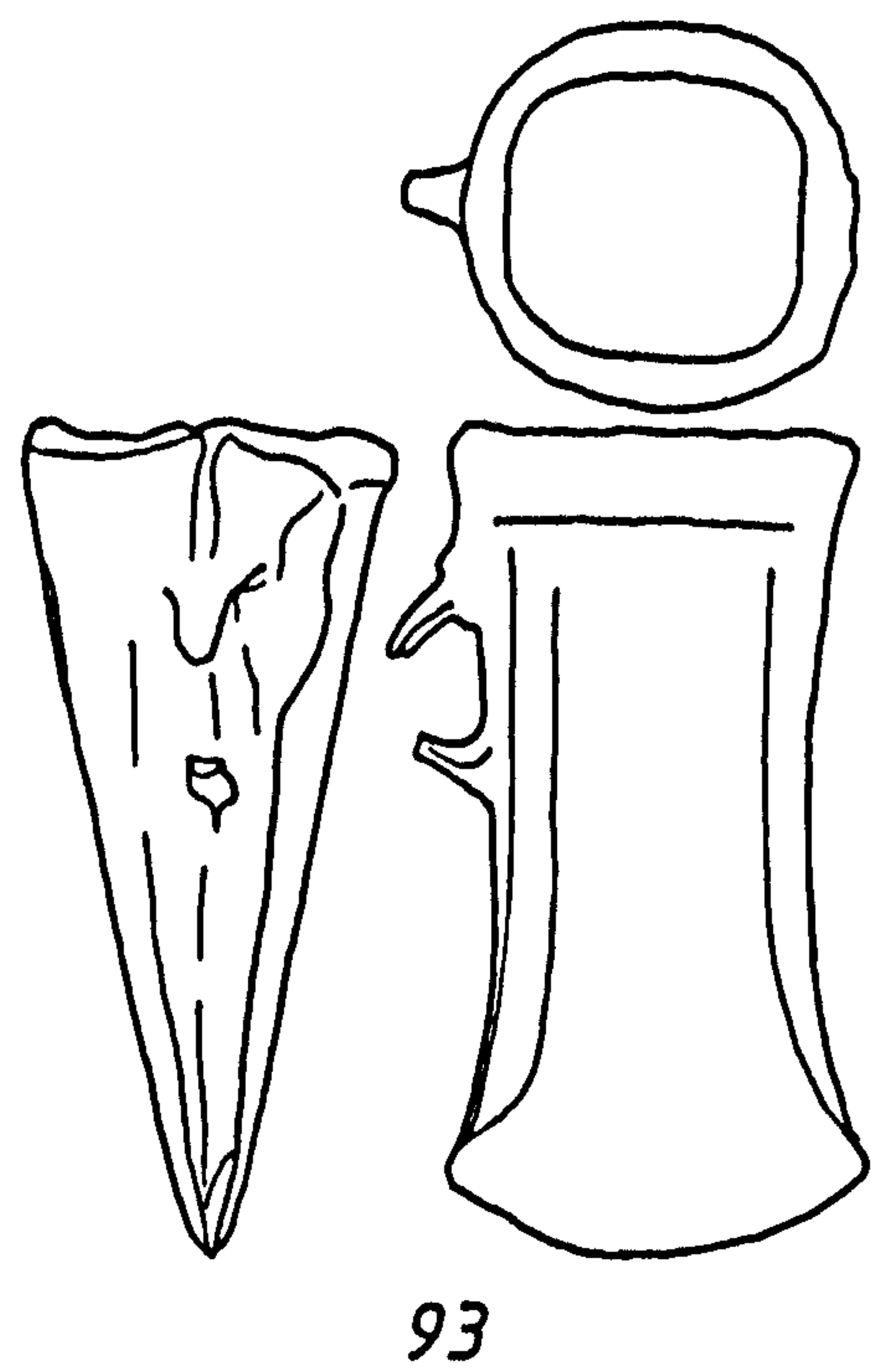
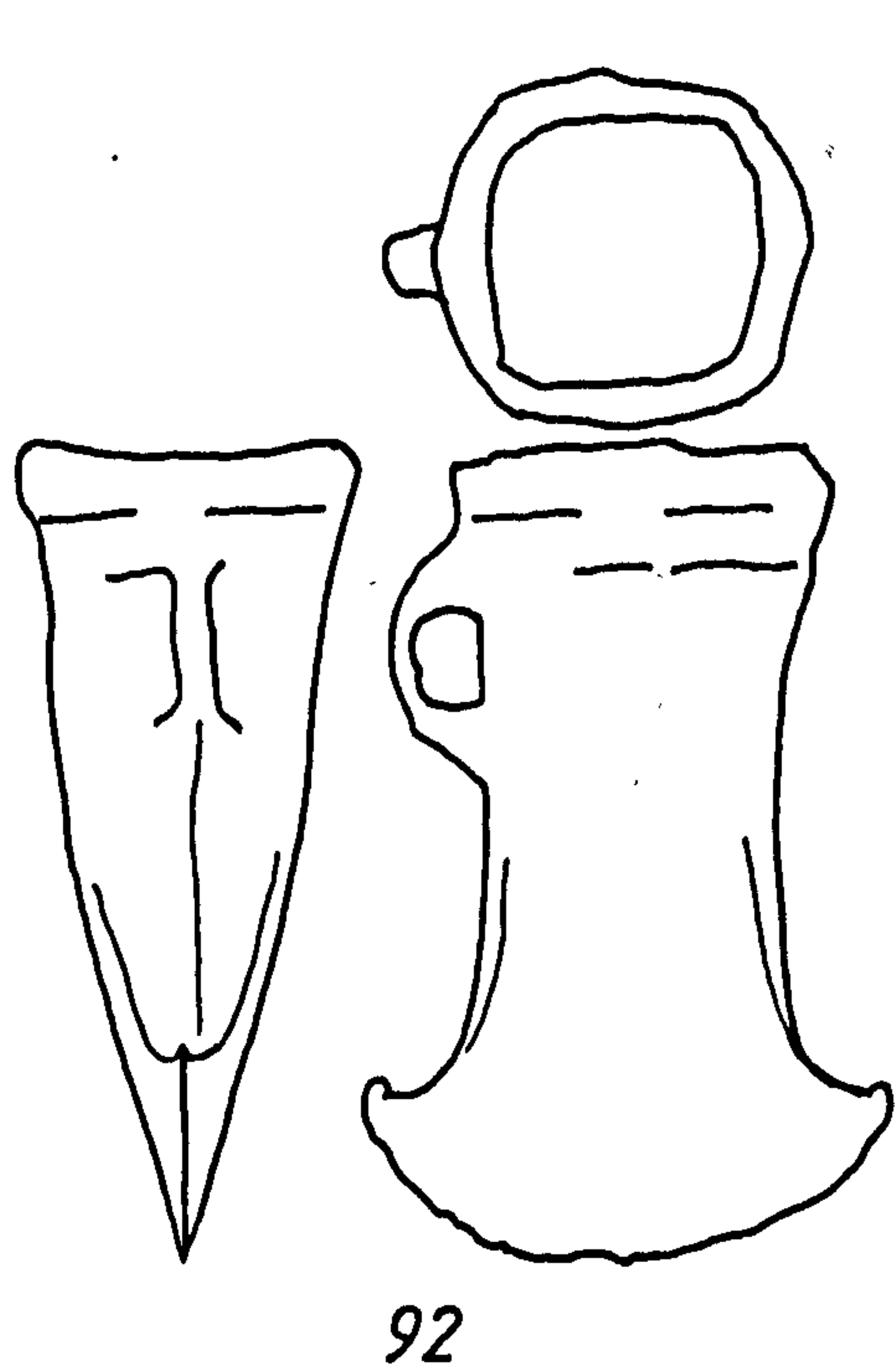
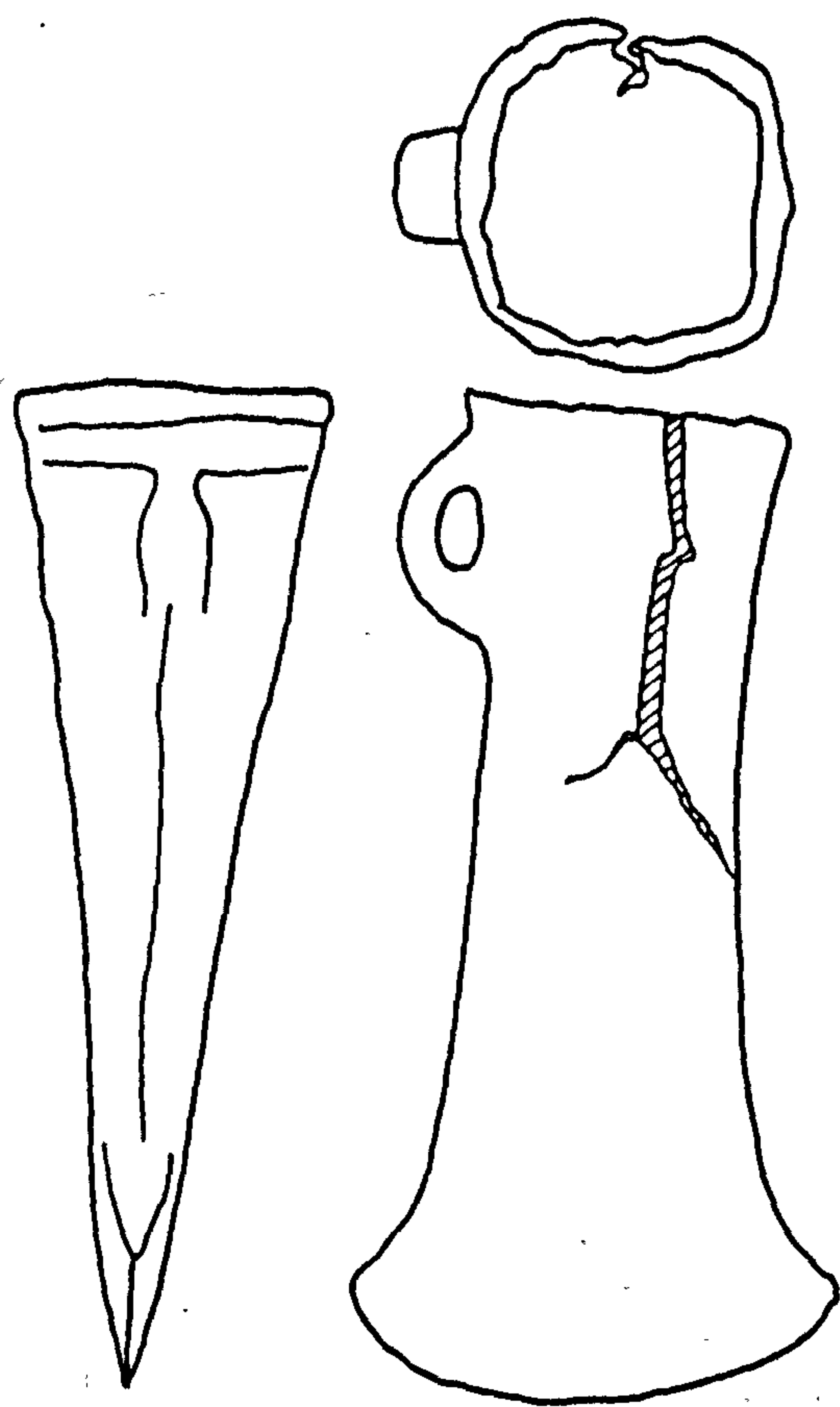
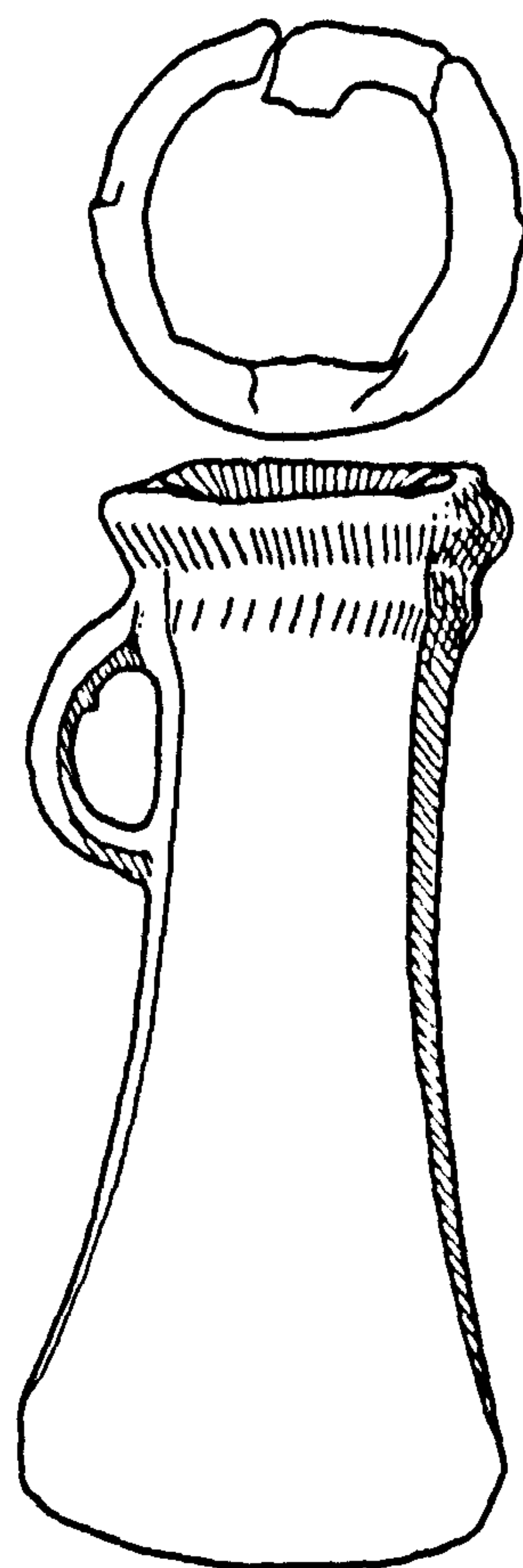


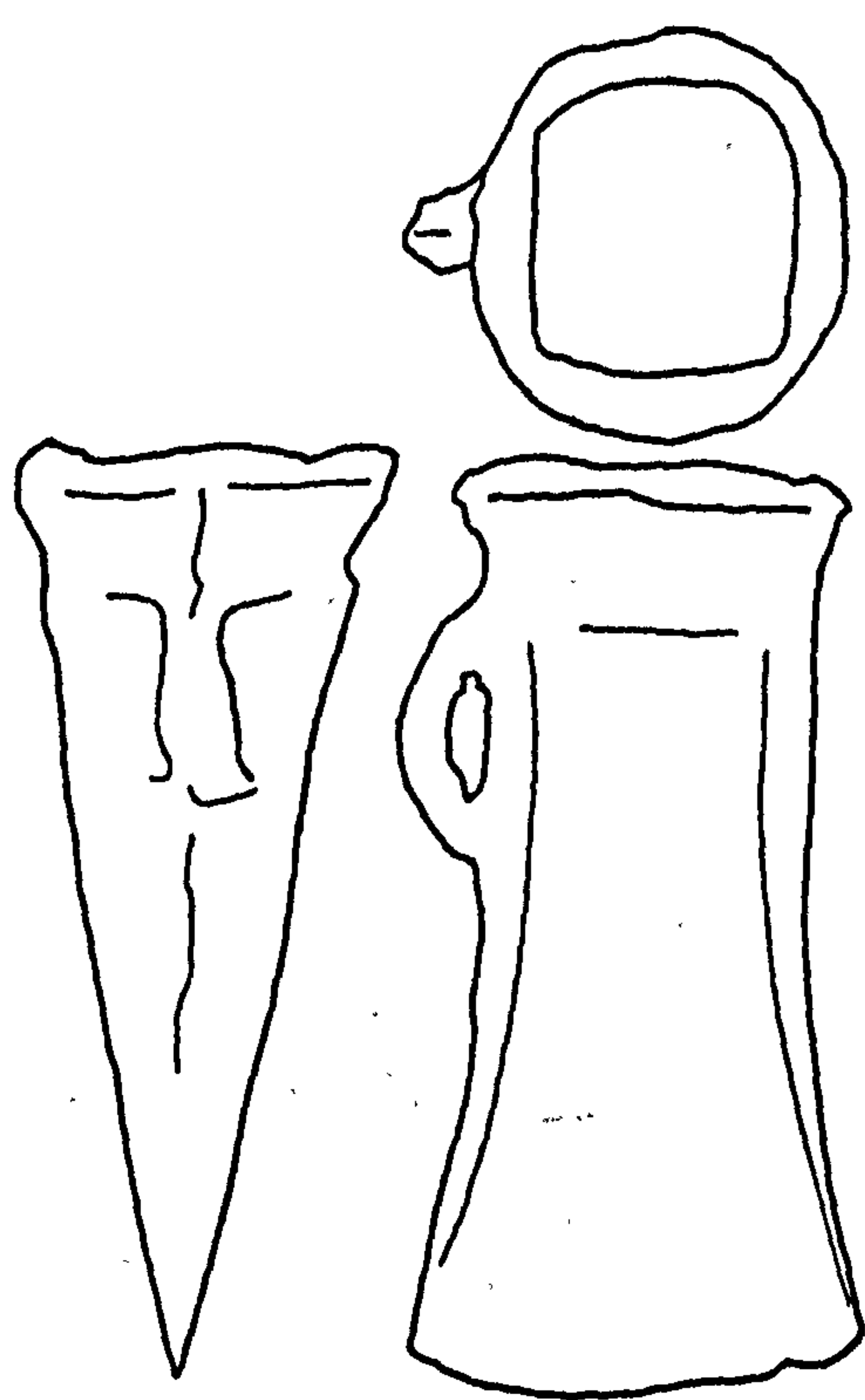
Fig. 35



104



101



99



105



Fig. 36

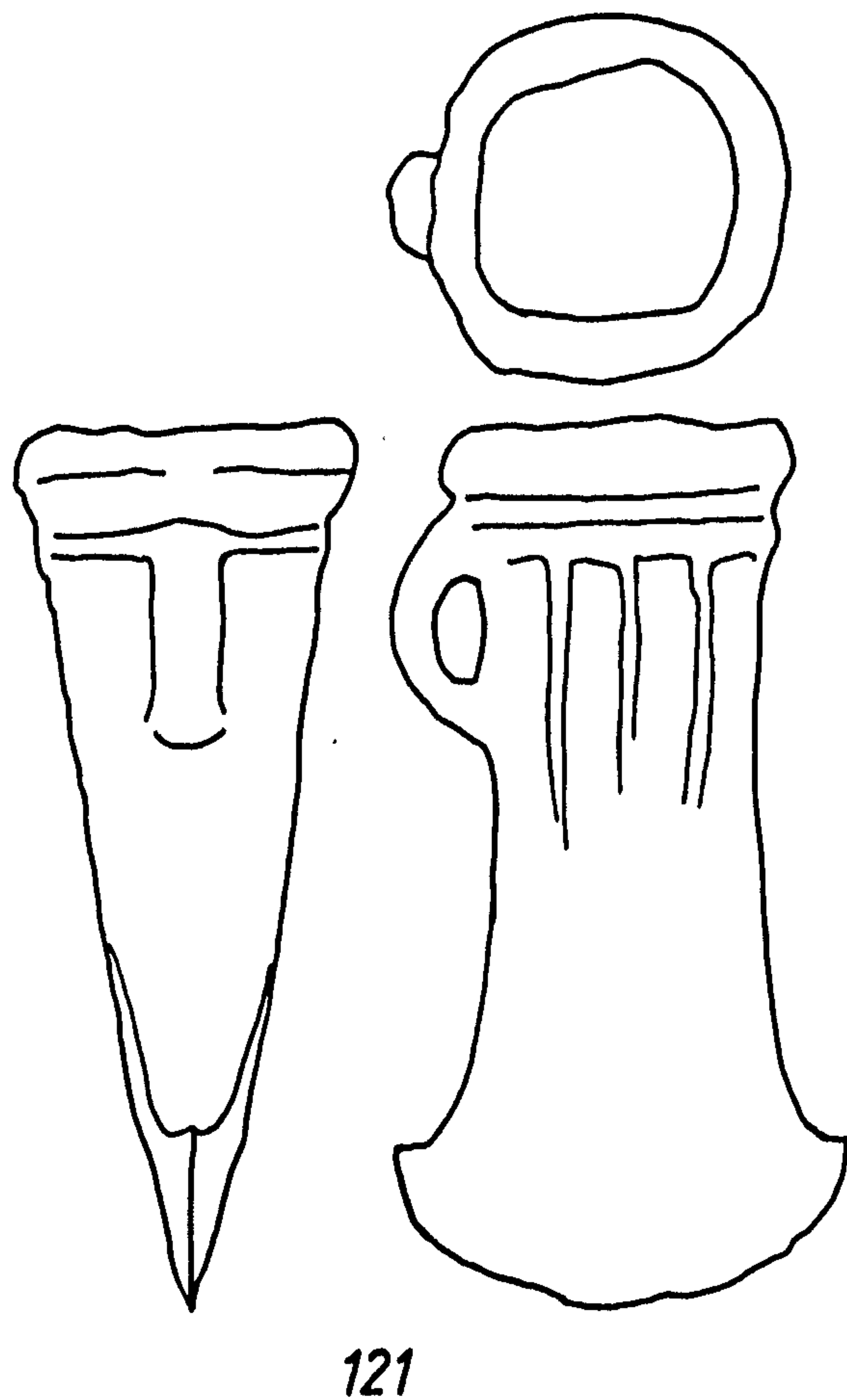
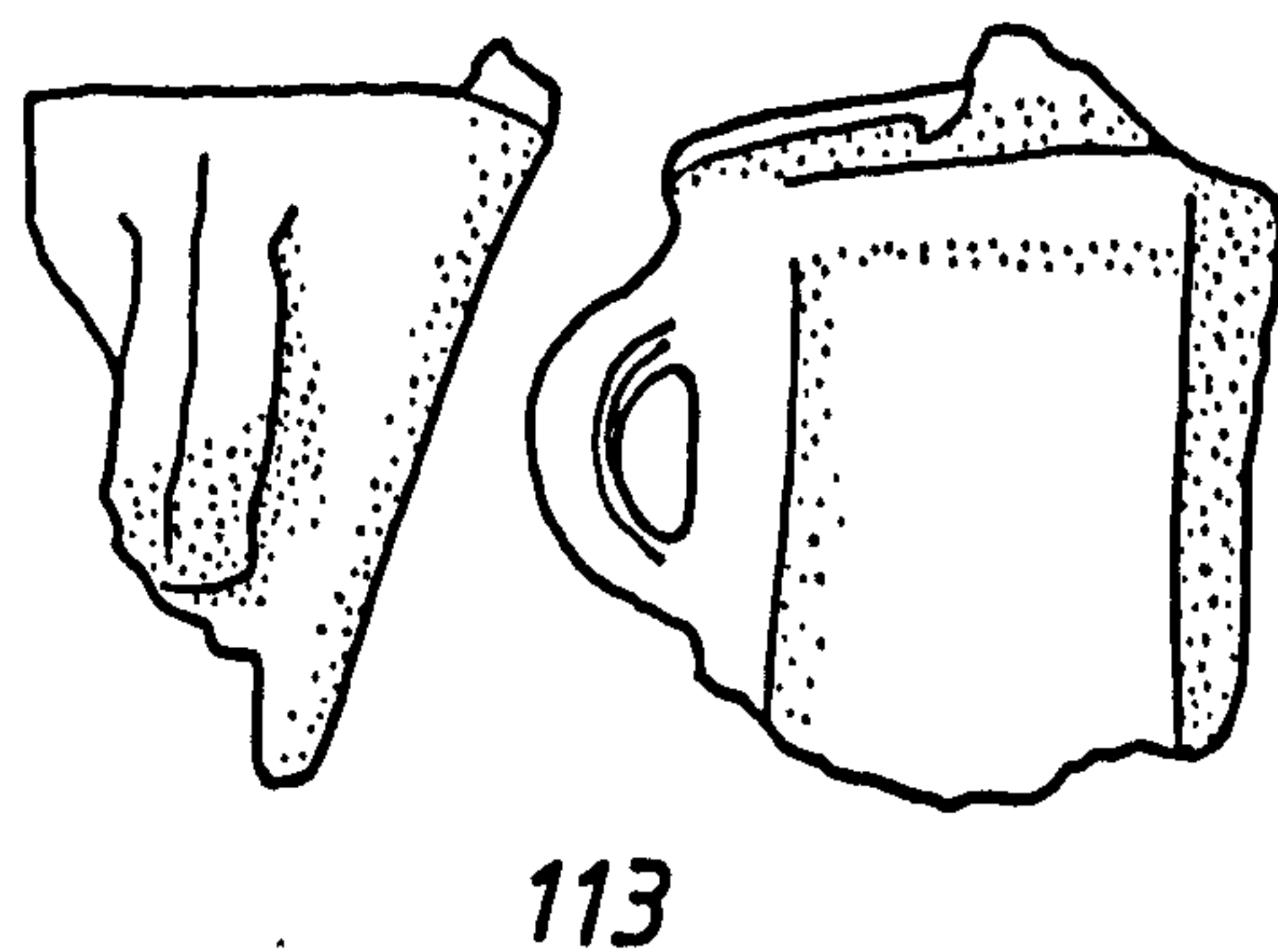
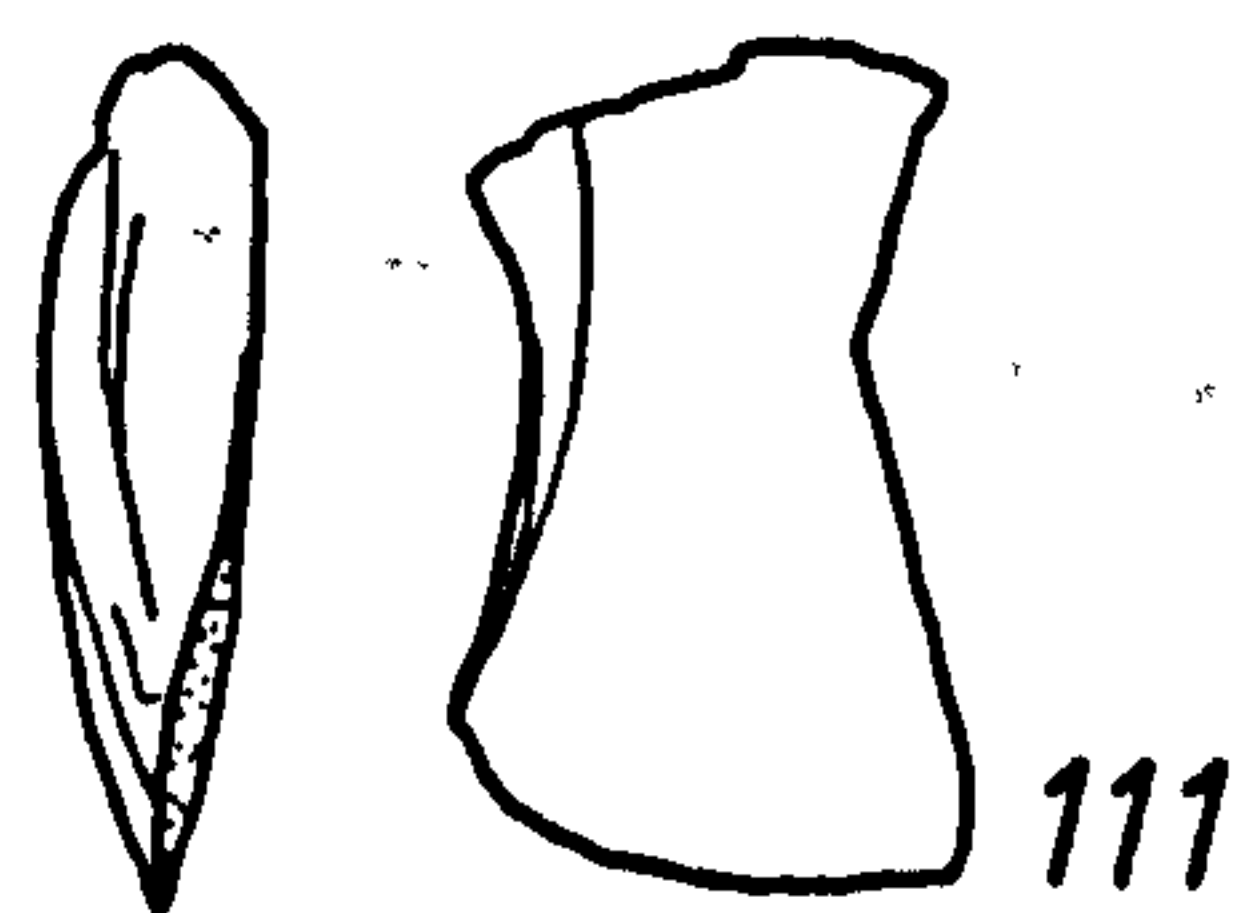
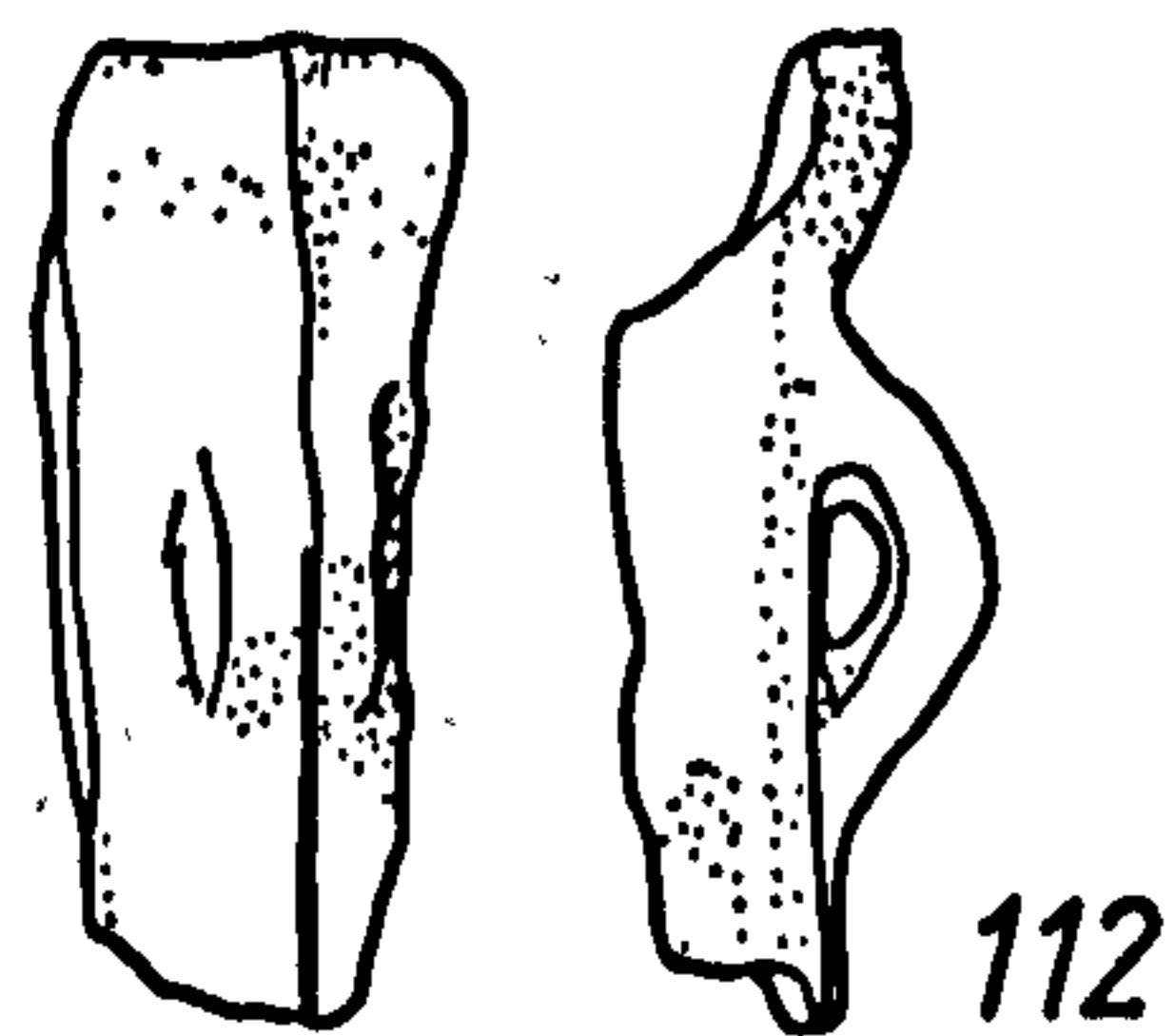
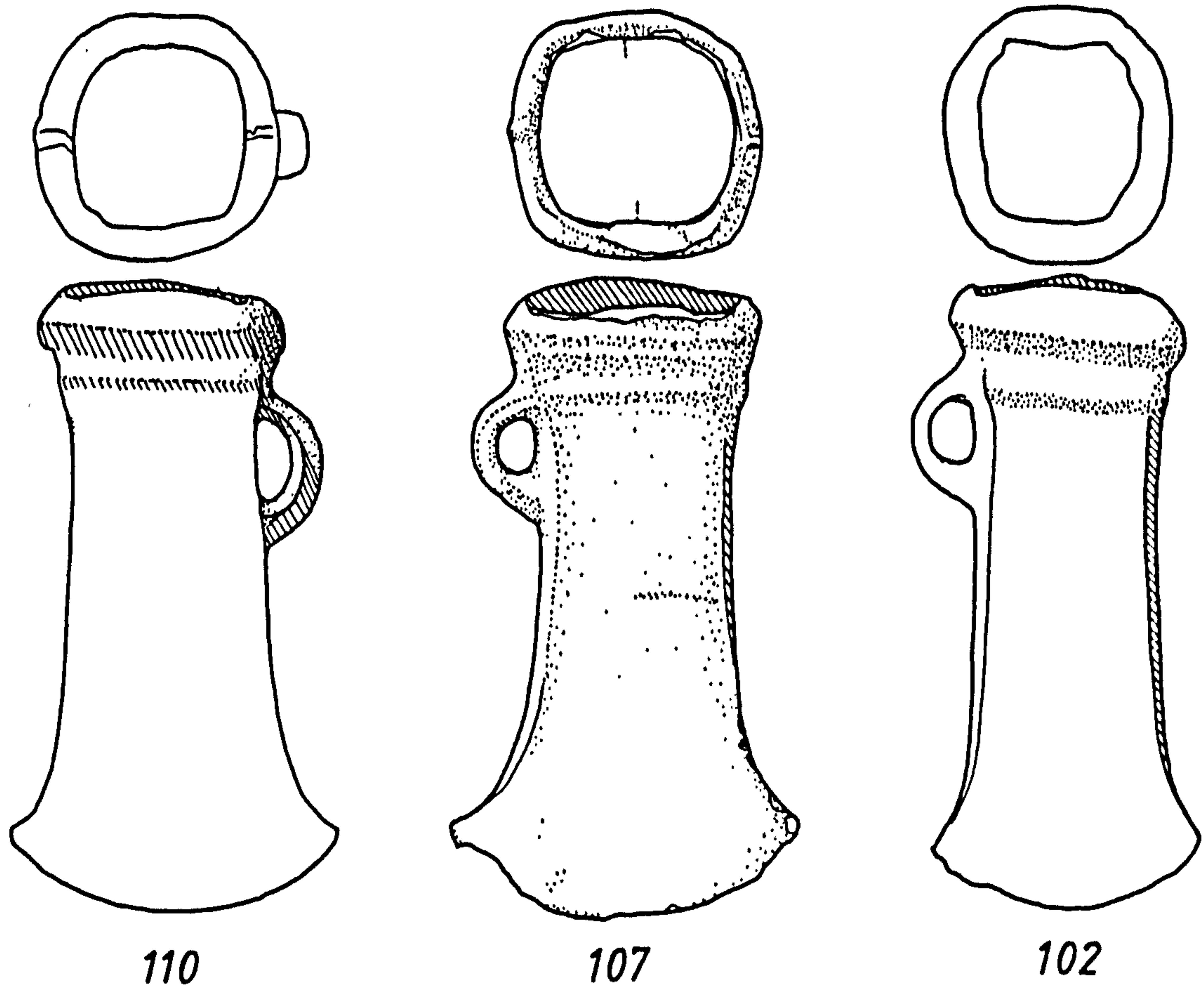
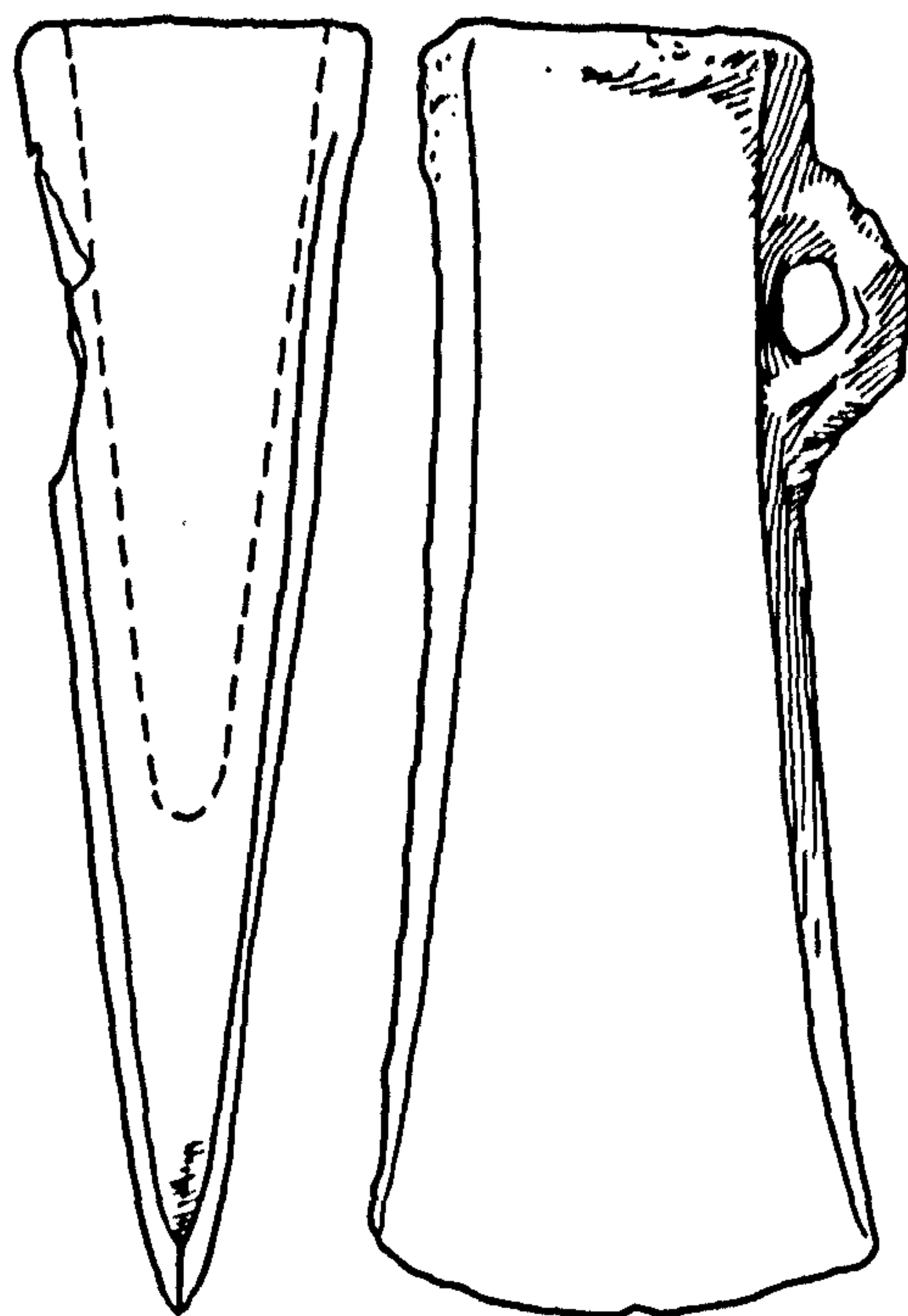


Fig. 37

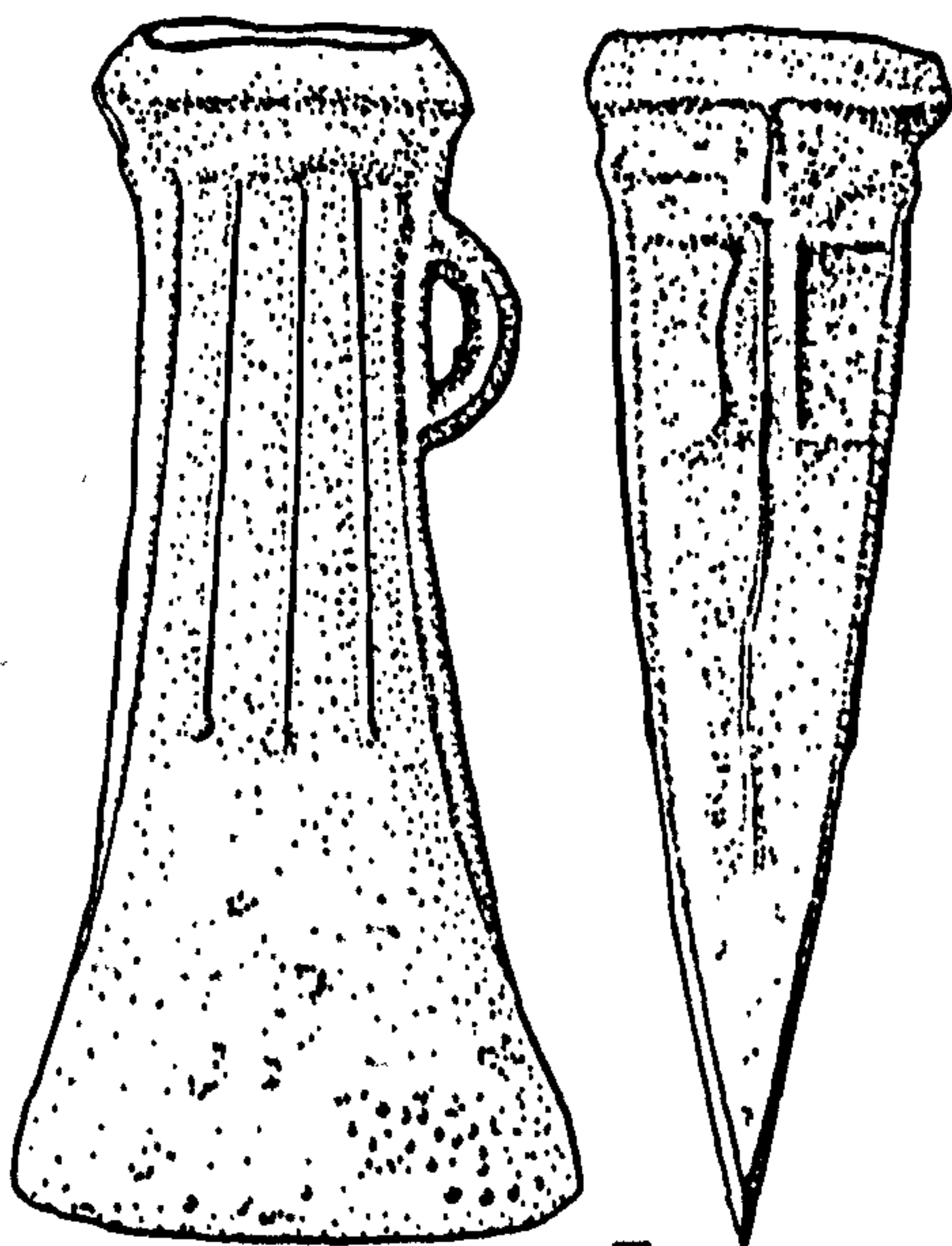
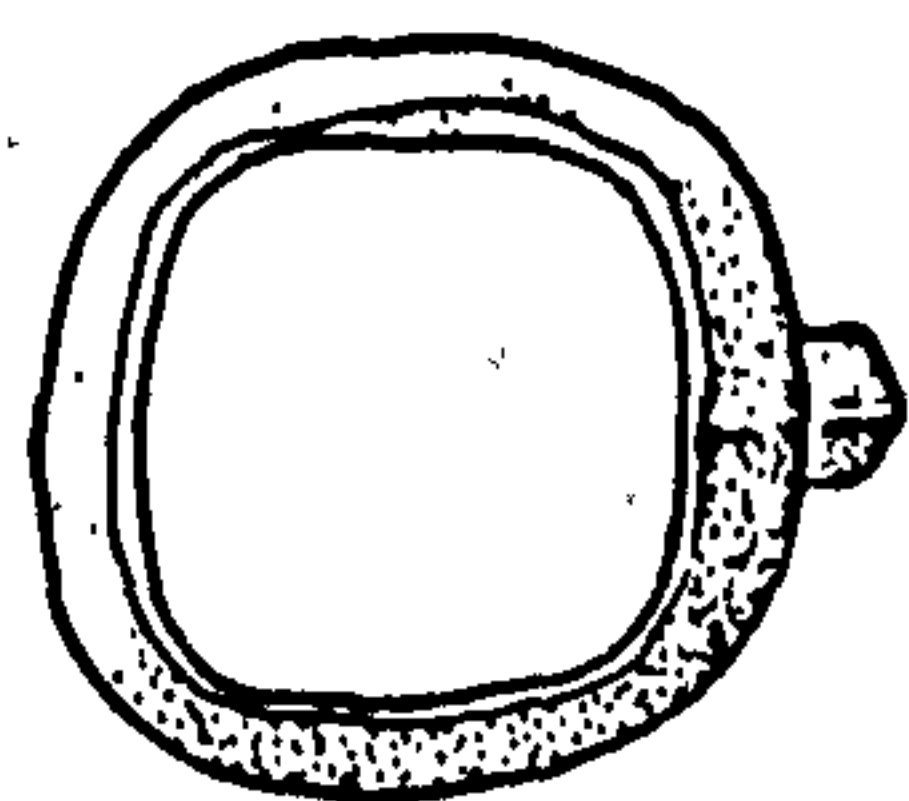


132

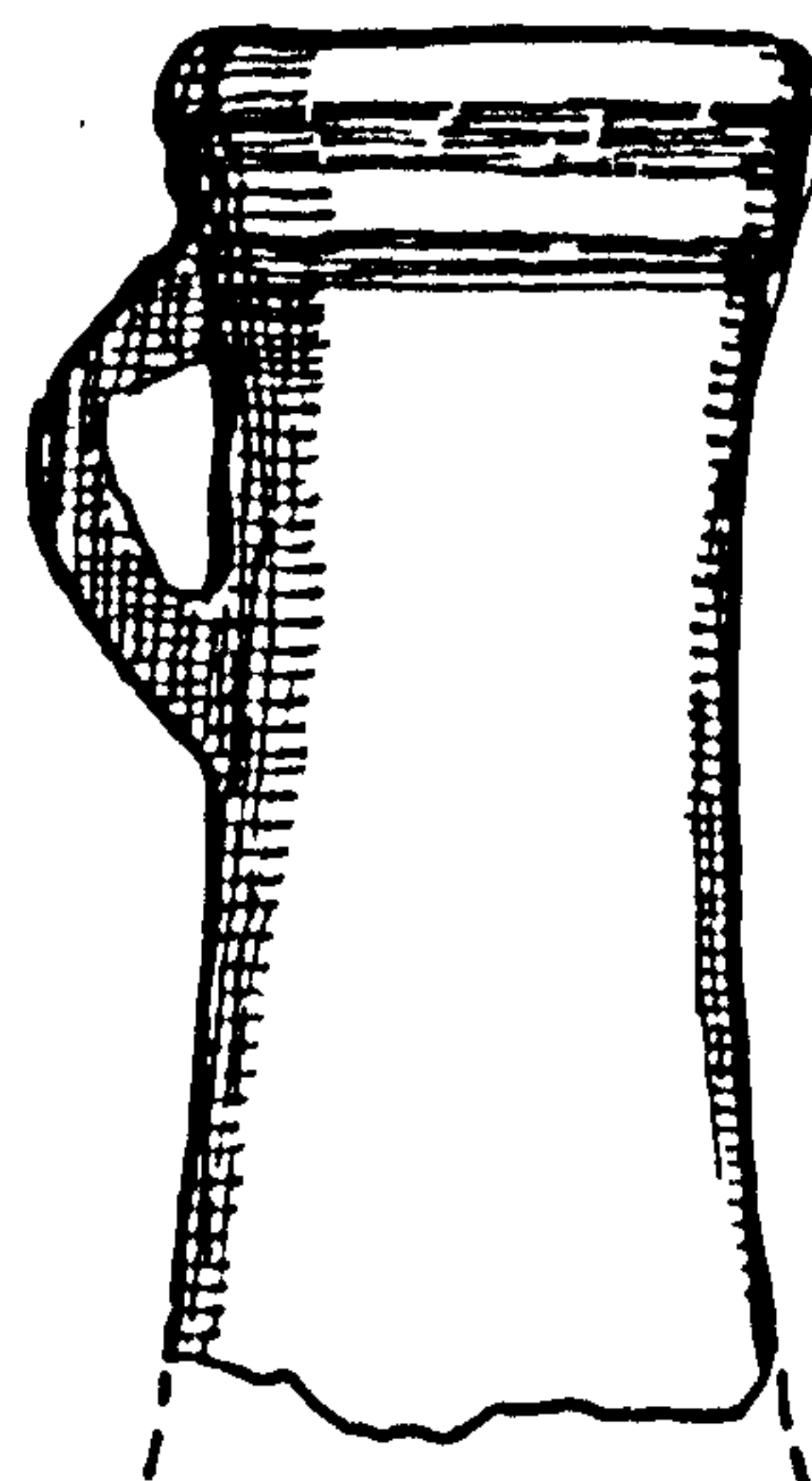
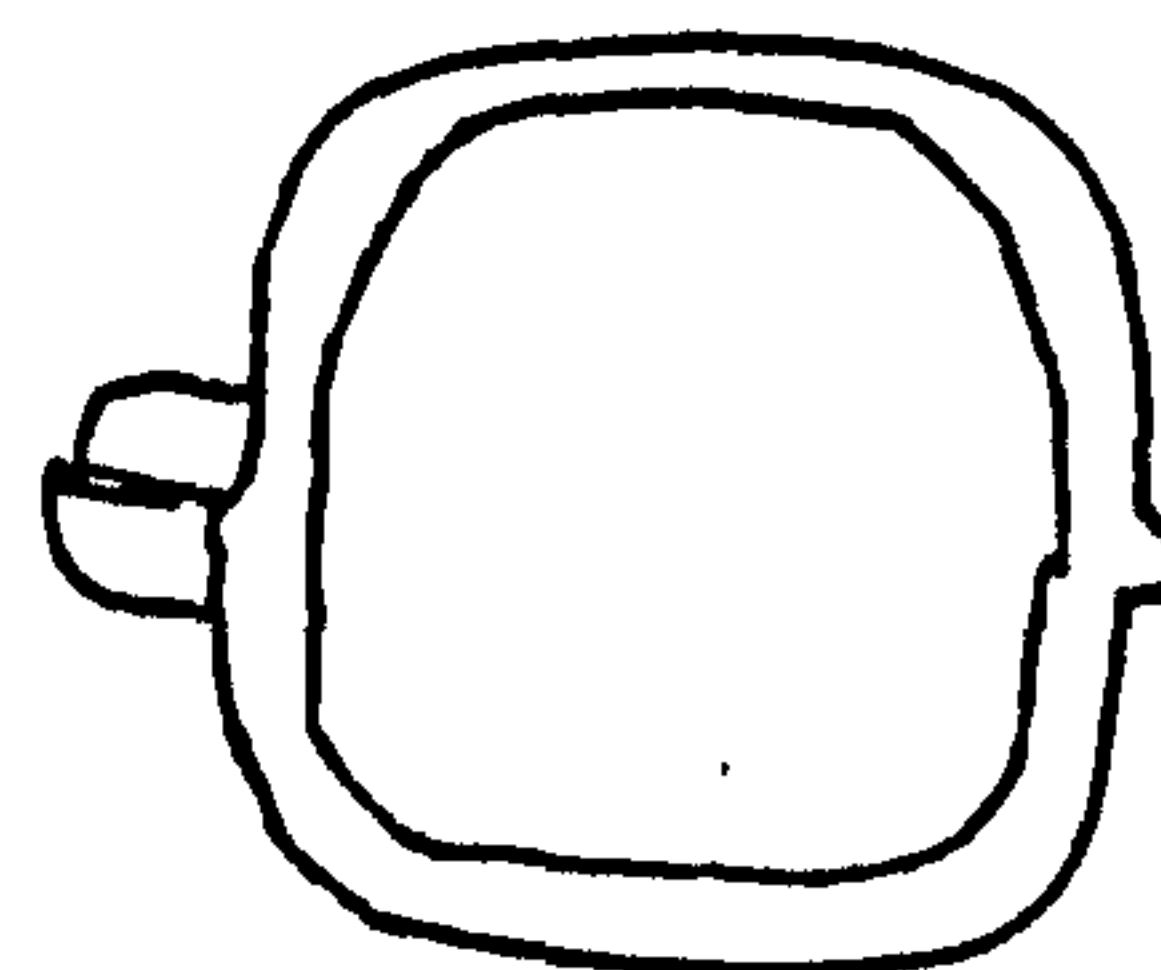
118



119



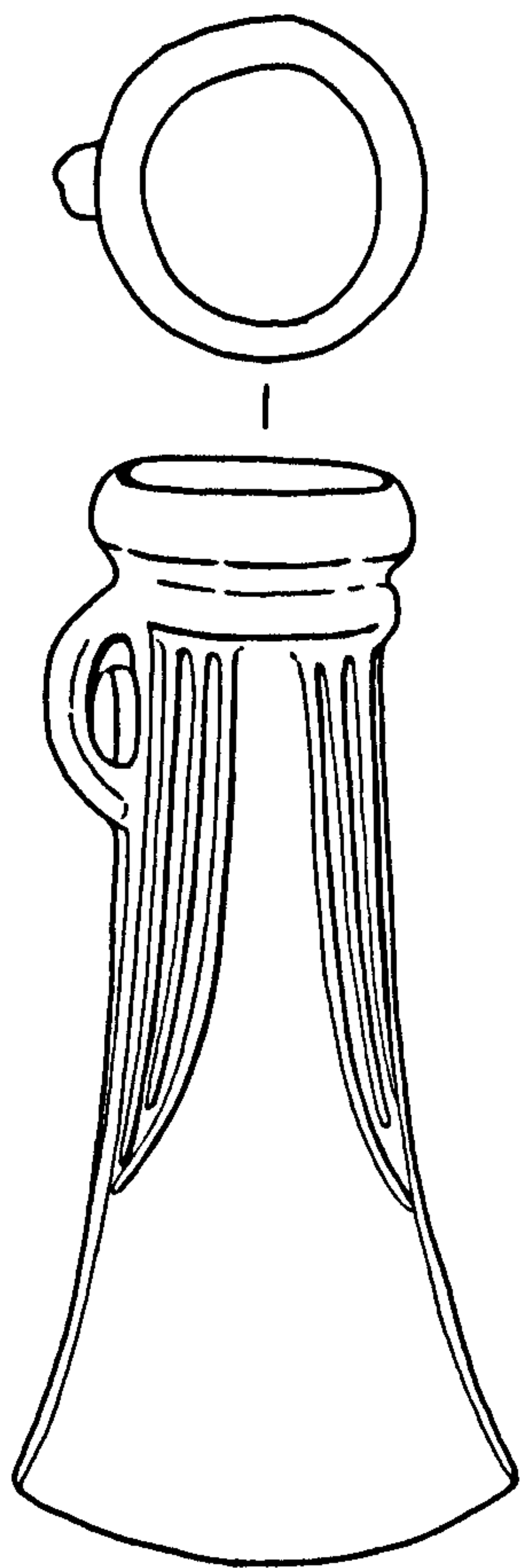
134



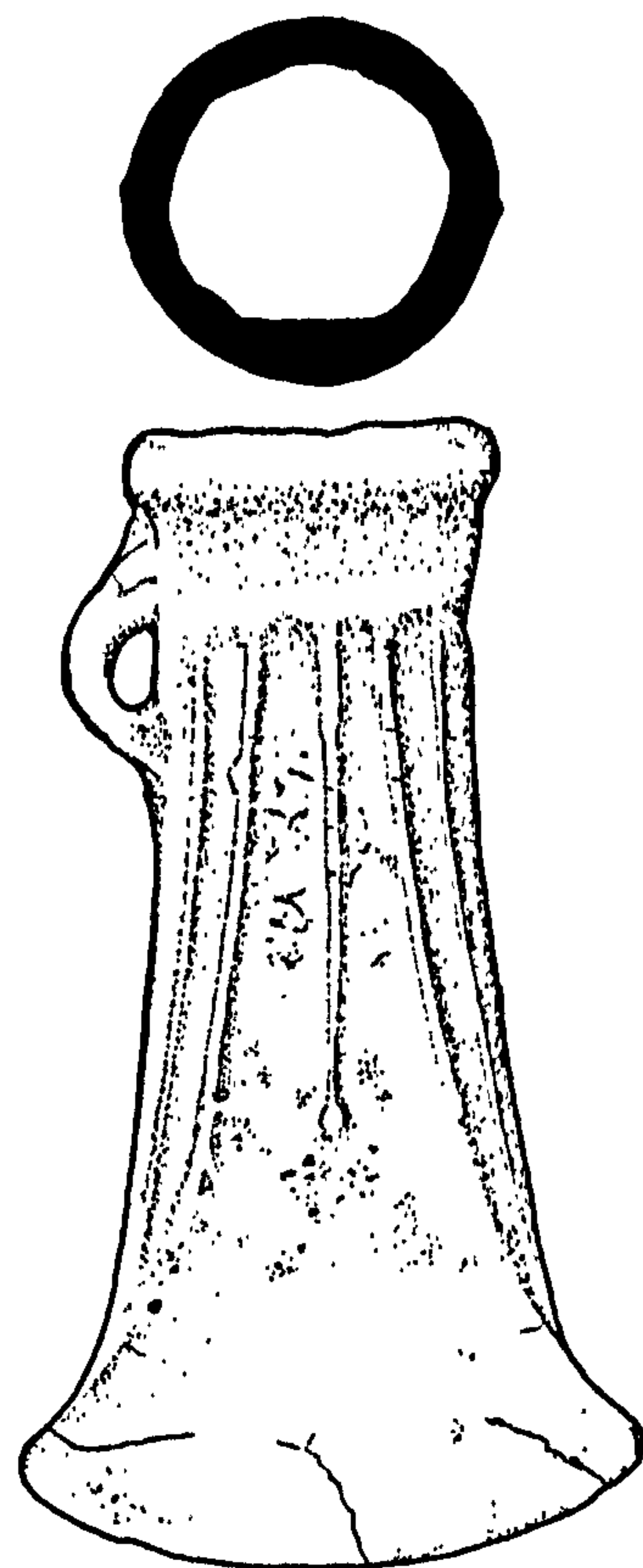
133

Fig. 38

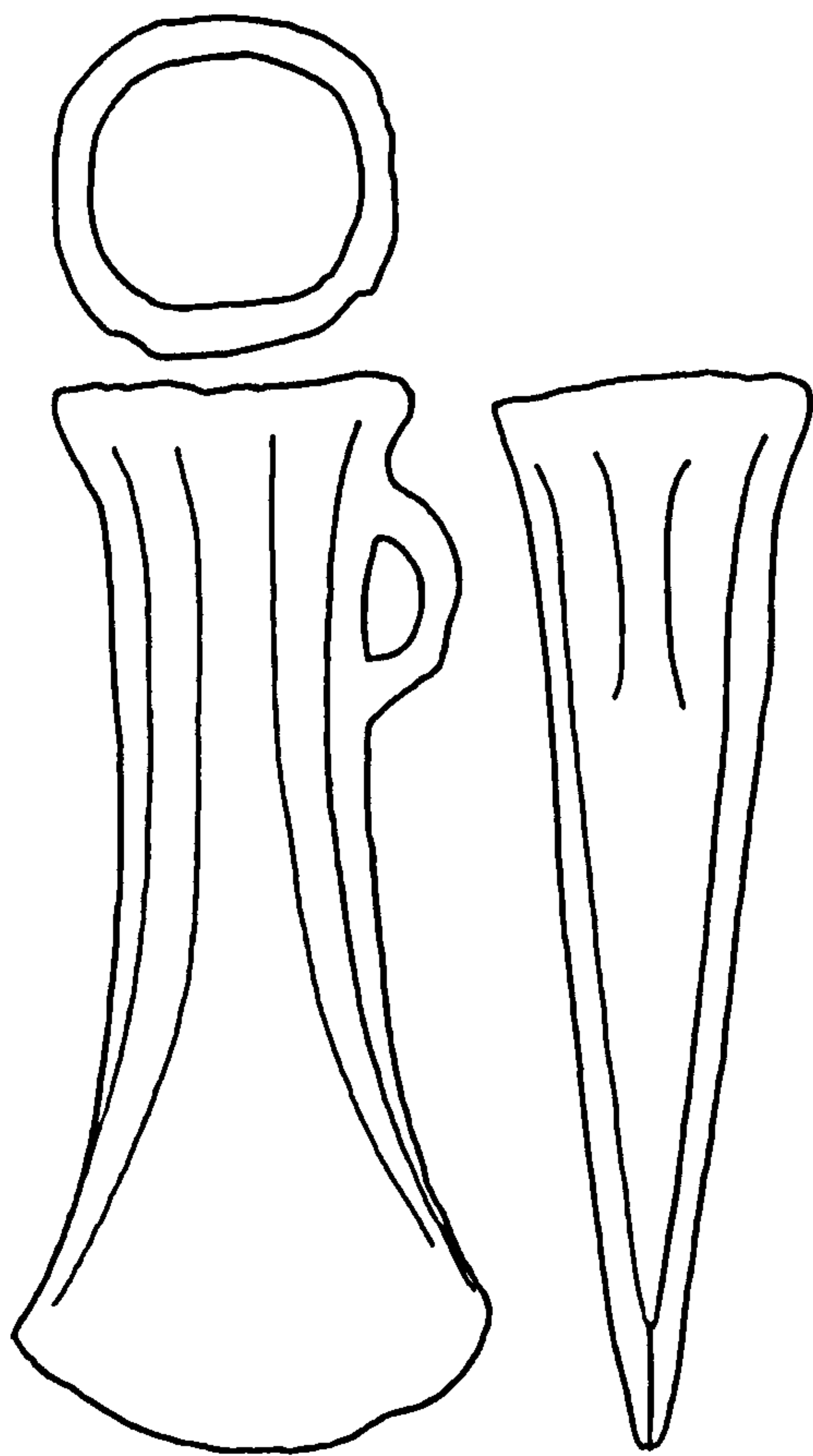




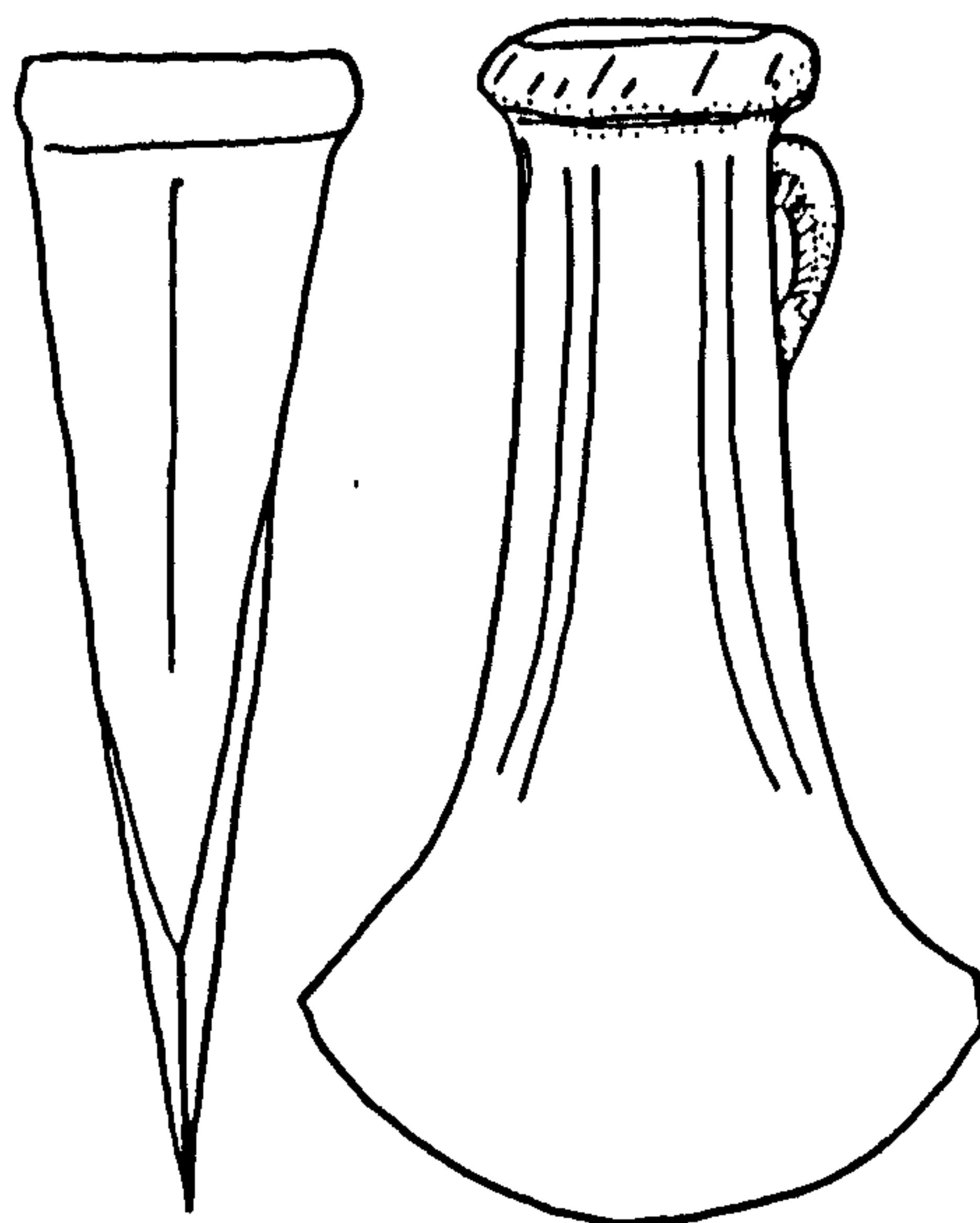
137



123

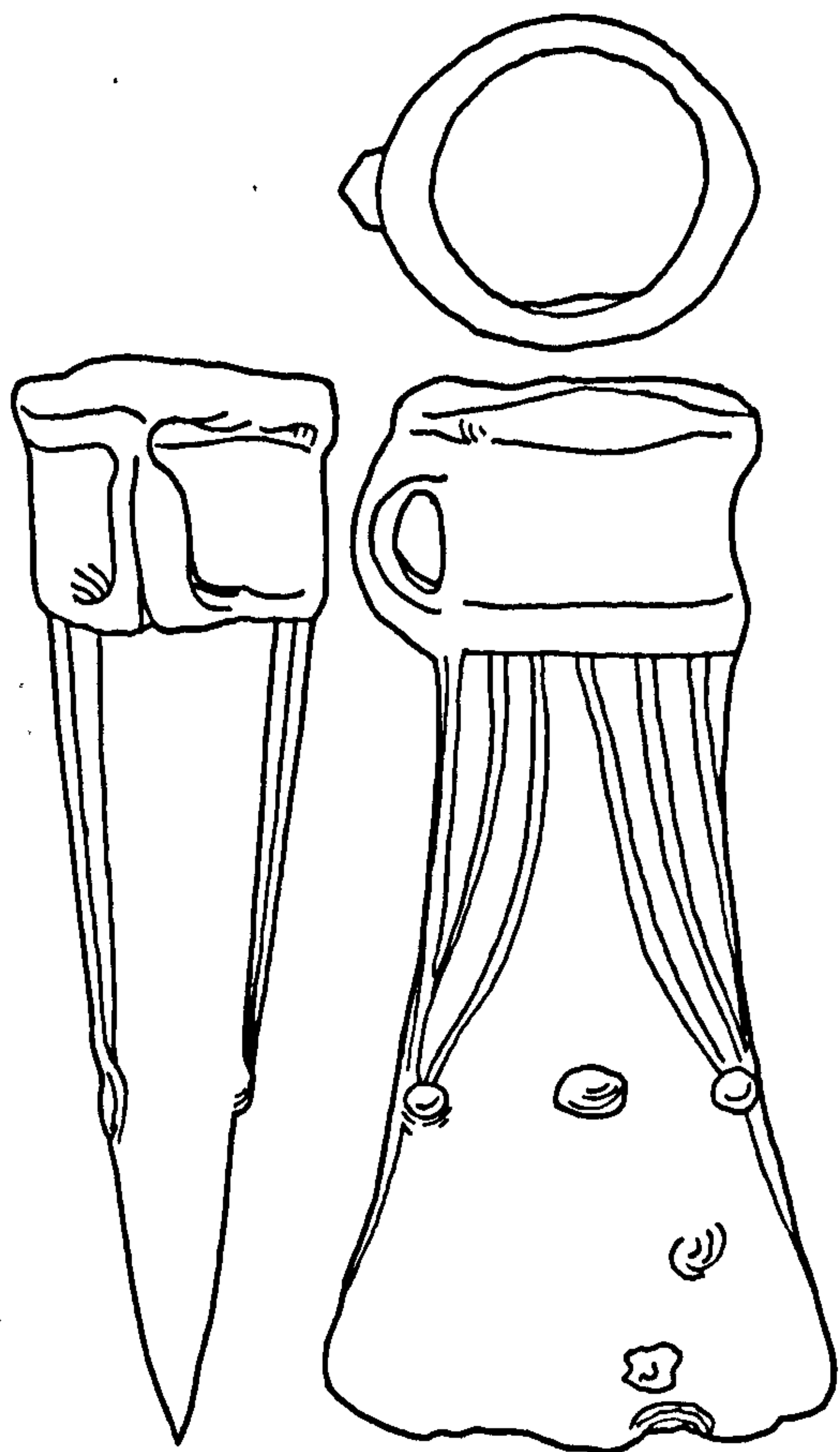


124

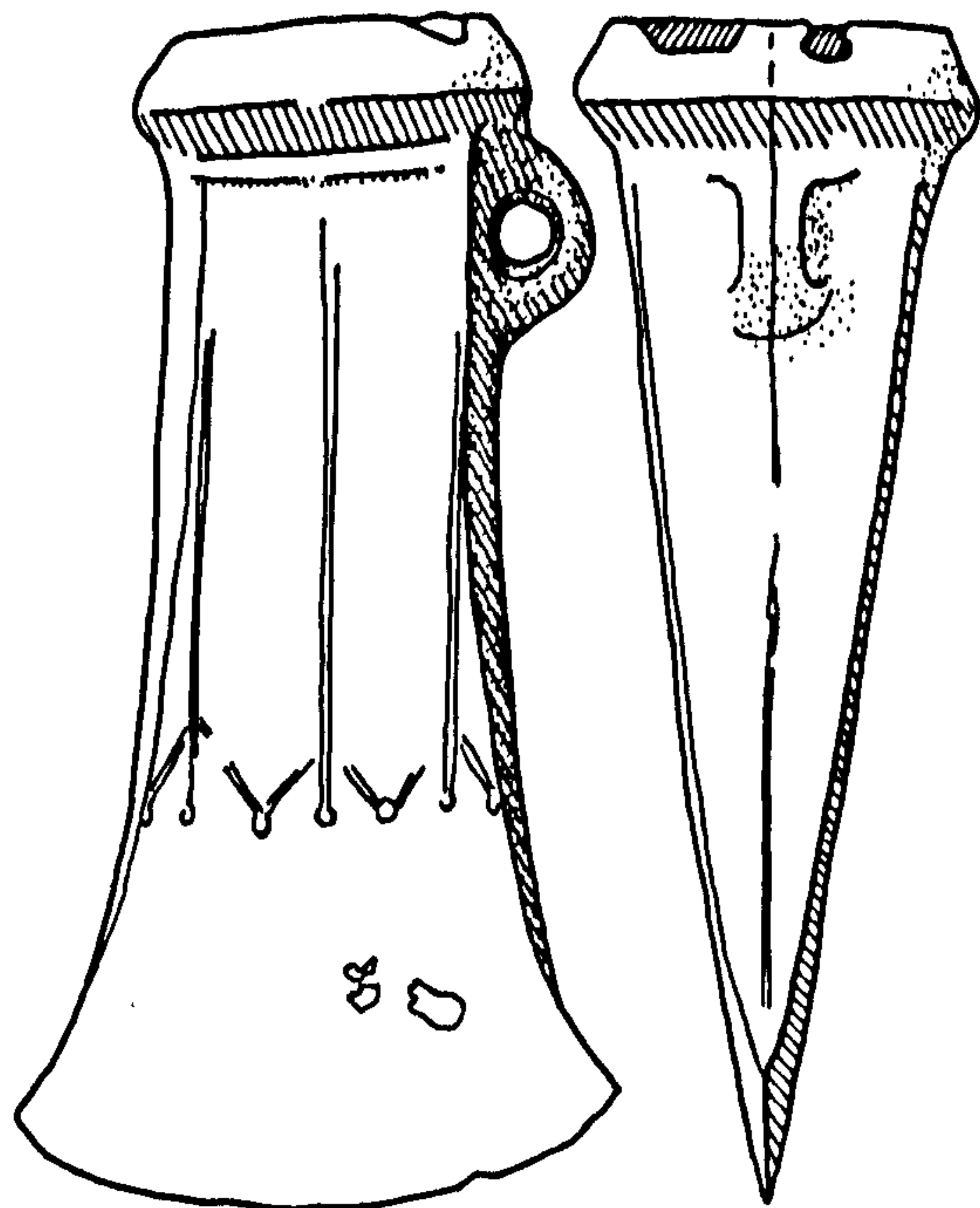


122

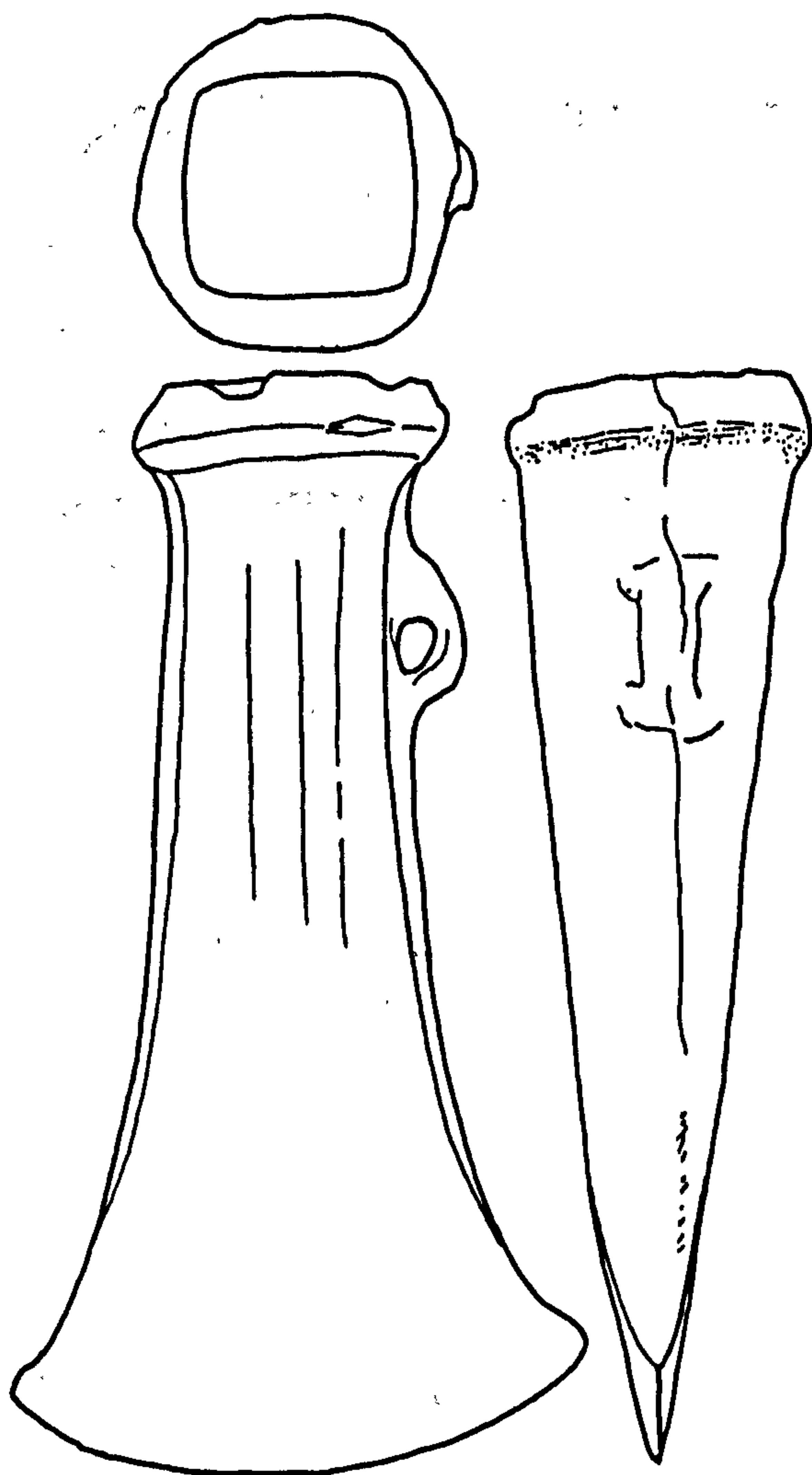
Fig. 39



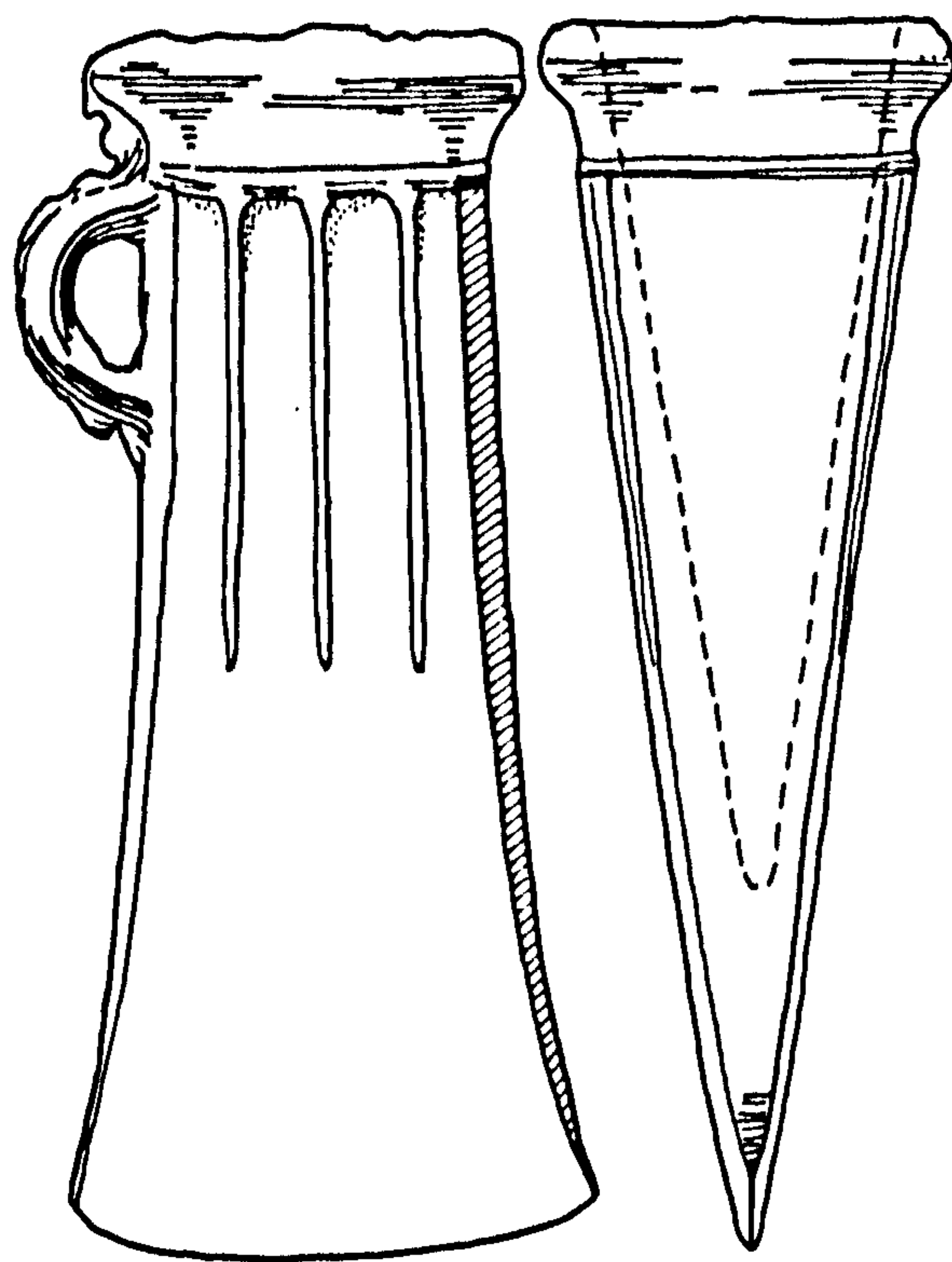
120



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Fig. 40

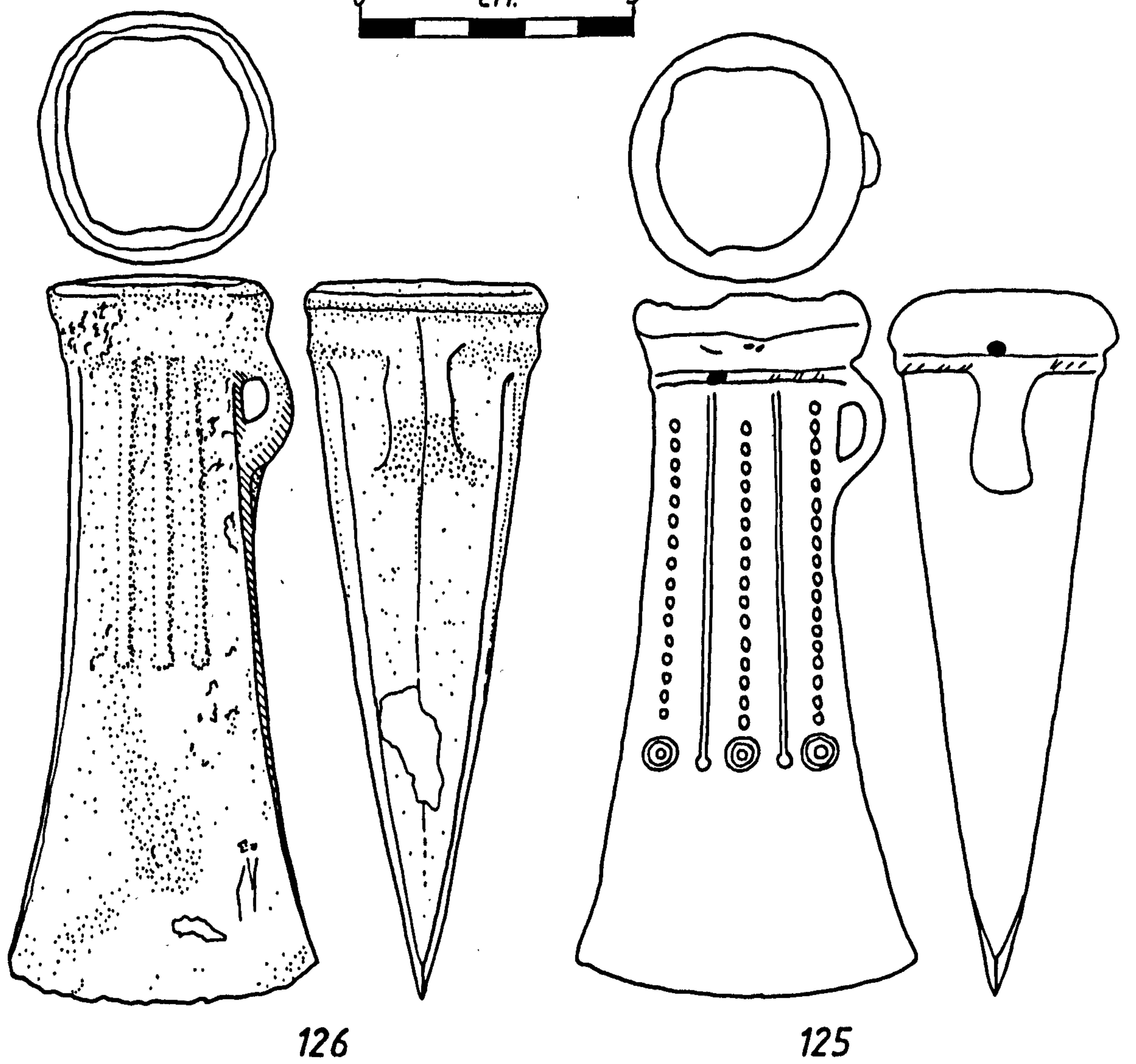
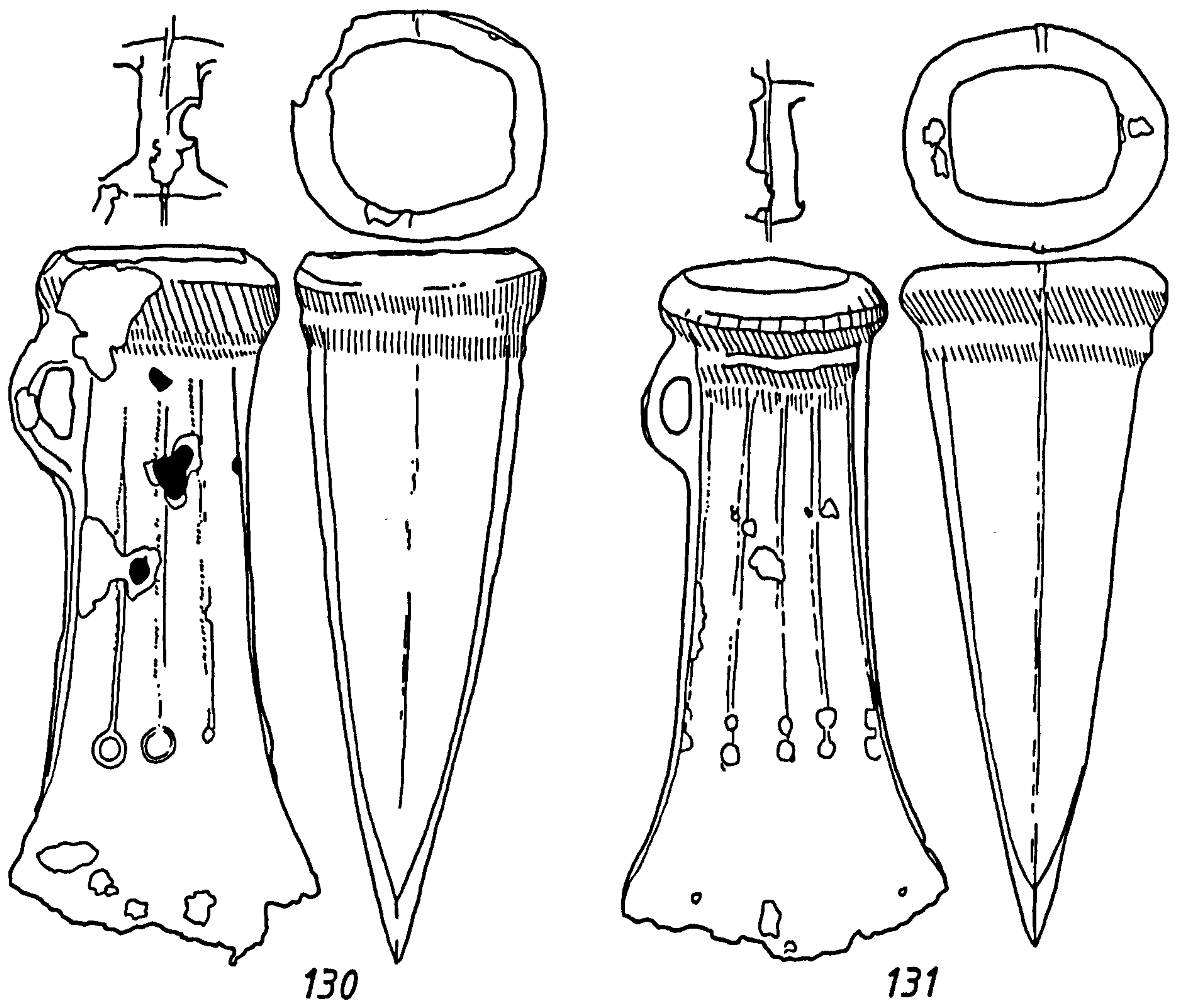


Fig. 41

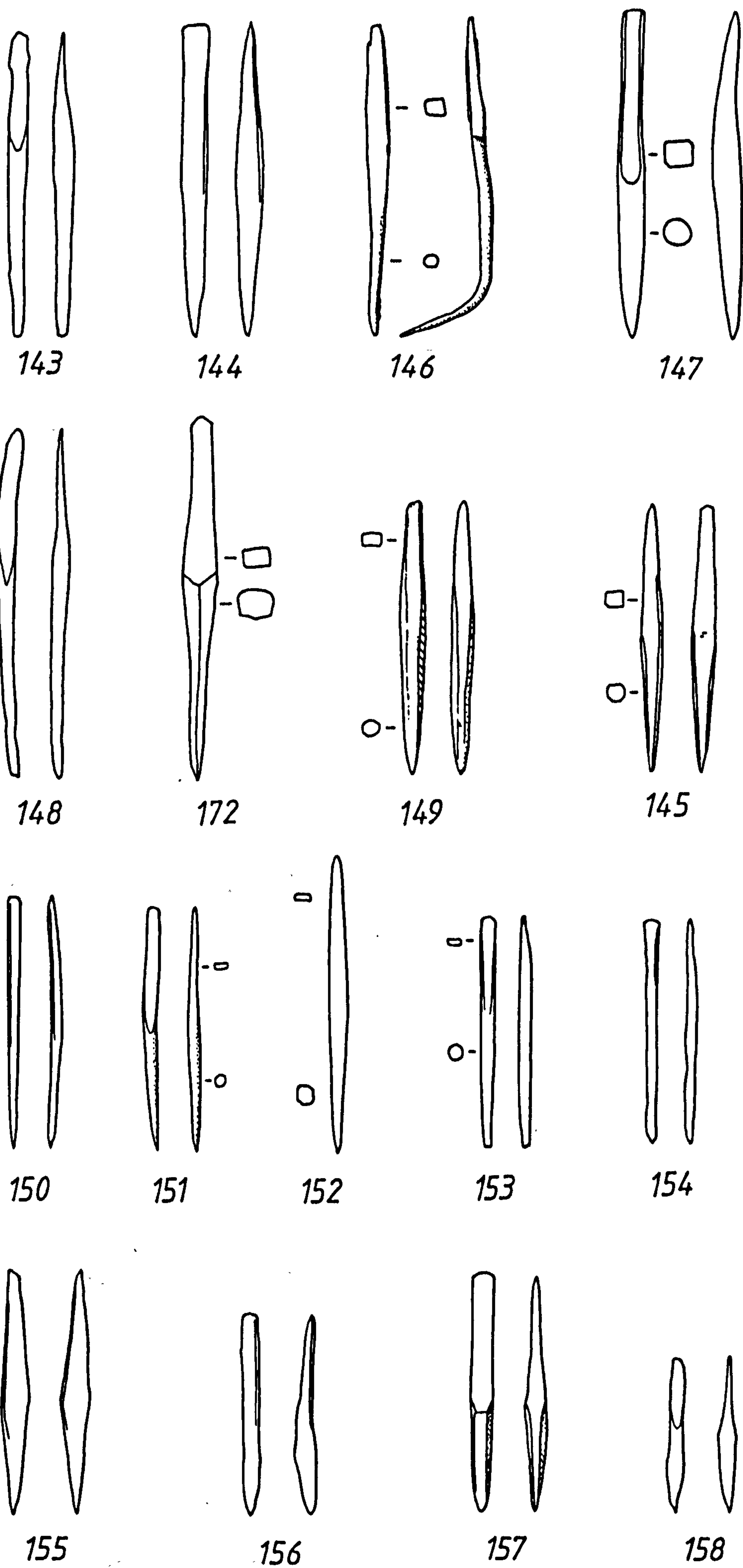


Fig. 42

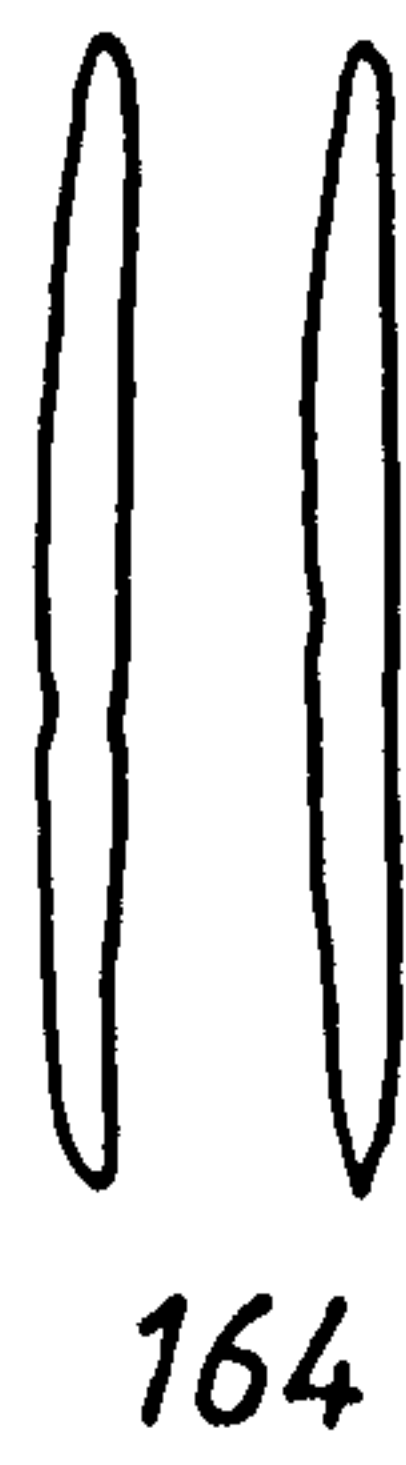
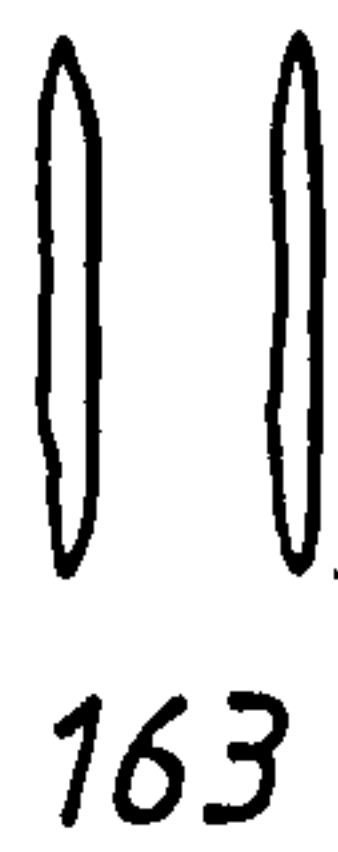
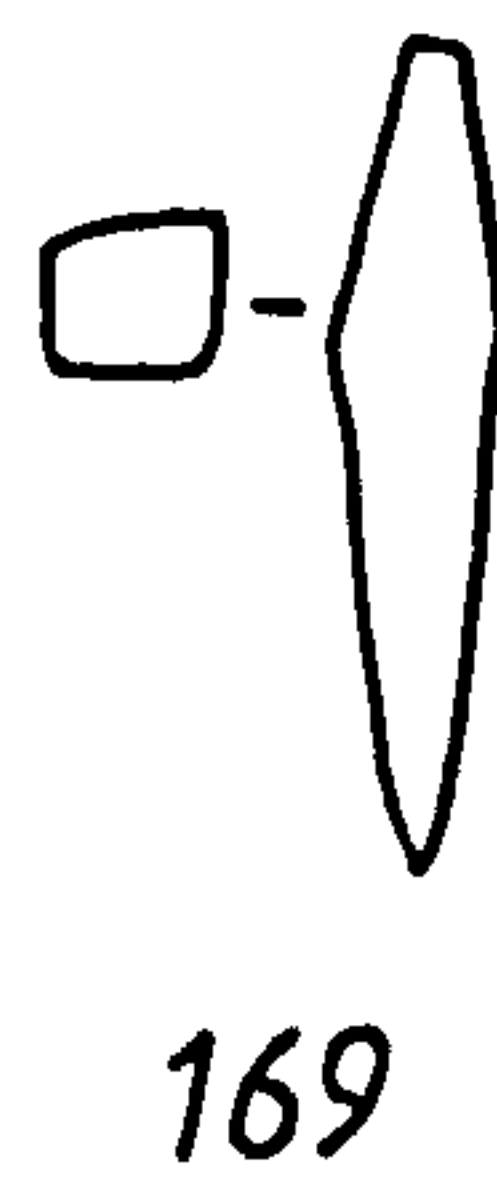
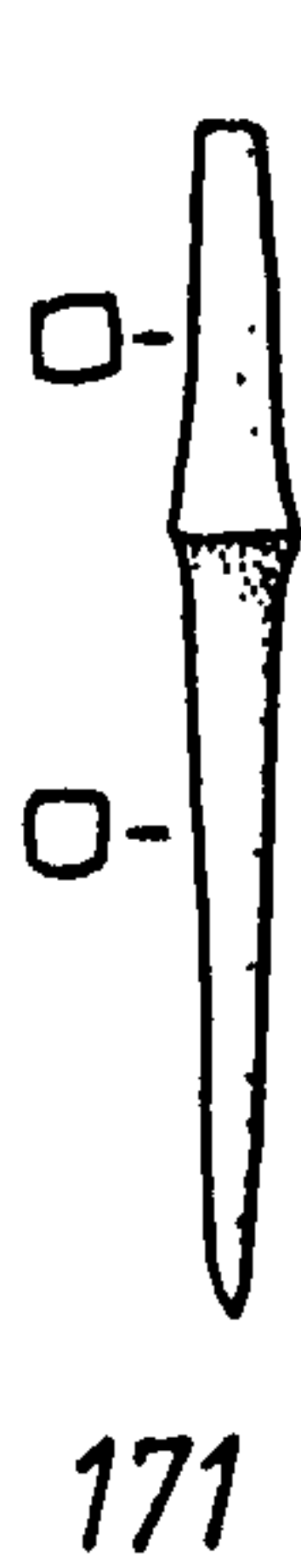
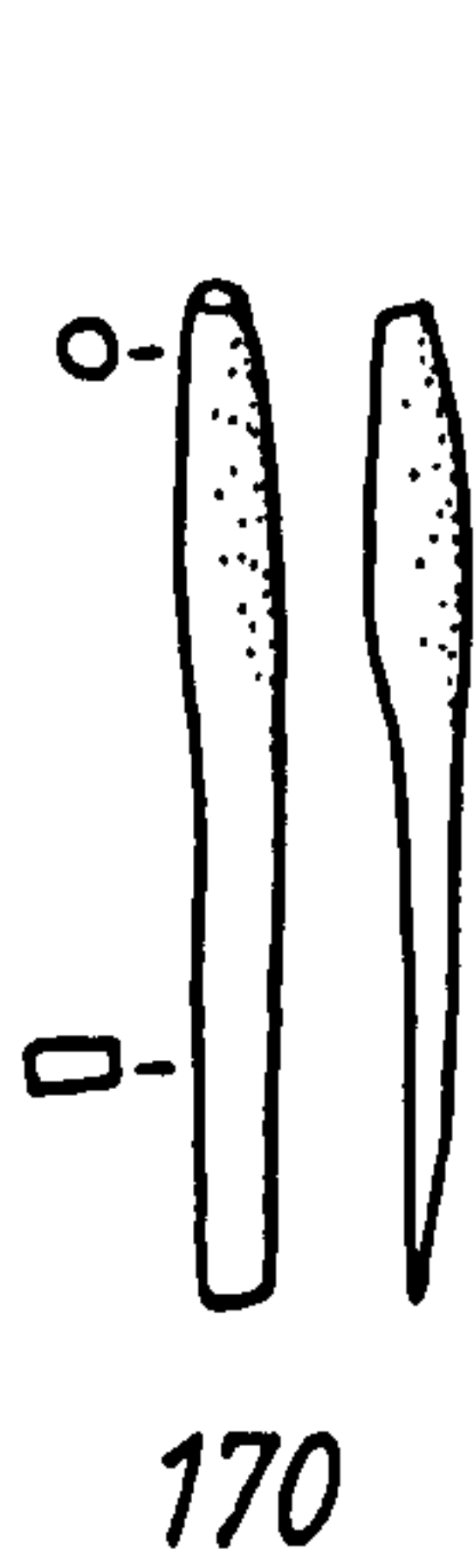
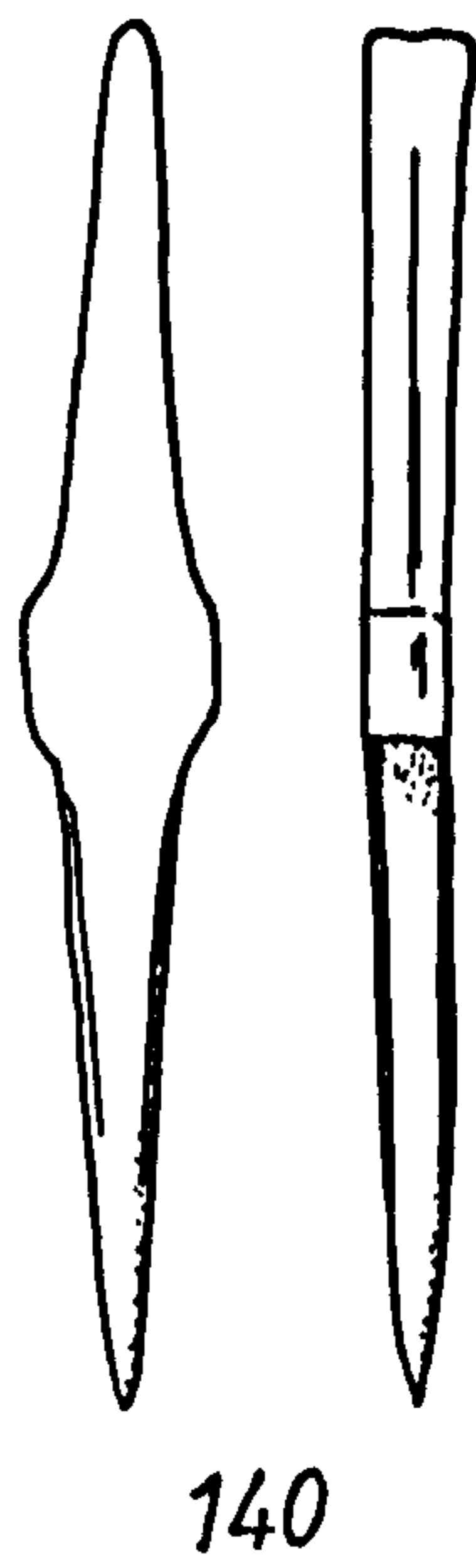
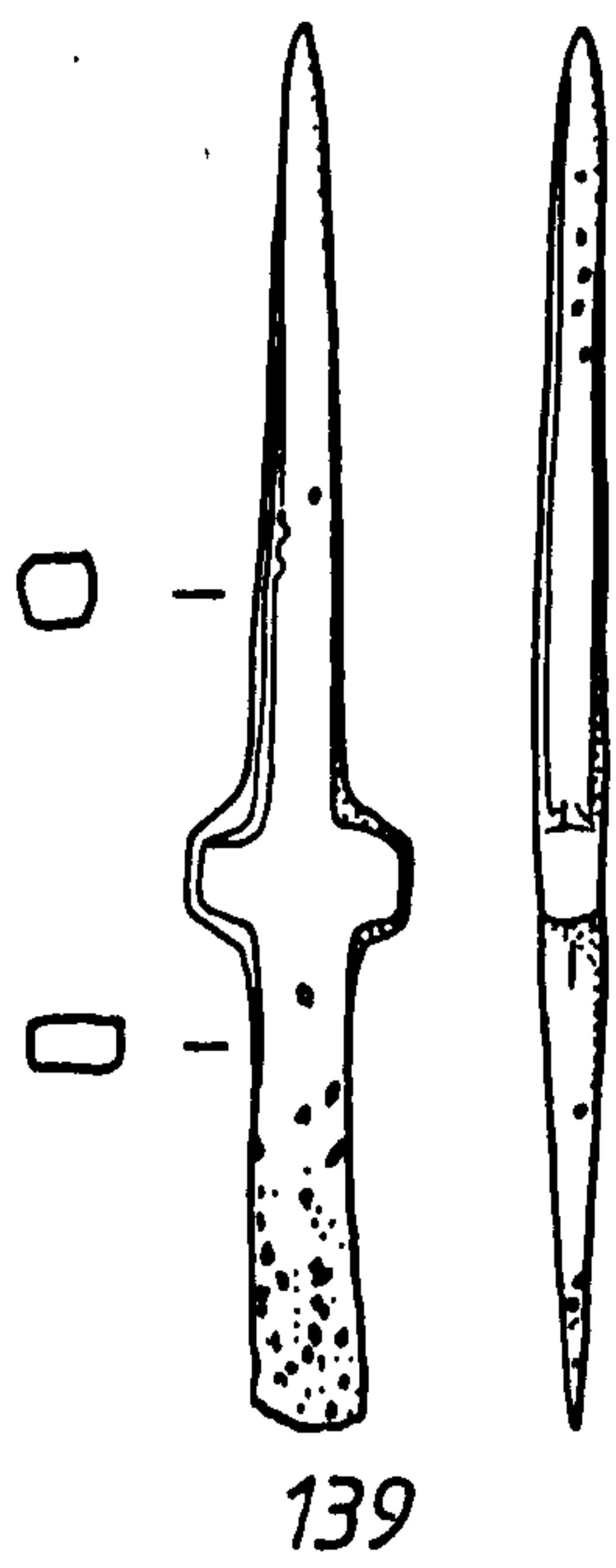


Fig. 43

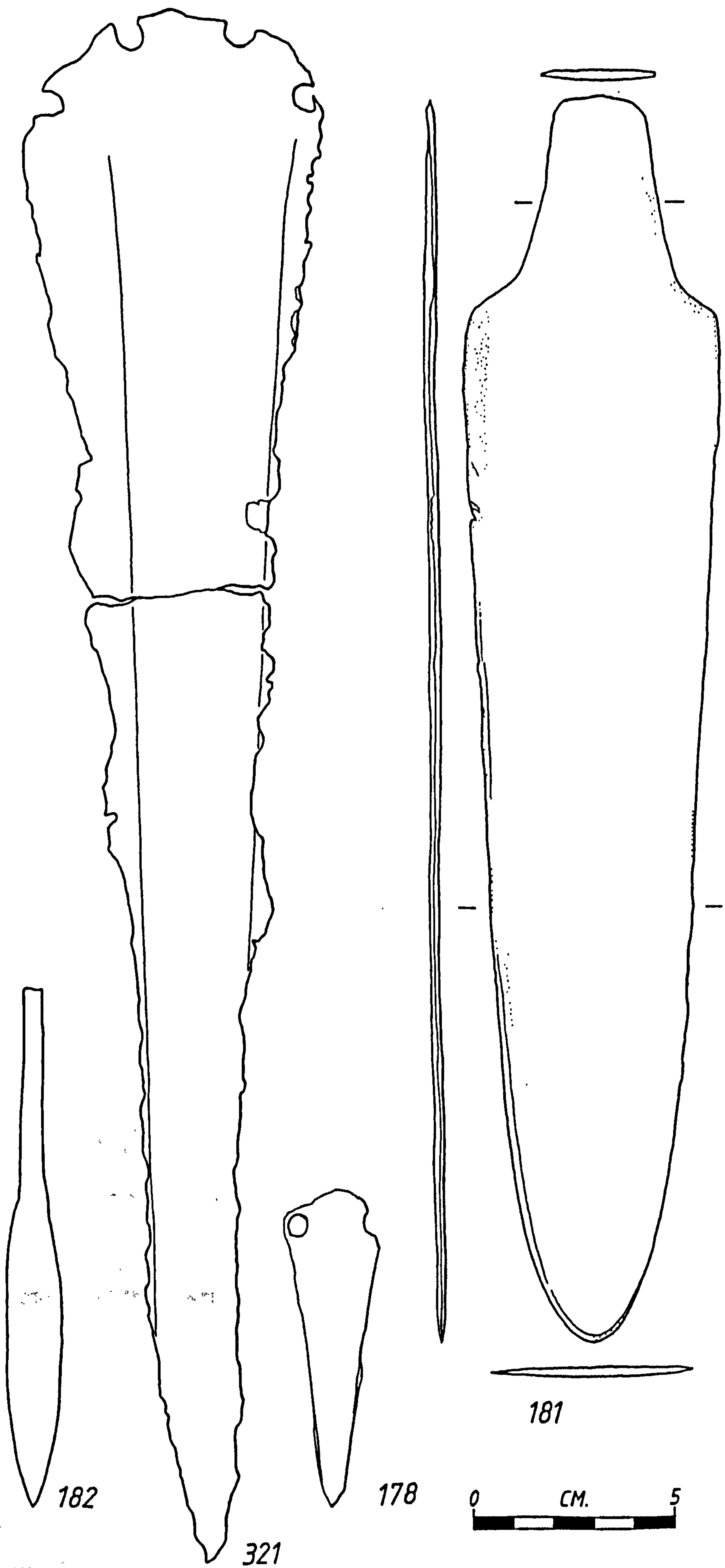


Fig. 44

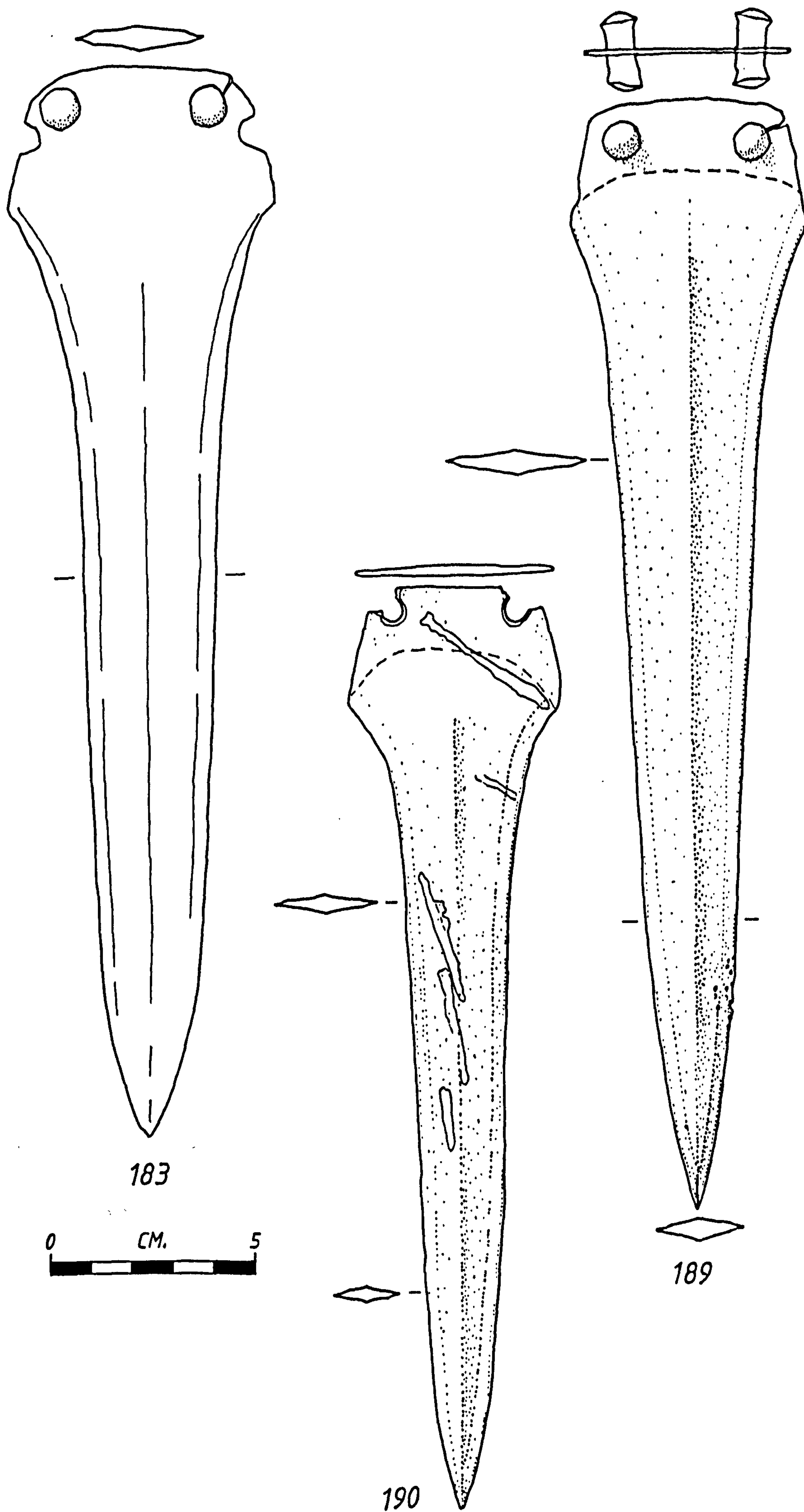


Fig. 45

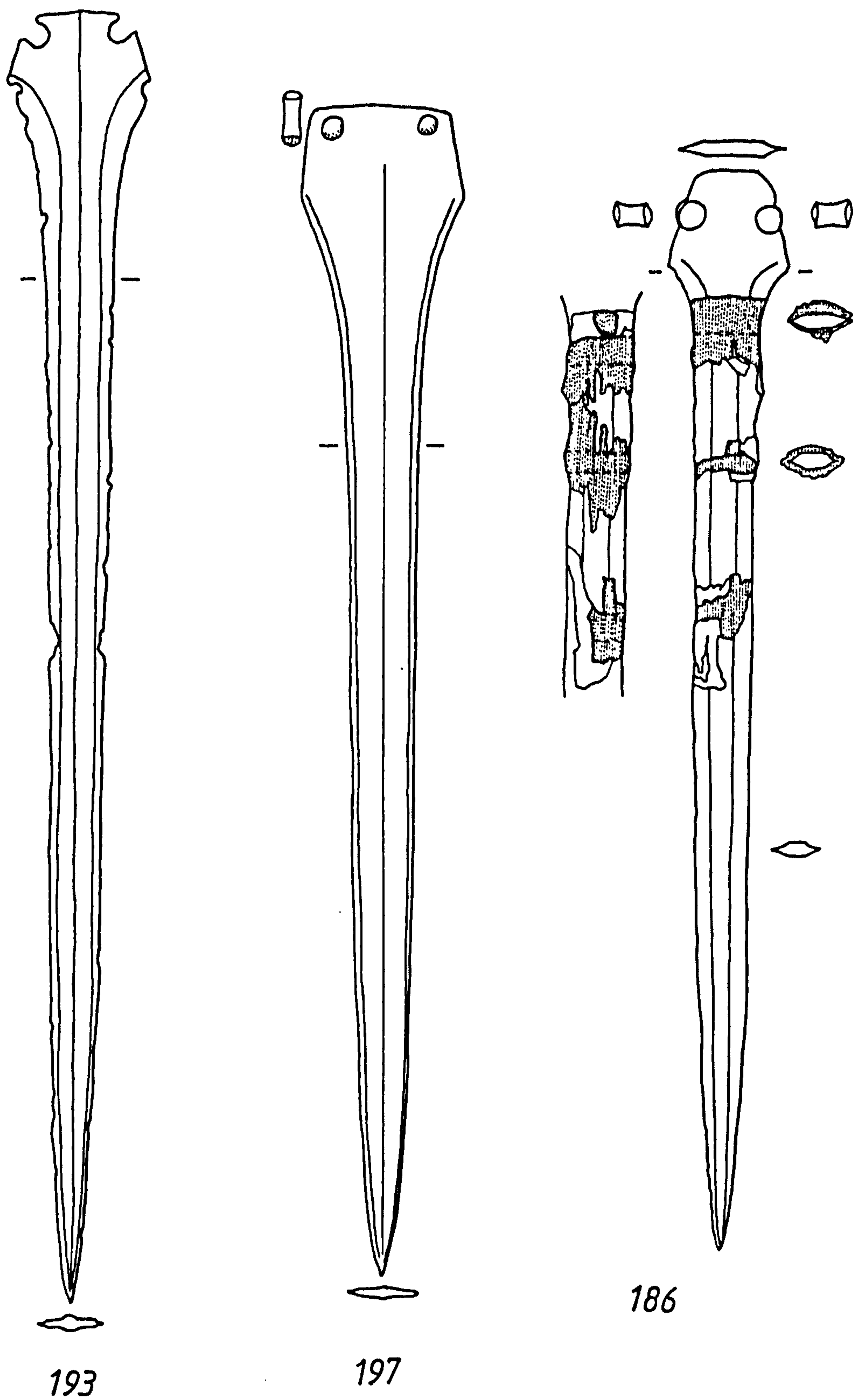


Fig. 46

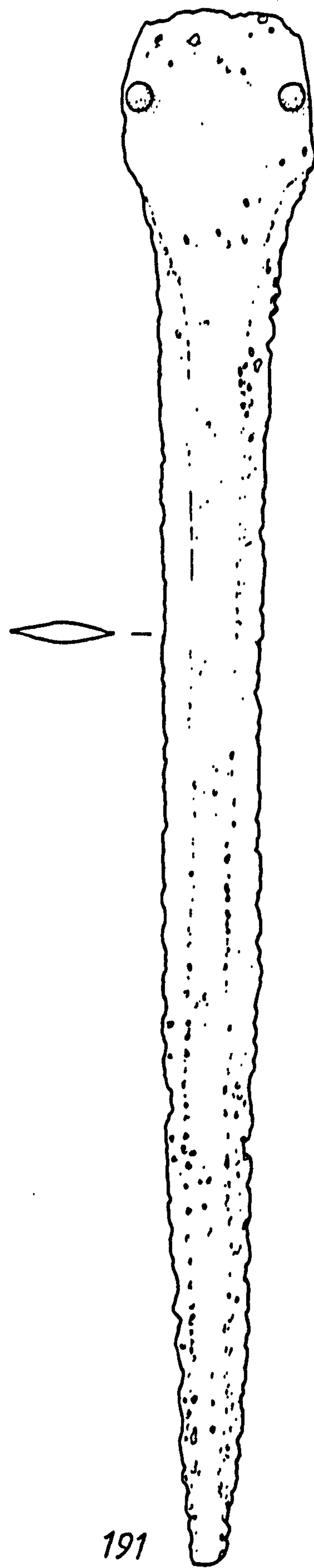
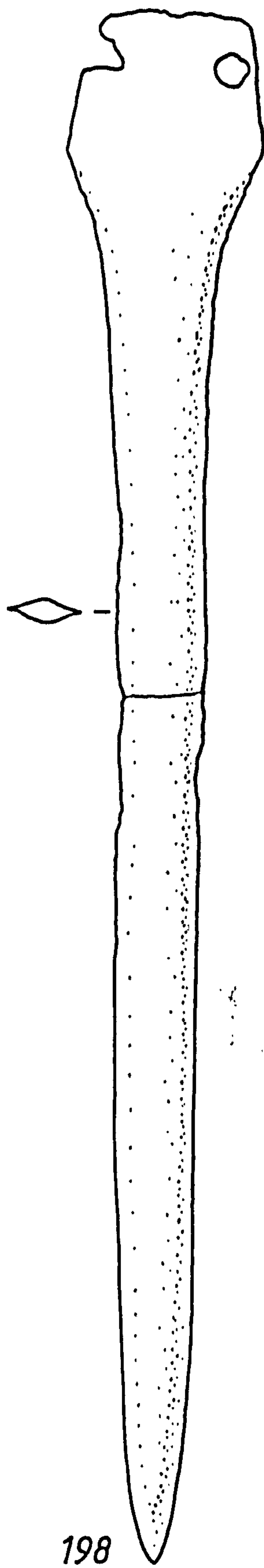
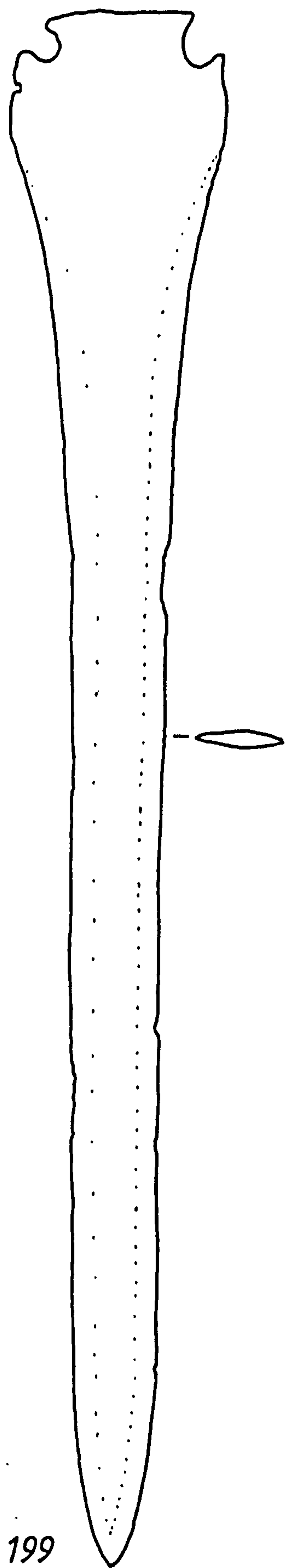
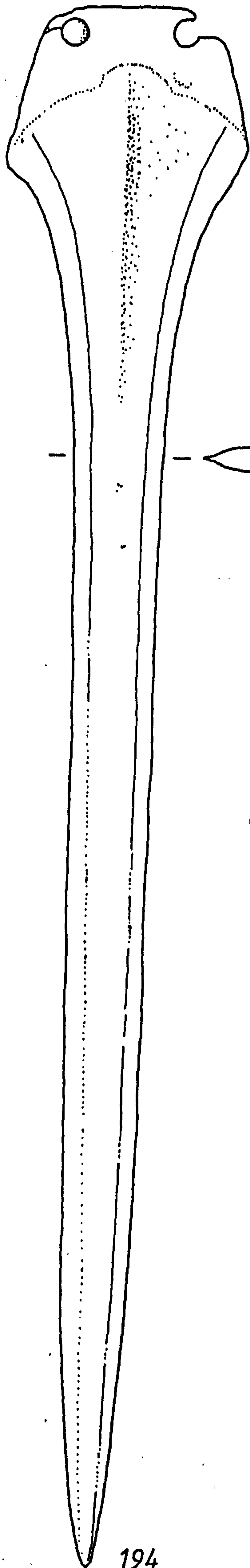
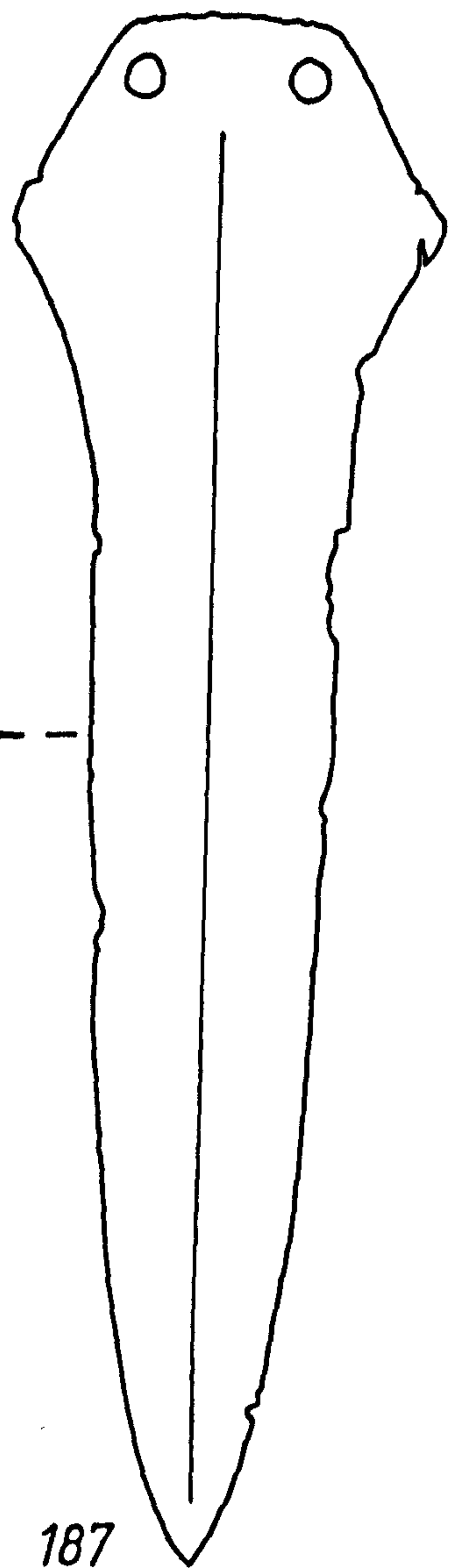


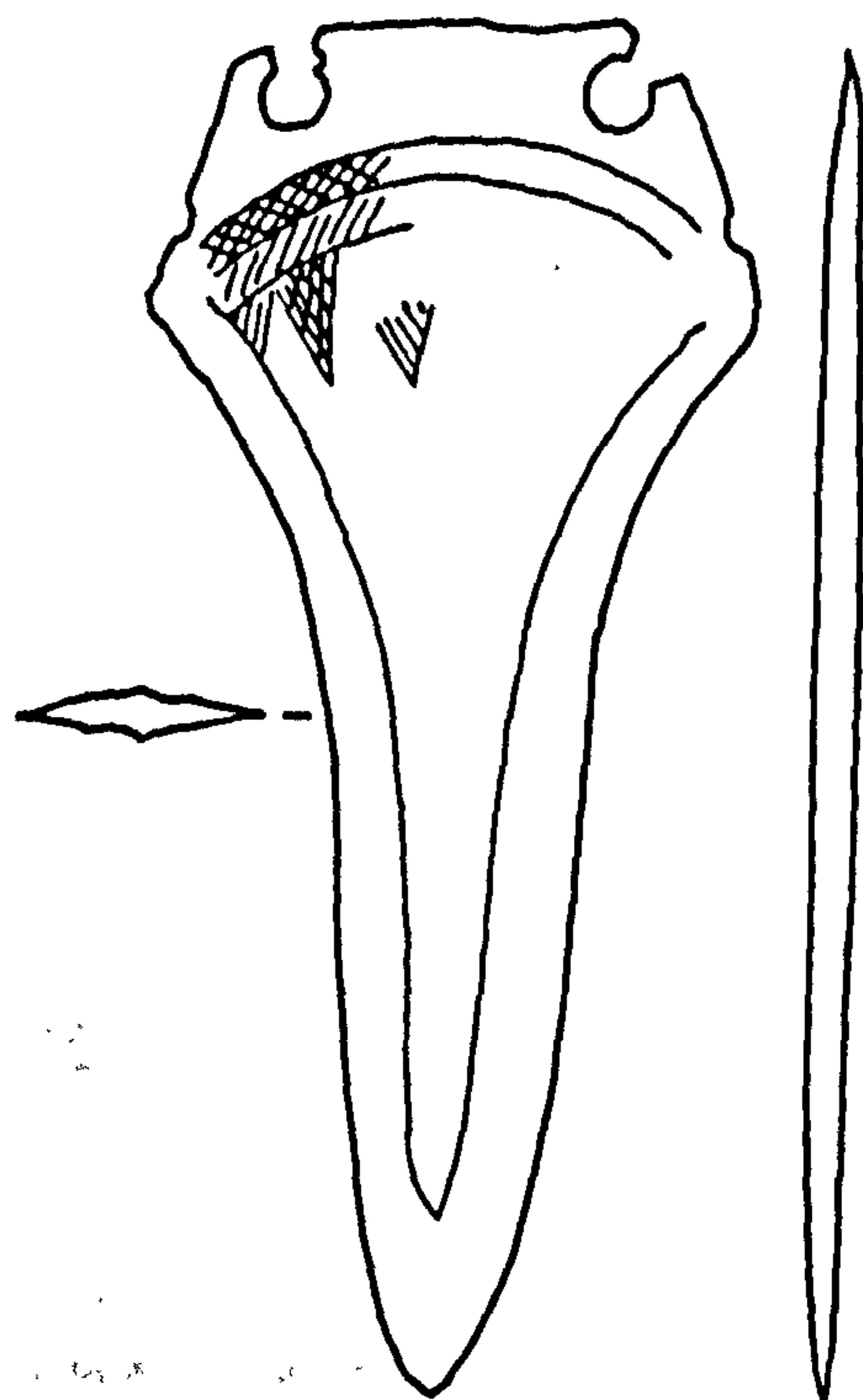
Fig. 47



194



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207

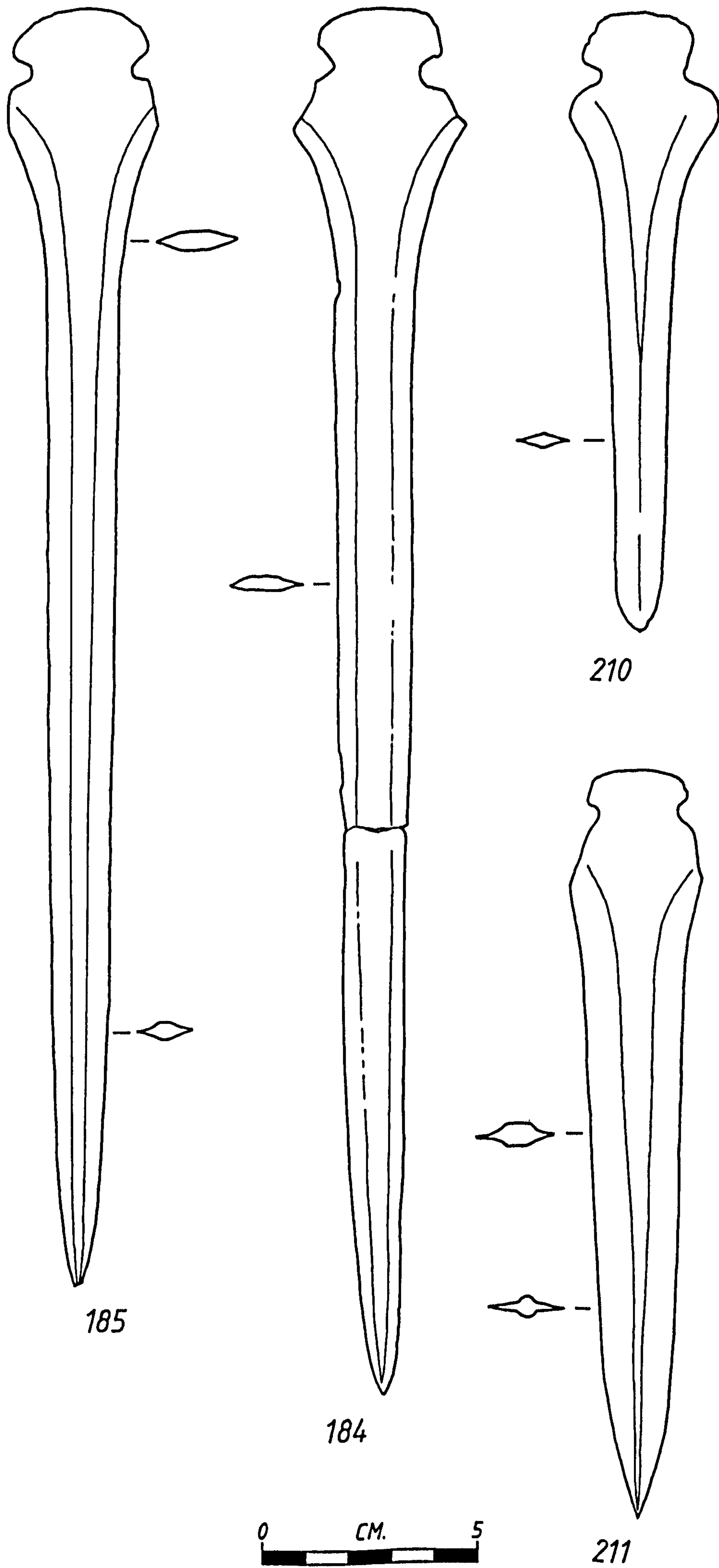


Fig. 49

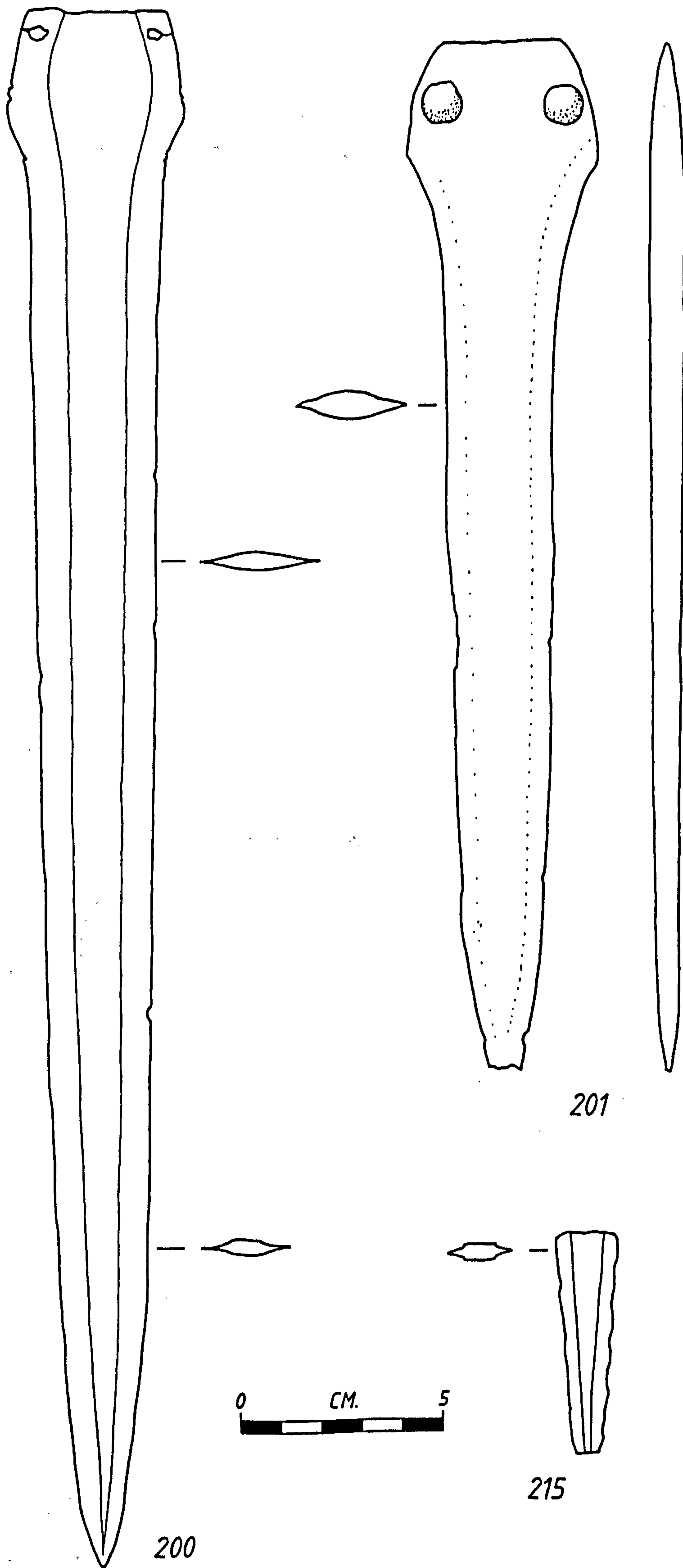


Fig. 50

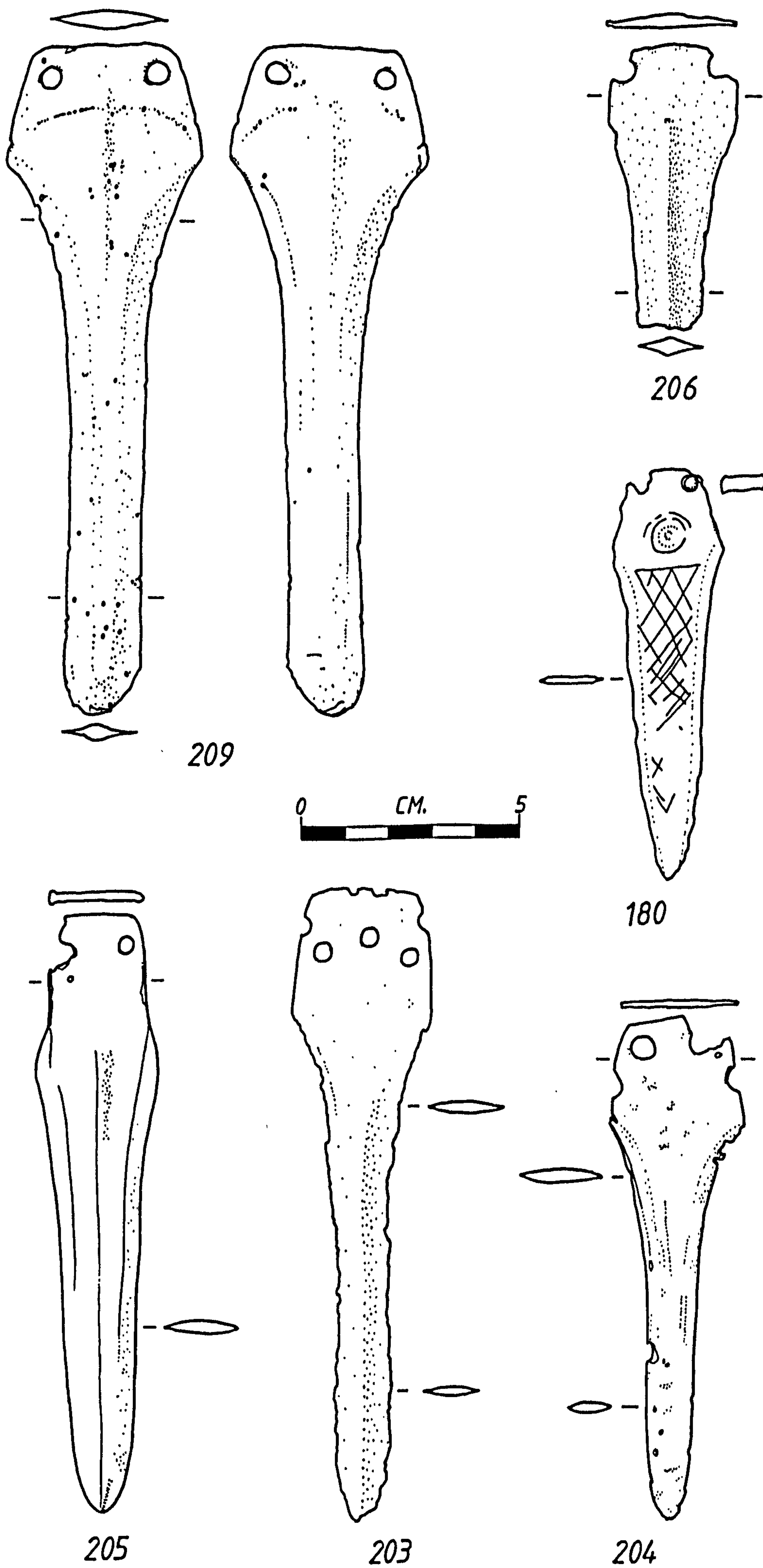
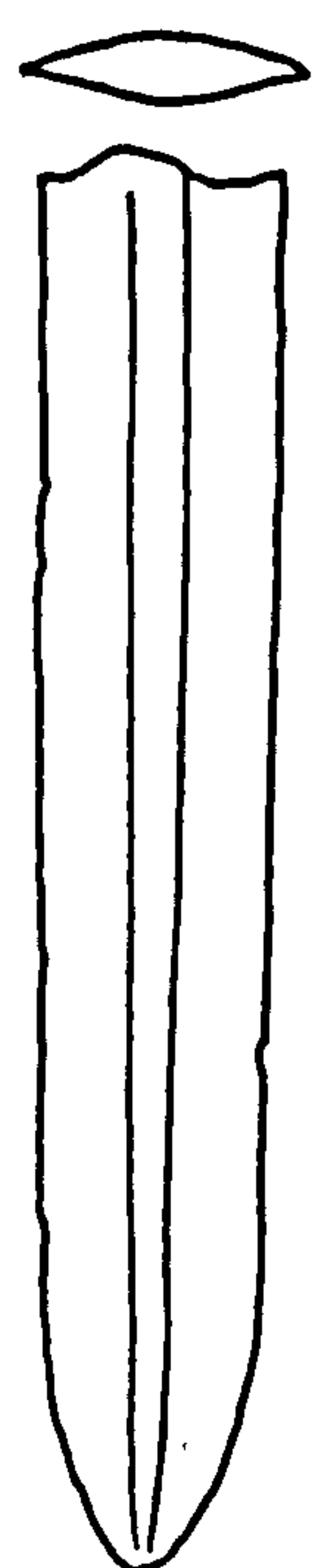
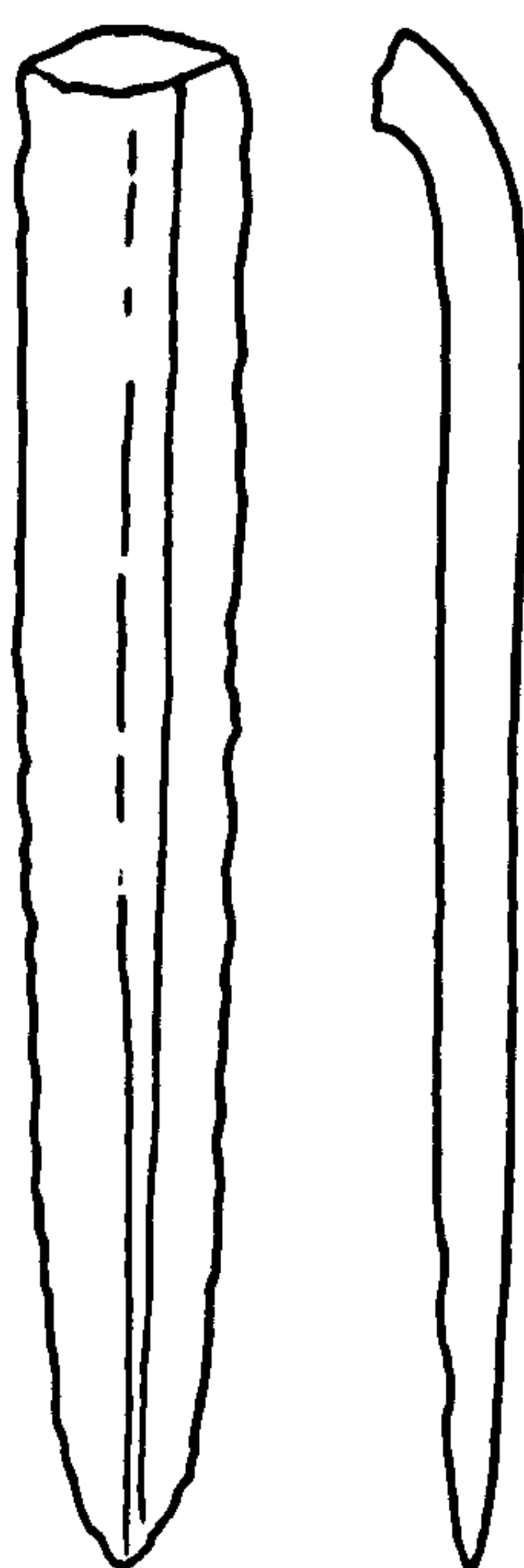


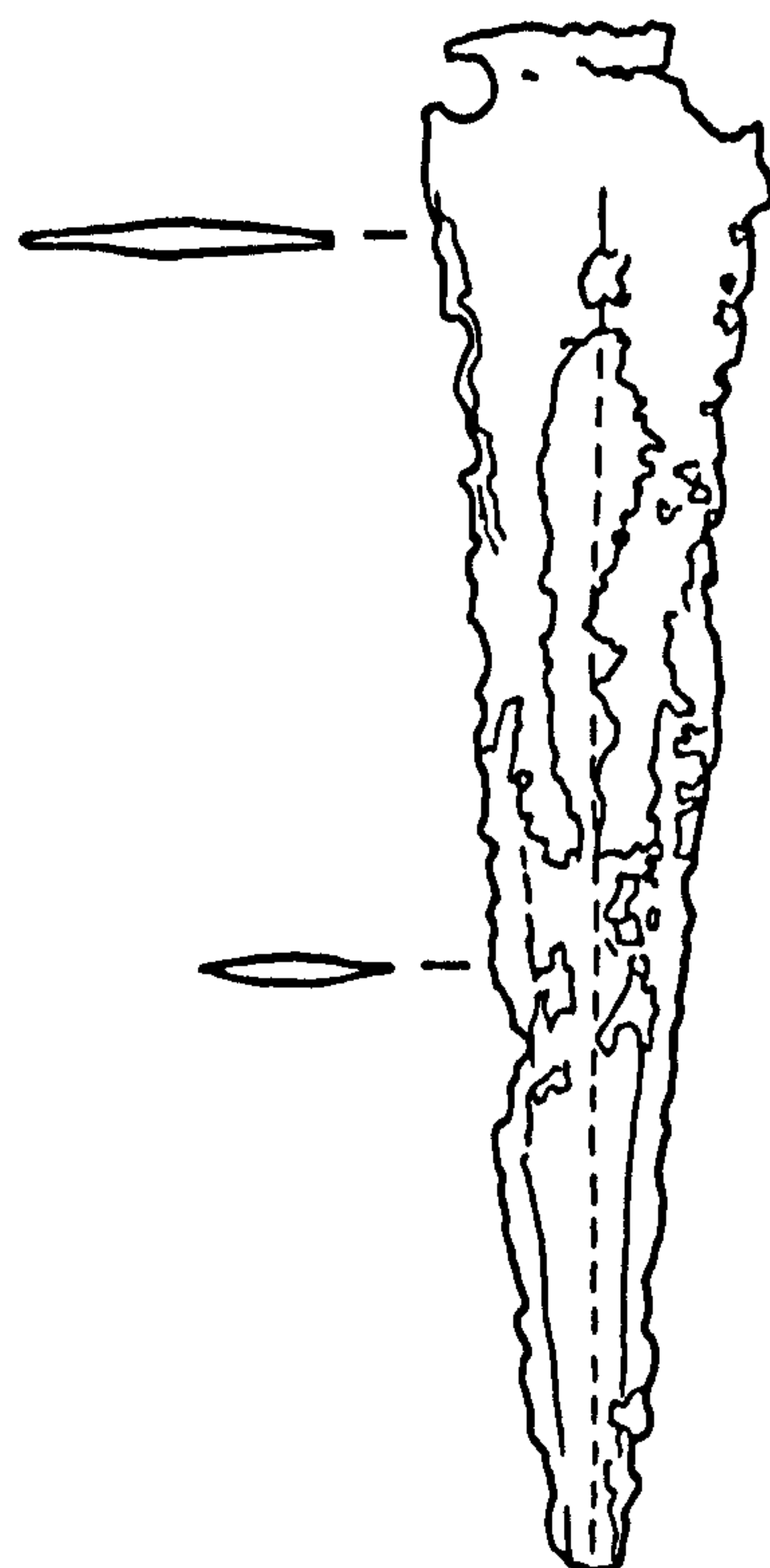
Fig. 51



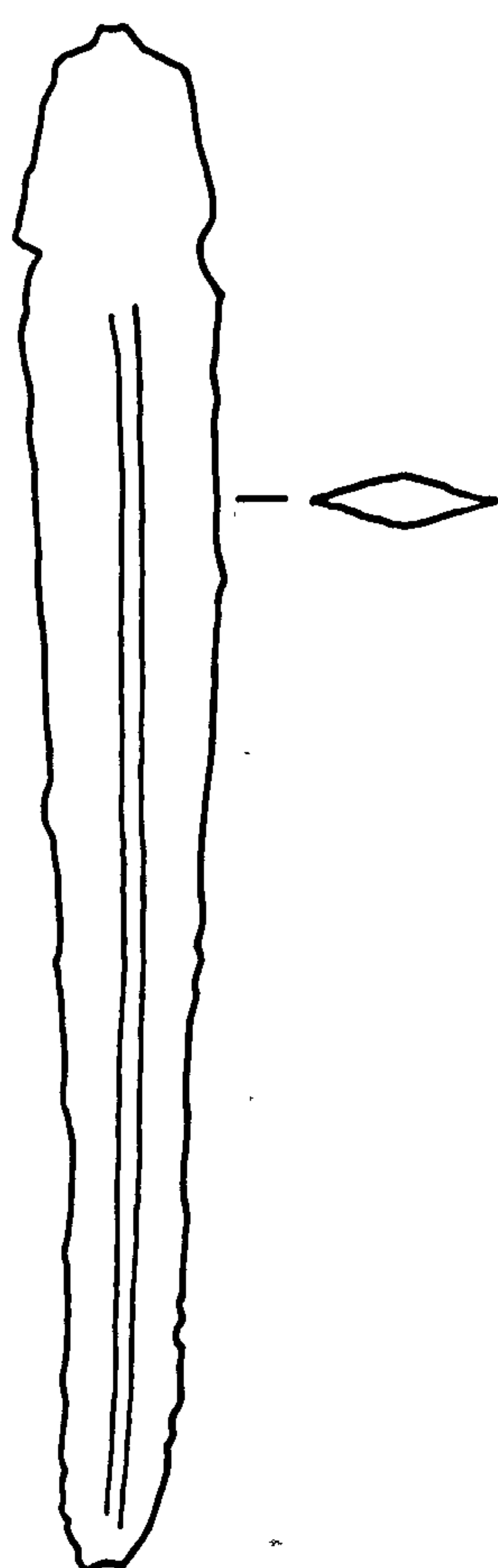
195



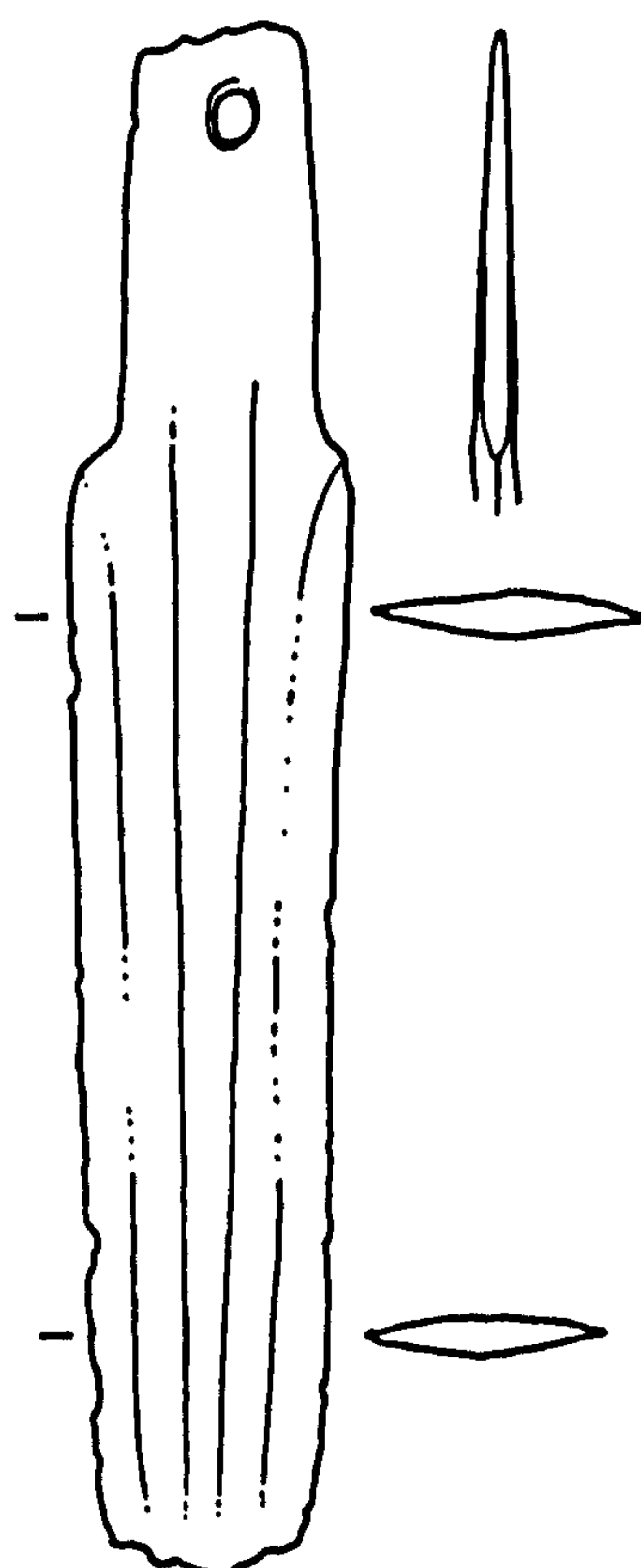
192



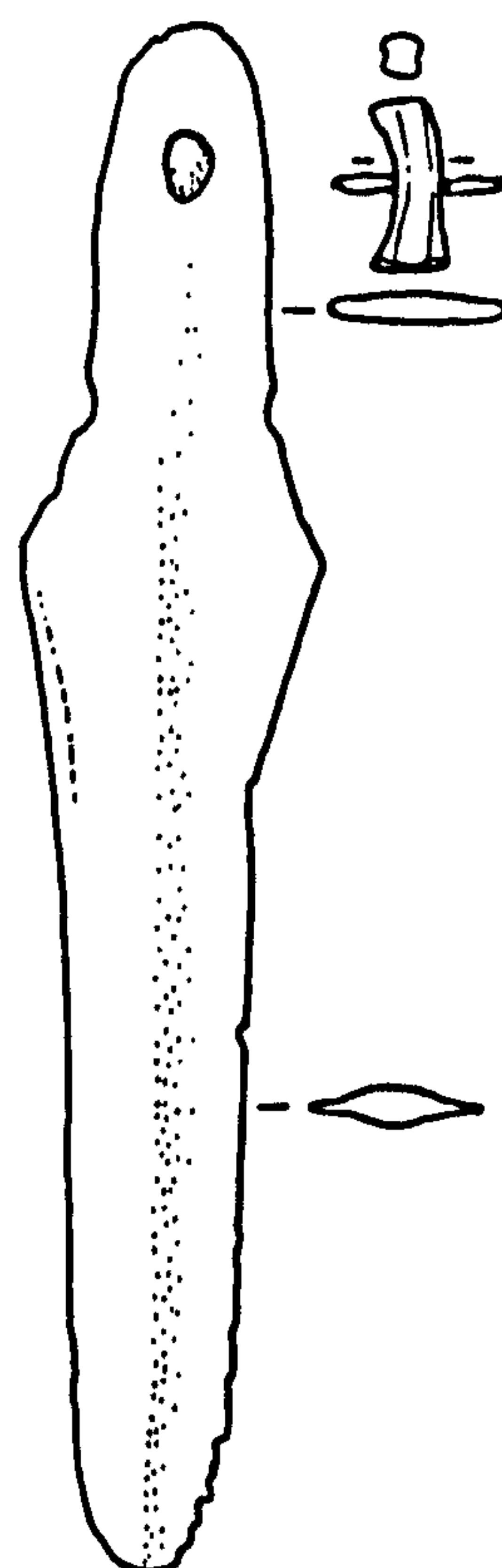
214



208



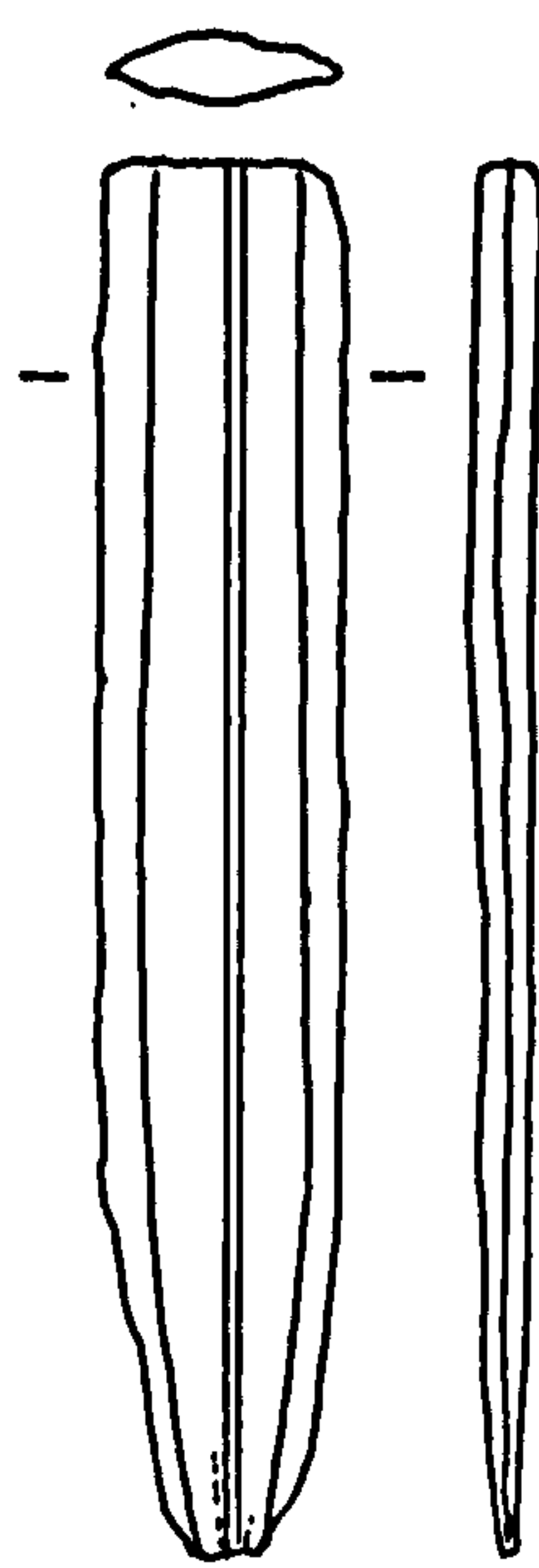
216



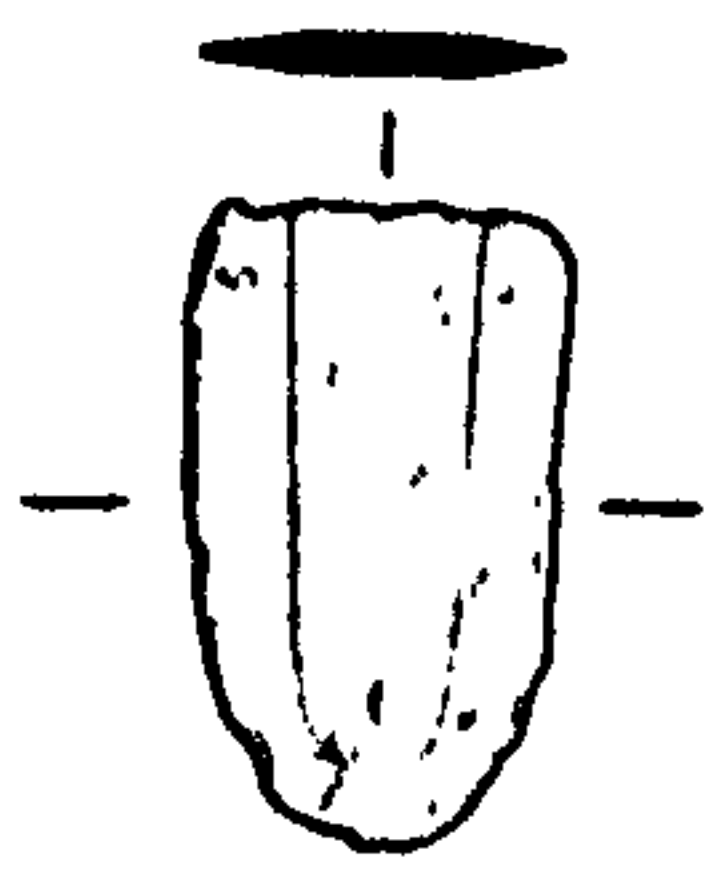
213



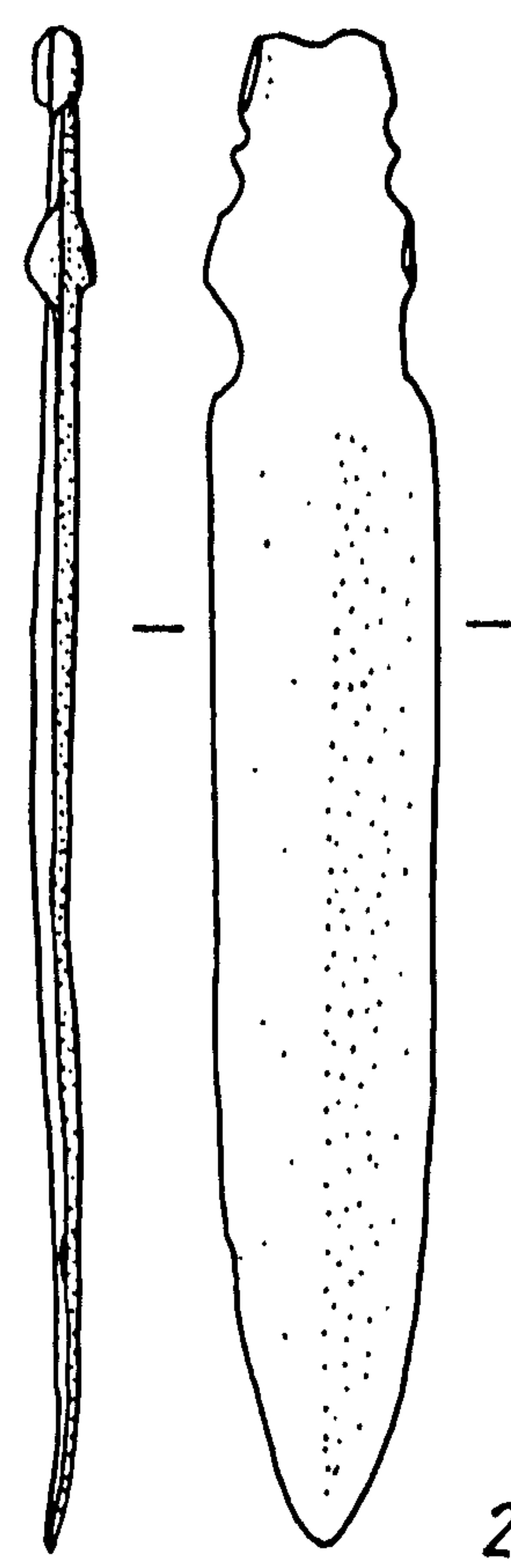
Fig. 52



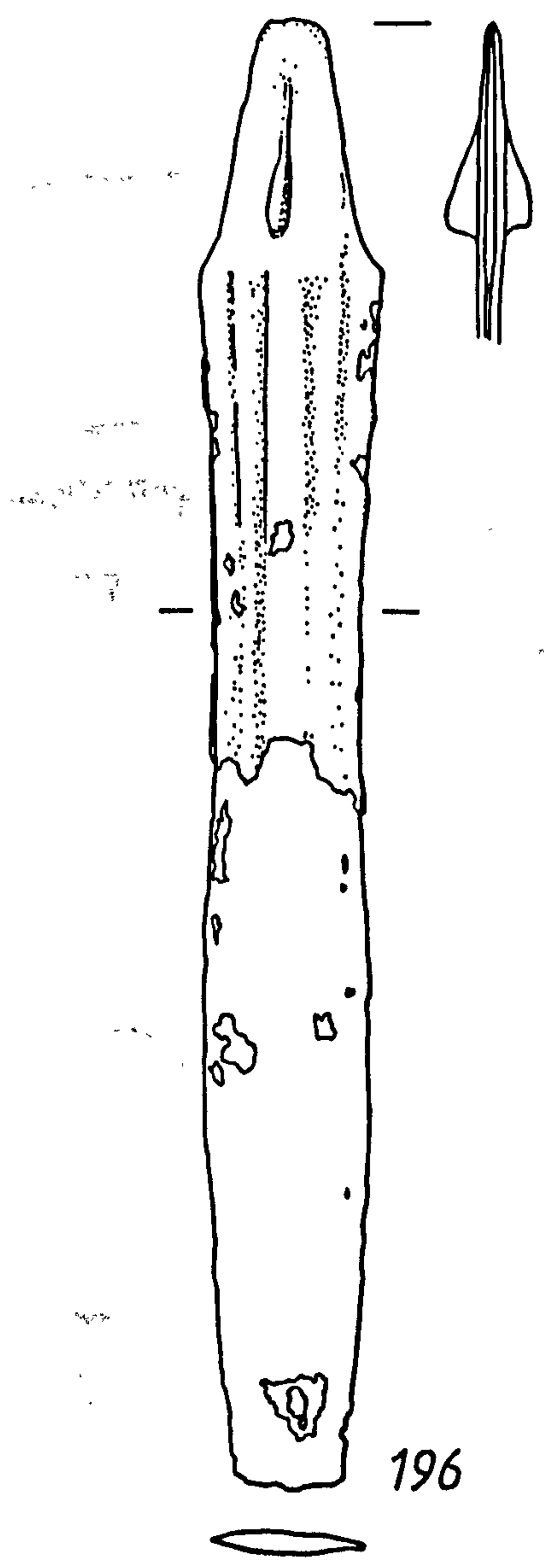
219



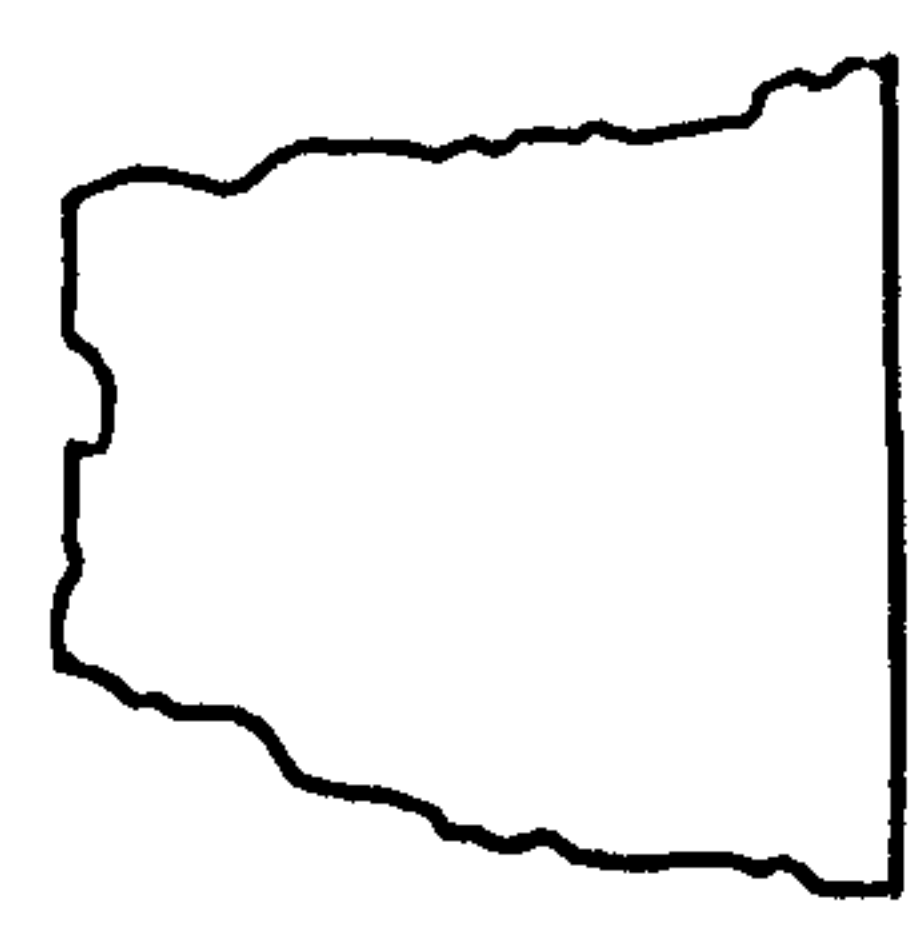
217



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228



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Fig. 53

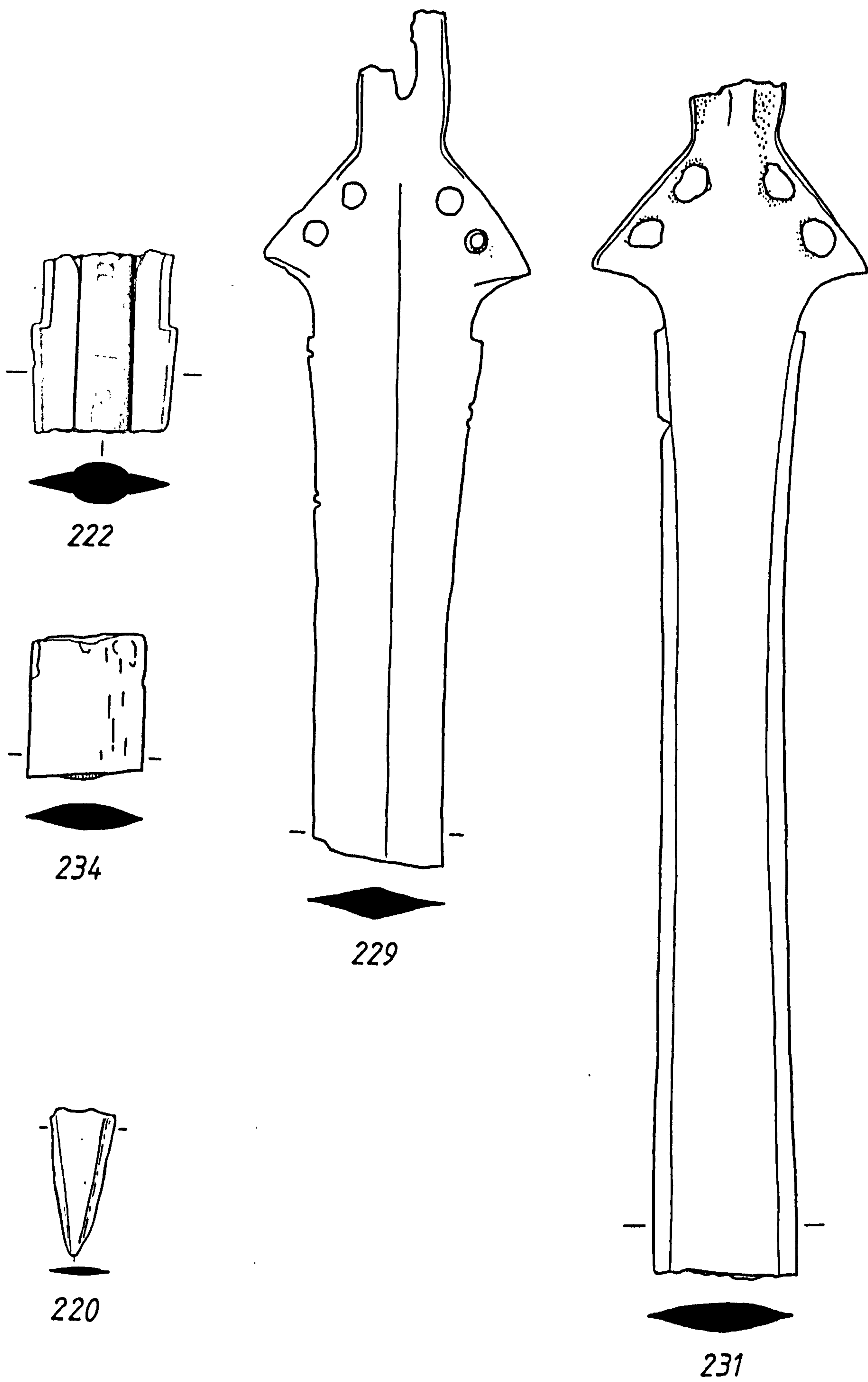


Fig. 54

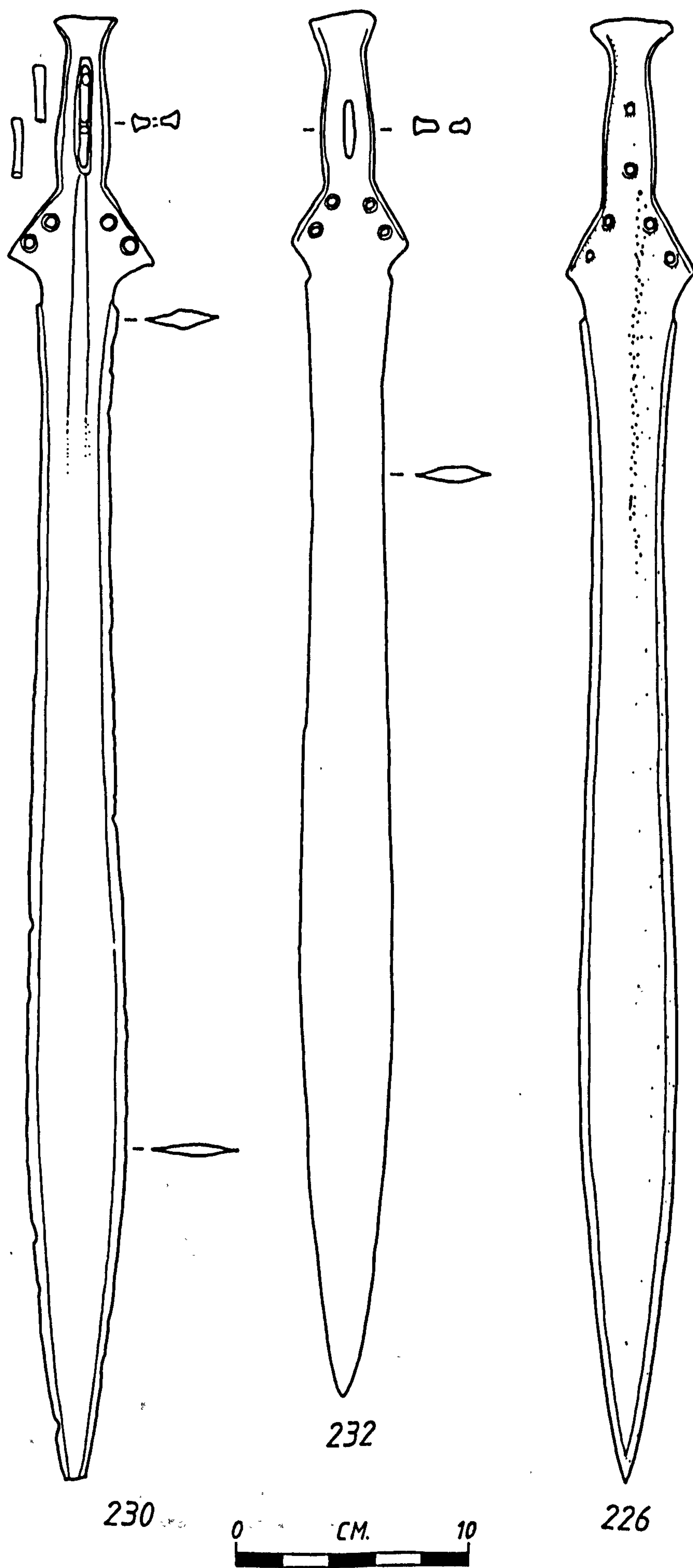


Fig. 55

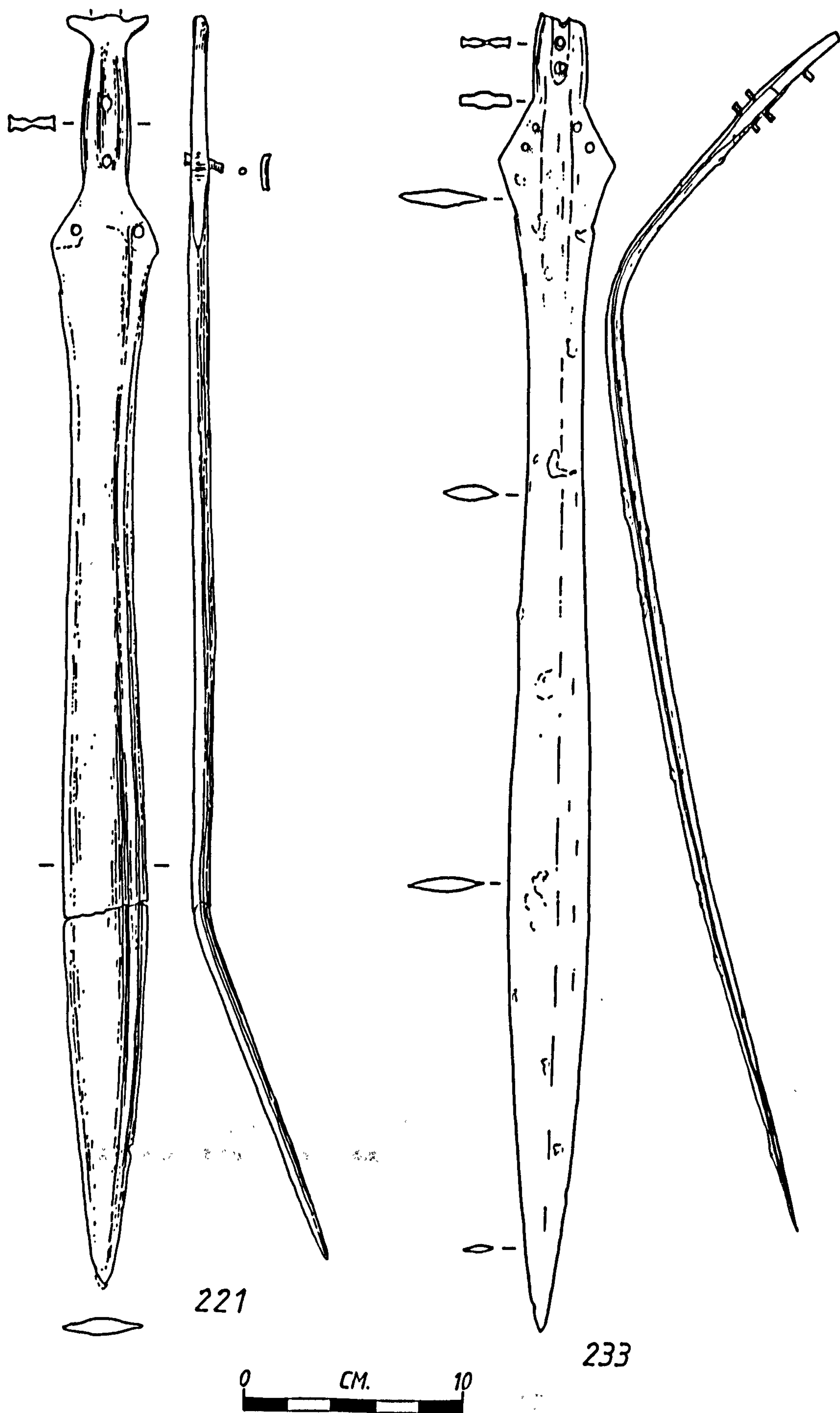


Fig. 56

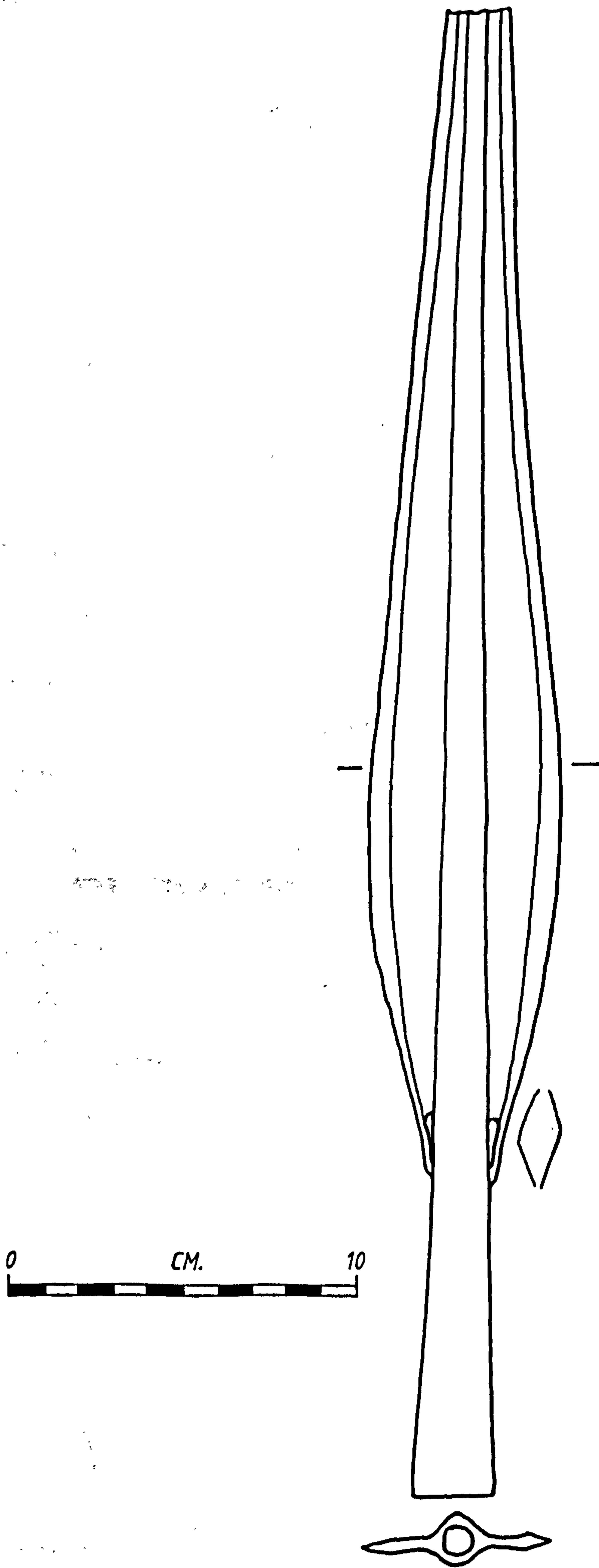
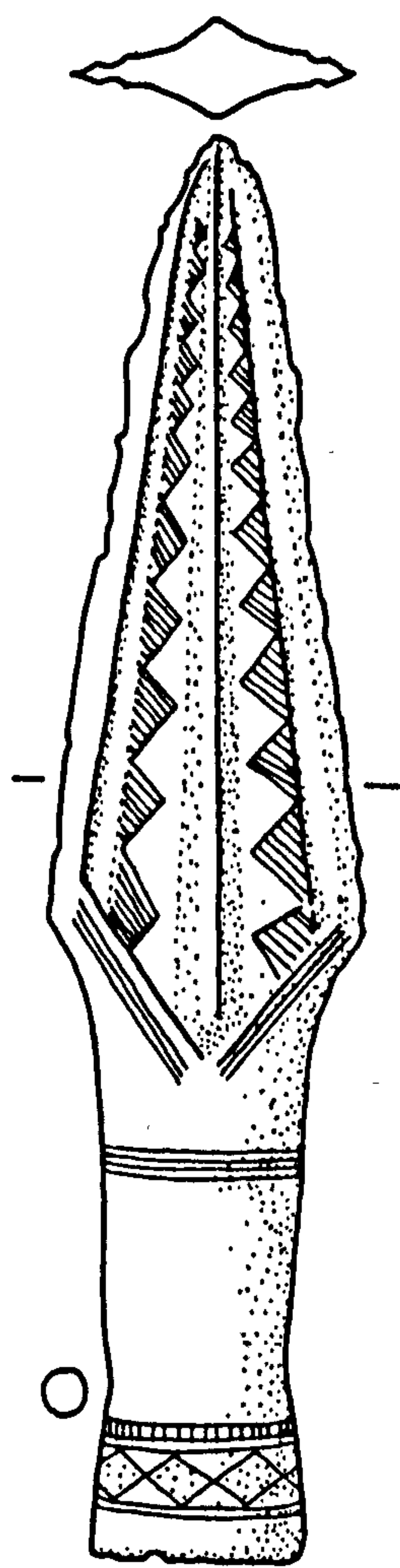
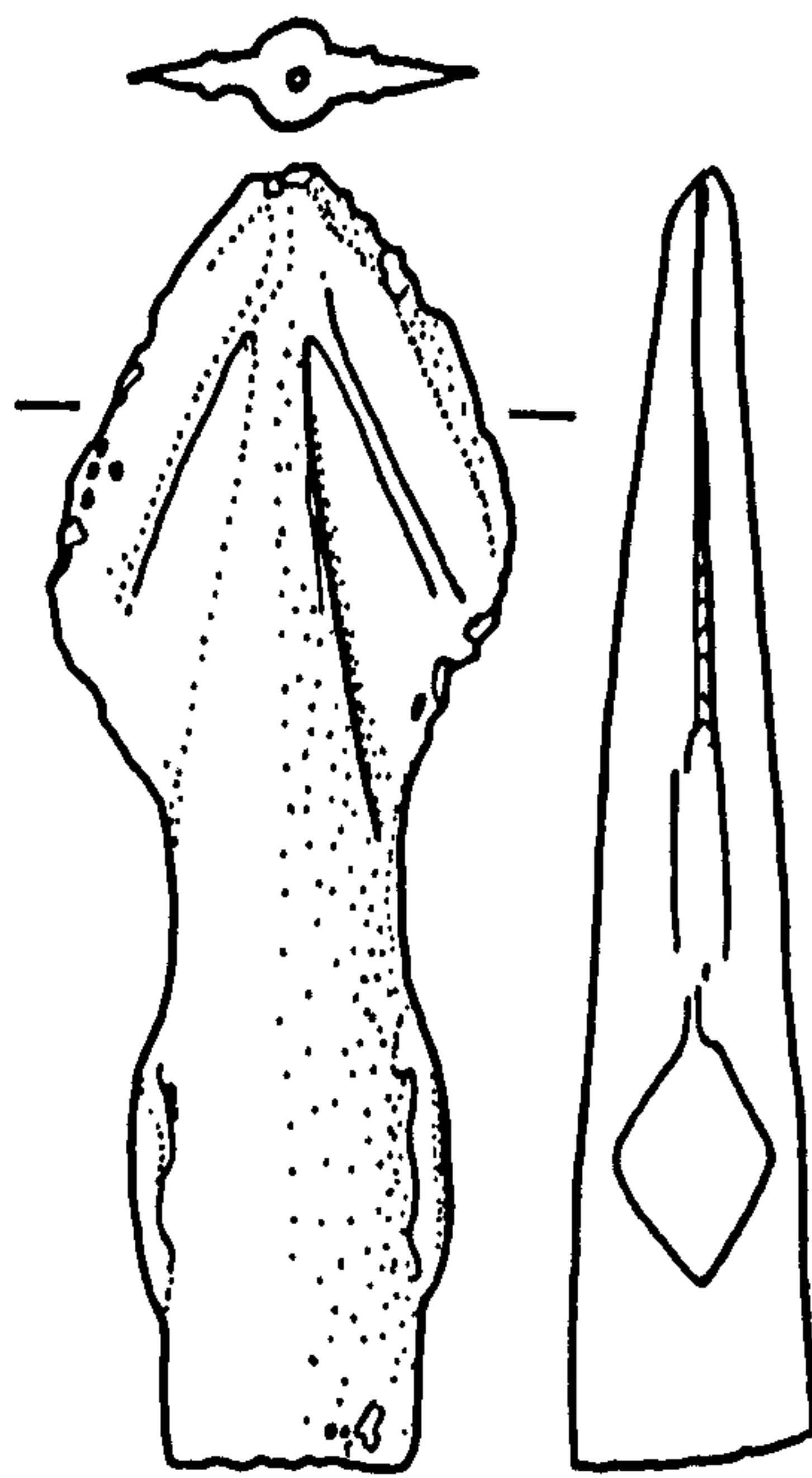


Fig. 57

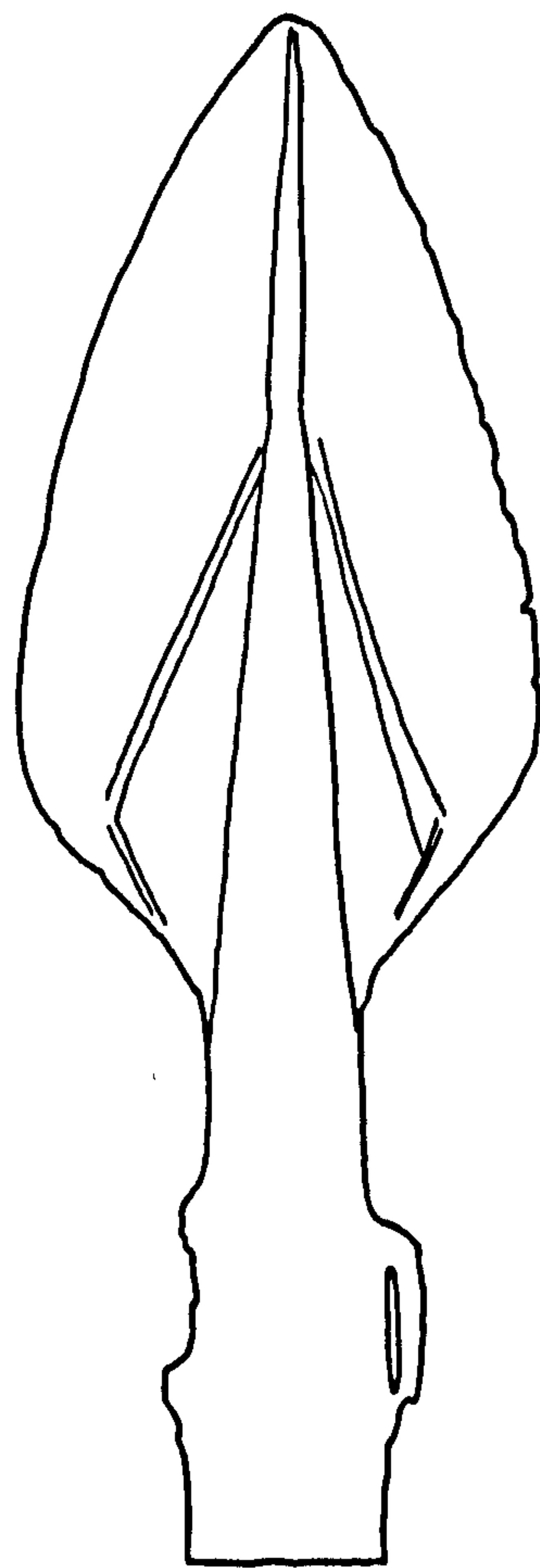
256



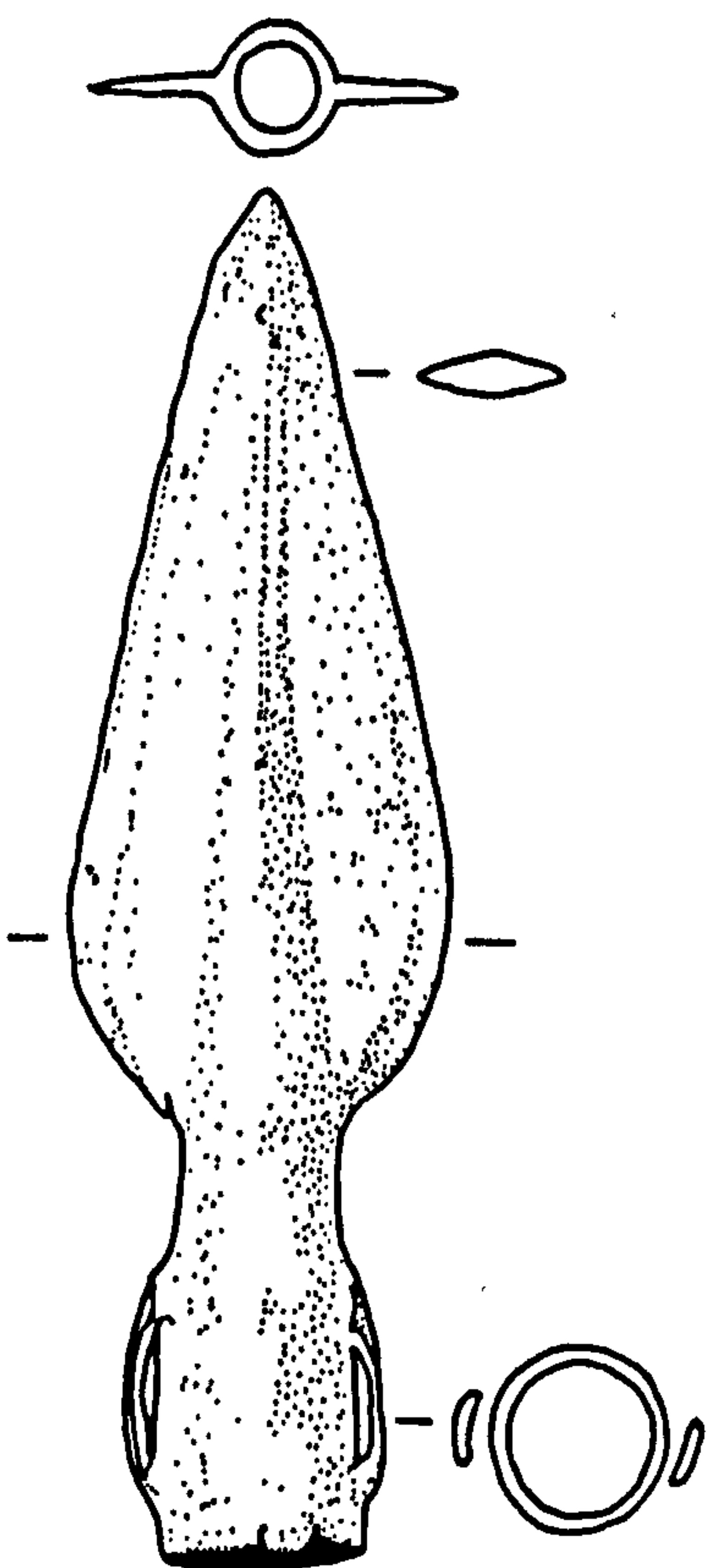
239



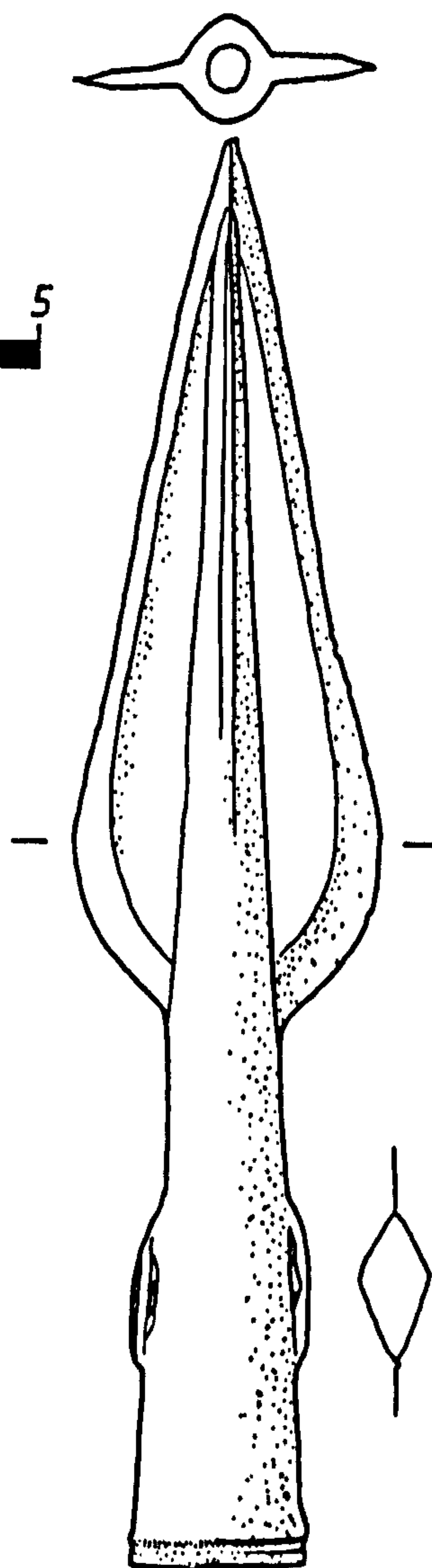
240



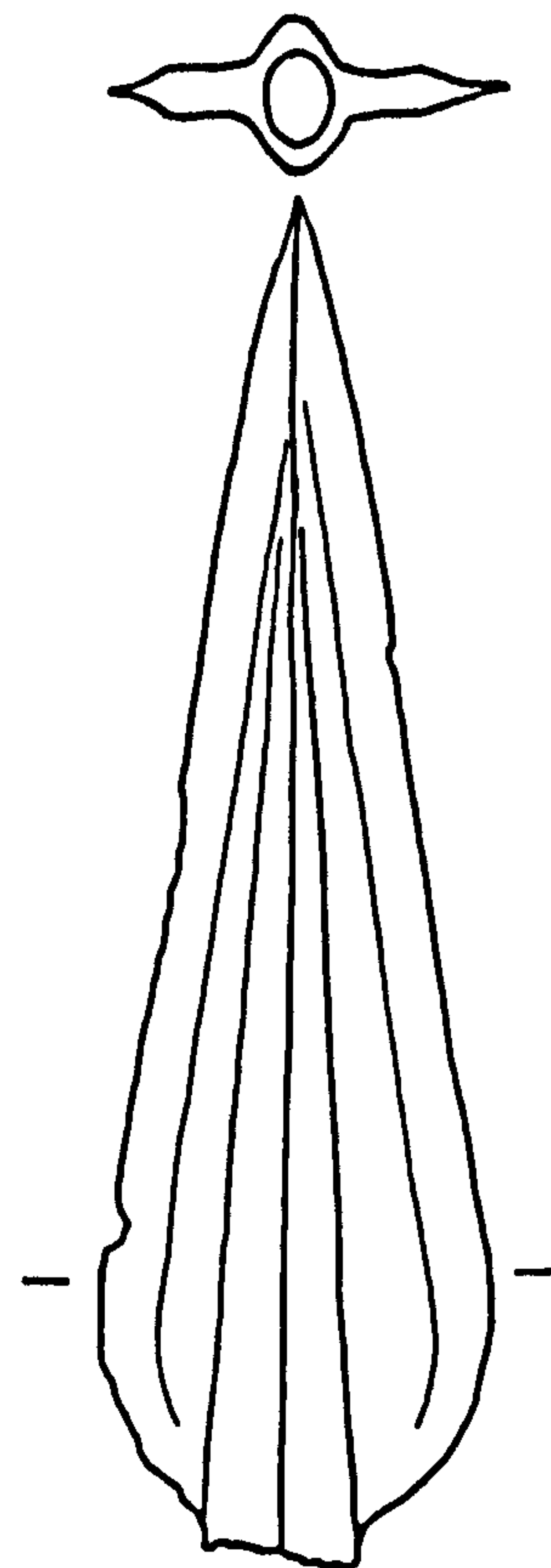
241



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Fig. 58

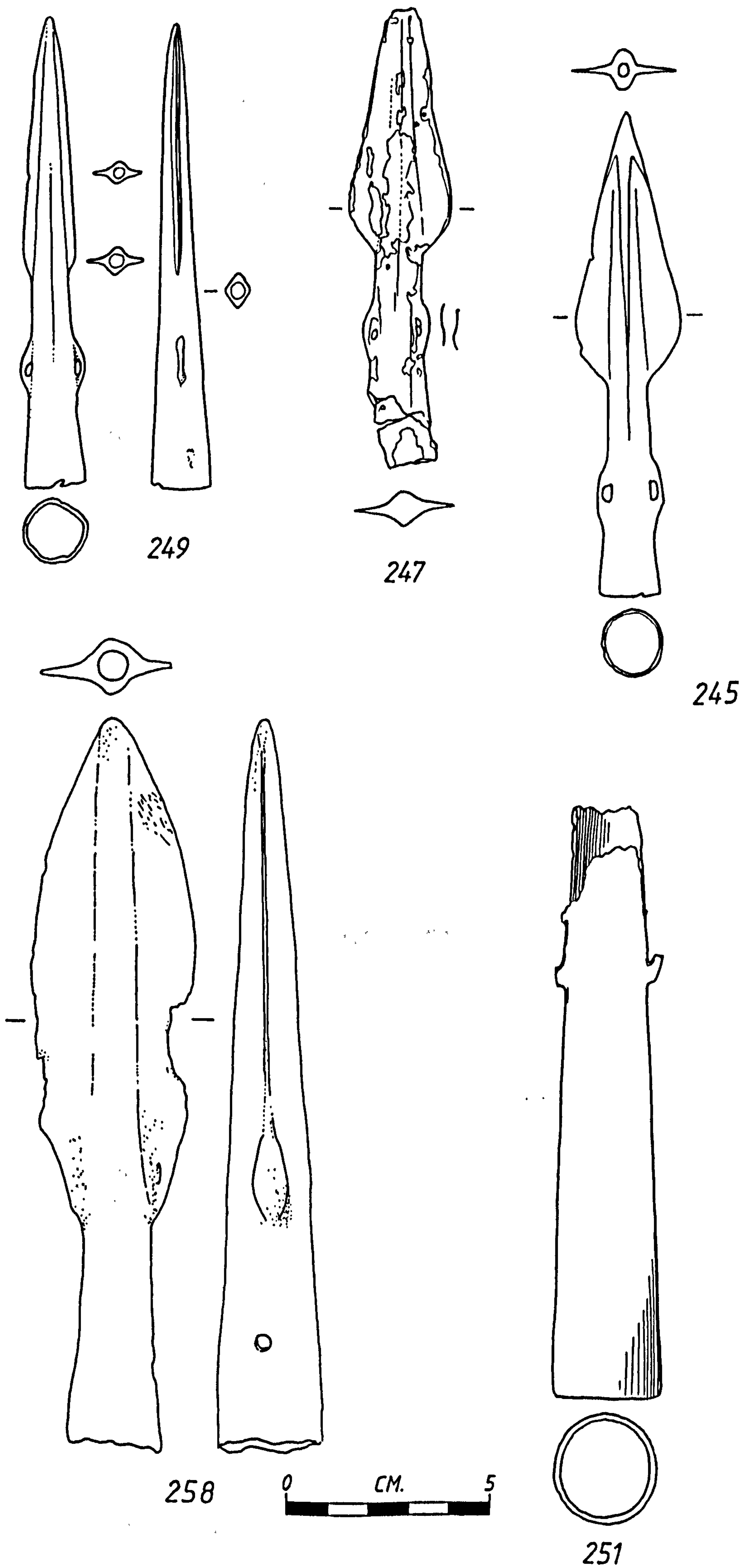


Fig. 59

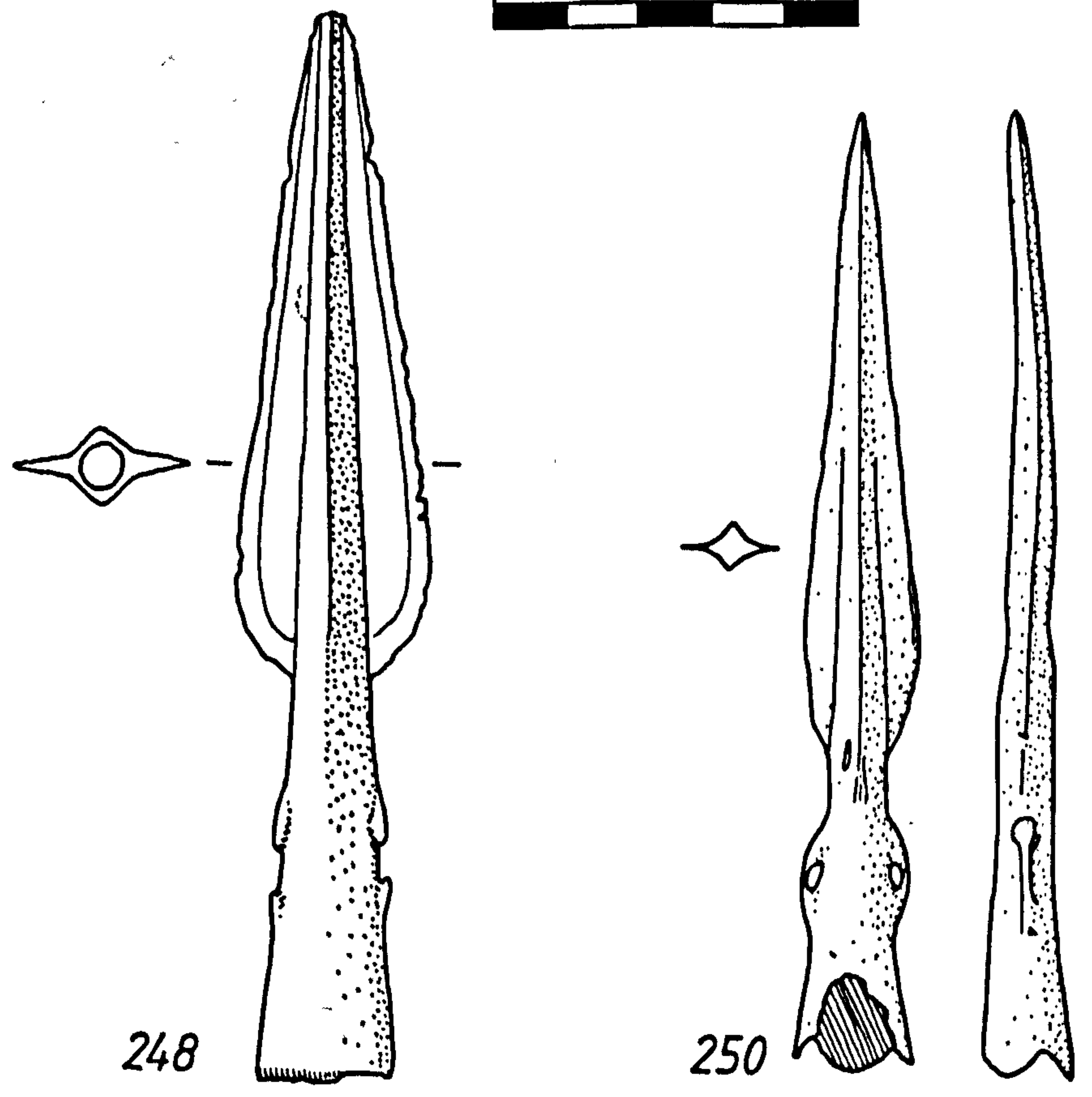
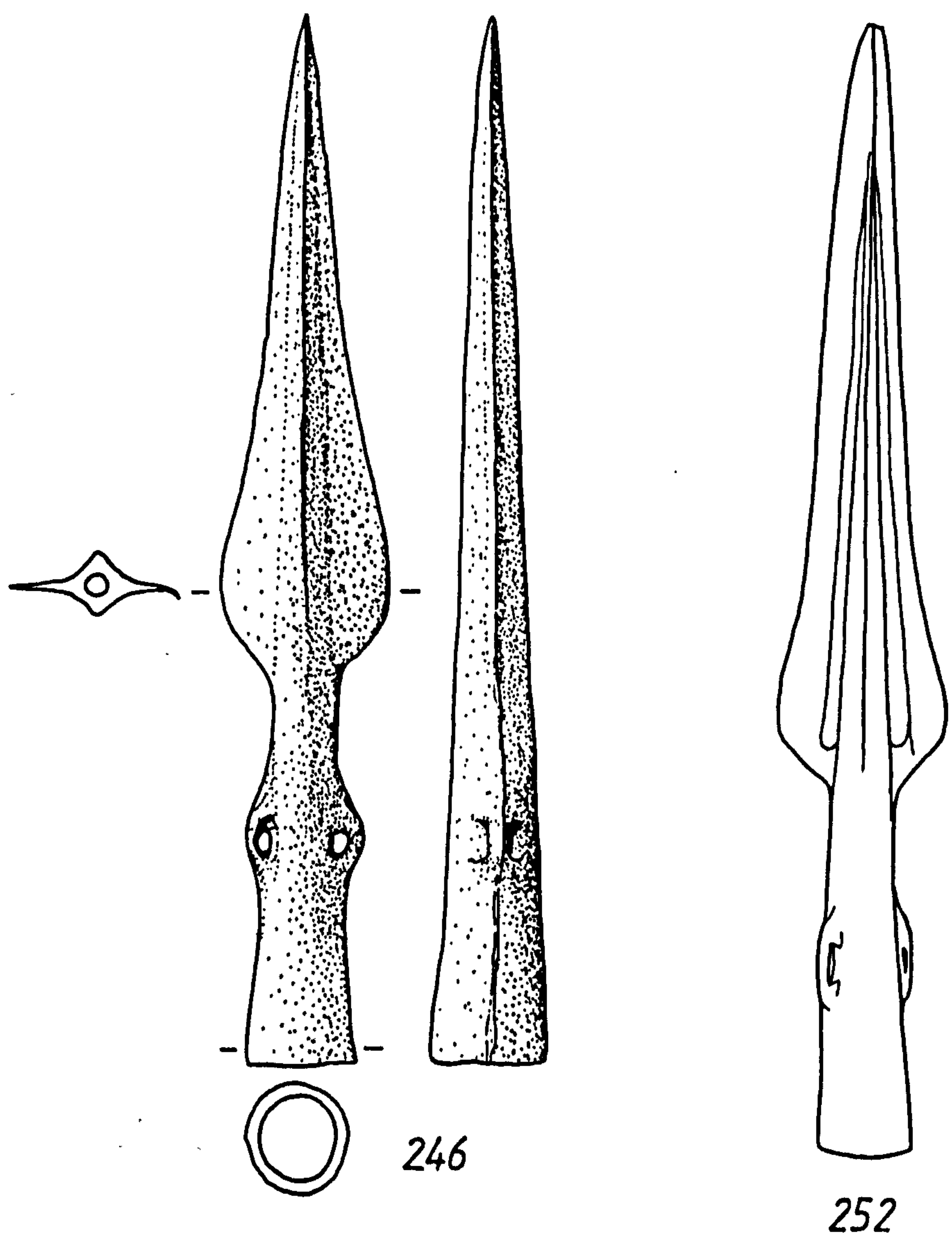


Fig. 60

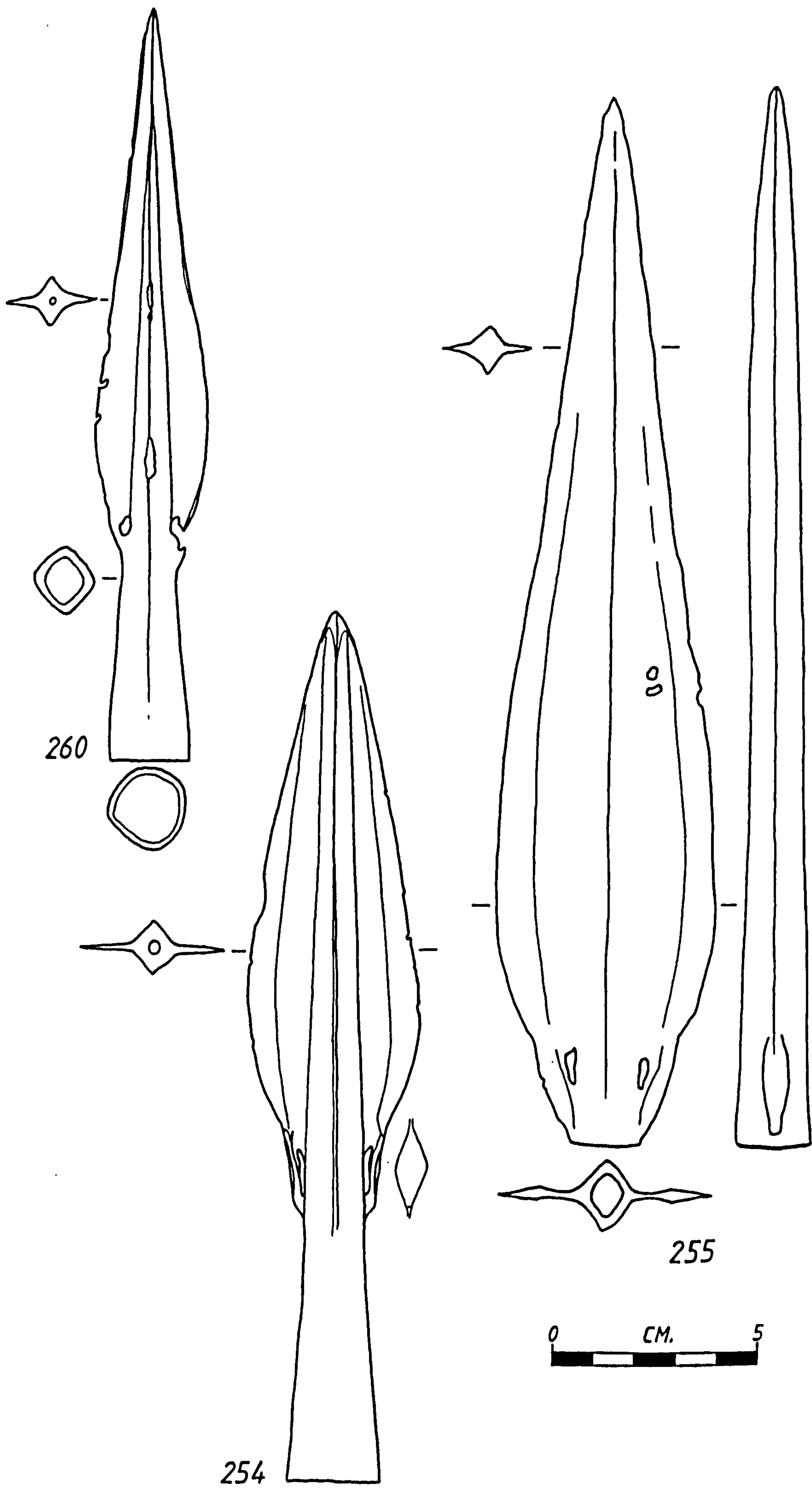
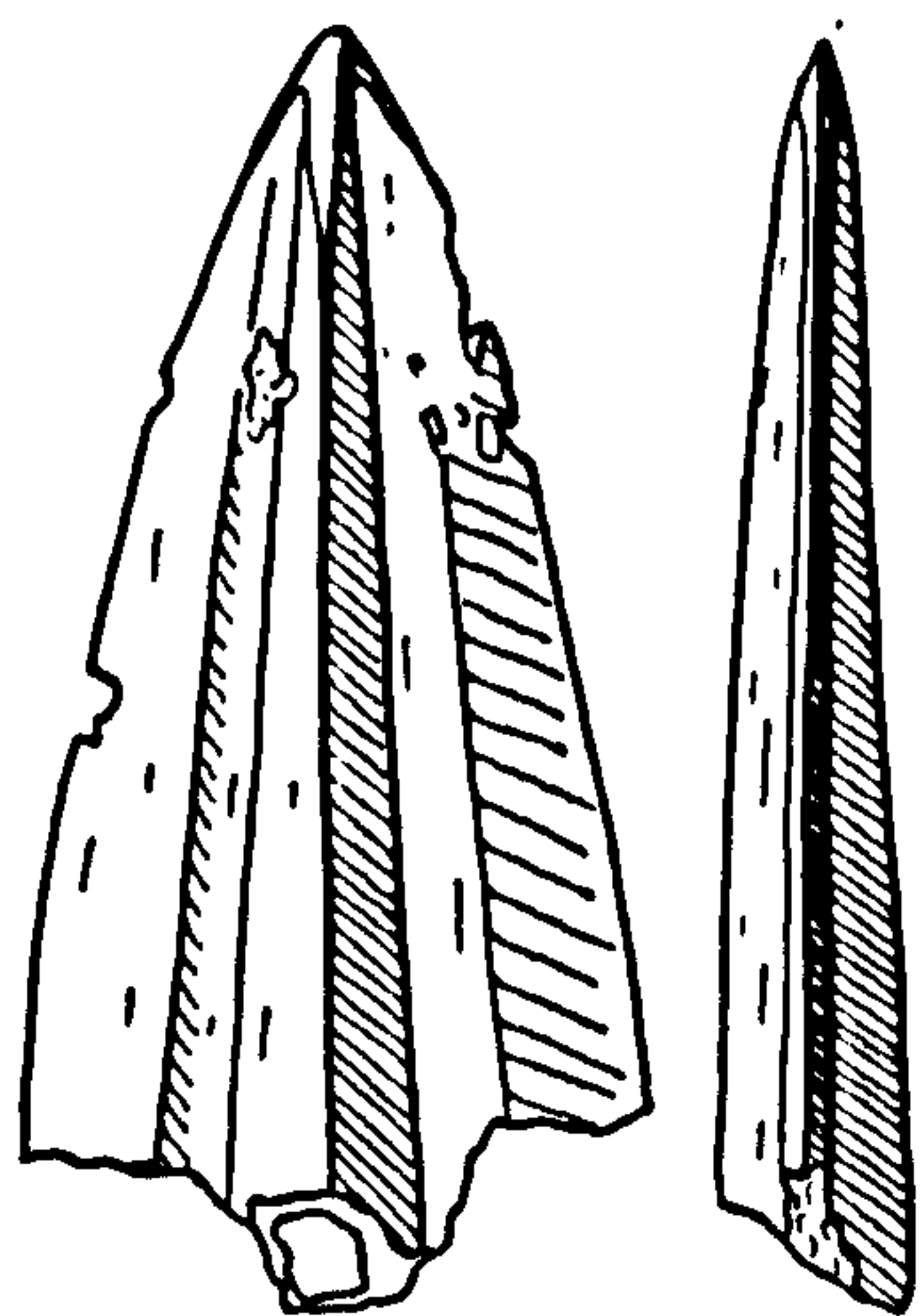


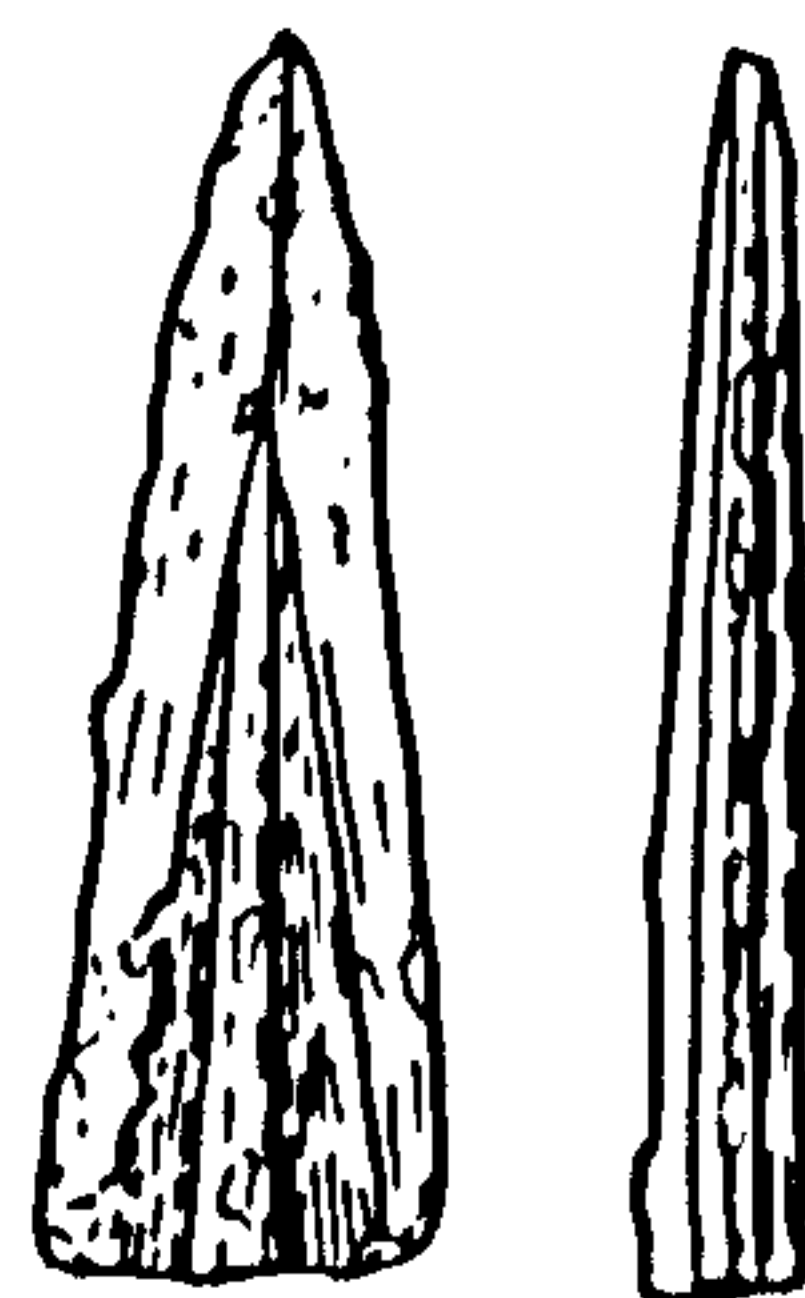
Fig. 61



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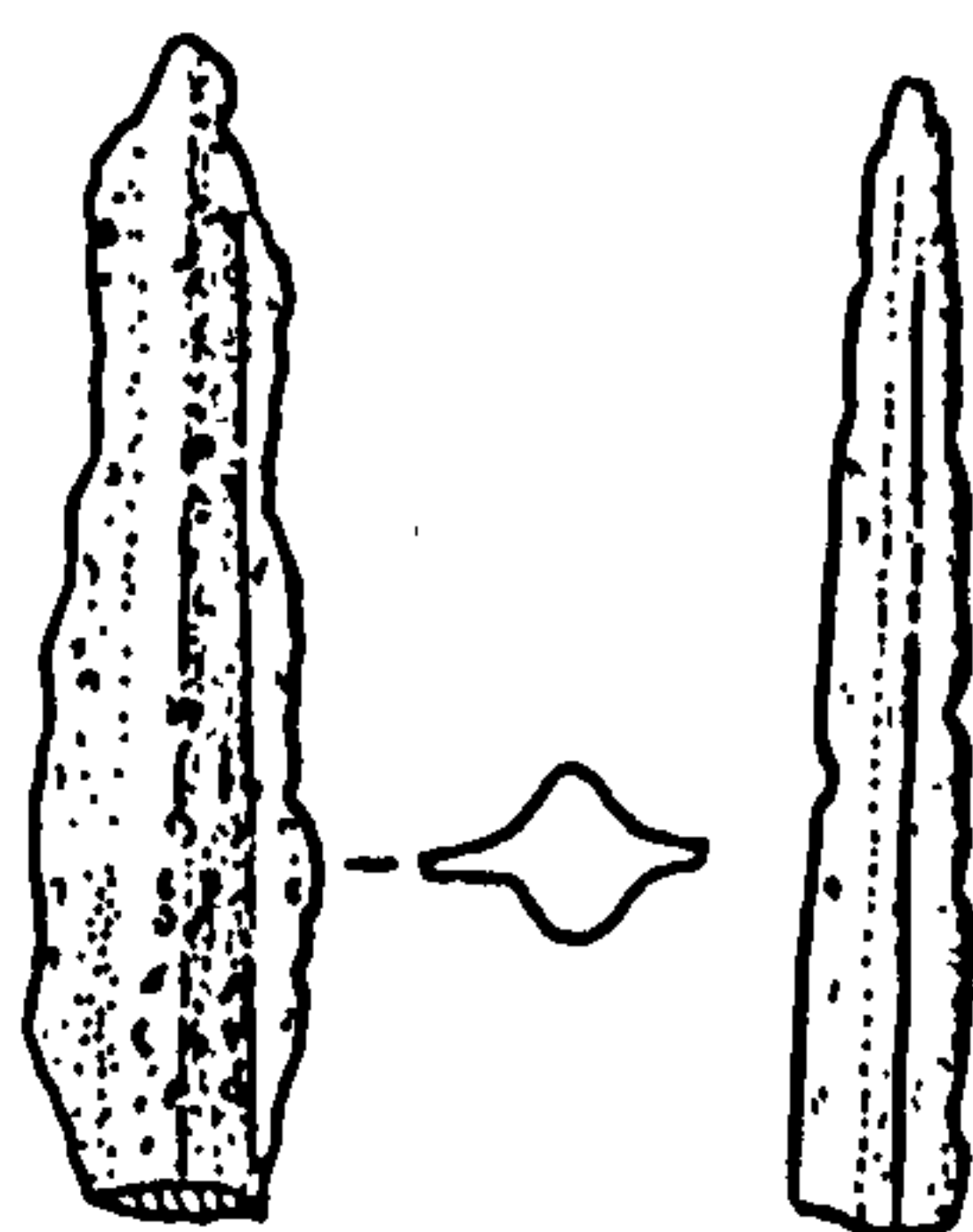
264



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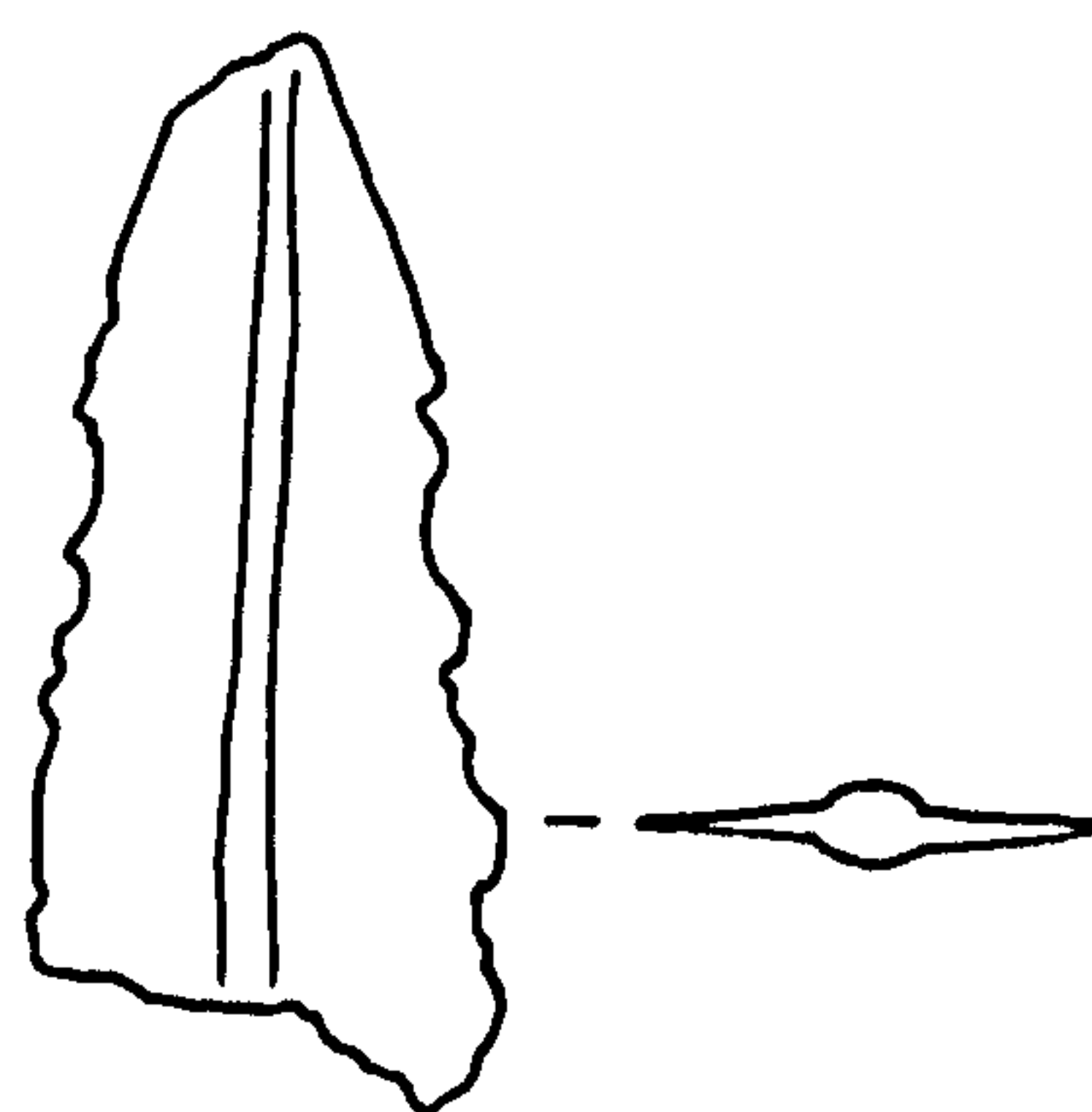
278



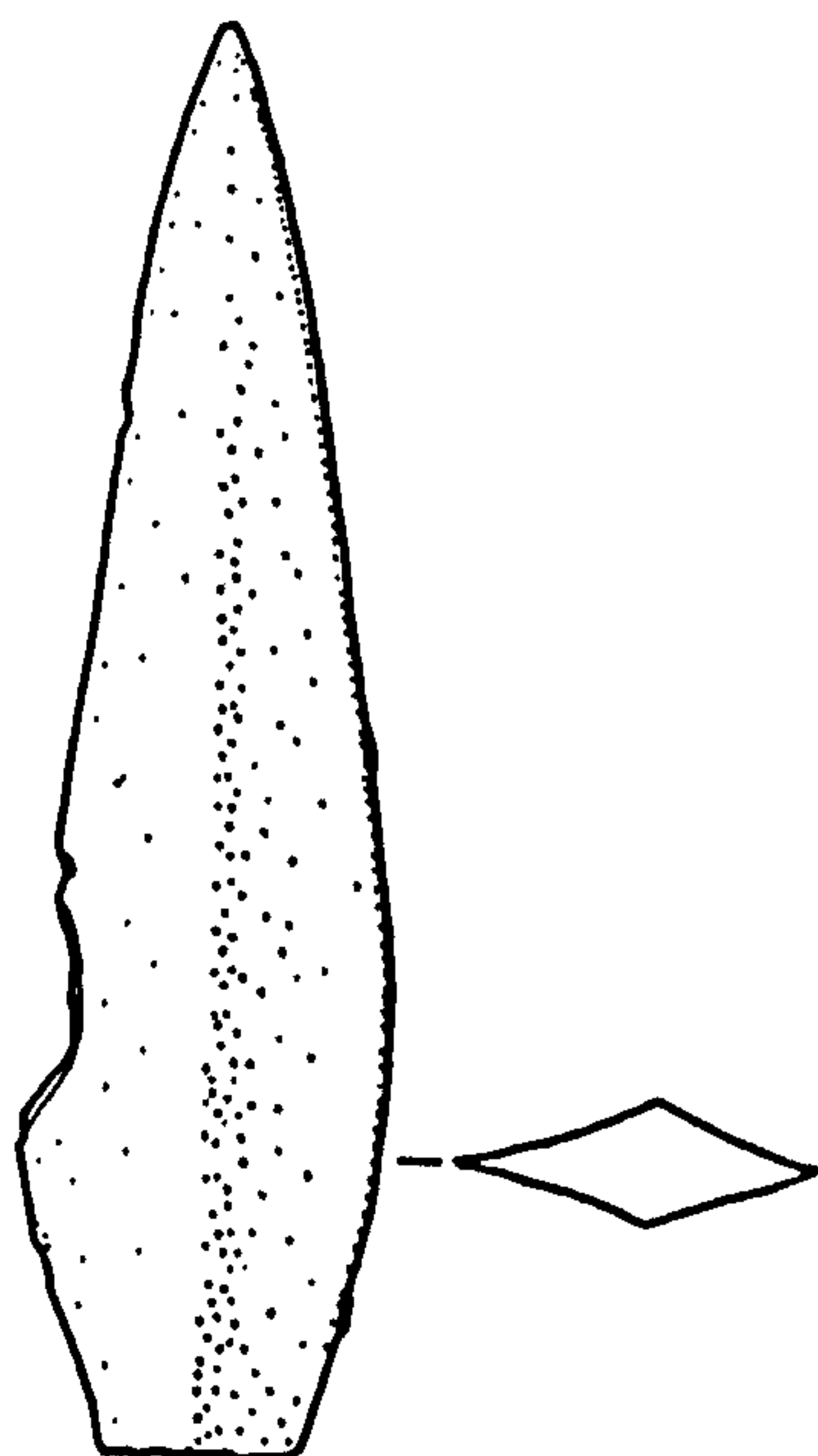
237



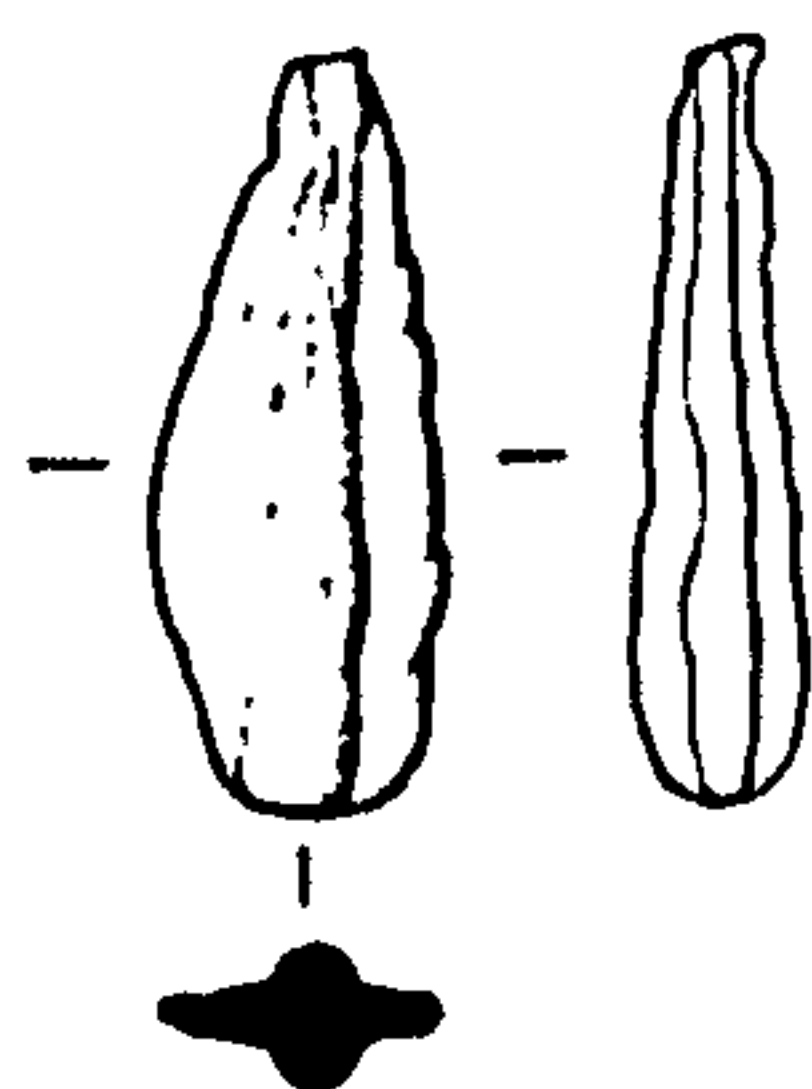
263



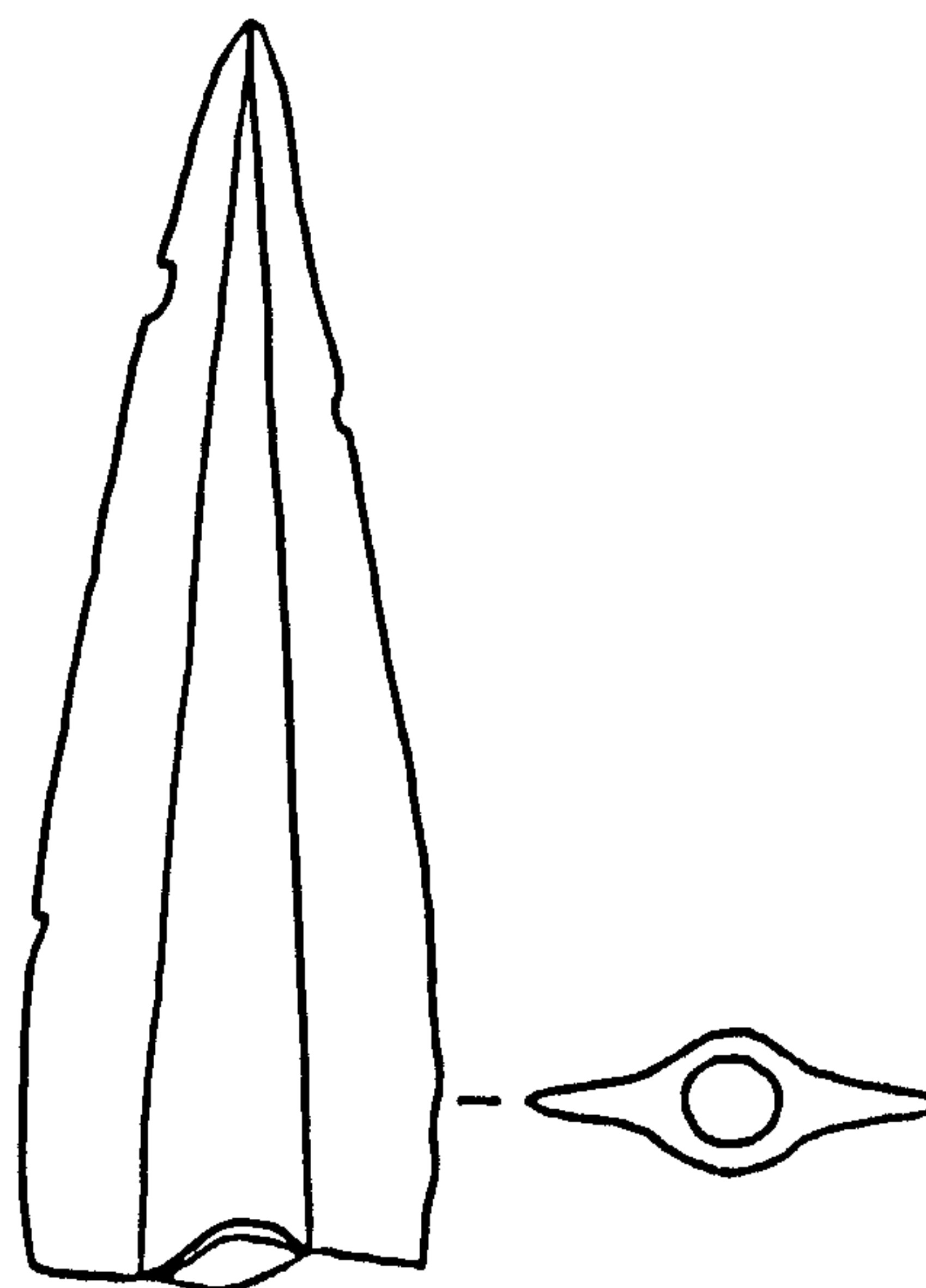
235



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Fig. 62

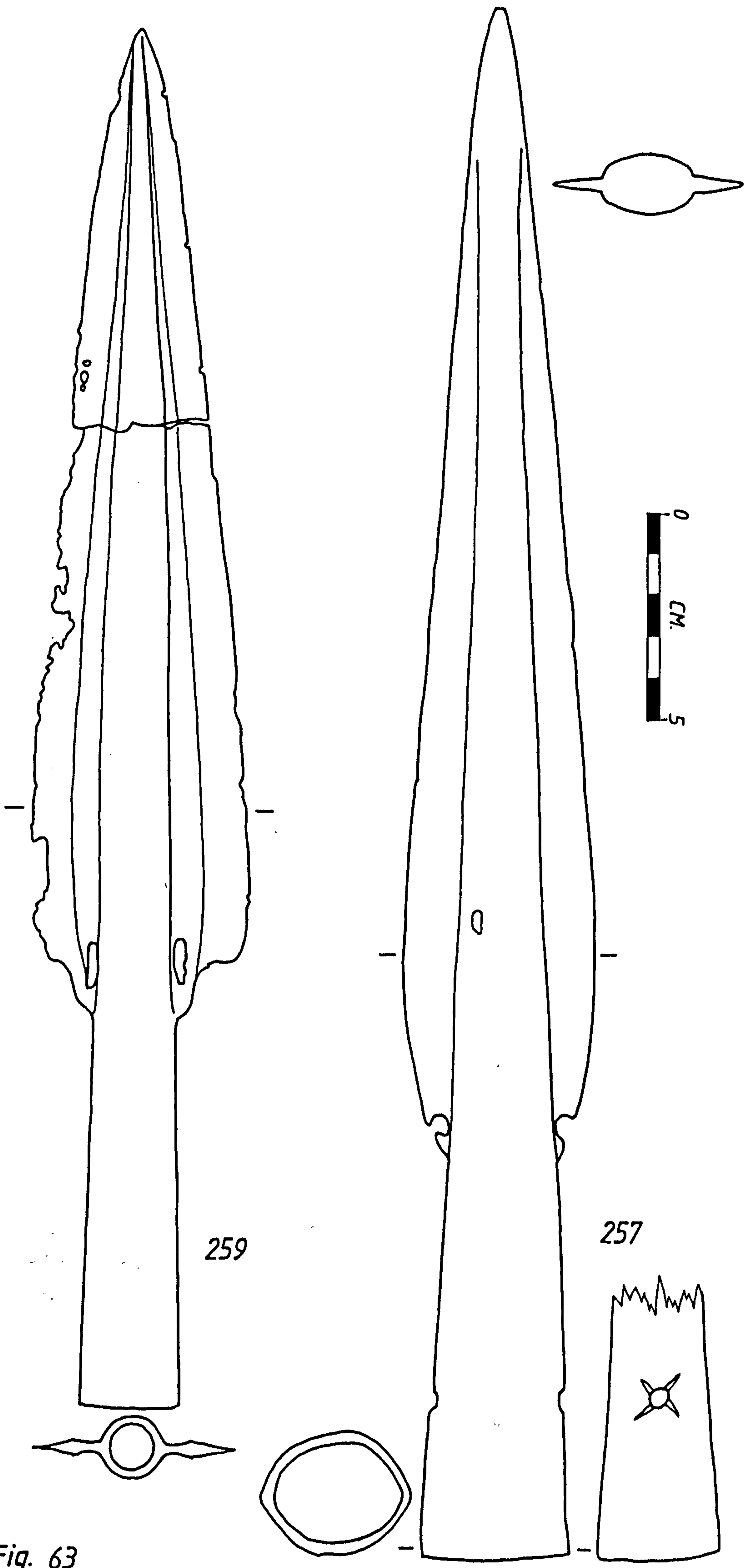
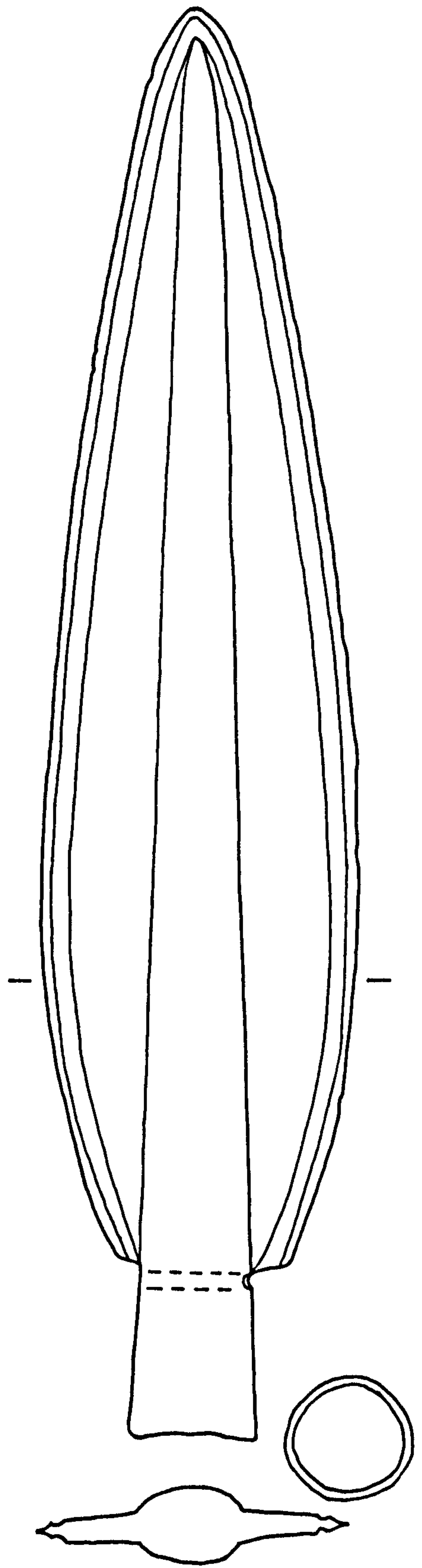


Fig. 63



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Fig. 64

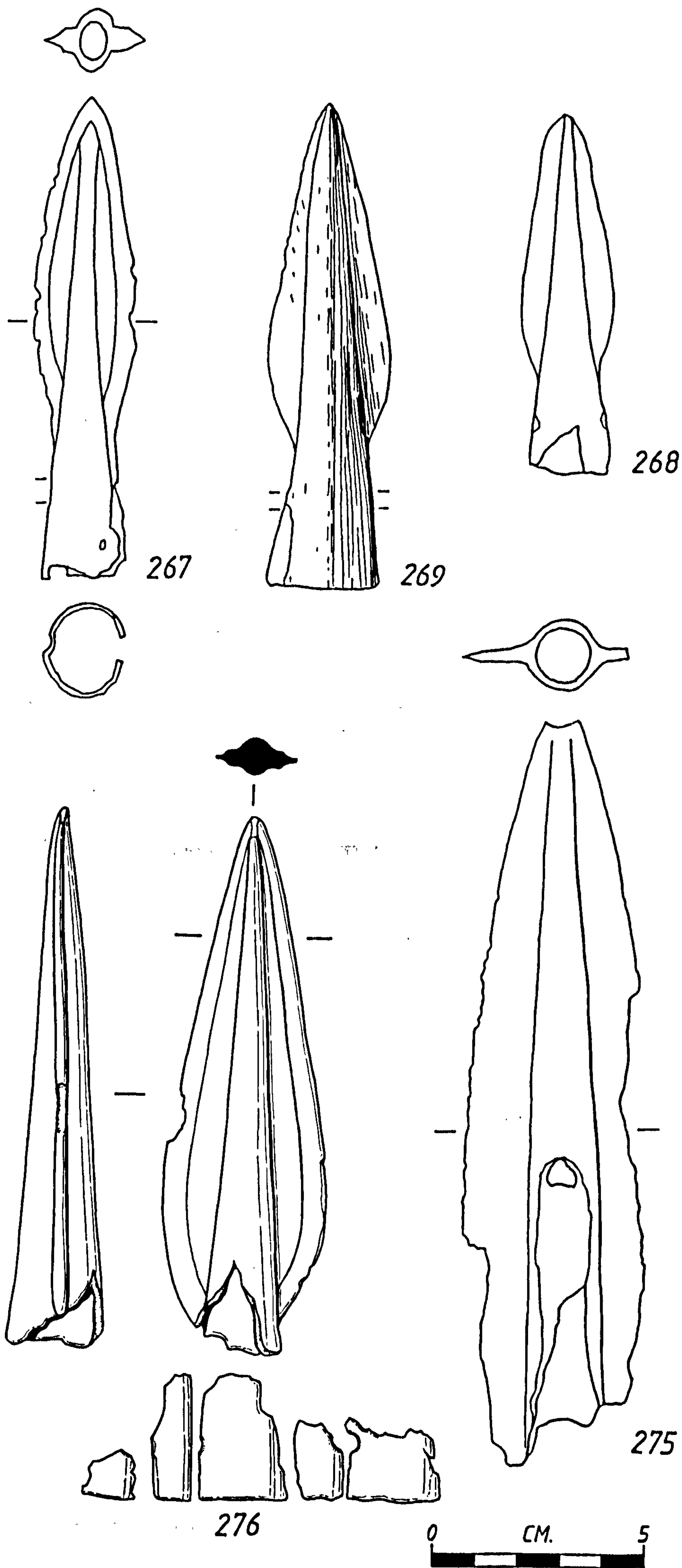


Fig. 65

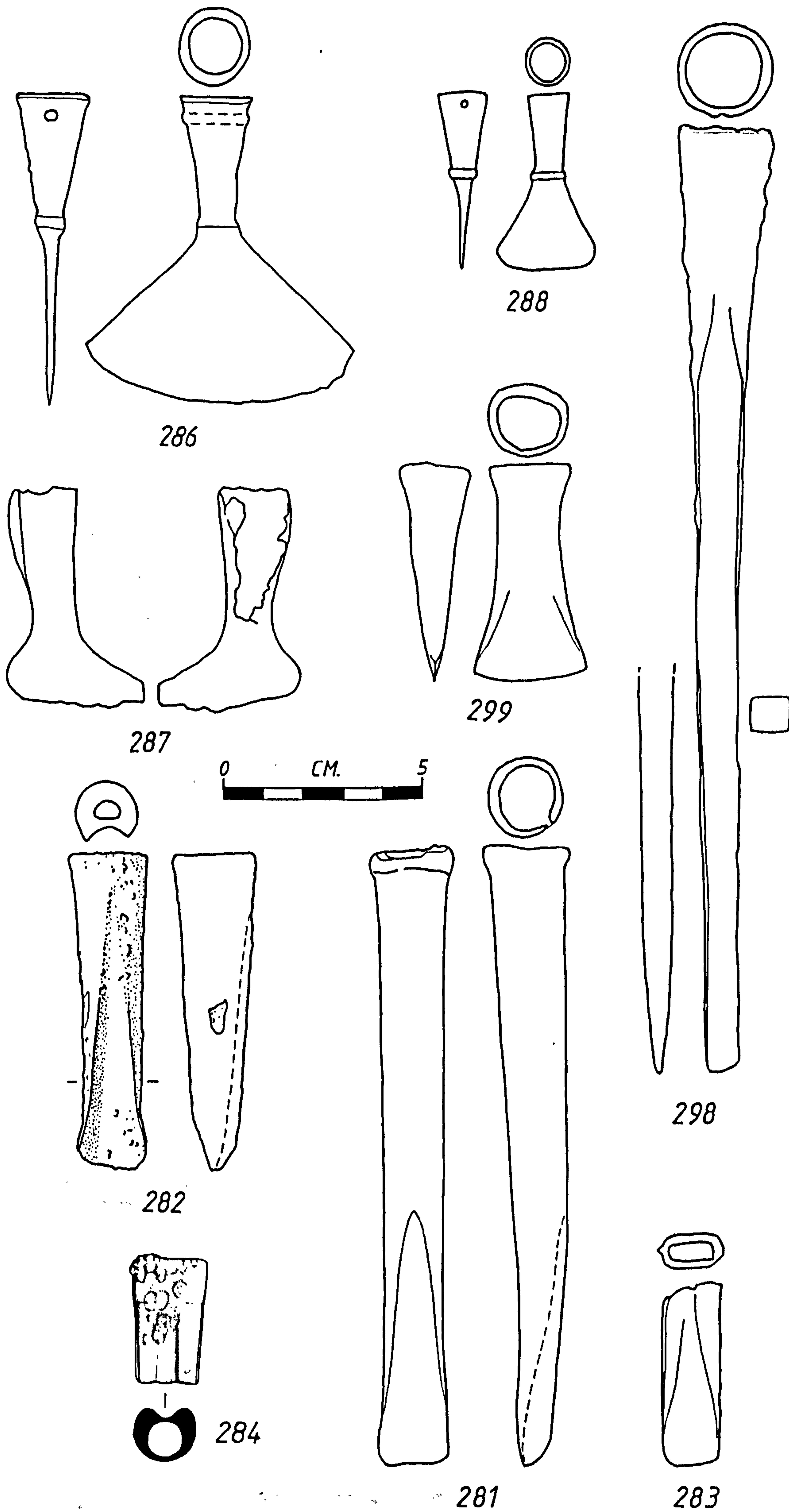


Fig. 66

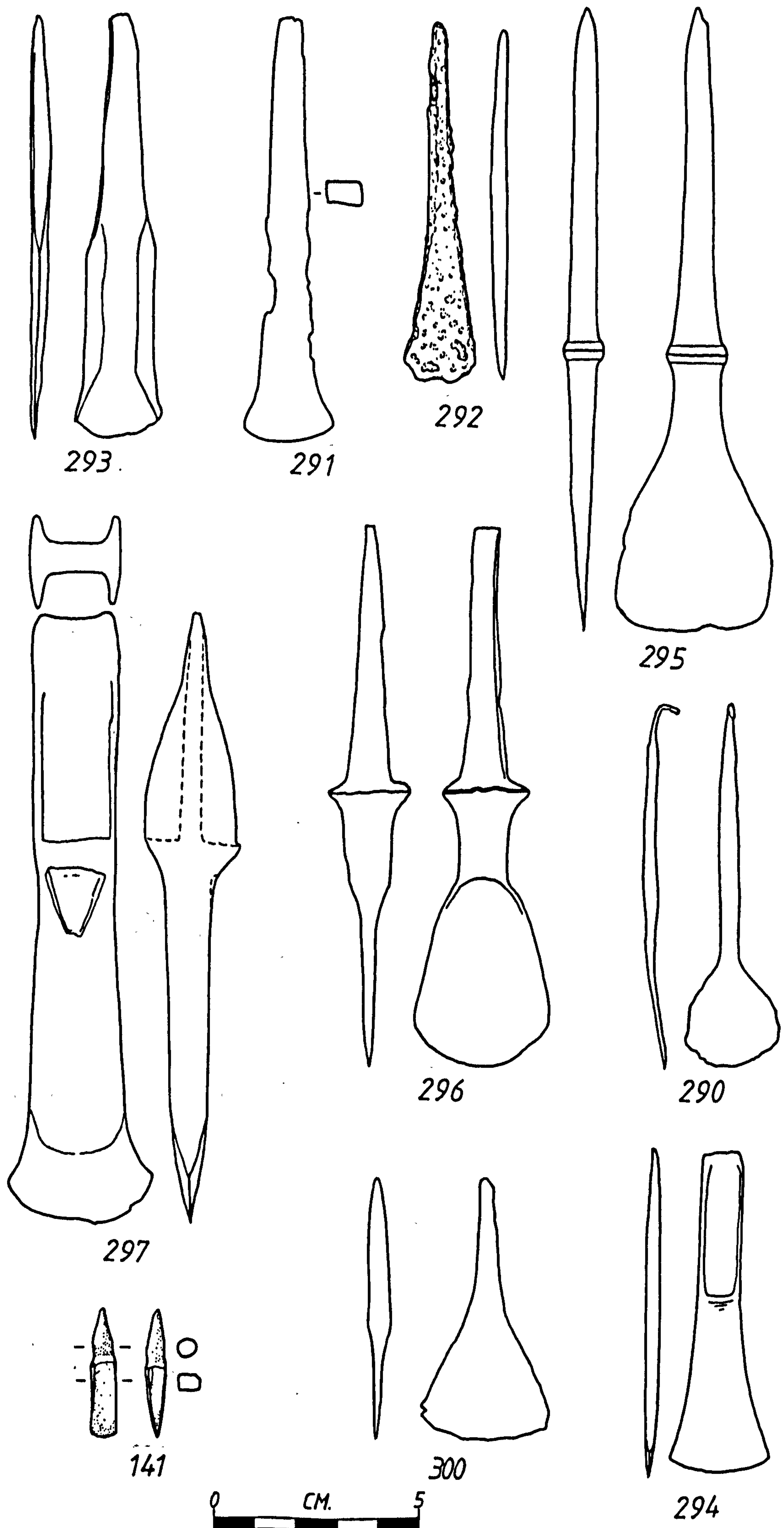


Fig. 67

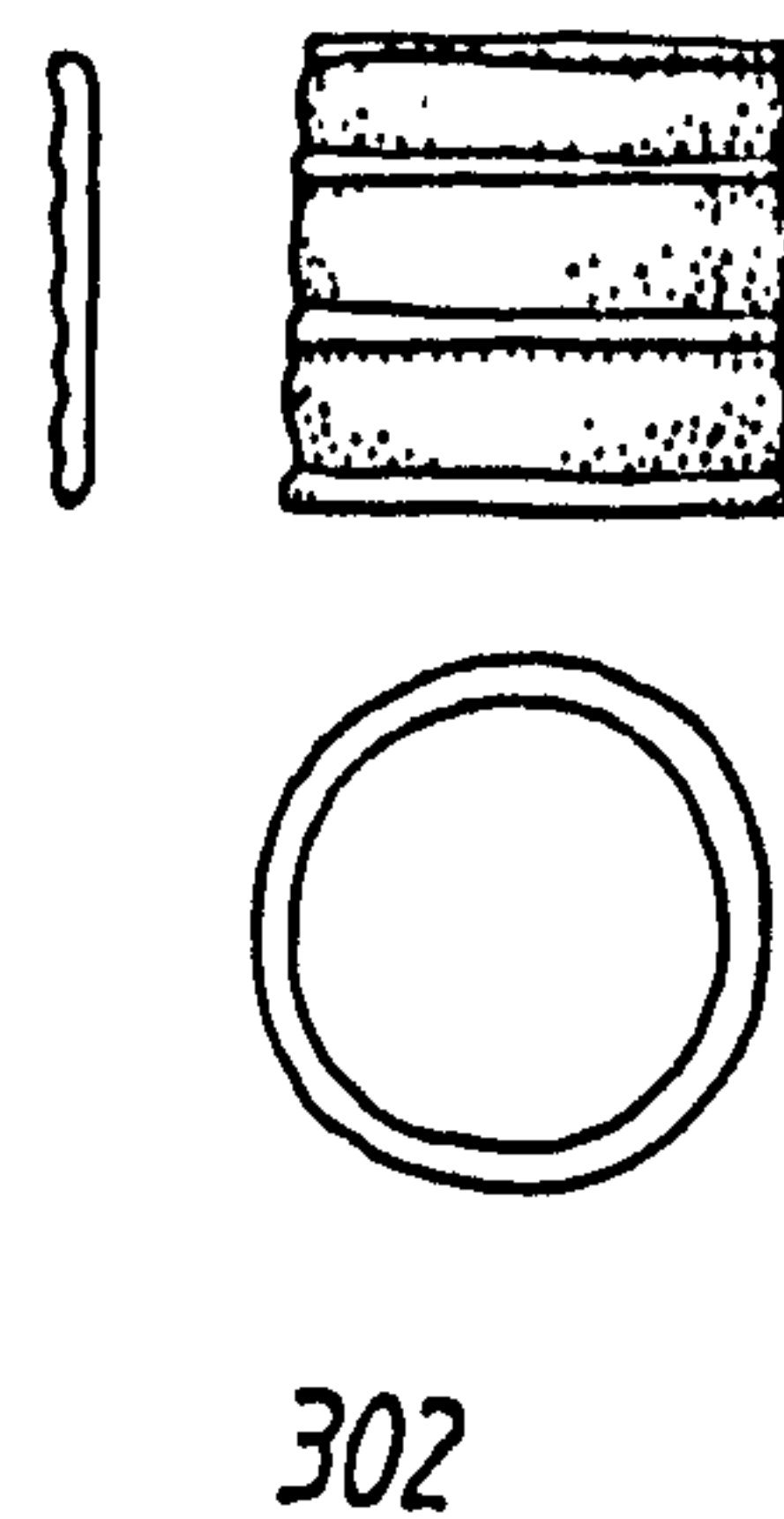
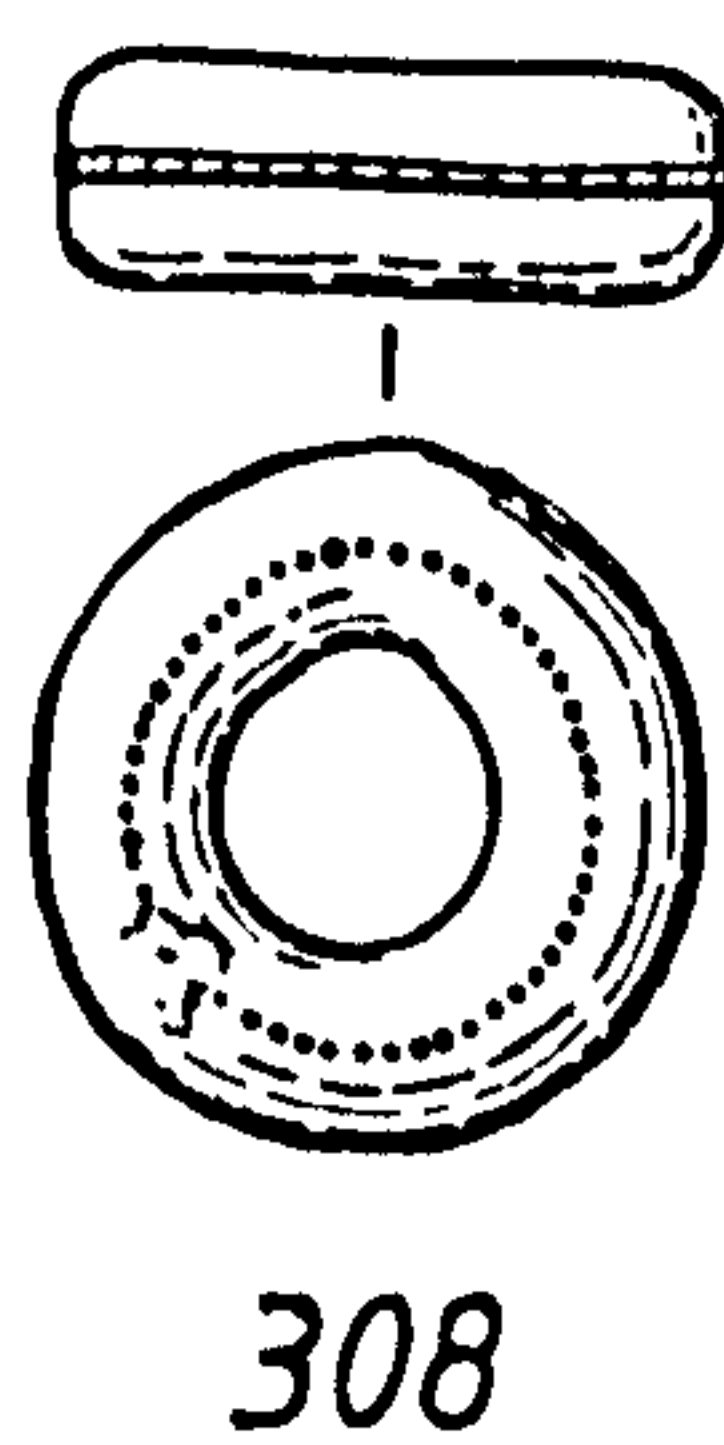
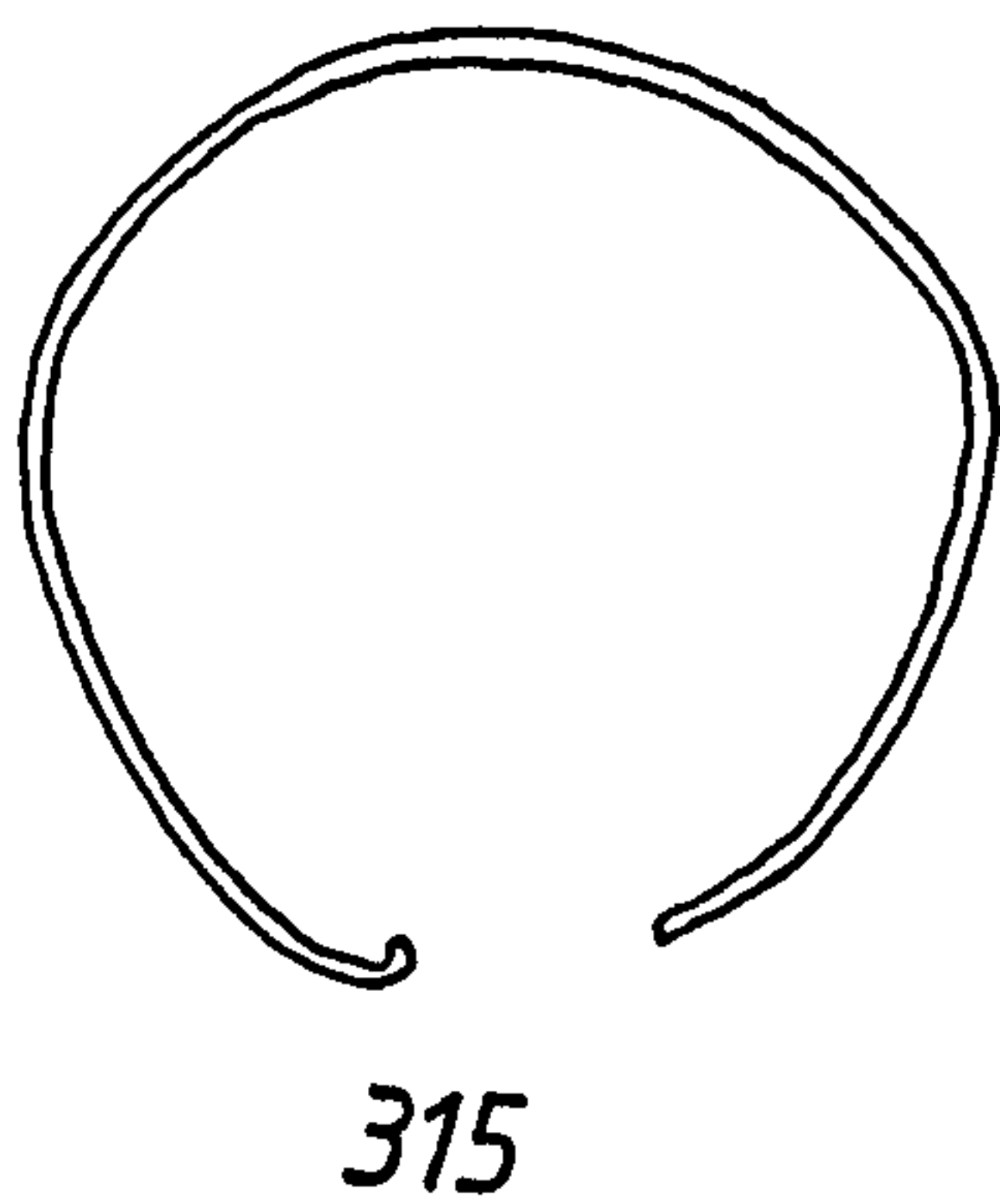
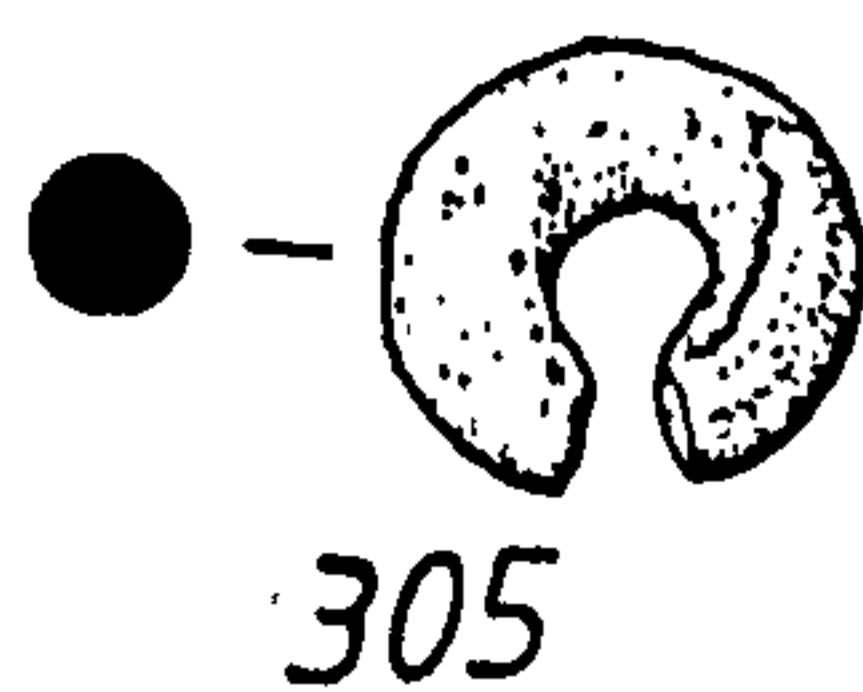
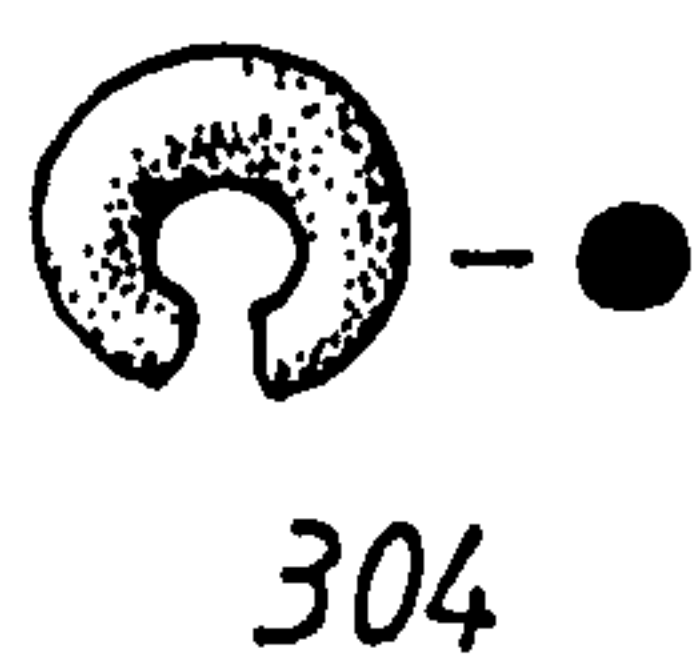
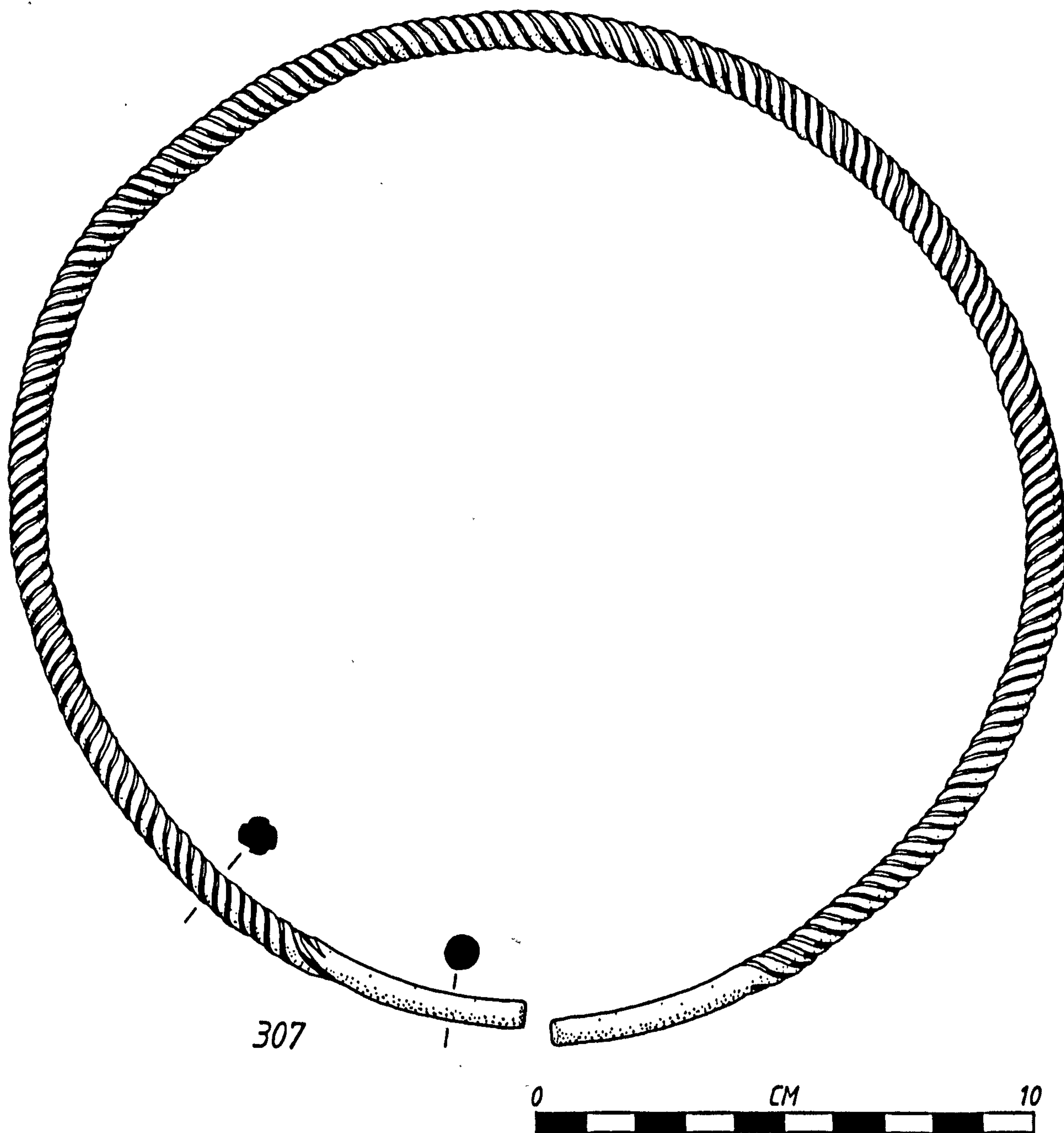


Fig. 68

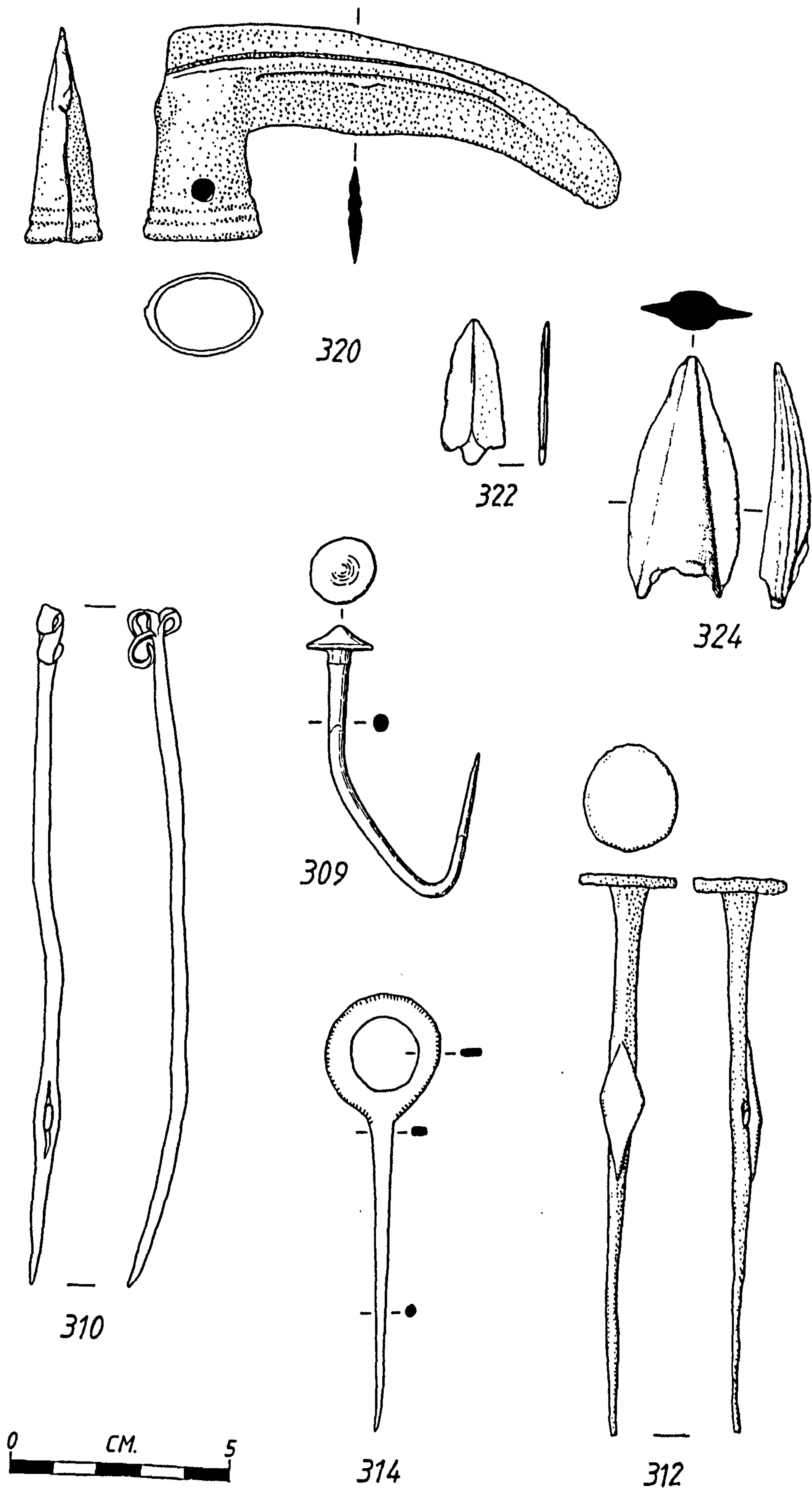


Fig. 69

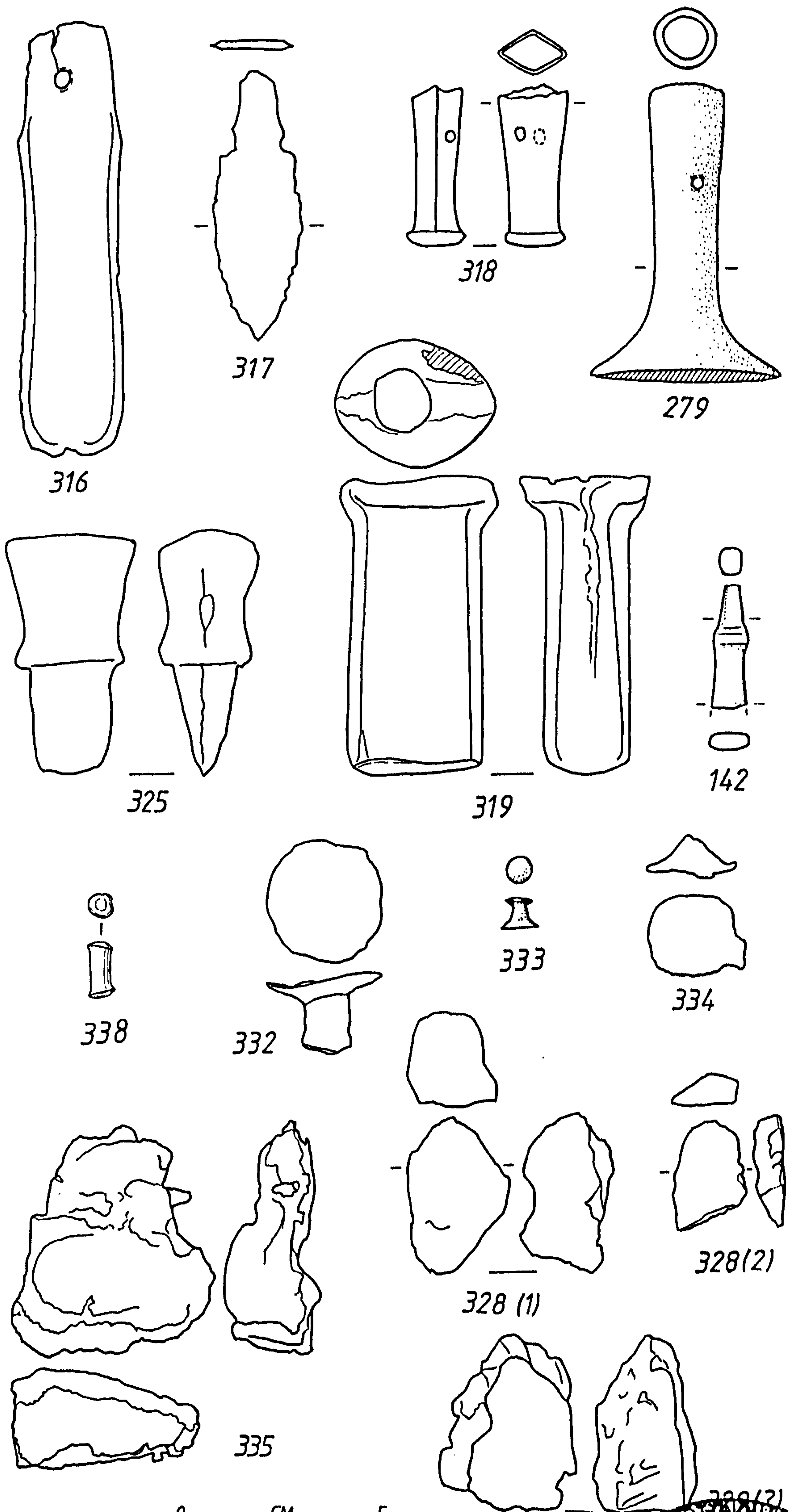


Fig. 70

