A Re-Interpretation of the Late Bronze Age Metalwork Hoards of Essex and Kent

Volume I of III

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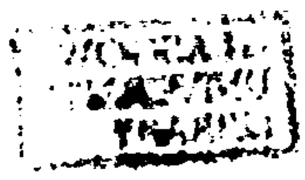

Abstract

In 1960, C.F.C. Hawkes presented his 'Scheme for the British Bronze Age' to the C.B.A. conference in London, an occasion which marked a turning point for Bronze Age studies in Britain. Prior to this, the chronology of Bronze Age Britain had been organised solely through the identification of culturally unified groups, characterised by similarities in material culture. The work of Hawkes and his contemporaries differed in that greater importance was given to the role played by technological advances, particularly in the field of metalworking. Hawkes' paper heralded an overhauling of the Bronze Age chronology, one which resulted in a chronological framework that has remained unchallenged to this day, though it has since been been subject to refinement and clarification on an almost continual basis. In the Later Bronze Age, this refinement has focussed almost exclusively upon the evidence provided by metalwork, and has been possible largely on the nature of this evidence, which is frequently recovered in the form of hoards. The traditional reasons put forward to explain the existence of these hoards - namely that they represent the burial of caches of valuable objects or raw material for safekeeping in times of strife - has further encouraged the creation of an independent metalwork chronology. More recent works have, however, challenged the role of bronze in Bronze Age society. While traditional interpretations focussed upon the intrinsic value of bronze, implying that it was by its possession that status was accrued in the Bronze Age, recent reference to anthropological work has suggested that it was through the deliberate discarding of material goods that an individual or social group might have achieved status in the eyes of their fellows. Following this, a dichotomy developed, with the votive deposition of ceremonial objects in wet contexts being contrasted with the deposition of secular 'founder's' hoards on dry land. While this was undoubtedly a radical rethinking of the role of metalwork, it took place against a backdrop which left some aspects of the traditional interpretations unchallenged. One area which received little in the way of revision was the chronological framework, and in particular the method used in its construction, i.e. typological classification. Recent works have, however, offered an alternative to traditional archaeological classification, particularly in the field of ceramic studies. These use theories of human categorisation processes derived from other areas of research, in particular psychology and linguistics. The purpose of this thesis was - through reference to the advances made in studies of this kind - to re-interpret a body of metalwork evidence, in particular the 'founder's hoards' of the 'Carp's Tongue' Complex in Essex and Kent. These hoards include a wide range of artefact categories, often surviving in fragmentary condition, and have traditionally been interpreted as an inevitable by-product of the metalworking process. By examining the nature of the contents and the structure of these hoards, and by making a detailed appraisal of the manner in which each of the individual artefact categories included was treated prior to its inclusion in the hoard, it was possible to establish that there was indeed a strong association with the metalworking process. It also became apparent that regularised methods of destruction were employed upon the artefact categories included in these hoards, and that specific selection processes operated during the accumulation of the hoard contents, with certain artefact categories being favoured for inclusion. It therefore seemed likely that, instead of being a direct by-product of the metalworking process, these hoards were instead collections of metalwork which deliberately referenced the metalworking

process, as well as other routine activities, such as the agricultural cycle. By considering these findings within a wider context, it was possible to see these hoards as functioning as material props in ceremonies which created metaphorical associations between activities often perceived by archaeologists as being secular in character with more metaphysical aspects of existence, such as the transformation of the body after death.

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Chapter One: Hawkes'1960 Scheme for the British Bronze Age, and its Implications for the Study of Later Bronze Age Metalwork Hoards

In 1960, Christopher Hawkes presented a paper to the C.B.A. Bronze Age conference entitled 'A Scheme for the British Bronze Age'. It can quite justifiably be viewed as a seminal work. Firstly, it summarises many of the observations made by both Hawkes himself and by his contemporaries working in Bronze Age Studies during the 1950s. In addition, its importance is further enhanced by the fact that its contents have subsequently had so much influence on the work of others whose research interests lay in the same period.

Hawkes structured the paper in the form of a comprehensive chronological scheme, presenting a historical summary which identified a succession of different cultural groups differentiated through perceived differences in material culture. This chronological framework has remained virtually unchanged to this day. There have been some disagreements as to the precise dating of the various groups defined by Hawkes (Burgess, 1979), but the basic cultural groups described and their places in the relative chronology have remained virtually unchallenged. Despite having had such a considerable influence on works produced in the later 1960s and 70s, the 'Scheme for the British Bronze Age' did not achieve publication, although it has been widely circulated amongst academics. This apparent lack of publication appears unusual, but the reason for Hawkes' reticence in circulating this scheme in a more high-profile manner may become more apparent when its place in the wider body of Hawkes' writings is considered.

'A Scheme for the British Bronze Age' was presented in the same year that another work by Hawkes - 'The ABC of the British Iron Age' - achieved publication. This latter paper sparked off a series of attacks upon Hawkes' work in the Iron Age, instigated primarily by Hodson (Collis, 1995). It is not unreasonable to suggest that the aggressive response to Hawkes' synthesis of Iron Age Britain might have discouraged him from presenting 'A Scheme for the British Bronze Age' for publication, for the underlying principles behind both papers were largely similar.

However, despite the lack of exposure afforded to this paper, its place in the study of the British Bronze Age is of undeniable importance. It has retained its place as the accepted means by which the Bronze Age is organised into phases and sub-divisions, and as a result of this the work is considered worthy of detailed examination.

Hawkes' 1960 Scheme for the British Bronze Age: A Summary

Several attempts to establish a chronological scheme for the British Bronze Age had been made prior to the Hawkes 1960 paper. The primary source material used to construct such a scheme was the metalwork evidence, with pioneering work carried out by scholars such as Montelius (Montelius, 1908). Hawkes himself, in association with Kendrick, presented a comprehensive chronological scheme in the 1930s (Kendrick and Hawkes, 1932). However, in the intervening period between the publication of the Kendrick and Hawkes volume and the presentation of Hawkes' 1960 paper, one of the fundamental tenets of Bronze Age material culture had been successfully challenged, radically altering the way in which this period of prehistory was perceived. The Deverel-Rimbury urn, once seen as a *bone fide* cultural indicator of the later Bronze Age (Kendrick and Hawkes, 1932, 119), had been removed to an earlier point in the chronology, becoming instead associated with the middle Bronze Age (Butler and Smith, 1956). Hawkes' 1960 scheme incorporated this conceptual shift, though in other aspects the scheme differed little from that which was originally proposed in 1932. The tripartite division evident in the 1960 scheme was also apparent in the 1932 chronology, though in the earlier accounts of Montelius and others, only a two-fold division was proposed.

The 1960 'Scheme for the British Bronze Age' was, however, presented as a more complex chronological narrative than its 1932 predecessor. The same three basic divisions were noted - Early, Middle and Late - but in addition a further division was imposed between the Neolithic and the Early Bronze Age, a 'Copper Age', within which knowledge of alloying was unknown. Further subdivisions were isolated within each stage in the chronology, and, instead of relying solely upon bronzes, perhaps the most outstanding aspect of Bronze Age material culture in Britain, Hawkes endeavoured to incorporate a broad range of evidence within his work, basing his chronological divisions upon changes in pottery types, settlement forms, and funerary practices (Table 1).

Hawkes' 'Copper Age' was equivalent to the Beaker Horizon, a period which is now viewed as being Late Neolithic in character. In recent interpretations of this transitional phase, copper objects are used alongside the existing range of Neolithic material culture forms as symbols of status and authority (Clarke *et. al.*, 1985). The work of Hawkes stressed a similar sense of continuity between the Neolithic and the Copper Age. His 1960 Scheme conveyed the impression of a largely Neolithic population, complemented by the arrival of invaders from continental Europe. These brought with them their own specific artefacts, the distribution of which could be used to chart their progress. From the Netherlands came a group which brought with them the cord-zoned beaker, and from the Middle Rhine came another associated with the bell beaker.

These foreign forms were incorporated into the existing indigenous culture, and this mingling of traditions continued onwards into the Early Bronze Age. Hawkes was able to isolate a technological marker which enabled him to separate the Early Bronze Age from the preceding Copper Age: the introduction of a copper-tin alloy. It was the development of this alloy which marks the real start of the 'Bronze Age', for a copper-tin alloy is a harder and more durable material than unalloyed copper. This increase in hardness gives bronze a greater functional value, allowing metal objects to compete at last as viable alternatives to their stone counterparts.

During the Early Bronze Age, more innovations and technological advances arrived from continental Europe. Hawkes' first phase postulated that an influx of peoples from a number of continental origins arrived in the British Isles. There were invaders from continental Europe, and others - the 'Battle Axe people' - from eastern Europe. Ireland was also the recipient of external influences, with Hawkes suggesting that the halberds and the lunulae so characteristic of this period were indicative of contact with the Mediterranean and Scandinavia respectively.

The introduction - or, perhaps one might rather say, *imposition* - of hitherto unknown techniques and materials resulted in a indigenous response. Innovation occurred in the Highland Zone of the north and west of Britain, giving an industry which used open moulds for casting (Hawkes' 'Irish First A' industry). And, at a roughly equivalent point in time, the Wessex I culture derived from Brittany was giving rise to the 'British First A' industry.

Innovation inspired by the introduction of new techniques from abroad marked the transition from the first to the second Early Bronze Age phase. This period was characterised by the introduction of the double-matrix mould, a development which allowed more complex castings to be undertaken. Hawkes' 'B' industry equated with the Wessex II culture, and, elsewhere in Britain, the introduction of the techniques induced change. Further innovative techniques developed: the addition of a core enabled socketed objects to be produced, with the socketed spearhead replacing the halberd, and the flat axe was replaced by the flanged variety. This new combination of objects - socketed spearhead and flanged axe - were taken by Hawkes to be indicative of a new industry, an 'Irish B industry'. Elsewhere in the British Isles, however, outwith the hotbeds of development in Wessex and Ireland, the earlier industries remained largely unchanged, giving what Hawkes describes as 'A2' industries.

This picture of the early Bronze Age gives the impression of change brought about through the introduction of new technologies and ideas from continental Europe, followed by subsequent adaptation and response by the indigenous traditions. The result of this eclectic mix is the Middle Bronze Age, which Hawkes suggests is characterised by an

insular tradition derived from the intermingling of all these industries over the period between 1800 and 1400 BC.

The initial phase of the Middle Bronze Age was marked by the appearance of the first 'C' industry. During this period, ideas which had originated in the highland zone were to be developed, and the area at the forefront of innovation changed. Previously, it had been the south-eastern lowland zone which spearheaded technical achievement during the period characterised by the Wessex Cultures. Now the advances were coming from the north and west. In these areas, the side-looped and basal-looped spearheads were developed, the dirk was derived from the shorter dagger, and the flanged axe was superseded by the haft-flanged axe. It could not be said, however, that the south and east were trailing uselessly in the wake of their highland counterparts, for changes were occurring here, too. Hawkes suggests that the first appearance of the palstave in hoards across southern Britain dates to this period, giving what he describes as the first 'D' industry. This heralds the important role that the lowland zone was to play in the future development of the metal industries.

During Middle Bronze Age 2, this contrast between lowland and highland zone continued. The highland zone displayed a clear sense of continuity, with the development of preexisting ideas giving rise to forms like the rapier and the wing-flanged axe (the second 'C' industries). However, radical changes were taking place in the south-east. Deverel-Rimbury pottery appeared, along with a new repertoire of metalwork types, including palstaves, socketed axes and razors. This corresponds with the 'Ornament Horizon' of Smith (Smith, 1959) and can be described as equivalent to Burgess' Taunton industry (Burgess, 1969). Tin-bronze was still utilised, but Hawkes suggests that one of the important indicators of the Late Bronze Age - the leaf-shaped sword - might in fact have been present in the extreme south-east of the country.

Development in highland and lowland Britain continued to differ throughout the final phase of the middle Bronze Age. The third 'C' industries in the north and west gave a similar range of objects to those seen in Middle Bronze Age 2, with rapiers and looped spearheads continuing in production. The south-east, however, was subject to change, with new types such as transitional palstaves, socketed sickles and bifid razors occurring. Swords were now being locally developed, in a period which appears to be roughly equivalent to Burgess' Penard phase (Burgess, 1969).

The transition to the Late Bronze Age was marked by a technological innovation, namely the introduction of lead into the tin-copper alloy. This division was established as a result of metallurgical analysis carried out by Brown and Blin-Stoyle, whose work revealed a demarcation between unleaded Middle Bronze Age types, and leaded Late Bronze Age types (Brown and Blin-Stoyle, 1959). The initial phase of this period was characterised by what Hawkes termed the first 'F' industry, and it marked, according to Hawkes, the end of

the Middle Bronze Age insular culture. The decline of Deverel-Rimbury at this time occurred concurrently with the rise of 'Urnfield' influences from continental Europe, and it was during this period that 'founders' hoards' became increasingly common, in a phase which corresponds to the 'Wilburton' industry of Burgess (Burgess, 1968b).

These changes only seemed relevant when applied to south-east England, and Hawkes neglected to mention what changes might have been taking place concurrently in the Highland Zone, an omission which would cause Burgess to consider the Middle Bronze Age-Late Bronze Age transition in northern England in greater detail (Burgess, 1968a). However, the second phase of the Late Bronze Age was seen by Hawkes as having a more widespread manifestation. The second 'F' industry was marked by the appearance of the Ewart Park sword and the manifestation of regional variation in socketed axe styles. Hawkes suggests that the entire country was now host to foreign influences, with settlers occupying the northern province (as indicated by evidence recovered from north-east Scotland) and with clear links evident between Ireland and Scandinavia. Hoards could now be described as displaying regional variation: 'personal hoards' occurred in the north, while 'founders' hoards' were present in the south. And, while a largely homogeneous metalworking tradition was evident across the entire country, the south-east of England once again showed a degree of difference. The industry was largely the same as that which characterised the rest of Britain, but the occurrence of novelties such as socketed swords allowed the presence of a new industry to be postulated. This was the 'G' industry which equates to the 'Carp's Tongue Complex' of Burgess (1968b), a regional phenomenon whose unique nature was highlighted by Evans almost forty years before (Evans, 1931).

This picture remains largely unchanged until the end of the Bronze Age, although a third Late Bronze Age phase could be defined with the appearance of Hallstatt-derived material. With these new invaders from the continent came a final technological innovation, namely the knowledge of iron-working, and thus the Bronze Age finally gave way to the Iron Age.

Subdividing the Material: the Criteria Employed

It is apparent that Hawkes used two means of dividing the material into phases. Firstly, there was the importance afforded to technological change. Certain technical innovations - such as the introduction of leaded bronze, the first appearance of double-matrix moulds, the initial manifestation of sheet-bronze working - were considered important enough to merit the imposition of a division within or even between phases. However, closely linked with these technological aspects was the belief that such improvements resulted from the arrival of new cultural forms through invasion or trade.

Since this thesis focuses upon the Late Bronze Age, I will use Hawkes' Late Bronze Age period to discuss his conclusions. For Hawkes, the transition between the Middle Bronze Age and the Late Bronze Age was a technological one, with the inclusion of lead in the bronze alloy being considered a significant enough milestone to allow such a division to be imposed. This was a noteworthy departure from what had come before, for studies of the Bronze Age prior to this 1960 scheme had focussed almost entirely upon typological change. For earlier scholars like Montelius (Montelius, 1908), artefactual changes were the means by which divisions were imposed, with one of the primary cultural indicators being the leaf-shaped sword. The importance of the leaf-shaped sword as indicative of the Late Bronze Age was to continue for some time, with Hawkes similarly describing this category of artefact as Late Bronze Age in date (Kendrick and Hawkes, 1932).

The situation in Hawkes' 1960 work is not, however, so clear-cut. While the 'founder's hoard', another of the cultural indicators noted in earlier works (Montelius, 1906; Kendrick and Hawkes, 1932), remained a means by which the Late Bronze Age could be characterised, the leaf-shaped sword had lost its primary role. In fact, according to Hawkes, this object first appears during Middle Bronze Age 3, thus demonstrating that the mere appearance of this new artefact form is not considered sufficiently outstanding to merit the transition to a new chronological phase.

Why, then, was the technological advance demonstrated by the use of leaded bronze considered so important? The addition of lead to the bronze alloy is seen as significant, for this composition allows the liquid metal to flow more easily within the mould, thus facilitating casting (Brown and Blin-Stoyle, 1959, 193). The metallurgical analysis carried out by Brown and Blin-Stoyle revealed a division between traditional Middle Bronze Age types (rapiers, looped spearheads, palstaves) and Late Bronze Age forms (pegged spearheads, leaf-shaped swords, socketed axes). This allowed the traditional typological arguments to be further bolstered through technological evidence. Early forms of sword could also be differentiated from those more indicative of the Late Bronze Age through their composition. The Ballintober type sword, which amalgamated a leaf-shaped blade and a hilt similar to that of a rapier, could be demonstrated as an early form as much by the unleaded composition of the bronze as by its transitional form.

This trend was so predictable that it led Brown and Blin-Stoyle to argue that:-

'Consistent absence of high lead content...sharply distinguishes the foregoing Middle Bronze hoards from the material of the first phase of the British Late Bronze Age, initiated by the arrival of leaf-shaped swords from the Continent' (Brown and Blin-Stoyle, 1959, 196)

This observation allowed outwardly similar types to be clearly defined as belonging to a specific chronological phase, and the advantages which could be gained by applying this newly discovered criteria can best be demonstrated by considering the problem of the knobbed sickle. Fox, in his study of the non-socketed sickles of the British Isles, argued that the two main concentrations of this artefact - in Somerset and Essex respectively - were roughly contemporary (Fox, 1941). He argued that their appearance resulted from the arrival of two separate groups of immigrants from the west Alpine region. The Somerset and the Essex sickles were, however, associated with an entirely different range of artefacts, but Fox maintained that the palstaves included along with the Somerset examples resulted from an intermingling of intrusive and indigenous cultural traditions.

Smith, by contrast, argued that the Somerset hoards were in fact of Middle Bronze Age origin (Smith, 1959). The results of metallurgical analysis enabled her theory to be substantiated, for the ribbed knobbed sickles of Somerset proved to be composed of a lead-free bronze, while the unribbed knobbed sickles of Essex found in association with leaf-shaped swords and 'Carp's Tongue Complex' material indicated that there was a substantial lead content in the bronze alloy. The claims Brown had made, initially through comparing and contrasting the objects associated with the two populations of knobbed sickles, could now be backed up by the fact that both groups displayed different levels of technological achievement in their manufacture.

The main means by which Middle Bronze Age and Late Bronze Age material could be differentiated had now been established, but Hawkes used additional instances of change to present a more detailed chronology through subdividing the basic tripartite scheme yet further. These sub-divisions were based largely upon cultural differences, though some technological markers were also used. Middle Bronze Age phase 2, for example, is characterised by a purely cultural change, namely the appearance of Deverel-Rimbury pottery in south-east England. The Late Bronze Age, however, is differentiated through technological achievement as well as differing artefact types: Hawkes' Late Bronze Age 2 is marked by the first manifestation of sheet bronze-working, a technique which Hawkes and Smith suggest was introduced along with the bronze buckets and cauldrons imported from the Mediterranean (Hawkes and Smith, 1957). This second phase is also associated with the widespread adoption of Urnfield-influenced metalwork types which were originally restricted to south-east England during Late Bronze Age 1. A return to cultural differentiation is apparent in Late Bronze Age 3, with the appearance of Hallstatt material providing an indicator of change brought about through invasion from continental Europe.

Hawkes' 1960 Scheme for the British Bronze Age: Regional Patterns

Throughout Hawkes' 1960 scheme, a marked degree of regional variation is demonstrated. Some phases are marked by innovation or change in one specific area, while the rest of the country may retain most - if not all - of the characteristics that were dominant in the previous phase. For instance, while Middle Bronze Age 2 brings about change to south-east England in the form of the Deverel-Rimbury tradition and a new range of metalwork forms, the situation in the highland zone of the north and west remains largely unchanged. In the latter, the metalwork forms do not remain completely static: new types are being produced, but these appear to result from the continuing development of already-established ideas rather than coming about through the sudden introduction of innovative and hitherto unknown forms.

This pattern seems even more striking at the onset of Late Bronze Age 1. This phase seems to be restricted only to south-east England, and Hawkes does not even discuss what changes might have been occurring in the rest of Britain during this time. The conclusion one must reach is that he believed the situation outwith south-east England to be largely static. The implication of the 1960 Scheme is therefore that mainland Britain in its entirety cannot truly be described as being of Late Bronze Age character until the onset of Late Bronze Age 2, when the new artefact forms which are so characteristic of Late Bronze Age 1, such as leaf-shaped swords and socketed axes, finally become more widespread.

The realisation that the British Isles could not be treated as a single homogeneous entity when considering changes in material culture forms had occurred much earlier than 1960. Perhaps the most striking example of the way in which the British Isles could be characterised can be seen in The Personality of Britain (Fox, 1932). Fox compared the lowland areas of Britain, - which he viewed as comprising the south-east of England and also the Midlands - with the 'Highland Zone' which included most of the north and west of the country. A contrast could be made, he suggested, between the ways in which both geographical zones responded to new cultures (Fox, 1932, 40). Whereas cultures tended to be imposed upon the lowland zone by invaders who settled there, a process of absorption tended to occur in the highland zone. This difference was believed to have resulted because the more rugged terrain and wetter climate of the highland zone made it less inviting to invaders from continental Europe. The process of absorption, it could therefore be argued, came about as a direct result of the unrest in the Lowland Zone. Refugees displaced through invaders uprooting them from their lands might be forced to relocate to the Highland Zone, and hence their skills could be drawn gradually into the dominant culture. References to such displacement are evident even in comparatively recent works of individuals such as Burgess, whose work will be discussed at a later point in this chapter (Burgess, 1968b).

These observations by Fox shaped a mode of thinking which divided mainland Britain into two discrete zones. This dichotomy between lowland and highland areas continued, and must have shaped Hawkes' thinking in some way. The division between highland and lowland zones is evident in the 1960 scheme, but the manner in which Hawkes used these concepts should be considered.

It has already been mentioned in the resume of the Hawkes' 1960 chronological scheme that geographical variation is considered important by the author. Hawkes sees the south-east of England as operating in the same way as Fox did: as part of the lowland zone it becomes the recipient of new ideas and technologies, brought about as a result of invasion or settlement by foreign peoples. Indeed, in terms of its metalworking industries the south-east is often viewed as being precocious, with Hawkes suggesting that it shows early evidence of leaf-shaped swords, and also the first truly 'Late Bronze Age' industries.

However, his interpretation of the Highland Zone does differ markedly to that of Fox. Fox characterises the north and west as being little more than passive recipients of techniques that must be introduced from elsewhere. Hawkes, by contrast, does not dismiss the possibility that the Highland Zone might be contributing with innovations of its own: in the Early Bronze Age and the Copper Age in particular, he suggests that many of the technological improvements did in fact originate in the Highland Zone. Although the south-east of England did benefit to a great extent from exposure to other cultural groups, this did not necessarily mean that the Highland Zone was entirely devoid of innovative skills.

It could be argued, though, that the experimentation and innovation of the Early Bronze Age in the Highland Zone was a short-lived phenomenon in Hawkes' scheme. Hawkes did stress the conservative nature of the Middle Bronze Age insular culture which held sway in the Highland Zone. Because it was formed through the fusing of continental influences and existing indigenous traditions, change took place in a less unexpected and less volatile manner. Development occurred at a slower rate than it did in the south-east, where - for one reason or another - change was rapid, as new techniques and types of artefact were introduced in comparatively quick succession. In fact, we could suggest, by paraphrasing Fox, that the traditional industries of the north and west changed only because they absorbed new influences imposed upon them from without. The innovations noted by Hawkes might have been dependent upon the initial stimulus provided through exposure to the exotic materials and techniques of production which originated outwith the area.

Patterns of Migration: the Material Evidence

Several waves of immigration were envisaged as having taken place during the Bronze Age, each associated with the appearance of a specific cultural group within the British

Isles. The earliest of these took place in the Copper Age, where a recurring 'package' of exotic items was evident. These items included the pottery form known as the 'Beaker', barbed-and-tanged arrowheads, archer's bracers and also copper axes. These objects required in some cases specialised knowledge in their manufacture (e.g. the metal objects) or even in their use. Although other contacts were also apparent in this period, according to Hawkes, it was the so-called Beaker people who proved most influential.

It was suggested earlier that Hawkes envisaged the Middle Bronze Age as being more insular in character, but it was during this period that the south-east of England was seen as the recipient of an influx of people who bore close links to the 'Urnfield' culture of continental Europe. Along with their new metalwork forms, they allegedly brought with them the pottery form which became known in its British context as 'Deverel-Rimbury' ware, and which was considered to be a classic indicator of the Late Bronze Age prior to the writing of Hawkes' 1960 scheme.

'Deverel-Rimbury' pottery as a distinct type had been defined first by Abercromby (1912), but perhaps it was Crawford who first established it as an important type-object of the Later Bronze Age (Crawford, 1922). He suggested that evidence for the arrival of a group of Celtic-speaking invaders could be identified by the appearance of a number of associated artefact types. These included leaf-shaped swords, and a range of bronze objects such as winged axes and razors, as well as 'Deverel-Rimbury' pottery.

'Deverel-Rimbury's association with the Late Bronze Age stems from the recovery of this pottery form in cemeteries which were considered analogous to the Urnfields of continental Europe. Following this initial assumption, the notion that 'Deverel-Rimbury' pottery was of Late Bronze Age origin appeared to be virtually self-replicating. Barrows which featured Deverel-Rimbury pottery were considered to have been subject to later re-use in the Late Bronze Age (Kendrick and Hawkes, 1932, 141), and the presence of Deverel-Rimbury urns along with bronze razors led to these razors being unequivocally described as Late Bronze Age in date (Piggott, 1946). Piggott did note isolated instances where razors appeared to have been recovered with early types of urn, as in the example from Stranraer, but she put such discrepancies down to the lingering continuation of outdated pottery types in the Highland Zone (Piggott, 1946, 124). The possibility that both razors and urns might have dated to the period preceding the Late Bronze Age did not, it seems, occur to her.

It was only with the work of Butler and Smith that the traditional role of Deverel-Rimbury pottery was questioned (Butler and Smith, 1956). Both authors had concluded separately that the Deverel-Rimbury tradition was in fact Middle Bronze Age in date: Butler having decided this following an examination of the razors, and Smith as a result of re-evaluating the pottery. Their initial work was closely followed by Smith's work on the

metalwork hoards of southern Britain (Smith, 1959). She concluded that Deverel-Rimbury pottery was often associated with forms of bronze ornament which were also found in hoards containing typical Middle Bronze Age artefact forms such as palstaves and looped spearheads.

'Deverel-Rimbury' could therefore no longer be linked with the 'Urnfield' culture of Europe. However, it was argued by Hawkes that although Britain could not boast the presence of Urnfields in the continental sense, other distinctive characteristics of the Urnfield culture remained unchallenged, most specifically in terms of the metalwork forms occurring. In the case of the 'Carp's Tongue' Complex of south-east England, particular affinities could be demonstrated with the metalwork recovered from the lake-dwellings of Switzerland. And, later still, one final wave of Bronze Age immigrants was to arrive, these invaders bringing with them material culture forms which could be demonstrably linked with the Hallstatt culture of continental Europe.

Later Developments: Following on from the Hawkes 1960 Scheme

In brief, two main observations can be made with regards to the Hawkes' 1960 chronological scheme and the way in which it diverged from its predecessors. In the first instance, the elevated importance of technological change should be noted, though changes in cultural forms are still considered valid markers by which subdivisions of the material can be established. Secondly, Hawkes recognised that Britain did not function as a single homogeneous whole: change occurred at different rates in different places.

Hawkes did not contribute any further work which improved the detail of this chronology for the Bronze Age. Instead, it was left for others to continue where he left off, and one figure in particular is outstanding in the late 1960s literature for the manner in which he elaborates and enhances Hawkes' basic chronology. This individual was Burgess, who produced two important papers towards the end of the 1960s. The earlier paper was a detailed study of the Later Bronze Age metalwork of the British Isles and north-west France (Burgess, 1968b), the later a broader summary of the changes that had taken place in British Bronze Age Studies during the 1950s and 1960s (Burgess, 1969).

It is to the second of these papers that I will turn my attention first, as it is more general in content. Chronology and Terminology in the British Bronze Age (Burgess, 1969) clearly took as its starting point the Hawkes 1960 paper. In content, it is largely a re-iteration of Hawkes' previous work, and can probably be described as the closest the 1960 chronological scheme came to publication.

Burgess stressed the problematic nature of the typological indicators once seen as indicative of the Late Bronze Age. Of prime importance in this respect is the changed status of Deverel-Rimbury pottery, and he firmly re-iterates its renewed role as a Middle Bronze Age form. Burgess promotes the concept of change marked by technological advance even more strongly, particularly in the case of the Middle Bronze Age-Late Bronze Age transition. For, like Hawkes, Burgess notes that the three metalwork types which were seen as classic Late Bronze Age types - namely leaf-shaped swords, socketed axes and pegged spearheads - were all occurring during the Middle Bronze Age. It was only in the Late Bronze Age, though, that they became standard items in the repertoire.

This observation is hardly novel. However, what does set Burgess apart is the fact that he openly argues that the onset of the Late Bronze Age occurs in different regions at different points in time. Although geographical variation was noted in Hawkes' 1960 paper, the division between the Middle and the Late Bronze Age was rather nebulous. While Hawkes does suggest that Late Bronze Age 1 is a phenomenon restricted solely to southern Britain, he does not elaborate on the situation elsewhere in the country. Burgess, by contrast, argues that a Middle Bronze Age tradition remained in place for a further two centuries after the Late Bronze Age industries had appeared in south-east Britain.

Burgess also suggested that the identification of a Middle and a Late Bronze Age could only be argued in terms of metalwork typology. When other forms of archaeological evidence are considered, a dearth is apparent in relation to the entire later Bronze Age period. He claimed that:-

[over] *'much of the British Isles, there are no settlements, burials, defended sites, pottery or other non-metallic cultural material which can be safely assigned to the Middle or Later Bronze Age'* (Burgess, 1969, 29)

He notes some exceptions, such as Deverel-Rimbury and flat-rim pottery, but these are described as being isolated and localised. Indeed, when one refers back to the Hawkes 1960 scheme, it becomes apparent that the use of metalwork typology as a means of differentiating phases and sub-divisions of phases becomes increasingly important as one moves towards the close of the Bronze Age, with the existence of three Bronze Age phases being postulated only through differences in terms of the dominant metalwork types occurring.

The work of Burgess and the Subdivision of Later Bronze Age Metalwork

The second paper by Burgess is a work which gives a more detailed discussion of a specific aspect of Bronze Age Studies, namely the later Bronze Age metalwork of Britain and north-west France (Burgess, 1968b).

Previous work carried out by Briard had highlighted the often-close similarity between British metalwork types and their equivalents in north-west France (Briard, 1965). Burgess pursued this line of enquiry, and drew parallels between the French and the British metalworking industries, using his findings to construct a chronological framework which enabled certain industries to be linked together as contemporary. He used Hawkes' observations to a certain extent, but considered the material in greater detail, characterising each separate industry, and defining a nomenclature for the metalwork types.

The initial phase in his scheme is the 'Penard' phase, which equates to Hawkes' Middle Bronze Age 3, i.e. the period in which it had been suggested that the earliest leaf-shaped swords were arriving, along with other exotic items of metalwork. Burgess argued that until the writing of his 1968 paper, the arguments set out by Hawkes had received little attention because no one specific type of import could be clearly defined at this point (Burgess, 1968b, 3). He characterised this period as a time in which a wide variety of continental forms were being imported into mainland Britain. These introductions provoked responses from the indigenous metalworkers, who produced a number of new forms, some of which - according to Burgess - were 'decidedly outlandish' (Burgess, 1968b, 3). The hoards of this period could, he suggested, be characterised by the mixture of exotic and native types that they contained, with the flavour of this phase being best illustrated by reference to the hoard from Penard, Glamorgan. The Penard phase had its epicentre in south-east England, where the vast majority of pieces pertaining to this period are concentrated, and Burgess noted the close similarity between the French and the British material. The presence of similar swords derived from Urnfield contexts was one indication, as were the indigenously-produced swords from both areas which shared similarities while at the same time displaying regional variation.

The successor to the Penard phase was described by Burgess as the 'Wilburton Complex', and this was an equally localised phenomenon. It was largely restricted once again to a dense concentration of objects in south-east England, with outlying finds recovered from the Highland Zone.

Prior to the work of Burgess, there had been something of a hiatus in the Highland Zone during this phase, which was equivalent to Hawkes' Late Bronze Age I. A

continuing Middle Bronze Age tradition can be postulated, but this was never demonstrated in Hawkes' writing. Burgess, however, considered mainland Britain in more detail. He suggested that in this phase southern Britain was host to a bronze industry which could find parallels in a French industry defined by Briard as the St. Brieuc-des-Iffs tradition (Briard, 1965). Similarities could be demonstrated in a number of ways. The primary difference could be seen as a technological one, for the Wilburton Complex in Britain marked a watershed in the bronze industry. It was at this point that the widespread addition of lead to the copper-tin alloy became apparent, and Burgess argued that in north-west France the St. Brieuc tradition displays a similar departure from the preceding Rosnoen phase. Similarities in artefact types also allowed parallels to be drawn up between the two industries, most notably in the combination of a specific leaf-shaped sword type, characterised by its splayed shoulders, with long-tongued scabbard chapes and long tubular ferrules (Burgess, 1968b, 36).

While the Wilburton industry reached its zenith in the south-east of England, the Highland Zone was host to what Burgess termed the 'Wallington tradition'. Burgess argued that the presence of some stray Wilburton objects in hoards of material dominated by Middle Bronze Age types was indicative of a largely Middle Bronze Age industry running in contemporaneity with the Wilburton Complex. The presence of socketed axes and pegged spearheads alongside dirks, rapiers and looped spearheads could be construed as additional evidence, and Burgess discussed this industrial tradition fully in a detailed study of the later Bronze Age metalwork of northern England (Burgess, 1968a).

The period which was to follow the Wilburton/Wallington phase was described by Burgess as demonstrating something of an industrial revolution (Burgess, 1968b, 17). In this time, industries which could now be confidently described as 'Late Bronze Age' in Hawkes' terms became widespread over the British Isles. Burgess demonstrated the contrast between the Wilburton phase and its successor, the Ewart Park phase, by highlighting the differing distributions of the two sword types which characterised these periods. Whereas the Wilburton sword was restricted in its geographical distribution, with examples coming primarily from south-east England, the Ewart Park sword appeared to achieve universal popularity throughout the British Isles, turning up in large numbers over the entire country, including Scotland, the north of England, and Ireland.

Once again, however, the extreme south-east of England maintained its affinities with north-west France. The native Ewart Park sword was recovered alongside the parallel-bladed Carp's Tongue sword, a variety of weapon which appears to have been more popular in north-west France. Indeed, Briard describes the tradition which succeeded the St. Brieuc-des-Iffs group as the 'Carp's Tongue Sword Group' (Briard, 1965), indicating the predominance of this specific sword type. The presence of this unmistakable sword type in south-east England had long been seen as significant in the archaeological literature,

and had been viewed as indicative of an invasion (Crawford, 1922: Evans, 1931). Alongside this sword type came an additional selection of associated paraphernalia, including the winged axe, and various small objects collectively described as 'Carp's Tongue bric-a-brac' (Burgess, 1968b, 17).

The 'Carp's Tongue Complex' was just one such regional variant which could be isolated within the metalwork dated to this period. While the overall picture portrayed a situation which was relatively homogeneous, closer study revealed several regional traditions which ran concurrently. The Broadward Complex could be differentiated by the wide range of spearhead types evident in its repertoire, but the most common method of distinction was centred upon a comparison of different types of socketed axe included in the metalwork hoards (Burgess, 1968b, 19).

In more general terms, finds from hoards dating to this period indicated that a wider range of objects were now being manufactured in bronze, and this evidence - combined with an apparent increase in the number of founders' hoards occurring - allowed Burgess to bolster his argument for an 'industrial revolution'. Founders' hoards, with their large numbers of broken and worn-out weapons and tools were seen as evidence for the collection and subsequent storage of scrap metal at a convenient central point for later recycling.

This period of regional variation set against a background of national homogeneity was broken by the appearance of material derived from continental Hallstatt contexts. The link with a full-scale invasion was seen by Burgess as problematic: these types are largely absent from native hoards, and the nature of the objects and their coastal/riverine distribution implied little if any impact upon the indigenous communities (Burgess, 1968b, 26). Burgess acknowledges the presence of Hallstatt material and the influence it was to have on native metalwork forms, but he does not commit himself to any claims as to the manner of its arrival, arguing instead that it was a subject which required considerable rethinking. (Burgess, 1968b, 26). With the Hallstatt material came the transition to an iron-based technology, although once more the nature of this change was seen as problematic.

This detailed summary of the metalworking traditions evident in later Bronze Age Britain bears many resemblances to the more general scheme proposed by Hawkes almost ten years previously. The Penard phase is roughly equivalent to the precocious industry characterised by Hawkes in his Middle Bronze Age 2 and 3 phases. Types familiar to us as Late Bronze Age in character are produced, such as leaf-shaped swords and socketed axes, but they are manufactured in tin-bronze, thus indicating their Middle Bronze Age origin. The Wilburton Complex of Burgess is equivalent to Hawkes' Late Bronze Age 1, with the first appearances of leaded bronze and founder's hoards being restricted to south-east

south-east England. Burgess, however, filled in the gaps apparent in Hawkes' scheme, by defining the Wallington tradition, the industrial complex dominated by Middle Bronze Age types cast from tin-bronze which he saw as running concurrently with the Wilburton Complex. However, both schemes converge once more from Late Bronze Age 2 onwards. At this point, Hawkes suggested, the entire country became influenced by foreign forms, an observation similar to the evidence for an 'industrial revolution' noted by Burgess. And further parallells can be seen in the way in which Hawkes suggested that differing axe types could be used to subdivide the country into a number of regional traditions.

Finally, Burgess marks the closing stages of the Bronze Age as a period characterised by the first appearance of Hallstatt material. Hawkes, too, used Hallstatt material to define his final subdivision, Late Bronze Age 3. In both accounts, this new material was indicative, too, of the introduction of those new techniques which would ultimately lead to the decline of bronze as a material from which tools and weaponry would be routinely manufactured.

In conclusion then, it can be argued that the two papers summarised in some detail throughout the course of this chapter have been instrumental in shaping Bronze Age Studies right up to the present. In particular, they have been fundamental in shaping our perceptions of Bronze Age metalwork, with the Burgess 1968 paper being particularly relevant in this respect. The metalwork chronology postulated by Burgess has remained largely unchallenged, and a tacit acceptance of this scheme has remained implicit in almost every discussion of Bronze Age metalwork to date. In some cases, the established scheme has been further refined and subdivided, and some debate over nomenclature has also been apparent. O'Connor, for example, has suggested that the Penard phase - traditionally viewed as the closing phase of the Middle Bronze Age - should instead be considered Late Bronze Age in character (O'Connor, 1980). Thus in his interpretation of the chronological scheme for the Bronze Age, the Penard phase replaces the Wilburton phase as the opening phase of the Late Bronze Age (O'Connor, 1980, 270). This alternative approach can be viewed as comprising little more than a refinement of what has already gone before. There have been some occasions when potential problems have been recognised within the chronology (e.g. in Bradley, 1990), but as yet little effort has been made to confront them.

I would argue, however, that we can no longer accept this scheme without making some kind of an effort to understand the processes which lay behind its creation. In addition, we must be prepared to address any inadequacies that might show up in the established chronology as a result of such a critical analysis. Throughout the course of the following chapter, I will be addressing this problem in greater detail, by examining the value judgments which underlie the classification of Bronze Age metalwork.

Chapter Two: The Classification of Bronze Age Metalwork

Bronze Age metalwork has been assembled into chronological order through the use of typological classification. This process is grounded on the assumption that the form of an object will not remain constant over time, and will instead evolve as practical experience and external influences (e.g. exposure to foreign artefact types) are utilised to improve existing designs. By cross-referencing between those contexts within which certain artefact forms occur, it is possible to establish which types were more commonly encountered at certain points in time, and to infer how changes in these types manifested themselves. The creation of such a chronology using metalwork types has been a long-term process which is still considered incomplete. As new discoveries are made, changes must be made as previously unknown types manifest themselves. Even now, new publications are produced which further clarify the chronology through closer, more intensive scrutiny of the metalwork (Burgess and Colquhoun, 1988; Needham, 1990a).

The practice of hoarding, particularly during the later Bronze Age, has been of particular assistance in this respect. Indeed, the evidence for a tripartite Bronze Age is entirely dependent upon the information gleaned from metalwork hoards, and Burgess argued that it was only on account of this that any kind of division between a Middle and a Late Bronze Age could be made (Burgess, 1969, 24). In all other respects, only a two-fold division is apparent: the earlier phase is characterised by a landscape dominated by references to ritual activity, while the later phase seemingly emphasises those aspects of life which are pertaining to secular and domestic activities. This apparent concentration on the secular has resulted in the belief that the metalwork hoards are also rooted firmly in day-to-day activities, and this has important ramifications for the establishment of a secure chronology based on these hoards.

Bronze Age Metalwork: Contexts of Discovery

Bronze Age metalwork is likely to be recovered in one of four contexts: in graves, as single finds, in settlement contexts, or in hoards. In the Early Bronze Age, finds are often recovered from graves, but this practice of including items of metalwork along with the bones of the dead virtually vanishes in the Middle and Late Bronze Age. Some exceptions are apparent, the most dramatic example being perhaps the skeleton from Tormarton, Glos. which was discovered with a Middle Bronze Age looped spearhead lodged in the spine (Ehrenburg, 1977).

Single finds of metalwork are recovered from all three phases. Since such objects are discarded in isolation, they can offer no useful insights into the formation of a chronology.

Instead, their allocation to specific periods is reliant upon cross-referencing with other similar examples recovered from more informative contexts.

Hoards are more useful in establishing such a chronology, particularly if they contain more than one type of artefact. However, a chronology built solely around metalwork types will remain only internally consistent. There will be no means of placing it within a wider chronological scheme unless some common point of reference can be found. The burial of hoards in pottery vessels can assist in this process, as can the recovery of radiocarbon dates from any organic materials which might have been buried along with the metalwork, e.g. organic containers or charcoal fragments. Such convenient associations are, unfortunately, rare, perhaps in part because hoards are only rarely recovered during controlled archaeological excavations. The situation is not altogether hopeless, however, for while the deposition of metalwork in hoards appears to be the most common means of disposal in the Later Bronze Age, similar finds are not unknown from settlement sites. Such finds are of crucial importance as a means of drawing the freestanding metalwork chronology into a wider chronological framework, for when recovered during controlled excavation, a metal object can be given a more precise date, and placed in relation to alternative chronologies constructed around other artefact types such as pottery.

Such a convenient intersection is, however, rare in the Late Bronze Age. Many of the Late Bronze Age settlement sites excavated in recent times have yielded little if any metalwork finds (as can be demonstrated by the lack of such finds from both Springfield Lyons, Essex (Buckley, 1987), and Lofts Farm, Essex (Brown, 1988a)). On those sites where metalwork is found, it is often confined to quite specific artefact types. The material tends to be fragmentary and insubstantial, as can be demonstrated clearly by considering the material from Runnymede Bridge (Needham, 1991). Here, tiny droplets of waste bronze from casting were recovered, along with small pieces of sheet bronze and pins, the latter being objects which are virtually unknown in hoards. One so-called 'settlement' site which has yielded rich deposits of metalwork was the cave site of Heathery Burn, Co. Durham (Greenwell, 1894), but this site is virtually unique, and although its identification as a settlement site has been maintained by many authors virtually up to the present (e.g. O'Connor, 1980), such a description must surely remain contentious.

Hoarding

The deposition of objects in hoards is a characteristic feature of the later prehistoric period. It predates even the Bronze Age, with collections of flint and stone axes having been recovered which date this practice right back to the Neolithic period. While the deposition of flint artefacts in this manner is ascribed to ritual practices (Bradley, 1990, 74-5), the explanations put forward to explain the presence of hoards in Bronze Age contexts show a radical shift in approach.

When bronze appears to supersede flint as the material from which the majority of household implements are manufactured, the interpretation of hoards becomes more problematic. This is because bronze implements differ from their stone and flint counterparts in one fundamental way. Whereas a flint axe could conceivably be re-used in a different form, by using the basic artefact form as a nearly-new flint nodule from which smaller artefacts - such as blades or retouched flakes - can be obtained, it is impossible to re-create the object in its original shape. By contrast, bronze, which requires a return to the liquid state as part of the manufacturing process, can in theory be recycled *ad infinitum*. Worn-out objects can be melted down and the metal from which they were formed used to create new ones. So, when tackling the problems posed by the interpretation of bronze hoards, one thing is certain: these collections of raw material could have been returned to the bronze pool for future re-use, and, for one reason or another, they were not.

Because such hoards should not exist in an efficient bronze-working industry, alternative explanations have therefore been put forward to explain their presence. These rely primarily upon an examination of hoard contents, and this process has been assisted by the fact that certain recurring patterns do appear to be evident within the material.

The categories of metalwork hoard first proposed by Evans towards the close of the last century (Evans, 1881, 457) have remained largely unchanged up to the present. He isolated three categories of hoard, separating each by their different characteristics. The first was the 'personal hoard'. This category was defined by the small number of objects included, items which were often deposited complete and in good condition. The presence of such hoards was attributed to the burial of valuable objects underground for reasons of safekeeping in times of strife, reasoning which could be described as the 'security motive'.

These personal collections of objects are perhaps typified by the smaller hoards more commonly recovered from Scotland and northern and western England (i.e. Fox's 'Highland Zone'). Examples include the hoard from Congleton, Cheshire (Jackson, 1927) which included two spearheads, a ferrule and a socketed axe, and that from Corsbie Moss, Berwickshire, which consisted of a leaf-shaped sword, a spearhead and a scabbard chape (Coles, 1959-60, 107-8).

Such small hoards can be contrasted with sometimes-massive collections of material which have also been encountered. These larger hoards have also been divided into categories by considering two things: firstly, the types of objects included, and secondly, the physical state of these objects. First of all, there is the 'merchant's hoard', which consists of a large collection of unbroken objects. To quote Evans, such hoards 'consist of objects ready for use and in considerable numbers' (Evans, 1881, 457). Palstave hoards of the Middle Bronze Age seem to fit into this category most aptly. One such example is that from Burnham-on-Crouch, Essex, where six palstaves were recovered in an as-cast condition. Some Late Bronze Age hoards can also be seen as falling into this category.

such as the hoard from Dovercourt, Essex, in which fifteen complete socketed axes were discovered within a pottery vessel.

These hoards of complete objects can be contrasted with hoards dominated by broken-up bronze implements and pieces of ingot metal. Such hoards - the so-called 'founders' hoards' - are believed to have been stores of scrap metal, buried by metalworkers for later use.

The widespread recognition of these categories allowed hoards to be conveniently compartmentalised following little more than a brief consideration of their contents. A further refinement of these divisions did occur in 1957, when Hodges defined a fourth category, the 'craftsman's hoard', a group which perhaps lay somewhere between the 'personal' and the 'merchant's' hoard (Hodges, 1957). These differed from the true 'personal hoards' by their different content. 'Personal hoards' could be characterised by a dominance of weaponry and weapons-related accoutrements, while the 'craftsman's hoard' consisted of small tools and socketed axes, supposedly the personal toolkit of an artisan.

All these categories traditionally shared one common attribute, however, and this was the reasoning which lay behind their initial deposition. In every instance, it was possible to explain their presence by referring to the 'security motive' as the primary motivation for their creation.

In his 1930 book, The Bronze Age, Childe used the standard categories which had originally been established by Evans. It could perhaps be said that he used the evidence available more inventively, for he engaged in a more in-depth examination of the metalwork hoards, using the information he found to make certain claims about the nature of the Bronze Age, and - more specifically - the bronzeworking industry. He suggested that the 'merchants' hoards', which seem to concentrate upon certain artefact types, could demonstrate the specialised production of these types (Childe, 1930, 44). These 'merchants' hoards' could be contrasted with the 'founders' hoards' by the physical condition of the objects present within them. Whereas the 'merchant's hoard' was made up of objects which had just reached the end of the production stage and which now awaited dispersal to their new owners, 'founders' hoards' were composed of objects which had reached the end of their useful lives. A difference in the chronological structure of these hoards could then be inferred: since the 'merchants' hoards' included objects which had come straight off the production line, they provided a cross-section of material which had originated at a similar point in time. 'Founders' hoards', by contrast, covered a wider chronological range of material. The objects contained within a 'founders' hoard' would consist of objects discarded when they were worn-out and useless, and this allowed a different timescale to be inferred. Such objects might have circulated for different lengths of time prior to discarding, and some might have remained longer in the stockpile without being selected for recycling by the metalworker.

The likelihood of a hoard being composed of objects that originated at a similar point in time is crucial to the construction of a valid chronological scheme. For it is only by making the assumption that a group of objects recovered together were manufactured at a chronologically similar point that such a scheme can be created. The 'security motive' as an explanation for hoard deposition is invaluable in this context. By arguing that the artefacts recovered in a 'personal' hoard were the valued possessions of an individual until the moment of their deposition, the probability of their contemporaneity can be bolstered. Perhaps the 'merchant's hoard' is even more important in this respect. The merchant will, after all, be dealing in goods which customers want to buy; objects that will, in effect, be fashionable. Therefore the 'security motive', when extended to the 'merchant's hoard' (for the hoard can be ascribed to the actions of a trader burying his stock when threatened by potential thieves) allows a clear chronological framework to be established.

The 'founder's hoard' is more problematic, however. Once again, the 'security motive' can be cited as an explanation for the existence of such hoards. In this instance, the deposition of the hoard has come about through the metalworker attempting to protect his raw material from theft, an act similarly motivated to those which create any other category of hoard. However, it must be remembered that in these hoards residual material will present, and this will contaminate any chronological scheme created by those individuals unwary enough to be aware of this fact.

It is for this reason that 'founders' hoards' present something of an enigma to those who attempt to arrange Bronze Age metalwork into a chronological scheme. The 'chest of drawers' style of compartmentalisation which is so clear in the work of Burgess - where every piece is strictly attributable to a specific point in time - is very often not borne out in the hoards themselves. There are numerous examples of anomalies. The Shoebury I hoard, Essex, is a case in point. This hoard, dated to Hawkes' Late Bronze Age 2 (Burgess' Ewart Park phase), included a broad-bladed palstave, untrimmed from the mould. This is a type which is interpreted as a classic indicator of the Middle Bronze Age, and Shoebury I is not unique in this respect.

The hoards of the 'Wilburton Complex' have also proven themselves to be similarly problematic. Colquhoun presented a comprehensive account of the contents of one such hoard, the example from Blackmoor, Hants. (Colquhoun, 1979). He suggested that the hoard contained elements from both the Wilburton metalworking tradition and the succeeding Ewart Park industries. From the contents of this hoard and others which could be dated through typological similarities to an equivalent point in time, he was able to suggest that such 'founders' hoards' could be dated to a period of transition from one industrial phase to another. The time difference could, it was argued, be demonstrated physically in the wear of the objects, for the castings from the previous phase were generally in a poorer condition than those which were representative of a later metalworking industry (Colquhoun, 1979, 113).

This led to the old explanations for the deposition and subsequent abandonment of 'founders' hoards' being largely discounted. The 'merchants' and 'personal' hoards still retained their 'security motive' explanation (as demonstrated in Burgess, 1974), but the 'founders' hoards' were now believed to be residual by-products from practices which were an integral part of the contemporary metalworking industry. It was argued that these hoards, comprised of a mixture of metalworking traditions, were largely made up of unwanted bronzes, scrapped in readiness for recycling. These consisted largely of items deemed unfashionable by their previous owner, and it was surmised that these were exchanged for new replacements, and then stockpiled by the founder as a readily available source of scrap metal. Into this stockpile could be added unwanted castings from more recent production. These were invariably discarded because they were deemed by the manufacturer to be poor quality and substandard. Having a collection such as this enabled the manufacturer to have a quantity of raw material on hand for whenever it might be required.

The greater emphasis now being placed upon the role played by bronze hoards in the bronzeworking industry did, however, have wider implications. As well as allowing a more detailed study of the structure of the industry, the new theories could also be employed to further enhance the original chronology. Hoards were no longer restricted to a certain phase or industry; instead they could be dated more precisely to a specific point *within* the industry. Peaks of hoard deposition could be isolated, and these now became the subject of interpretation (Burgess and Coombs, 1979). One such peak was identified at the transitional period between the Wilburton and the Ewart Park phases, i.e. between Late Bronze Age 1 and Late Bronze Age 2 in the Hawkes' 1960 scheme. Wilburton hoards were seen as consisting either of types which were restricted only to the Wilburton Complex - the find from Wilburton itself being an excellent example of this (Evans, 1885) - or, perhaps more frequently, were found to contain a mixture of Wilburton and Ewart Park elements.

The peak noted at the close of Late Bronze Age 1 was, however, comparatively minor in comparison to that seen in the closing stages of Late Bronze Age 2, the Ewart Park phase. Here, we encounter large numbers of the 'Carp's Tongue' hoards, the 'founders' hoards' *par excellence,* with their often-considerable quantities of copper ingot fragments.

In both cases, the explanation put forward was that these hoards were deposited in response to problems occurring within the bronze-working industry, and that their presence could be used to demonstrate physical evidence of stress. The difficulties were seen as being quite specific in nature, pertaining only to the bronze industry, and having little if any repercussion on other aspects of Bronze Age society. The Wilburton hoards were interpreted as resulting from the displacement of the Wilburton smiths by those specialised in the production of Ewart Park metalwork. With their skills and their products

unwanted, these smiths were forced to seek out new markets elsewhere. Their exodus from the south-east of England explained the Wilburton elements visible in the Broadward Complex of the Highland Zone (Burgess, Coombs and Davies, 1972).

The afflictions which were to trouble the superseding Ewart Park phase were even more profound. In this instance, it was not one specific craft school which was under attack, but rather the entire industry (Burgess, 1979). With the advent of iron-production, bronze fell from favour. Bronzeworkers, with their product no longer held in high esteem, sought to recapture its value by cutting down the amount of bronze in circulation. By making it such a scarce commodity, it was hoped to increase demand amongst the consumer population.

Such interpretations allow the 'founders' hoards' to be pinpointed more closely to an exact point in time. In addition, anomalies can be more easily explained within this interpretative framework. The flat axe recovered from the hoard at Danebury, Hants., becomes neatly explicable as a stray find retrieved in antiquity and deposited within the bronze stockpile for use as and when required (Cunliffe and O'Connor, 1979). Childe's argument that 'founders' hoards' by the nature of their contents prevent assignment to a specific point in time is thus no longer seen as applicable. Instead, a chronological anomaly becomes an object retrieved by an enterprising bronzeworker, and thus it can be disregarded from the dating procedure.

Each individual hoard - representing either the valued possessions of an individual buried for reasons of security, or the by-products of a bronze-working industry buried in times of commercial upheaval - can thus become an entity which has the potential to provide us with a synchronic cross-section of the bronze-working industry in its entirety. The 'personal hoard' will allow us to ascertain which objects were held in high esteem as items of personal value at a specific point in time; the 'merchant's hoard' will demonstrate which objects were being manufactured and distributed at a point contemporary to deposition; and the 'craftsman's hoard' will show what a Late Bronze Age artisan's toolkit consisted of at the time of abandonment. By contrast, the 'founder's hoard' will demonstrate a duality in terms of its contents. Firstly, there will be present the scrapped and worn-out objects retained by the smith because they are no longer wanted by the user, either because they are worn out or because they are no longer fashionable, and secondly there will be failed castings from recent production. Objects which do not lie comfortably within either of these two categories can be easily explained away as residual material found elsewhere and brought back to the stockpile for re-use. Because the recycling of bronze is an ongoing process, it is only occasionally that these hoards will be placed within the ground, such an activity occurring whenever the industry is disrupted through unrest or competition resulting from the replacement of one craft tradition with another.

The assignment of these hoards to specific points in time allows comparisons to be made regarding the objects included, and this is where the evolutionary concept becomes important. It is one thing to comment upon the fact that hoards can be assigned to a certain chronological horizon, but of equal importance are the criteria used to decide whether certain metalwork hoards are dated to a chronologically equivalent period, or whether they are of later or earlier date.

The means of differentiation is established through the recognition of various technological yardsticks. These were noted during the previous chapter, namely the introduction of lead into the copper-tin bronze alloy, the introduction of the double-valved mould, etc. The evolution of the axe can demonstrate this quite clearly. Flat axes, cast in an open mould, will require a lower standard of technological achievement than the palstave, which requires the use of a double-valved mould. Finally, the socketed axe results from a further technological advance, with the two-part mould further augmented through the addition of a clay core. Similar scales of achievement will apply to other categories of objects, too.

The idea of inevitable progression is not always borne out, for it is apparent that while certain technological advances take place at a very early stage, cross-fertilisation between categories is not instantaneous. Socketed spearheads, for example, come into being as far back as the Early Bronze Age, but the socketed axe does not achieve real popularity until the Late Bronze Age. Similarly, such a simplistic division serves only to explain the broad patterns which are visible in the material. In basic terms, we have an Early Bronze Age characterised by the flat or flanged axe, a Middle Bronze characterised in the lowland zone by the palstave and the highland zone by the haft-flanged axe, and a Late Bronze Age characterised by the socketed axe. On closer inspection, such a clear-cut demarcation is not so evident: the Taunton hoard, interpreted by Smith as Middle Bronze Age in date (Smith, 1959) contains a socketed axe, and palstaves are regular inclusions in Late Bronze Age hoards.

The basic divisions described above can therefore be taken only as very general guidelines. The creation of a more realistic chronological scheme for the metalwork thus requires a recognition of there being a greater degree of complexity within the material, and a means of achieving this is illustrated in the work of Burgess and others. It is not merely a straightforward comparison between certain types of artefacts, such as axes, swords, spearheads, etc. that allows a detailed chronology to be established. Instead, a more complicated comparison is required between different recurring features noted on the members of a single category of artefact. Certain features of an object will be seen as advantageous from a functional point of view, and these will be retained and developed, whereas those which are in any way problematic will be discarded in the future by the manufacturer.

There is a clear association between this method of classification and biological explanations for evolutionary change in the plant and animal worlds, as Sørenson has argued (Sørenson, 1987). Different artefacts from different sources can be arranged together according to their category, and then placed in some kind of chronological order. There is a recognition of improvement and refinement taking place within various artefact categories over time, and this sense of continual adaptation and change is apparent in the work of many scholars. The possibility of degeneration is less often encountered, though the work of Childe does prove an exception to this general rule (Childe, 1930, 57). In his interpretation of typological classification, a move forward in time need not necessarily equate with an inevitable progression in design or technological achievement.

Childe's cautionary approach does, however, seem to be unusual. For the majority of scholars (as demonstrated, for example, in Evans, 1881, and Montelius, 1908) continual progression is evident. This progression is reflected in the chronological scheme for the Bronze Age still in use today, and it is important to note that, although there have been one or two instances where certain artefact categories have been recently allocated to different points in time (for example, the allocation of the leaf-shaped sword to the closing stages of the Middle Bronze Age rather than it being restricted entirely to the Late Bronze Age), the basic patterns have remained the same. Instead, it is the degree of detail which has changed in the intervening years since Evans, and later, Montelius, made early efforts to arrange Bronze Age metalwork into some kind of chronological order.

This clearer definition has come about through an increasingly detailed comparison of objects which lie within a particular category of artefact. Such a changing approach can be illustrated with reference to one such category. The category which I have selected for this purpose is the former 'type-object' of the Late Bronze Age, the leaf-shaped sword. In order to place various examples of these objects into a logical chronological order, certain traits must be isolated within each individual example and then compared. By looking at the objects deposited in association with these swords, rough guidelines as to the time of deposition can be obtained, and thus swords deposited as single finds can then be included in the comparison. The aim is to see how certain characteristics change over time, from their initial introduction to their floruit and ultimate abandonment, and such information can be used to construct a detailed scheme, such as that postulated by Burgess and Colquhoun in their 1988 corpus The Swords of Britain.

In this work, the material available was divided initially according to the chronological scheme first established by Hawkes in 1960 and further elaborated by Burgess in 1968. Swords were assigned to the early Penard/Rosnoen phase, the Wilburton phase or the Ewart Park phase. One of the most important means of differentiation in this basic division of the material was the detail of the hilt. Early indigenous swords combine a leaf-shaped blade with a hilting mechanism similar to that seen on the rapier, a combination seen on the Ballintober-type sword. The Ballintober sword is followed by the Wilburton sword, with

its narrowed ricasso and slotted tang, and this is ultimately replaced by the Ewart Park type.

The basic principles which lie behind the typology can be isolated here. Certain traits are observed by indigenous metalworkers exposed to exotic metalwork, and these are then employed to influence the form of future castings. The Ballintober, which is a hybrid between the indigenous rapier and the numerous foreign forms of sword which were being circulated and also deposited in the closing phases of the Middle Bronze Age, provides a perfect illustration of this principle at work. It is also argued that the Wilburton sword is a similar native interpretation of contemporary foreign forms. Burgess and Colquhoun argue that the Wilburton sword, which may display decoration on the blade and around the ricasso, is in fact a native adaptation of the St. Brieuc-des-Iffs type of north-west France. By contrast, the Ewart Park sword demonstrates a native response to an already indigenous form, for it is suggested that the Ewart Park sword represents a reaction by the inhabitants of the Highland Zone to the Wilburton swords which were percolating through to the area from the south-east of the country. It is argued that the Ewart Park sword is less ostentatious in nature, and Burgess and Colquhoun even suggest that:-

'it is not surprising that this far from the centres of Wilburton sword production, and in the harsher northern environment, there should have been a coarsening and simplification of the quintessentially bold, exaggerated Wilburton lines' (Burgess and Colquhoun, 1988, 52).

The Ewart Park sword, therefore, is viewed as a descendant of the Wilburton form which has suffered degeneration, at least in an aesthetic sense. This change has come about through an evolutionary change identical to those seen in the animal or vegetable kingdoms. Those features not required for its continuing survival in the harsher northern environment have been 'bred out' of it.

Burgess and Colquhoun reinforce their argument with reference to an elaborate body of evidence gleaned from exhaustive comparisons made between individual sword specimens, and it is the manner in which these comparisons have been undertaken which should be examined in detail. The basic types of sword which can be picked out amongst the corpus as a whole are further subdivided into a series of classes and sub-classes. When a number of traits are measured and the results plotted out visually, each individual sword should be capable of assignment to a sub-group which is characteristic of a specific point in space and time.

Burgess and Colquhoun succeeded in creating sub-classes of this kind. However, this process was not unproblematic, and the boundaries they have created are precisely that: creations which are based largely upon observations made in the present and means of division considered important by contemporary workers. It certainly appears true that this

process is markedly less problematic when fewer specimens are available for comparison. In fact, their difficulties in sub-division appear to increase over time, as the leaf-shaped sword is deposited in greater numbers, and over a wider geographical extent. But in every instance, from the Penard onwards, there are difficulties: swords which are anomalous, and which cannot be fitted easily into any of the isolated groups.

In the case of the Wilburton Complex, such anomalies are clearly present in the classification. Traits are followed over time, leading to the establishment of a suggested chronological development of the Wilburton sword. One example of the problems encountered during the classification of this object is seen in the Wilburton Group F swords. While Wilburton swords demonstrate a change in hilt design, evolving from a wide-splayed hilt to a narrower one, the Wilburton F group displays a combination of a wide-splayed hilt and a blade shape which anticipates the later Carp's Tongue sword, a type which is seen as a later form contemporary with the Ewart Park sword. Therefore the swords of this group possess a set of contradictory traits: early hilts and late blade forms.

Such difficulties become even more apparent in their study of the Ewart Park material. The authors agree that all Ewart Park swords show a high degree of standardisation, and in fact mention that it is impossible to distinguish them by any visual means (Burgess and Colquhoun, 1988, 55). Their initial step in the process of creating classes for this material was to subdivide it into regional groups, and then the material was further subdivided into chronological phases. Early swords could be differentiated by isolating features which were shared with the Wilburton swords, for the finding of features common to both indicated that the two different forms were likely to have been in circulation at a similar point in time. And, by contrast, swords which instead shared those traits also seen in the succeeding Gundlingen sword were interpreted as being later in date. These later swords demonstrated the replacement of those traits characteristic of the Wilburton examples with others which were to be developed and given greater importance, until their predominance would ultimately result in the creation of a sword-type which would belong to the Thames-Gundlingen group.

The earlier and later Ewart Park swords could be isolated and thus removed from the main body of the material, but this left an intermediate group which still required to be classified. This material was initially divided into two groups, and these were then plotted out visually. However, out of a total of 351 swords, only 180 showed a sufficient number of distinct features which could then be differentiated in this manner. Despite the fact that almost 50% of the total sword population could not be considered in the study, Burgess and Colquhoun concluded that their findings did in fact have significance, and that there was a progression between swords which displayed a large number of early features and those which demonstrated a preponderance of late features. Graphically, though, they encountered difficulties when trying to create a series of discrete groups, as their graph showed no distinct clusters of material, displaying instead an uninterrupted curve.

Further difficulties arise with the authors' strict adherence to Burgess' 1968 scheme for Later Bronze Age metalwork. The Late Wilburton variants were recovered from the Highland Zone, and it was also from this area that the earliest Ewart Park swords were recovered. The authors' explanation for this northern innovation has already been mentioned: that the Ewart Park sword is a type which was created through removing the ostentatious elements inherent in the Wilburton design, and transforming it into one which was more simple, straightforward and functional. But it remains to be explained why exactly this product of the north and west should have become so universally popular over the entire country. The role of the Highland Zone was, after all, thought to be that of a passive recipient which received material and manufacturers from the innovative south-eastern portion of England. It is, however, this sword type which ultimately dominates - and gives its name to - the Ewart Park period. Even in those extreme south-eastern counties of England where the Carp's Tongue sword is recovered in considerable numbers, large quantities of Ewart Park swords are present. Of the swords recovered intact from the river Thames, the majority are representatives of the Ewart Park types, with Carp's Tongue examples turning up only on rare occasions. The hoards of the 'Carp's Tongue Complex' show a similar pattern. Many of these hoards show roughly equal percentages of Carp's Tongue and Ewart Park sword fragments, and in some cases contain no examples of the Carp's Tongue sword-type. The hoard from Bexley Heath, Kent, for example, classed as 'Carp's Tongue' in the literature, included among its contents an adjoining hilt and upper blade fragment from a Ewart Park sword, while the Carp's Tongue sword was unrepresented.

What is clearly apparent in the type of study discussed above is the search for some kind of objective reality inherent within the material, a desire to discover what Hill and Evans term a 'natural typology' (Hill and Evans, 1972, 232). The objective which lies at the heart of a study of this kind is the isolation of different classes and sub-classes which exist as discrete entities. However, as Burgess and Colquhoun's attempts to classify Later Bronze Age swords have shown us, a clear-cut subdivision of this kind is seldom, if ever, possible. There remain objects which do not fit easily into the classification. The mismatching of analytical classification procedures and human categorisation processes will be dealt with in depth during the next chapter, and perhaps at this point it should be noted that the objective reality sought by scholars who pursue this kind of study is more a creation of their own preconceptions. The case of leaf-shaped swords again demonstrates this point well, as alternative classifications for this artefact category have in fact been undertaken.

Hill and Evans, in their 1972 paper which dealt with the problems of typology and classification, noted that it was impossible to give each of the individual traits which could be isolated within the material equal weighting. Each different criterion had to be treated in relation to the others, and their relative importance would be dependent upon the questions

being addressed by the researcher. The work carried out on swords by Burgess and Colquhoun illustrates this well. Burgess and Colquhoun have taken a specific body of evidence, examined it in detail, and as a result they made claims as to the chronological ordering of this evidence. More recently, however, Brown also examined this same evidence, emphasising different traits in the material, and achieved a quite different result (Brown, 1982).

It could be argued that Burgess and Colquhoun arrived with a set of preconceptions - namely the established chronology of the Bronze Age suggested by Hawkes and further elaborated by Burgess in 1968 - and that they 'read' the typology of the material with the aim of backing-up this chronology. As was discussed in the previous chapter, the traditional interpretation of the Late Bronze Age in Britain is to see the Lowland Zone as a place of innovation, a role brought about through exposure to immigrants and imports from continental Europe. The Highland Zone is by contrast a poor relation; retarded and slow to progress, functioning as the passive recipient of the novelties and technologies first developed in the lowland areas. Burgess and Colquhoun's work on swords backs such a thesis up well. Most types are seen to originate in the south-east, because they are recovered in larger numbers here, and the Ewart Park sword, the only type seen as originating in the Highland Zone, does so because it is created as a response to imported Wilburton examples.

Whereas Burgess and Colquhoun concerned themselves with isolating and highlighting the changes in such features as the shape of the hilt and riveting arrangements, Brown paid equal attention to more practical elements of weapon design (Brown, 1982). She contrasted the fighting techniques required in the use of a rapier with those involved in the use of a leaf-shaped sword, and calculated indices related to these aspects (Brown, 1982, 4-5). The crucial element which set the leaf-shaped sword apart was the downward weighting of the blade, important in generating the powerful downstroke which was required for the object to function as a slashing weapon. Therefore, she argued, the crucial elements were the length of the blade and its maximum width, and in addition the distance down the blade at which the maximum width occurred.

Brown argued that while Wilburton and Ewart Park swords bore close similarities in terms of their blade weighting, the differing treatment of the hilt rendered the two types quite distinct. Her ultimate conclusion was that there was no obviously demonstrable evolution between the two types (Brown, 1982, 13). This argument is a crucial departure from the traditional approaches, for - as was suggested first by Hawkes in 1960 and further argued by Burgess in 1968 - it has been virtually accepted that the Ewart Park sword developed from and ultimately replaced the Wilburton sword.

The hoard from Isleham, Cambridgeshire, has been interpreted by Burgess and others as further evidence which backs up the traditional chronology. The vast quantity of

fragmentary metalwork recovered allowed this deposit to be categorised as a 'founder's hoard', dating to the period of transition between the Wilburton and the Ewart Park phases. Hence the presence of Wilburton swords alongside their Ewart Park replacements could be considered an acceptable anomaly. Brown, however, argued that the presence of fragments from a sheet-bronze industry could indicate that the Isleham hoard was instead contemporary with the Ewart Park site of Heathery Burn, Co. Durham (Greenwell, 1893). This enabled her to suggest that the phases differentiated by Hawkes as Late Bronze Age 1 and Late Bronze Age 2 might in fact have been occurring simultaneously (Brown, 1982, 25).

Brown's paper has been sadly neglected in the literature, described by some as interesting but dismissed as lacking importance in the wider field of Bronze Age studies (Taylor, 1989). However, the arguments made within it only seem radical because they do not support the established canon which was set up first by Hawkes and then recreated and bolstered by a succession of works by Burgess and others. Brown interrogated part of this familiar body of material in an altogether unfamiliar way, and produced a scheme for the Late Bronze Age which is in some ways quite revolutionary when compared to the traditional chronological narratives.

By suggesting that the Ewart Park sword does not owe its ancestry to its Wilburton counterpart, Brown establishes it as an independent innovation from the Highland Zone. The north and west of Britain are no longer seen as passive partners of the Lowland Zone: instead innovation occurs here during a period which may be running simultaneously with the Wilburton phase in the south and east. She backs up this theory with evidence drawn from the typological analysis of spearheads, claiming that many finds show indications not of retarded development in the Highland Zone, but rather of early Ewart Park sword manufacture (Brown, 1982, 29). The end result is that the Broadward Complex, once seen as a successor to the Wilburton Complex (Burgess, Coombs and Davies, 1972) can now be viewed as a possible contemporary of it.

This is a necessarily truncated presentation of Brown's work: suffice it to say that enough doubts should have been raised by her alternative interpretation to make us much more aware of the inadequacies of the traditional chronology which retains its dominance in Bronze Age studies. It should also teach us to be much more critical of the material evidence which confronts us. A comparison of the differing interpretations carried out by Burgess and Colquhoun and by Brown can demonstrate how the same body of material can be interrogated to yield a quite different picture. Retarded development in one school of thought, i.e. the retention of old outdated manufacturing techniques, such as the continued use of Middle Bronze Age spearhead types, can be interpreted instead as evidence of the precocious production of innovative designs, i.e. the early appearance of Ewart Park swords. Each set of theories can be argued at length and their relative merits discussed exhaustively by scholars, but it must be accepted that it is the very nature of hoard

deposition which leads to such uncertainty. Because the metalwork is often discarded in a manner which enables only relative and not exact dating to be carried out, and because the changes in manufacturing detail which are observed take place over a comparatively short space of archaeological time, it must be accepted that the 'underlying truth' behind the metalwork chronology can never be confidently attained.

It is with this realisation in mind that this study of Late Bronze Age metalwork has been approached. It is recognised that there existed substantial problems in the study of this archaeological data set, and that these problems would have to be recognised in this thesis. It is impossible to gain satisfactory answers to these problems. Instead, we must accept that our traditional chronology need not necessarily be the correct one, and that there may be other ways in which this same set of material can be ordered.

Perhaps one of the most problematic aspects of traditional approaches to the classification of the material is the creation of typologies which become so detailed and so complex that they are often used to demonstrate arguments which may be so tenuous as to render them meaningless outside a realm of theoretical abstraction. As Hill and Evans argued in their 1972 paper on archaeological classification, typologies are not natural: they are created by the researcher in order to address the specific points that he or she wishes to address in the context of their work. It should therefore not surprise us that Burgess and Colquhoun and Brown can reach such differing conclusions as to the place of the Wilburton sword in the Bronze Age of Britain.

However, I would argue that Brown's work presented us with a major departure from the norm. It was pointed out earlier that she sought to ascertain how the various types of leaf-shaped swords differed from one another in practical terms, by considering the weighting of the blade, for example, as opposed to establishing different types and sub-types through the recognition of detailed variation in the shapes of tangs and hilting mechanisms. She recognised that different schools of manufacture would produce hilts which would differ according to the tastes of the smith responsible. It was the dimensions of the blade which were of prime importance to the individual who was required to use the sword in battle, and it was by considering these dimensions that she was able to demonstrate that both the Wilburton and the Ewart Park sword types were related in practical terms, even though the details of their hilt and shoulder regions differed markedly. It could therefore be argued that the typology created by Brown is more convincing, as it is grounded in a more practical classification method.

Archaeology does not hold the monopoly on the study of human classification methods: there have been numerous occasions where this subject has been addressed in fields of study which lie outwith its immediate interests. While the classification methods employed in the biological sciences have greatly influenced archaeologists, more recent explorations in this area carried out in the social sciences have been until recently neglected.

It can be argued that since archaeology is the study of human beings and the way in which they operate upon and within the world around them, then the subject of human classification procedures has direct relevance to those who have an interest in this study. Since this thesis is directly concerned with the way in which different categories of artefact are constructed, used, and ultimately destroyed by human agents, then the problem of categorisation becomes a fundamental one.

Chapter Three: Contemporary Debate

It has been established thus far that the chronological framework in place for the British Bronze Age is largely dependent upon certain suppositions regarding the strategies which lay behind the initial deposition of metalwork hoards. Such strategies were traditionally linked with either the safe storage of personal possessions in times of strife, or the hoarding of a precious raw material. In either case, it was the metal itself which was deemed to possess a certain intrinsic value which might render it desirable to those other than its rightful owner. This school of thought described the exchange of bronze in terms which would not have seemed out of place if applied to economic transactions taking place in a modern, industrialised society. Bronze was traded by entrepreneurs, and functioned as a commodity exchanged between two individuals who had no mutual obligation. The moment of transaction was the point where all obligations between the exchanging parties were cancelled out. This thesis was carried further by some: the Breton-type socketed axe, for example, was interpreted as possessing the qualities of a primitive form of currency (Dunning, 1959). Such thinking continued to be evident in the literature right up to the late 1970's, something clearly demonstrated by Burgess' explanation for the disproportionately large number of hoards occurring towards the close of the Bronze Age. Burgess attributed this peak to anti-inflationary measures carried out by the bronzeworkers. Because so much bronze was in circulation, measures were taken to increase its scarcity by burying some of this excess metal (Burgess, 1979).

However, new interpretations of the role played by bronze within Bronze Age society were being developed concurrently by a new group of scholars. These alternative interpretations were generated by an increasing interest in contemporary anthropological work. Anthropology was not a new source of analogy; Childe, for example, had previously used ethnographic examples to illustrate his concept of the 'itinerant smith', the metalworker displaced from all social context who circulated between communities, instigating change and progress within those social groups he had dealings with (Childe, 1930). But in this instance, the examples were carefully used to bolster arguments which were already well-established.

Anthropology, like any other source of evidence, can of course be used to counter as well as to support any argument, and the work of anthropologists was to become the ammunition with which the traditional views were attacked. Rowlands, in a 1972 paper, used numerous ethnographic examples to argue against the validity of the itinerant smith. In the cases he chose to present, the smith was always strongly associated with the community within which he served. His role - and in the examples quoted, the metalworker was invariably male - was more often than not viewed in a doubtful, ambiguous light, and there seemed to be something of a dichotomy in the attitudes of those who encountered him. On the one hand, he became a subject of fear and respect, but those

same powers that engendered such feelings often contributed also to him becoming a figure of contempt.

This alternative approach took a step aside from traditional interpretations. Bronze no longer functioned merely as the raw material from which implements were created to fulfil the utilitarian needs of the community. Instead, the metal itself, and the associated manufacturing process used in its production, were given greater importance in the realms of ritual and religion.

Rowlands carried out a more detailed critique of traditional interpretations of Bronze Age metalworking in his Ph.D. thesis, which was published in 1976. Rowlands questioned first of all the assumptions which lay behind the term 'industry' as it was used in a traditional context, namely as a descriptive term used to label a collection of items deemed similar to one another on account of the materials used in their manufacture or the methods employed to create them (Rowlands, 1976, 115). He suggested a new definition for the term, arguing that an 'industry' might be 'any form of productive work that is carried out as a specialist activity (whether full-time or part-time)' (Rowlands, 1976, 115). With reference to the archaeological material, he was able to demonstrate that there was evidence to support the presence of a metalworking 'industry' (as per his own definition) in the Middle and Later Bronze Ages of southern Britain. The evidence he used to support this theory consisted of three basic observations (Rowlands, 1976, 116). Firstly, the sophisticated methods employed in the casting and post-casting techniques suggesting that a great deal of skill was required on the part of the manufacturer, and the learning process involved in acquiring such skills must in itself have been extensive. Secondly, the process of manufacturing metal objects would have required facilities set aside specifically for that purpose. Lastly, the wide range of types available and the standardisation apparent from the Middle Bronze Age onwards strongly suggested that specialised metalworkers were operating by this time. Rowlands then engaged in a series of regional examinations of the material, and concluded that, as well as there being evidence for a metalworking 'industry', there was also evidence for there being a two-tier division in metalwork production, particularly in the Thames Valley and East Anglia. While one sphere of manufacture produced the tools used in everyday life, the other was responsible for the production of more complex items such as swords, shields and spearheads, these latter items being objects of fine workmanship which also serve as prestige and high-status items (Rowlands, 1976, 123). Such a hypothesis does seem to be borne out by patterns apparent in the typology of these different objects, as can be demonstrated with reference to late Bronze Age material. Socketed axe forms, for example, show much local variation, while high status items such as swords demonstrate a greater uniformity of style over a considerable geographical extent.

At a similar point in time to Rowland's re-appraisal of the manufacture and circulation of bronze artefacts, Sahlin's book Stone Age Economics was becoming more widely

known (Sahlins, 1974). This work, along with later publications by Gregory (Gregory, 1982), provided a more in-depth analysis of how the economics of preindustrial, small-scale societies operate. While it was recognised that the quasi-western capitalist model was quite unacceptable as a means of characterising the Bronze Age, it was only now that the whole problem of the circulation, exchange and deposition of Bronze Age metalwork was finally called into question. The concept of gift exchange, which had been noted and discussed previously by anthropologists (Mauss, 1925), was an integral part of this, and it became increasingly apparent that it was through the discarding of wealth - rather than its accumulation - that status could be established and maintained. Such a view worked in direct opposition to the strategy of wealth accumulation postulated by traditional scholars in the field of Bronze Age studies.

1980 saw the publication of Barrett and Bradley's book Settlement and Society in the Later Bronze Age, containing a series of papers written by those scholars who had been influenced by advances in anthropology (Barrett and Bradley, 1980a). In several of these, a radically different picture of Bronze Age Britain was postulated, though admittedly this re-interpretation was largely restricted to archaeological evidence from the 'Lowland Zone'. Rowlands, who had already dealt with the problems inherent within traditional interpretations of metalworking, now used anthropological models to present a more wide-ranging re-assessment of social organisation on a larger scale. Using recent ethnographic data from north-west America, and referring also to Homeric texts - written evidence which he claimed provided a close parallel to the European Bronze Age - Rowlands presented an alternative model in which the achievement of status through gift-giving between social groups became of paramount importance (Rowlands, 1980).

This paper by Rowlands, and additional examples in the same volume (for example, Barrett and Bradley, 1980) raised the problems posed in interpreting the deposition of fine metalwork in riverine contexts. However, it was the work of Bradley which would over the coming years investigate this phenomenon in greater detail, and which would address the problem of hoard deposition in considerable depth.

Bradley used a 1980 paper by Gregory to demonstrate possible ethnographic parallels to the reasoning which lay behind the deposition of riverine metalwork. Gregory had worked extensively in New Guinea, and had examined the details of the potlatch ceremony (Gregory, 1980), thus providing Bradley with a suitable analogy by which the situation in Later Bronze Age contexts could be understood. The exchange of gifts between individuals created - as Bradley described it - 'a pattern of alternating disequilibrium' (Bradley, 1982, 119) and this resulted in a situation where no partner in the gift exchange could benefit in the long-term. In the immediate future following a gift to a neighbouring group, status would be increased, but there remained the knowledge that in time the recipients would regain their status by returning the gift, and would probably obtain added interest by making the return gift even more extravagant. In order to avoid the shame of

being out-classed by a competitor, and to escape a form of galloping inflation brought about by a circle of exchange which grew greater and greater with each round of gift-giving, it would prove more prudent to offer gifts to someone or something which could not return the gift in anything more than an abstract manner.

Bradley argued, once again citing Gregory's findings, that the best way to increase status was by actually removing the objects from circulation. Instead of donating gifts to the living, they were offered to the gods or to the dead. He suggested that a series of deposits, namely the Bronze Age metalwork recovered from rivers and wet ground, resulted from this kind of practice.

This modified picture of the Bronze Age was one of competition between groups and individuals over the acquisition, exchange and, ultimately, the sacrifice, of high-status metalwork. The dichotomy already argued by Rowlands for the initial production and subsequent circulation of metalwork was then extended through to the process of deposition, as Bradley sought to elaborate his understanding of metalwork deposition by re-interpreting the problem of bronze hoarding.

He sought to establish a means of definition which might enable one to differentiate a hoard buried for religious reasons from one which was buried for secular purposes. Levy was also attempting this kind of differentiation within the bronze hoards of Denmark (Levy, 1982) and she proposed a number of differences which might serve to identify whether a hoard resulted from religious or secular practices (Levy, 1982, 56). The most important factors were the context of burial and the contents of the hoards. A basic guideline was as follows: a votive hoard would be deposited in a wet context and would be dominated by weaponry or chariot fittings, whereas a utilitarian hoard would instead be dominated by small tools or scrap metal, and would be placed on dry land, in a situation where recovery would be fairly straightforward.

Bradley was to use such a division as a means of identifying different exchange mechanisms which might have been operating within Later Bronze Age society. Gregory had noticed differences between gift exchange and commodity exchange in his work on the New Guinea evidence (Gregory, 1982), and Bradley suggested that a similar situation might have given rise to the hoarding patterns apparent in south-east England.

Gregory demonstrated that, unlike gift exchange, which carries with it long-standing debt, commodity exchange cancels out any debt at the time of transaction. Whereas gift-partners share relations of alternating superiority/inferiority, those who participate in commodity exchange operate at a certain social distance, and have no obligations to one another. Bradley argued that the metalwork hoards of south-east England demonstrated such a dichotomy. He suggested that the 'merchants' hoards' and the 'founders' hoards' could be interpreted as possible evidence for commodity exchange (Bradley, 1985, 33).

The 'merchants' hoards' consisted of items which were of the same category, thus suggesting some degree of standardisation, while the 'founders' hoards' comprised collections of scrap metal, where the object had been destroyed in a reduction process which had robbed it of its original meaning. Bradley also cited an observation by Muckelroy (Muckelroy, 1980), whose examination of two Bronze Age shipwrecks found on the English coast had led him to suggest that the cargo from the Langdon Bay example was made up of objects reduced to scrap metal. Muckelroy demonstrated a comparison between wrecks such as that from Langdon Bay with the contemporary Middle Bronze Age hoards recovered on dry land, and argued that it was likely that both were linked with the transportation and storage of scrap metal (Muckelroy, 1980, 107). Bradley expanded upon this initial observation, reaching this conclusion: that 'founders' hoards' consisted of objects which had lost their original meaning, either through their destruction, or through a dislocation from their usual place or time of circulation. This therefore accounted for the anomalies so clearly apparent in the hoards; the stray material from previous industrial phases, the foreign types so frequently encountered in scrap hoards, and the overall poor condition of the objects. The original categories of objects included and the meanings that these categories carried with them had, to all intents and purposes, been erased.

To demonstrate this, he referred to the hoard evidence from south-east England. He suggested that certain categories of object could be seen entering the archaeological record through deliberate deposition as complete items into the Thames. Around this central core area, there was located a periphery within which these same items were being recovered as scrap metal in utilitarian hoards.

One question remains, however. If the practice of hoard deposition played such an integral role in the process of metalworking, as Bradley suggested, then why do these hoards occur in such a selective area? Why are these hoards which supposedly result from the commodity exchange of raw materials restricted to specific geographical locations, instead of recurring in a more uniform pattern throughout space and time?

Bradley addressed this problem in a 1988 paper, where he attempted to explain the sudden increase in 'founders' hoards' apparent in the Late Bronze Age. He concluded that the deposition of these utilitarian hoards took place on a regular basis, and he then proceeded to invert the principles which lay behind the 'security motive' as postulated by Childe. Whereas strife and unrest had once been seen as the principal motivation which lay behind the initial deposition of these hoards, Bradley suggested that, conversely, such disturbances would create disruption in the smooth running of the metalworking 'industry', thus preventing their recovery.

In addition, Bradley argued that the increase in hoarding was indicative of an increase in metal consumption during the Late Bronze Age. Because the votive sphere was consuming metalwork at an ever-increasing rate, metalworkers were forced to step up the

pace of recycling. The end result of these increased levels of consumption was crisis within the bronze industry, and ultimately, the widespread adoption of iron, particularly in the secular sphere.

Current Debate: Revolution or *En Passe?*

The work of Rowlands, Bradley and others certainly marked a radical departure from the traditional approaches, but how valid should we consider this new portrayal of the Bronze Age to be, where the once-divided categories of the economic and the social are now more closely interwoven?

It is pertinent to note that many of the terms used in anthropology to describe conspicuous consumption - terms which have consequently been adopted by archaeologists - mirror closely those used in Western economics. Goods are offered as a means of investment, although the return comes in a fundamentally different form than it would in an industrialised, capitalist society. In a pre-industrial, small-scale society, such an investment gives the individual or social group in question an increase in prestige and social standing. However, the language of conspicuous consumption clearly uses the ideas which lie behind capitalist economics and the terminology associated with these, as a metaphor through which the processes involved can be described. But the two schools of thought are radically different. In the traditionalist approach, it is the storage and the accumulation of wealth which is the primary motivation for an individual's actions, whereas the theory of competitive consumption argues that it is the disposal of this wealth which is the key factor.

There is much to be said in favour of applying the theories of gift exchange and conspicuous consumption to the archaeological material of the Late Bronze Age. But one problem still remains largely unaddressed. This is the continuing dichotomy which lies between gifts and commodities, high-status and low-status objects, ritual and utilitarian practices. Rowlands did criticise this persistent duality (Rowlands, 1986, 746), an impressive act when one realises that it was arguably his own work which triggered off this alternative interpretation of metalwork production and circulation. Rowlands argued that the problems Bradley had encountered during his categorisation of metalwork deposits could largely be due to the imposition of such a duality upon the material, and indeed, when one studies the work of Gregory - which initially influenced Bradley's explanations for the deposition of metalwork - one finds an entirely different picture.

Gregory's work on gift exchange in New Guinea presented the reader with an escalating scale of gifts (Gregory, 1982). The high-status objects highlighted as special by Bradley were only part of the wider picture. From Gregory's observations, it was apparent that everything was treated as a gift, from basic necessities such as foodstuffs and agricultural implements all the way up the scale to marriage partners and exotic goods. In

the light of this, we must realise that the web of interdependency hinted at in Bradley's work may be infinitely more complex than has previously been imagined. If this is the case, then why stop at the agricultural implements and the foodstuffs? In a society where the consumption and exchange of metal objects seems to be playing such a fundamental role, then could it not be argued that the raw material itself, as well as the objects crafted from it, might have been considered a worthy gift? Such a hypothesis could be used to question the standard explanations for the nature of the cargoes carried aboard the wrecked vessels recovered from the Channel. These cargoes were perhaps an integral part of a massive gift from one individual or social group to another, and we can only begin to wonder at what might have prompted such a large accumulation of bronze to be transferred over such a distance.

The scrap-dominated hoards have recently been offered alternative explanations for their existence which suggest that they lie outwith the realms of secular practices. Taylor, in his recently-published Ph.D. thesis which studied the Later Bronze Age metalwork hoards of southern England argued that hoards such as the Isleham hoard, Cambs. consisted of bronze buried for its own sake (Taylor, 1993). It was the possession and the discarding of the raw material itself which became the important factor here, and the categories of object employed to create such hoards were largely irrelevant. However, the social context of this deposition remained largely unexplored. Taylor slotted his findings into the general model of the Later Bronze Age which had been established in Barrett and Bradley's 1980 volume, and the roles played by both bronze itself and the objects created from it remained unexplored.

It is undoubtedly true that the work of Rowlands, Bradley and others has given us a model by which we can understand some of the idiosyncrasies which have long been puzzling scholars of the Bronze Age. I would suggest, though, that a largely uncritical acceptance of Rowlands' model has continued to promote a picture which is two-dimensional in nature. To convey the Late Bronze Age as a heroic period characterised by gift-giving and sacrifice is admittedly a vast improvement upon the image portrayed by the traditional school. It allows us to envisage a period of prehistory which seems fundamentally different to our own twentieth century society. However, I do believe that we can now move beyond this, by engaging in a more complex dialectic with the wide range of material which is available to us.

One of the major breakthroughs in recent archaeological thought which can assist us in this process is the application of the concept known as 'structured deposition'. The principles which underlie this concept were first presented in a book edited by Hodder, entitled Symbolic and Structural Archaeology (Hodder, 1982). Several authors postulated that the final act of deposition of certain categories of material could be used as symbolic representations of more wide-ranging aspects of the beliefs which operated within a certain group of human agents at a specific point in space and time. Included among these papers

were Shanks and Tilley's work on skeletal material in Neolithic chambered tombs (Shanks and Tilley, 1982) and work carried out by Moore on the deposition of rubbish in specific contemporary African social groups (Moore, 1982).

Following on from this came the re-interrogation of a number of Neolithic sites in Britain. What had hitherto been dismissed as mere midden deposits were soon seen as having been structured in a far more complex manner. Work by Thomas and Whittle on the Neolithic long barrow at West Kennet (Thomas and Whittle, 1987) and by Richards and Thomas on henges (Richards and Thomas, 1984) demonstrated that even material normally perceived by archaeologists as rubbish - such as broken pottery and animal bones - was in fact being discarded in a specific manner.

Such detailed studies were adding new depth to the Neolithic in Britain. However, in Bronze Age studies, these new concepts were employed in only a very basic manner. It was demonstrated that certain categories of metalwork were being deposited in ways which could be interpreted as 'special'. But this re-appraisal served only to reinforce the dichotomy which lay between the 'special' and the 'day-to-day', the 'ritual' and the 'secular'. The categories originally isolated within the material were still being recreated in a largely uncritical fashion. This was in spite of the fact that such a division was one which was entirely of our making. Recent archaeological writings have, after all, concluded that in small scale societies, the realms of the ritual and the secular are closely interwoven and virtually indivisible (Garwood *et. al.*, 1991, vii).

Perhaps the reason for the continuity apparent in Bronze Age studies lies largely in the nature of the subject. This field of interest retains something of a split personality, for, while new breakthroughs were being made in the interpretation of social organisation, running parallel to this was an unchanging tradition of metalwork classification. New studies were produced which sought to increasingly clarify the classification schemes which led to the traditional chronology presented by Hawkes in 1960.

I have already demonstrated that this chronological scheme is not without its problems, and this fact has been admitted by others. Bradley, for example, recognised its problems (Bradley, 1990, 13) but seemed quite happy to persist in maintaining an uncritical reliance upon the traditional chronology.

It is not within the scope of this thesis to rework the chronology of the Later Bronze Age; suffice it to say that we should be aware of its limitations, and treat it as a creation developed within the field of archaeology and not a valid and unequivocal truth. Suffice it to say that the one major pitfall which permeates all aspects of this period is a persistent misunderstanding of the way in which human beings categorise and interpret the world within which they operate.

Classification versus categorisation

Thus it is to the problem of classification that attention must now be turned. How does the traditional method of classification differ from a more practical means of ordering material? It was demonstrated previously in the course of Chapter Two how Brown succeeded in ordering an assemblage of material in a manner which differed markedly from the more traditional schemes. If these traditional classificatory schemes derived through typological ordering are so infallible, then how was she successful in this?

It has more recently become a wider practice to offer a critique of traditional typology. The vanguard of this backlash has been outwith the realms of Bronze Age metalwork studies, and it is to the field of ceramic studies that one must turn in order to encounter radical new thinking in terms of categorisation methods.

An initial discussion of the problems inherent in archaeological classification was presented by Miller in his 1985 book Artefacts as Categories. Miller carried out ethnographic fieldwork in India, examining an assemblage of pottery types used by the residents of a village. He compared the classificatory schemes practised by those who used the objects in question on a day-to-day basis with a classification constructed through a comparison of those attributes which would have been considered important by a pottery specialist working on the same assemblage. He found a discrepancy evident between both approaches. What became apparent was that the classification scheme established through standard methods employed by archaeologists was too detailed. In reality, many of those traits used to indicate different classes, e.g. rim form, were disregarded by those who actually made use of these objects in their routine activities.

Miller's work has been followed more recently by work on assemblages of archaeological material by Boast (1990) and Barrett (1991). Boast examined British Beakers, in a study which can perhaps be seen as a critique of the complex subdivisions upon this material suggested by Clarke (1970). Barrett again took ceramics as a starting point, but presented a more general paper which addressed the whole problem of categorisation, relating it to the traditional school of archaeological thinking which seems to operate alongside the creation of rigorously defined typologies. Both authors recognised that the creation of these typologies is only the first step in a more complex interpretative process. For what is perhaps even more crucial is the manner in which typological change has been used to create histories and explanations. Barrett argued, for example, that in this school of thought - what he terms the 'normative' school - the typologies are mapped out over areas of time and space to create different 'cultures', and that some explanation must be created in order to allow for change in these cultures. The cultures are largely static; the categories within them are the physical representations of social 'norms' which should be adhered to and hence deviation from the standard will not be encountered. Therefore any change must be instigated from outwith the social group, through trade or invasion.

When applied to the situation in Later Bronze Age metalwork studies, this criticism is valid of traditional interpretations, although to be fair one must consider that the material is presented in a more complex manner, where some scope is given for innovation. This leaves us with a major problem: the new theories regarding the circulation and deposition of bronze are still being presented against a backdrop which is largely shaped by 'normative' thinking. Therefore, if we truly wish to make any critical re-assessments of the way in which we approach Later Bronze Age archaeology, then we must also thoroughly re-examine our entire classification process.

Archaeologists are not alone in practising classification. The classification of the material world is a fundamental one, practised by all human beings, and studies of this subject have consequently been carried out in fields outside archaeology. Several authors have argued that methods of classification are not universal. Instead, human agents will classify the world around them in a culturally specific manner (Foucault, 1970). An indication of this has already been seen in Miller's work on Indian ceramics, where classification carried out by an archaeologist failed to correspond with the classificatory schemes employed by those who used the material. It therefore seems likely that there is no universal typology which will - with increasingly detailed interrogation of the material - suddenly reveal the underlying truth behind the mystery of Bronze Age metalwork. Instead, any archaeological analysis will be just as culturally specific as any categorisation processes carried out in the past, created by archaeologists who undertake this practice according to their own preconceptions. Hill and Evans argued that the traits illustrated as worthy of study and considered important as a means of subdivision will depend largely upon the research purposes of the scholar who interrogates the material (Hill and Evans, 1972). It is perhaps worth hearkening back at this point to the problem of the leaf-shaped sword, where two markedly different chronological pictures can be created by emphasising different sets of attributes in the same collection of objects.

The problem is that any traditional method of classifying archaeological material seems to rely upon the belief that it is some tangible quality present within the objects themselves which will allow some means of differentiation to be imposed. Contemporary studies of categorisation - whether within or outwith the field of archaeology - argue instead that the definition of a category can only come about when it is placed in relation to other categories. Categories cannot be studied in isolation: it is through differentiation with other categories that they come into being, and such differentiation comes about through practical use, where categories become established, are recreated, or changed over time.

This re-appraisal of human categorisation processes has been centred largely within the subject of psychology, and it is to work carried out within this discipline that I will be turning my attention throughout the remainder of this chapter. However, other disciplines have also dealt with this subject, and so further exposition in addition draw upon advances

made in the field of linguistics. And philosophy, too, has yielded several discussions within recent decades. For it was Foucault who opened The Order of Things with the observation that categorisation varied with one's cultural perspective, so arguing that the universal truths claimed by those who practice objective scientific disciplines are themselves based upon cultural assumptions (Foucault, 1970).

Of crucial importance - and cited widely in the recent work on ceramics carried out by Barrett and Boast respectively - is a 1979 paper by Rosch. In this work, Rosch envisages categories as capable of being presented in diagrammatic form, arguing that they can be shown in horizontal and vertical planes. The vertical dimension enabled divisions to be made between varying degrees of categorisation, and these divisions were dependent upon the number of shared attributes occurring between various members of a group. Three divisions were introduced, which she labelled 'superordinate', 'base' and 'subordinate' levels of categorisation. At the superordinate level, the members of a category might share very few common attributes, whereas at the other end of the scale - the subordinate level - the number of shared attributes would be considerable.

We could take, as one way of illustrating this means of differentiation, the category 'furniture'. This would constitute one superordinate category, whose members share little in the way of common attributes. Moving down from this superordinate level to the base level, we find categories composed of objects which are similar to one another, both in terms of appearance and function. We would thus find a series of clearly-defined categories such as tables, beds, chairs, etc., and it is these different categories which can be arranged alongside one another along the horizontal axis. The degree of differentiation is similar between each one, and is sufficient to allow each category to be perceived as different from the others. For example, the members of the category 'chair' will share a number of attributes, and their context of use and the motor movements of the body required to utilise them will render them different from other categories at this level. Below the base level, however, the number of shared attributes will rise, and thus it will be necessary to introduce some kind of a linguistic tag in order to express any differences between the members of a category. This may be related to the context of use, and so we find ourselves using terms such as 'kitchen chairs', 'dining chairs', etc.

Rosch argued that human agents tend to operate most comfortably at the base level, i.e. at the point where categories are sufficiently easy to distinguish to avoid confusion, and yet where further linguistic differentiation is rendered unnecessary. It is at this base level that one will be able to clearly conceptualise an example of the category in question and, in the majority of cases, when an individual is asked to visualise an example of this category, the image will be the one which most clearly embodies those qualities deemed to be typical of it. This constitutes what Rosch terms the 'prototypical core' of the category. A chair, therefore, might to us possess certain characteristics: four legs, a seat, and a back.

However, it should be clear that although these qualities may illustrate a 'typical' chair, they are not necessary requirements for an object to be considered a chair. Other examples can appear radically different, and yet they will still be accepted without question into the base-level category 'chair'. So the category, as Rosch argues, will never remain closed and consistent. New members will be incorporated, as the category is re-worked and re-defined through practice, and as a consequence of this, the prototypical core of attributes which should ideally represent the category 'chair' might as a result change (Rosch, 1979, 36).

Lakoff and Johnson dealt with this process of change in some detail in their book Metaphors We Live By, again focussing upon the category 'chair' (Lakoff and Johnson, 1980, 122-124). They argue that we have no difficulty in accepting examples of chairs which deviate from the prototype (e.g. swivel chairs, hanging chairs and beanbags) because their similarity is recognised through the fact that 'they bear a sufficient family resemblance to the prototype' (Lakoff and Johnson, 1980, 123). There need not be what Lakoff and Johnson term 'a fixed core of properties'. Instead, all that is required is for an object to bear a sufficient similarity to the prototypical core of the category. This concept of 'family resemblance' was noted by Wittgenstein as early as 1958, in observations which perhaps pioneered this re-definition of categories, presenting them as unbounded entities which blur at the edges, as opposed to tightly bounded discrete groups.

Categories, then, can be envisaged as nebulous collections of similar objects, recognised as much by their difference to other objects as by their similarities to one another. Certain examples will be recognised as embodying the desired characteristics of the prototype better than others, but there will be no difficulty in shifting perceptions to cover any changing interpretations as to what makes a good example of the category in question. This recognition operates at cross-purposes to the traditional methods implied by typology. Instead of consciously seeking difference, and attempting to impose boundaries upon the material in question, one must instead recognise that variation will be present, and ask how closely a certain category of artefact follows something which might represent a prototypical norm. Or conversely, one could try and ascertain how loosely the idea of this norm is imposed upon the members of a specific category.

This leads one to focus fully upon the complete history of any specific object. At what stage in the object's life does the category come into being? The answer is, of course, at an initial conceptual stage in the mind of the craftsman who creates it. Barrett, in his work on later prehistoric pottery, reminds us of this fact (Barrett, 1991, 206). It is the individual responsible for the object's manufacture who will decide how closely it adheres to a prototypical norm. Of course there will be pressure from those for whom the finished object is intended. This, however, will not manifest itself in the form of economic pressure inflicted by those willing to move their custom elsewhere if the goods do not prove satisfactory. Instead, those who supported the smith within their community may have had

considerable influence in how the objects should look in the first place. A perfect example of this kind of influence could be demonstrated by considering the iron objects of the Llynfawr hoard. These resemble contemporary cast bronze artefacts closely, and yet have been manufactured from wrought iron. They demonstrate considerable skill on the part of the smith, for their manufacture would have been a difficult and troublesome process (Crawford and Wheeler, 1920-21).

The category is thus created first through the process of manufacture, and is formed with reference to those objects already in circulation and use. In other words, with reference to that which is considered by the manufacturer to be 'prototypical' of the category in question. After completion, the object can be envisaged as a material prop which can then be utilised by human agents during the process of their engagement with their surroundings. It is through this process of use that this meaning will be sustained, or changed, and this will then influence the way in which the next generation of objects are manufactured. Meaning will remain relevant at the moment of discard, resulting in a situation where information regarding an object's place in the wider material code can be inferred from at least one stage of an object's life.

Now we have defined the process of categorisation, and considered both its fundamental importance and also its culturally-specific nature, it is time to consider the importance of categories on a wider basis. How are categories utilised to structure the world, and what relevance does this have to the archaeologist?

Miller argued in 1985 that categories operated on three levels, and that each of these levels could be accessible to the archaeologist through material culture. Using again the example of ceramics, he suggested that, first of all, one could consider how ceramics could themselves be divided into categories, and how some types could be considered equivalent or different by those who used them. Secondly, one could study the way in which these various categories could be placed into an internally related code, and finally, there was the manner in which ceramics were structured within the wider material world.

It is possible to understand the archaeological potential of these three aspects by utilising the concept of structured deposition. Although we must realise that our interpretation is confined to the final, closing stage of an object's life, it should in theory be possible to examine other aspects of its use and even of its manufacture. In the field of Bronze Age metalwork, we should re-situate the study of metal objects back into a wider context. By studying depositional patterns of mould debris, we can gain insights into the process of manufacture. Studying use is not unproblematic for metal objects, for insights into an object's use through wear analysis are largely impossible to obtain in metalwork. Instead, such a study must progress further, encompassing those strategies employed in the deposition of other by-products of agricultural production and consumption. In other words, though we may continue to examine metalwork as a dominant subject of study, and

even examine those base level categories which make up this all-encompassing category of material in some depth and detail, we will gain more insights through referring back to the wider field of material categories. As Miller observed, the categories isolated by the archaeological specialist - whether in ceramics or in metalwork - play only a fragmentary role in the structuring of the material - and therefore the social - world. Thus, if we are intent upon studying people and the way they operated in the past, we cannot exclude all other aspects of the material record. Dislocating metalwork from its place in the wider material world in order to exhaustively classify it might tell us much about the metalwork, and give us our own internally structured ordering of the material which has meaning and relevance in the twentieth century, but the information yielded about how that metalwork might have been used and interpreted during the Bronze Age is, at best, minimal.

The aim of this work will therefore be to concentrate upon a specific body of material, while performing a series of referrals back and forth to other aspects of the material world. Before commencing my own work, I will consider some practical examples already carried out by other scholars.

My first example is Barrett's recent work on the ceramic assemblages from Cranborne Chase. Barrett noted a marked change in the way in which categories of ceramic material were utilised between the Early and the Middle Bronze Age. He contrasted the situation in the Early Bronze Age - where the vessel categories used in burials were restricted to that practice - with that evident in the Middle Bronze Age. Here, there was a switch in practice, and the same category of ceramic vessel was utilised in both domestic and funerary contexts. This change, Barrett argues, was just a small part of a more widespread change in social practices. In a more widespread context, these encompassed changes in domestic architecture, and also an increasing tendency over time to control and enclose agricultural land.

Barrett uses this evidence to argue for changes in the categorisation of people, as well as in the categorisation of material things. He reminds us that the categorisation of people is an equally important aspect of the process of categorisation (Barrett, 1991). Since these objects are essentially the props by which social relations are played out, whether in routine or in ritual contexts, the way in which they are organised and structured may also yield insights into how the world of human relations was structured. The nuances and the details will be lost to us, but, as Barrett suggests, the dominant meanings may still remain visible. And, in the situation illustrated by the Cranborne Chase material, such a shift does seem to be apparent. The dominant meanings apparent in the Early Bronze Age are replaced by a different set of cultural values during the period of enclosure seen during the Middle Bronze Age, something which may be indicative of a transformation in political authority.

Barrett's study was written with reference to the work of Rosch, and so the language employed to discuss the ceramic assemblage is similar to that which has already been used

previously in this chapter. In other words, we see the re-creation of categories with reference to an already established prototypical core of attributes. However, the only work carried out in metalwork studies which remotely equates to this type of interpretation is seen in a paper by Sørenson, published just prior to the widespread use of theories derived from outwith the two related fields of archaeology and anthropology.

Sørenson's work was a study of Scandinavian metalwork in the Bronze Age/Iron Age transition, and her primary objective was to determine how different categories were utilised during this period. She noted that while certain categories of object, i.e. ceramics and stone tools, were subject to continuous though gradual change throughout this period, the design and decoration of the bronzes remained consistent (Sørenson, 1987, 92). Using the terminology of Rosch, the prototypical core of the category was more closely adhered to during the manufacture of bronze objects than it was in objects created from other materials. Sørenson studied several superordinate categories of material, namely weapons, tools, ornaments, toilet equipment and dress fittings, and finally 'unique objects', which are in many cases linked with horses. Certain categories included both locally produced and also imported objects (e.g. weaponry) while others (e.g. ornaments) were almost exclusively local in origin. She used her findings to conclude that the categories linked with males were more likely to include imported goods than those linked with women were. The latter tended to be associated with material that was of local origin. She then extended her study to include the manner of deposition, and also examined the different stylistic designs seen on the objects. Whereas the 'female' objects tended to concentrate upon abstract geometric designs, male objects were decorated in a more naturalistic fashion, in a manner akin to the rock carvings which were also being created in Scandinavia at this point in time.

These conclusions were then utilised to make claims regarding the roles of men and women in Scandinavia during this period (Sørenson, 1987, 100). Sørenson had thus used the changes she had found in the material record to add extra depth and understanding to the interpretation of this period of Scandinavian prehistory. Men and women, she argued, operated in different material universes which made use of different ritual activities. At times, however, these different spheres of activity did come together.

Sørenson's work demonstrates that there is scope for studying metalwork with a less blinkered approach to the material, and for accepting the fact that, by replacing this rather specialised area of study back into its social context, we can draw conclusions about wider issues.

It should be remembered that, by considering the manner in which different categories of object are deposited, it may be possible to demonstrate how human agents might have categorised the world around them. Since those objects which make up the material world form the settings and the props which are utilised during negotiations between individuals.

it stands to reason that the archaeologist should be able to retrieve some information about these negotiations. However, one aspect remains irredeemably lost, and this is, of course, the linguistic element of any interaction.

It has been recognised by those studying linguistics and also anthropology that the realm of language may be more closely linked with the material world than we might perhaps imagine. Lakoff and Johnson demonstrate, in Metaphors We Live By, just how pervasive the material world is in the realm of linguistics. Perhaps the most obvious - and yet at the same time, most insidious - example of this is the use of metaphor. Lakoff and Johnson show how metaphors have shaped many of the concepts which we use in personal linguistic interactions today (Lakoff and Johnson, 1980). Similar work in anthropological contexts has demonstrated how language is coloured by metaphors which are culturally relevant and specific (Howe, 1977; Crocker, 1977).

Since the same language will be employed in any social engagement, whether of a ritual or of a day-to-day nature, we can infer that the metaphors employed will be of relevance to those who participate and those who witness these engagements. Material props will be drawn into such engagements, and their use will be appropriate to the situation. Howe, for example, noted how two species of tree were employed by chiefs of the Cuna as metaphorical references, portraying qualities in their peers which could be interpreted as good or bad. The qualities of these two trees would be quite familiar to those being addressed, and thus we can argue that it is the language of the day-to-day which will be brought into use in more specialised activities (Howe, 1977, 145).

Could it therefore be suggested that we face a similar situation in Late Bronze Age Britain, i.e. the use of metaphors derived from familiar, routine activities? The presence of utilitarian objects in contexts which seem unusual might be indicative of this, and thus should come as no surprise to us. Evidence for utilising the realm of the domestic and the secular as a source for both the metaphors and the material props employed in events which an archaeologist might term 'ritual' should therefore be expected, and an interpretation of material deemed to be the residue from secular practices should always recognise this.

Chapter Four: An Evaluation of Traditional and Contemporary Interpretations for the 'Carp's Tongue' Hoards

The practice of segregating ritual and secular activities has been evident even in recent interpretations of the Late Bronze Age. However, it is possible to challenge this dominant view through reference to one specific group of material: the 'Carp's Tongue' metalwork hoards. These hoards comprise a series of metalwork deposits which have traditionally been characterised as 'founders' hoards' by the presence of fragmented material amongst their contents. They are concentrated in south-east England, their density being greatest around the lower Thames and the Thames estuary, and the extreme south-east coastal regions of England (Burgess, 1968b, 23). These hoards have been dated typologically to Burgess' Ewart Park industrial phase (Hawkes' Late Bronze Age 2), and can be identified by the nature of their contents (Burgess, 1968b, 38-39). The material commonly encountered within these hoards includes socketed axes of the 'south-eastern' type, 'Thorndon' type socketed bronze knives and socketed spearheads with decorated spearheads. However, there are in addition to these items a range of forms which are deemed more 'foreign' in character, such as 'Carp's Tongue' swords and winged axes. Such forms are more commonly associated with mainland Europe - and in particular, France - than the British Isles, and it is this greater emphasis on 'foreign' material that has led to the 'Carp's Tongue' hoards being perceived as different to contemporary deposits of metalwork encountered elsewhere in the British Isles.

There are two aspects in the traditional interpretations of the 'Carp's Tongue' hoards that I wish to re-evaluate. Firstly, the supposition that these hoards are essentially foreign in nature, being largely composed of material which originated outwith the British Isles, and secondly, the assumption that they represent outstanding examples of 'founder's hoards', consisting primarily of objects broken up in readiness for the melting pot.

The 'Carp's Tongue' Complex as Intrusive Phenomenon

Crawford noted as far back as 1922 that metalwork hoards of south-east England tended to incorporate a selection of material which was perhaps more typical of continental Europe than mainland Britain. The objects included which were considered diagnostic of such continental influence were the winged axe, the hog-backed knife, the 'bugle-shaped object', the purse chape, and the 'Carp's Tongue' sword, which was to lend its name to the complex in its entirety.

In earlier literature devoted to the 'Carp's Tongue' Complex - such as Crawford's 1922 paper - these hoards become one manifestation of the inroads being made into this country by the so-called 'Urnfield Culture', who brought with them a new type of pottery, Deverel-

Rimbury ware. The concentration upon coastal stretches of south-east England, a location which is geographically close to continental Europe, also seemed to bolster this argument, with Evans arguing that evidence of landfall sites could be seen at places like Old England on the banks of the Thames, where a dense concentration of material was said to have been recovered from sites which resembled the pile-dwellings of Switzerland, the heartland of 'Urnfield' Europe (Crawford, 1922, 33).

Problems were later observed within the nature of the correlation between Deverel-Rimbury pottery and the metalwork with which it was traditionally associated, as Hawkes clearly demonstrated in his paper The Deverel Urn and the Picardy Pin (Hawkes, 1942). It was later still, though, that Deverel-Rimbury ware was finally discredited as a Late Bronze Age pottery form. This meant that many of the major differences observed by Crawford and attributed to those responsible for introducing both Deverel-Rimbury pottery and the alien 'Carp's Tongue' metalwork forms, e.g. square-ditched enclosures, became instead characteristic of the Middle Bronze Age period, which was at its zenith long before 'Carp's Tongue' metalwork developed. However, it remained clear that there was a distinctive 'package' of 'Carp's Tongue material evident, though the link with invaders from Central European 'Urnfield' cultures no longer remained valid.

Attention was then to turn slightly closer to home, and in 1968, Burgess - exposed to the publication of Briard's study of later Bronze Age metalwork in north-west France - argued that there were close similarities between the English 'Carp's Tongue' hoards and the series of French hoards which constitutes Briard's 'Bronze Final III', similarly described as 'le groupe de l'épee en langue de carpe' (Briard, 1965; Burgess, 1968b). The comparisons were considered to be most dramatic in the types of common objects included within the hoards: decorative fittings and ornaments, the presence of the winged axe as opposed to the socketed axe, the combination of the straight-bladed 'Carp's Tongue' sword and purse chape. By contrast, a typical 'native' British hoard might include the leaf-shaped sword in association with the short-tongue chape.

This apparent concentration upon material which was deemed foreign and exotic was used to conclude two things. Firstly, it was assumed that there were strong trading links forged between north-west France and south-east England (Burgess, 1968b). Secondly, because this material was being recovered from hoards of 'scrap' metal, the form of the objects may have meant little in themselves. Instead, they were being exchanged in this 'foreign' form, and were subsequently transformed by indigenous metalworkers into objects which fulfilled more closely the expectations of those who would ultimately make use of them (Bradley, 1985). The 'Carp's Tongue' Complex therefore lost its original role as evidence of an actual invasion by a specific cultural group. Instead, the emphasis was now very much upon these hoards being physical manifestations of the close relations enjoyed between cross-channel trading partners, as demonstrated by Burgess (1968b), and more recently, in the work of O'Connor (1980).

How might these close relations be expressed? If one follows Bradley's argument that the 'Carp's Tongue' hoards are composed of objects which are in the process of transformation, then these objects are valued only for the raw material which is used in their manufacture. Such an argument may be considered convincing, when one considers the evidence from the earlier shipwreck finds from Langdon Bay and Salcombe (Muckelroy, 1960). Although these have been dated to an earlier period in the Bronze Age, it is quite obvious that the vast numbers of end-winged axes recovered are not by any stretch of the imagination matched within dry land hoard deposits. Therefore it seems quite appropriate to suggest from this kind of evidence that 'foreign' material was restricted in its use to a sphere which lay outwith the processes which resulted in selection for ultimate hoard deposition.

It is fairly easy to allow the evidence from these two shipwrecks to colour one's interpretations for the entire Later Bronze Age. However, the subject is not as straightforward as it might seem. During the period when the 'Carp's Tongue' Complex was at its zenith, foreign objects were undoubtedly being utilised in the votive sphere. During the period when large numbers of leaf-shaped swords of the native Ewart Park variety were discarded in the Thames, at least one example of a complete Carp's Tongue sword appears to have been used in this same way. So, though it seems to have been more acceptable to employ indigenous objects in ritual practices, it was not impossible to utilise foreign objects in this same way, though this practice is, admittedly, unusual. The vast majority of Carp's Tongue swords instead survive only as fragments in dry land 'scrap' hoards, though one must bear in mind that the native Ewart Park sword is also represented in fragmentary form in these same areas. The deposition of swords and fine weaponry in water - often, but not always, in a complete state - is not a practice which achieved popularity in the so-called 'Carp's Tongue' heartland. Hoard deposition on dry land is a practice which appears to occur in a complementary fashion to deposition in water, though the two differing practices are not mutually exclusive. The Broadness 'hoard' of Kent, for example, and the deposition of a small number of weapons in the Medway at Chatham may be the manifestations of ritual deposition in wet contexts taking place on a smaller scale, though it must be noted that such deposits are almost without exception absent to the north of the Thames, in Essex.

Since it seems to have been acceptable to employ 'foreign' metalwork types in ritual practices normally dominated by types which we recognise as being indigenous to the British Isles, it could be suggested that the meaning of these types was not lost at some point in time prior to their arrival in this country. The 'Carp's Tongue' swords may have entered this country as complete swords, along with a set of accompanying paraphernalia, the recurring presence of which might lead us to envisage a 'package' of Carp's Tongue material, similar to the 'Beaker' package that was identified by Shennan during the Late Neolithic/Early Bronze Age transition (Shennan, 1977). Indeed, the presence of such a combination of exotic artefact types has undoubtedly become a yardstick by which the

'Carp's Tongue' phase can be judged, and this combination traditionally includes the following types: Carp's Tongue sword, purse chape, winged axe, Thorndon-type socketed knife, hog-backed knife, bugle-shaped object, and other 'bric-a-brac'.

Evidence which supports the presence of such a 'Carp's Tongue package' is not that easy to obtain, however . First of all, it is difficult to make any assessment about the roles these objects may have played when they survive only as fragments in a hoard. But, if one makes the assumption that the hoard contents can yield some insight into how the numbers of indigenous and intrusive types might have related to one another as complete objects, the results are perhaps unexpected. Although much has been made of the alien nature of the 'Carp's Tongue Complex', a detailed appraisal of the hoards studied showed that only a small amount of exotic material was in fact present (Table 2). In most cases, only one or two of the traditional 'type-objects' of the 'Carp's Tongue Complex' were represented. In Essex in particular, it was not uncommon to find hoards which did not contain any 'foreign' artefact types. Three Essex hoards contained representatives of either one or two foreign objects (Ref. No. 06, Shoebury I; Ref. No. 07, Shoebury II; Ref. No. 11, Vange) and in the case of the Shoebury I hoard the situation was rendered even more problematic by the fact that the foreign object in question was a bracelet which seemed more suited to a historical context which might be described as Middle Bronze Age in date (Ref. No. 06/21). Three Essex hoards by contrast contained representatives from six or seven exotic artefact types (Ref. No. 02, Grays Thurrock I; Ref. No. 05, Leigh II; Ref. No. 09, Southchurch I), and it is perhaps significant that these hoards were particularly large in terms of their size. Kent contrasted with Essex in that only two hoards - Ref. No. 14, Aylesford and Ref. No. 17, Cliffe-at-Hoo - did not include exotic material of any kind. Most had two or three exotic types, and only two hoards - again those which included the largest number of objects, Ref. No. 19, Minnis Bay and Ref. No. 20, Minster - yielded anything like the full range of material which most adequately fulfils our expectations of what should be included in a 'Carp's Tongue' hoard.

What of the two most diagnostic artefact-types, the winged axe and the 'Carp's Tongue' sword? Once again, we must make the assumption that hoard evidence can be used as a means of roughly assessing the numbers in which these objects might have circulated as complete specimens. Using this information, it seems feasible to suggest that these two types were the most numerically significant of the intrusive types noted. But it could not be said that either winged axes or Carp's Tongue sword fragments were recovered from the majority of hoards. And neither did the presence of either one of these categories automatically preclude the presence of the other. However, one interesting correlation was apparent which could represent an association that originated prior to the objects having been broken up and selected for inclusion in a hoard. Whenever they occurred, purse-chapes, bugle-shaped objects, Watford plaques and bonnet de police were always found alongside fragments of 'Carp's Tongue' swords. One can therefore suggest that while there is no real basis for the 'Carp's Tongue Complex' in its entirety, there is

scope for arguing that the swords may have circulated along with a certain recurring set of paraphernalia. While 'Carp's Tongue' sword fragments are not always found in association with chapes or scabbard fittings, those hoards where chapes and scabbard fittings occur always include fragments of 'Carp's Tongue' swords. And, while hoard finds can allow one to infer that it was not considered appropriate to embellish the scabbard of a Ewart Park sword with anything other than a short-tongued scabbard chape, the evidence given by the material found associated with the 'Carp's Tongue' sword suggests that the decoration and embellishment of sword and scabbard may have been an integral part of the 'Carp's Tongue' phenomenon. The Watford plaque from Grays Thurrock I (Ref. No. 02/209) seems to be of exactly the right proportions to mount the mouth of a scabbard, and the lozenge-shaped mount from Leigh II (Ref. N0. 05/120) is a convincing candidate for a sword pommel.

This greater attention to the decorative detail of the scabbard and pommel is matched by a similar embellishment to the sword blades themselves. In 'Carp's Tongue' weapons, the blade is always decorated by incised lines which define the midrib, and often similar decorative features defined the bevels which run down either cutting edge, too. Such decoration of the blade is at its most outstanding in a sword fragment which was included in the Stoke-at-Hoo hoard (Ref. No. 21/27). This example bore a series of incised curved lines which ran down both bevels on either side of the blade, likely to have resulted from finger nail impressions made in the original wax pattern around which the mould was formed. An emphasis on the individuality of both the sword itself and its scabbard is a possibility, and this is something which does not appear to be reflected in the Ewart Park tradition, although it is evident on occasion in the traditionally earlier Wilburton and St. Brieuc-des-Iffs form.

The presence of the 'Carp's Tongue' sword and its accompanying trappings should not, however, be overplayed. These swords do not appear in every hoard, and, when they are included, their numbers are small (Fig. 1). Differences can be seen in the two areas studied, too. In Essex, swords are represented by a smaller percentage of the material, and numbers of Carp's Tongue fragments are largely equivalent to the numbers of Ewart Park fragments included. In Kentish hoards, where sword fragments tend to be more numerous, Carp's Tongue swords are vastly outnumbered by Ewart Park examples, and in many cases, hoards contain only Ewart Park fragments.

The picture is similar with respect to winged axes. Again, they are not a consistent inclusion, and when they do occur, their numbers are small. Their frequent though not inevitable presence does leave us with some problems in terms of constructing a theory which explains their presence here. The 'Carp's Tongue Complex' is not an intrusive phenomenon which stands apart from the indigenous material culture of its surroundings. It also seems inappropriate to suggest that the large scale importation of raw material in the form of foreign metalwork forms from abroad was occurring. These hoards of 'scrap

metal' contain examples of both foreign and native artefact types fragmented in a similar manner and then placed together in the same hoard, and in every case it is the indigenous types which outnumber the foreign ones. It therefore seems more likely that these foreign types were circulating in this country as complete objects alongside their native counterparts, before they were deemed unsuitable for further use and removed from circulation. This possibility is further supported by the fact that a complete 'Carp's Tongue' sword has been used in the votive sphere in this country, and also by the fact that both Carp's Tongue sword fragments and winged axes show evidence of use prior to fragmentation and deposition. Sword blade fragments are nicked and chipped in places (though not perhaps as extensively as their Ewart Park counterparts), and the winged axes have in many cases been subject to considerable use. Some winged axes show signs of uneven wear and/or breakage along the blade (Minster, 20/73, 20/74) and others seems to have been resharpened at least once prior to their having been discarded (Minnis Bay, 19/21).

It seems feasible to suggest that the difference between foreign and indigenous forms of the same category was acknowledged, and, although there does not seem to be a 'Carp's Tongue package' *per se,* it is likely that some sense of value was afforded to these objects on account of their foreign origin. For, while these exotic categories are comparatively rare within these hoards, it can be demonstrated that their influence upon certain indigenous forms was significant.

The influence of the winged axe on indigenous axe forms

One of the most striking examples of the way in which foreign forms were translated into more acceptable indigenous versions can be seen by comparing the winged axe with the type of socketed axehead known as the 'south-eastern' type.

The distribution patterns of different socketed axe forms are traditionally believed to result from production and distribution on a local scale. The predominance of certain axe types in different regions of the British Isles was one of the characteristics of Late Bronze Age II noted by Hawkes in 1960, and Burgess used the pattern of distribution evident in the socketed axe population to argue for the existence of different metalworking industries or craft traditions during his Ewart Park phase (Burgess, 1968).

Evidence obtained from metalwork hoards does seem to support this picture of regional variability, and the 'Carp's Tongue' hoards are no exception. Here, the dominant socketed axe form is the 'south-eastern' type, characterised by its narrow, slightly waisted shape, its sub-rectangular mouth and rectangular body section, and its recurring collar configuration which features a large upper collar moulding, associated with one or more lower collar mouldings. The latter will be less pronounced in size, and will merge with the upper end of the loop.

Numerically speaking, the 'south-eastern' socketed axe certainly seems to form the major focus of axe production and consumption in the 'Carp's Tongue' area (Table 3). Only two Essex hoards - Grays Thurrock I and Leigh II - produced axes or fragments that could be confidently characterised as 'foreign', i.e. of the faceted type, the Yorkshire type, etc. Kent contrasted with this in that a number of 'foreign' axe types were included in the hoards, with a large proportion of the total hoard population containing at least one example of a socketed axe type that originated outwith the 'Carp's Tongue' heartland. Again, these made up only a small proportion of the total axe population, the only exceptions to this rule being the hoards from Cliffe-at-Hoo and Aylesford. In the first of these, Cliffe-at-Hoo, the majority of axe fragments could not be confidently ascribed to any particular axe form, due to the nature of their fragmentation, though they could in many cases have been of the 'south-eastern' type. Aylesford, by contrast, is unusual in many respects, for it consists only of a small group of four complete socketed axeheads (thus fulfilling many of the criteria used to define a 'personal' hoard), and its unique nature is supported by the exotic nature of its contents.

This convenient assumption that large numbers of a specific type of socketed axes indicate localised manufacture and distribution must be treated with some caution, however. Material evidence for the indented socketed axe of the Wilburton Complex (Sturry, 22/01-03) has shown that while the socketed axes themselves are deposited in hoards in south-east England, no evidence of their manufacture has come from this area. Instead, the only indications of their manufacture has come from well outside their main area of distribution, with a mould having coming from Fimber, Yorks. This suggests that either the axes themselves, or the moulds used in their manufacture, had been moved considerable distances prior to their deposition through trade or exchange networks.

The evidence for identifying the 'south-eastern' socketed axe as indigenous to the study area is, however, more encouraging, for included alongside them within the 'Carp's Tongue' hoards were fragmentary examples of the moulds which produced them. From Essex, moulds have come from the hoards of Grays Thurrock I and Barling, and in Kent, such objects were included in the Isle of Harty and the Stoke at Hoo hoards.

A correlation of this kind between the objects themselves and the mould debris used in their creation allows a more confident assertion that the point of manufacture and the point of deposition were roughly similar. Such a link could, however, be challenged by the isolated find of a stone mould for a Llantwit-Stogursey type socketed axe at the Petters Sports Field site, Surrey (Needham, 1990, 75). The mould fragment came from a site that was 'Carp's Tongue' in character, and Llantwit-Stogursey axeheads are not considered part of the 'Carp's Tongue Complex'. It is true that these axeheads are included in 'Carp's Tongue hoards, but their numbers are small, and their main area of distribution is in south-east Wales (Needham, 1990b, 75). Mould fragments relating to the manufacture of

Llantwit-Stogursey axes seem to occur outwith the main area of axe distribution (Needham, 1981), the Petters example being to be the most extreme instance of this. This anomaly might be taken as indication that the manufacture of these essentially 'foreign' axe types takes place in these outlying area, and Needham suggests that the Petters mould fragment supports the possibility of there having been a mobile group of axe manufacturers who produced axeheads in the Llantwit-Stogursey tradition outside the main area of axe distribution (Needham, 1990b, 75). However, I would argue that the presence of an axe mould does not necessarily have to indicate that manufacture must have taken place on the site. Instead, it is possible that axe moulds were viewed as portable objects which might be moved considerable distances through a series of exchanges, in much the same way as is envisaged for other artefact types. It therefore seems quite feasible to argue that in this instance it was the mould itself which was valued for its own sake, and not the object it was capable of producing, an argument that will be resumed at a later point in this thesis.

It has therefore been established that the 'south-eastern' socketed axehead is likely to have been the indigenous axe-type of the area characterised by the 'Carp's Tongue' hoards. It is deposited in hoards in association with winged axes and axes of 'foreign' forms that are more commonly encountered elsewhere in the British Isles. One must ask now whether or not contact with these exotic objects had any effect on the indigenous craft traditions, i.e. how rigorously defined was the 'south-eastern' axehead. Is the category consistently reproduced each time, or was it open to renegotiation and change brought about through exposure to foreign axe types?

The consistency of form in the 'south-eastern' type socketed axe was noted earlier - body shape and collar mouldings are distinctive and well-defined in this category. However, this tightly-defined shape is combined with a wide variety of decorative forms, and it is in this decoration that references to foreign types are apparent. Five sub-types of decoration are evident (Appendix 1), and it is to Group 3, the wing-decorated variants, that attention must be turned first of all.

An examination of many of the Group 3 'south-eastern' socketed axes reveals close similarities with the continental winged axes. The wing mouldings which decorate the upper body of the Group 3 'south-eastern' socketed axes closely resemble the wings of a complete winged axe, folded over as they would be when gripping a wooden haft. This wing-decorated motif is a common one in both Essex and Kent, and is clearly a representation on the indigenous 'south-eastern' socketed axehead of those traits which render the winged axe distinctive and 'foreign' in appearance. The implication seems to be that these objects are created with the intention of imitating winged axes as they would appear when hafted and ready for use.

There are, however, some indications that it is the winged axe in its complete and unhafted form which is being imitated on the 'south-eastern' axeheads. Such a possibility

can be inferred from an example of a wing-decorated variant which bears a raised saltaire design between the wings. While at first sight this appears to result purely from an imaginative interpretation of the standard winged axe design, it becomes apparent on gaining a more thorough knowledge of the winged axes included in the 'Carp's Tongue' hoards that there are examples of winged axes that bear a small raised 'x' shape between the wings (Grays Thurrock, 02/112: Minster, 20/71). Such a feature may have assisted in holding the haft securely in place during use, and it appears to have been translated into a decorative motif on the Minnis Bay axehead. It could only have been seen when the winged axe was removed from its haft, and while this process may have been carried out by an indigenous metalworker after the object had reached the end of its useful life in this country, it is conceivable that it was imported as an axehead and not a complete object. Whether the object arrived in an unused state and was subject to use in the area where it was ultimately to be discarded cannot be determined. But what is apparent is that the winged axe had a significant influence on the indigenous socketed axe forms of the 'Carp's Tongue' region.

The winged axe is not the only exotic form which provides a source of inspiration for 'south-eastern' decorative motifs. Some of the Group 3 axeheads, of a type included only in Isle of Harty hoard, seem at first sight to share many similarities with the wing-decorated axeheads described above. However, their decoration differs sufficiently for them to placed within their own sub-group. In these examples, the wing decoration lies beneath the level of the loop, in a position which cannot be matched in either the Group 3i wing-decorated axeheads or the winged axes from which they drew their inspiration. Instead, another source for this motif must be found, and it seems rather more likely that it was based on the indented socketed axe of the Wilburton complex (see the Sturry Hoard, 22/01-03). In this case the implications are particularly interesting, for if the Wilburton Complex can be described as the chronological forerunner of the Ewart Park phase in which south-eastern type axeheads are characteristic, then it means that deliberate reference is being made to objects which we might expect to be disregarded for reason of their unfashionability.

In Group 4, the ribbed variants, the basic 'south-eastern' axe form is embellished with a ribbed decoration similar to that seen on contemporary socketed axes of areas to the north and west of the study, e.g. the Yorkshire and the Llantwit-Stogursey types. These axeheads seem consistent in that they employ three ribs on either face, though these ribs may be parallel, slightly converging or slightly diverging. The ribbed 'south-eastern' axes, by contrast, vary in the number of ribs present, with as many as nine ribs present on some examples. These tend to be parallel to one another, though some examples do echo the converging ribs seen from time to time on 'highland' zone axeheads.

What is demonstrated by both the Group 3 and the Group 4 'south-eastern' axeheads is that slavish reproduction of 'exotic' forms is not the order of the day. Instead, features

derived from 'exotic' forms are merely used as starting points from which inspiration for decorative motifs is derived. These are used in conjunction with additional independently-derived motifs such as the pellet (Group 2), and the end result is that the 'south-eastern' socketed axe displays numerous decorative forms which may in most cases be nonetheless identified as a variation on one of the basic sub-groups. And, in a large proportion of these forms, the inspiration is quite clearly derived from an object which may have been perceived as 'foreign' by those who used them.

The Influence of the 'Carp's Tongue' sword on indigenous sword types

Evidence of foreign influence can also be seen to a lesser extent in the sword population. It was established earlier in this chapter that the indigenous leaf-shaped Ewart Park sword and the imported 'Carp's Tongue' sword differ in the shape of the blade (and thus the method of use) and also in the paraphernalia associated with them. The fragments of 'Carp's Tongue' swords included in the hoards studied were associated with the purse chape and with scabbard fittings such as the 'Watford plaque', and it seems quite feasible to suggest that this recurring association can give us some insight into how the 'Carp's Tongue' sword might have been presented as a complete object. By contrast, the Ewart Park sword is linked with the short-tongue chape, of which no examples have been recovered from the study area. This lack of indigenous scabbard fittings might allow one to postulate that in the study area the native sword was presented in a manner similar to the 'Carp's Tongue' swords, i.e. in association with purse chape and scabbard-fittings. Such a possibility seems less likely, however, when one recollects the consistent appearances of 'Carp's Tongue' sword fragments and purse chapes (Table 2). None of the hoards which contain only Ewart Park sword fragments have yielded purse chapes or scabbard fittings, after all.

Despite this ambiguity when it comes to the presentation of the Ewart Park sword in the 'Carp's Tongue' region, a degree of interplay is apparent between the native sword type and the imported 'Carp's Tongue' variety, though this is less evident than it is in the south-eastern socketed axe. Apart from the different blade shapes, Ewart Park swords differ from their 'Carp's Tongue' counterparts in the treatment of the blade. While the 'Carp's Tongue' swords are consistently decorated with a pair of incised lines defining the midrib, and often with an additional pair of incised lines defining the bevels which run either blade edge, the blade of the Ewart Park sword is quite plain and unadorned. However, there are isolated specimens (Borstal: 16/29, Minster, 20/113) which combine a leaf-shaped blade shape with a series of incised lines running down the midrib that are clearly reminiscent of the decoration employed on a 'Carp's Tongue' sword blade. It is the combination of these two traits - the indigenous leaf-shaped blade, and the decorated blade of the Carp's Tongue sword - that may be crucial to the development of the Thames/Gundlingen sword.

It can be concluded, then, that in both the examples cited we can see an acceptance of those attributes which belong to types that might be considered 'foreign'. But at the same time, this acceptance goes hand-in-hand with an apparent desire to transform these objects into a form which better fulfils the categories as preconceived by those who manufactured and also perhaps those who used the objects. At this particular point in space and time, categories are not tightly bounded entities. Instead, they are fluid and open to renegotiation, although at the same time there do seem to be efforts made to translate foreign forms into versions which are more acceptable to local tastes. Difference is noted, and becomes not a reason for exclusion nor aspiration. Instead, the essence of 'foreign' forms becomes a means by which existing traditions become enriched and renegotiated.

How does this fit in with established views of the 'Carp's Tongue' Complex? Traditional interpretations stress the alien nature of this group (Burgess, 1974), and it has been suggested that these hoards are more closely affiliated with their counterparts in north-west France. Such a view is challenged by the fact that only a small proportion of the material recovered in the 'Carp's Tongue' hoards can be described as 'foreign'. The views of Bradley, who suggested that the foreign material incorporated within such hoards was included only for its scrap value, can also be challenged. In his interpretation, objects such as winged axes and Carp's Tongue swords are being deposited outwith their normal sphere of influence, and are therefore meaningless. In reality, this argument seems equally implausible. 'Carp's Tongue' material might provide only a small proportion of the material included in these hoards, and yet its influence upon the indigenous forms alongside which it is recovered appears significant.

One traditional interpretation of the 'Carp's Tongue' Complex can now be discounted, namely that it is an intrusive phenomenon dislocated from its surroundings. It now remains to question the other assumption which colours our interpretation of the 'Carp's Tongue' hoards, namely that they are collections of scrap metal resulting from the metalworking process.

The 'Carp's Tongue' hoards as 'founders' hoards'

The first requirement before addressing this problem is to clearly define what is meant by a 'founder's hoard'. It was argued in Chapter Two that such hoards have traditionally been identified by the nature of their contents, the context of their deposition, and the condition of the artefacts included. Generally speaking, such hoards contained a wide cross-section of artefact categories broken up in preparation for the melting pot and deposited in a place from which they might be readily retrievable. However, as the 'founder's hoard' became a concept more closely linked with the actual process of metalworking, the category was more closely defined.

A contemporary picture of a 'founder's hoard' can be constructed using observations derived from the work of Bradley (1985) and Colquhoun (1979). Such a hoard will contain objects which are not considered worthy of use, either because they are worn out, or because they are of a form deemed unacceptable for use by consumers. This may be because they are outdated, or because they are of foreign origin and do not constitute a locally acceptable form. Older, worn out castings will be augmented by new castings discarded because they were considered substandard by the manufacturer due to the presence of casting flaws. All these objects will have lost their original meaning, and will function only as fragments of bronze. This stockpile will be further augmented by additional raw material in the form of ingot metal. Finally, evidence of the actual process of manufacture will be apparent, in the form of by-products such as casting jets or objects associated with the metalworking process such as mould-valves.

How do the 'Carp's Tongue' hoards conform to this? The definition established above was not after all directly developed for these hoards: Colquhoun established his criteria with reference to the Wilburton hoards, and Bradley's work focussed upon the concept of later Bronze Age 'founders' hoards' in general. Does it seem likely that the Carp's Tongue hoards are nothing more than stockpiles of bronze abandoned for some secular purpose in prehistory, or may they have a greater significance?

i) The presence of objects dislocated from their normal space and time of circulation

Firstly, I shall consider the proposal made by Bradley, that we should expect to find in 'founders' hoards' objects which have lost their meaning through their having been dislocated from their original place and time of circulation. In the 'Carp's Tongue' hoards, one aspect of this can be ruled out immediately. As was demonstrated earlier, the foreign items included were subject to considerable use, and while such use may conceivably have taken place elsewhere, perhaps even outwith the British Isles, what cannot be denied is that these foreign forms played a major role in influencing indigenous forms. To infer from this that foreign artefacts such as the winged axe and 'Carp's Tongue' sword had lost their meaning and were valued merely for their metal content therefore seems unlikely.

Objects dislocated chronologically have recently been used to argue for a more precise dating of 'founders' hoards'. According to Colquhoun, the manner in which hoards are constructed chronologically allows one to more closely date their point of deposition. The dominant material will be that which is worn out or unfashionable, augmented by newer material discarded in the manufacturing process, and augmented by isolated examples of earlier objects, perhaps recovered as stray finds. The hoard from Sturry, Kent (Ref. No. 22) might perhaps be used as an example of such a hoard. Here, we see fifteen objects traditionally ascribed to the Wilburton Complex (indented socketed axes, an end-winged axe, pegged spearheads, tubular ferrule) in a hoard which also contains three median-

winged axes, believed to date to the succeeding 'Carp's Tongue' phase, and also a narrow-bladed looped palstave, dated typologically to the Middle Bronze Age.

This pattern need not be so evident, however, if the theories proposed by Burgess are correct. For, if bronze is being dumped on a large scale at the close of the Ewart Park phase, then it is surely Ewart Park material that will dominate.

What we do indeed find in the hoards studied is a significant dominance of Ewart Park metalwork (Table 4). To begin with, the smaller hoards of both Essex and Kent include only Ewart Park material. The only possible exception to this is the fragmentary fillet-defined spearhead fragment from Leigh I (Ref. No. 04/06). While such objects could be described as 'Wilburton' in character, their presence in the so-called 'Broadward hoards' is not uncommon, and two such fragments were encountered in the 'Carp's Tongue' material studied. One was of particular interest. This, the lower blade and socket of a spearhead included in the Bexley Heath hoard, Kent (Ref. No. 15/50), incorporated a fillet-defined midrib with decoration of the socket more reminiscent of those socket-decorated spearheads so commonly encountered in the 'Carp's Tongue' hoards. Again this might indicate the localised incorporation of two different traditions in a similar manner to that already demonstrated in the winged axe and the leaf-shaped sword. The fillet-defined spearhead must therefore remain a doubtful indicator of older, outdated material.

The most frequently encountered object in these hoards which can be seen as predating the Ewart Park phase is the palstave. These objects demonstrated substantial chronological dissimilarity. Only one of these, the example from Dartford, was of the Wilburton 'late' form. The others - the palstaves from Shoebury I and Minster, and the unique palstave-sickle from Southchurch - were of earlier Middle Bronze Age types. The Dartford, Minster, and Southchurch examples had all been subject to fragmentation, but the Shoebury I palstave was deposited in a complete and indeed as-cast form. It is not inconceivable that the Shoebury I example was recovered from another context - as-cast palstaves are a feature of the Essex Middle Bronze Age hoards such as that from Burnham-on-Crouch - and its inclusion with a bronze armlet of similar date (again, in an as-cast condition) might support this. It may then have been stockpiled for future use. The presence of the other early pieces is, however, less easy to understand. These have all been fragmented, with only the lower butt and upper blade sections remaining. This suggests that they were subject to similar processes of destruction as were used on other artefact categories such as winged axes. It therefore seems feasible to suggest that these objects were used to augment the amount of metal in circulation, something which seems unlikely if bronze is in sufficiently plentiful supply to provoke the burial of these hoards in such great numbers.

In summary, then, objects predating the 'Ewart Park' phase are only a tiny proportion of the material recovered in the 'Carp's Tongue' hoards. The majority of items represent Ewart Park material, thus suggesting that the date of deposition for these hoards postulated by Burgess, namely towards the close of the Ewart Park phase, is not unrealistic.

However, the recovery of Middle Bronze Age palstave fragments from four out of twenty-two hoards should encourage us to at least question this conclusion.

ii) Casting failures and the abandonment of objects immediately following manufacture

The next criterion which can be used to identify a 'founders hoard' is, according to Colquhoun, the presence of miscast pieces. Casting failures are seen as having been discarded at the point of manufacture by the bronzeworker in a form of quality-control exercise. They are deemed unacceptable, and will therefore be returned to the stockpile for future use. Therefore, objects deposited in an as-cast form and which demonstrate evidence of a casting flaw should indicate the latest additions to the hoard, and therefore the date it was in use.

Is this theory borne out by the 'Carp's Tongue' hoards studied? An investigation of the material included in the hoards revealed that casting flaws were common in certain categories of object. On occasion, sword fragments revealed porosity of the bronze at the break, indicating a weakness of the metal which was likely to have contributed to their breakage, and isolated examples of other artefact categories also demonstrated casting defects. In Essex, the blunt and rounded appearance to the tip of a tanged knife appears to indicate a casting flaw, while similar poor castings in Kent are represented by a hog-backed knife from Allhallows I (13/25) and a fitting from Borstal (16/36). The former has an asymmetrical appearance, seemingly resulting from the liquid metal failing to fill the mould properly, while the latter reveals two rounded stumps on the rear face which may have be the vestigial traces of what should have been a loop.

However, the vast majority of casting defects were apparent in more complex castings, most specifically those which employed three-piece mould technology. Socketed axes (Table 5 & App. 2(i)), socketed gouges (Table 6 & App. 2(ii)), socketed chisels (Table 6 & App. 2(iiib)), socketed knives (Table 6 & App. 2(iva)) and socketed spearheads (Table 7 & App. 2(v)) all showed consistent evidence of substandard casting, especially in comparison with less complex castings such as tanged chisels ((App. 2(iiia) and tanged knives (App. 2 (ivb)). In the Bexley Heath hoard (Ref. No. 15), for example, 24 out of the 45 socketed axes included showed visible indications of casting defects (App. 2(i)). The nature of these casting defects revolved mostly around misalignment of the clay core. This gave rise to differential thickness of the walls, something which is likely to have compromised the length of the object's useful life, for the thinner wall would have been weaker and thus more prone to damage through the strain placed upon it through repeated contact with a poorly secured haft, for example. Core misalignment was common to socketed axes, socketed gouges, and socketed spearheads, and it is likely that several of the seemingly less pernicious casting defects noted may also be associated with this.

Such defects include an uneven appearance to the mouth of the socket, something peculiar to socketed axes. This problem has on the surface little more than cosmetic significance, though in some rare cases it appears severe enough to have seriously compromised the use of the object (Stoke at Hoo, 21/09). In this case, the top surface of the object was much reduced, suggesting that the haft could not be held securely in place. In most, though, the object's use would not have been affected in any way.

Another commonly encountered problem was the appearance of gaps in the bronze, caused by failure of the liquid bronze to circulate properly around the mould. Again, this appeared to cause little more than cosmetic damage, though in more than one case this may have compromised the use of the loop (Allhallows II, 13/01). Such gaps in the bronze were also evident in spearhead fragments - three Minster spearheads bore such flaws (20/123, 20/125, 20/128).

It is feasible, then, to suggest that many of these apparently aesthetic drawbacks are indications of more serious problems which may have reduced the length of the object's working life. Certainly, it is only on account of an object's fragmentation that many of these casting defects can actually be seen. It is perhaps significant that - while casting defects are commonly encountered on socketed gouges from Essex hoards, where the gouges are frequently deposited in a fragmentary condition - in Kent, where socketed gouges are on most occasions deposited complete, no indications of such flaws can be seen (Table 6 & App. 2 (ii)).

What is clearly apparent, though, is that only on rare occasions has a casting defect been of sufficient magnitude to prevent the object being subject to wider circulation and subsequent use. In these hoards, defective castings are not discarded on this account. Even some castings whose use must have been severely affected by their condition had been subject to final finishing and use. The socketed axe which displayed such severe mouth deformation from Stoke at Hoo (21/09) had been used, as had the loopless faceted socketed axe from Allhallows II (13/01). In other examples, some attempts to counteract the problems had been undertaken. A thin-walled socketed axe fragment from Borstal had been infilled with lead (16/14), and the peculiar appearance of a socketed hammer from Grays Thurrock I (02/144) may also derive from such a practice. Here, the object has almost a double-skinned appearance, as if an additional thinner core were inserted following casting and more molten bronze poured inside. In this instance, however, it is conceivable that the object had been heavily worn prior to this infilling, and rectifying this wear may have been the primary motivation for the repair.

In other words, objects were given final finishing touches and were then subject to sometimes extensive use even when quite substantial casting flaws were evident. There were only rare occasions when casting flaws caused an object to be discarded prior to circulation and use. In one example from Bexley Heath (15/45) core misalignment was so

bad that much of the face appeared to be absent towards the cutting edge. Casting seams had been removed, but the object had been discarded prior to its cutting edge being fully expanded and sharpened. The only other instances of unfinished objects with evidence of casting flaws are isolated examples with rounded notches apparent on the blade edge (Bexley Heath, 15/43; Dartford, 18/09). This kind of problem is that which would have most seriously compromised the use of the axe, for it is the cutting edge which is required to be intact for the object to function properly.

To place these findings in context, then, it can be concluded that a casting flaw had to be particularly severe in order to prevent an object from being subject to use. Such a realisation challenges yet another of the preconceptions which are held about 'founders' hoards and bronze-working in general, namely that a significant proportion of these hoards will be made up of objects discarded during the process of manufacture on account of their being deemed substandard or defective in some way.

iii) The 'Carp's Tongue' hoards as collections of worn-out material

The next aspect to consider is the condition of the objects at the time of their deposition. Have they come to the end of their natural lives, or are they discarded at a point in their history when they could still have been profitably used in the functions for what they were originally intended? Traditional views would favour the former scenario. Colquhoun argued that hoards would consist of a combination of failed castings discarded at the point of manufacture and heavily worn objects which were no longer considered usable. One could see these as having accumulated as a result of the metalworker operating a 'new for old' policy, where old objects were removed from circulation and exchanged for a new equivalent (Farley, 1979, 140).

It has already been demonstrated that the number of unfinished casting failures included in these hoards fails to match traditional expectations. Assessing wear on the objects is, admittedly, more difficult to ascertain than whether or not an object was actually completed in the first place. In many cases, the nature of the corrosion on a piece will obscure those parts of an object which require to be in good condition for any kind of evaluation to made. Many sword and knife blade fragments have thickened on account of corrosion build-up, and often this flakes away, giving a false impression of damage in antiquity.

The fragmentary nature of many objects does not assist in assessing the degree of wear, either. Sword fragments are a case in point. While many sword fragments appear to be in fine condition, it cannot be assumed that the entire blade would have been in an equally good state. Damage or even breakage may have taken place at another point in the blade's length.

Generally speaking, it was axes and small tools that proved most useful in assessing the levels of wear, and consequently, the conclusions that have been made are based largely upon observations made in these categories. Objects varied in terms of their condition. Some did not appear to have been used, though the manufacturing process had seemingly been completed. Examples of this include the socketed axe 15/22 from Bexley Heath, Kent, and the socketed mortising chisels from Minnis Bay, Kent (19/25. 19/26). Others had been subject to use, but remained in good condition, and little if any work would have been needed to make these objects into useful implements. The next degree of wear was seen in heavily worn pieces which had splayed blades on account of repeated resharpening. Sometimes these had an asymmetrical appearance as a result of uneven wear. Edges could be notched or chipped as a result of wear, but in every instance, it was apparent that the object could, with subsequent grinding and hammering of the cutting edge, have resumed its original function. Finally, there were examples of objects which were so severely damaged as to be useless. These included socketed axes with large notches missing from the cutting edge, and socketed objects which showed evidence of cracking around the socket.

Socketed axes were dominated by heavily worn examples, though severely damaged specimens were also numerous. Unused specimens were rare, but a number were still in good condition. Small tools tended to be in a better condition at the time of discard. On socketed gouges, the edges were chipped and slightly notched, but were generally surviving in good condition. The mortising chisels and the socketed hammer from Minnis Bay were in particularly fine condition.

Though it is difficult to assess wear accurately on account of the nature of these hoards, it is possible to suggest that the 'Carp's Tongue' hoards are comprised mainly of objects which have reached or are reaching the end of their useful life. However, there are additional inclusions of objects which are still in a fine or even an unused condition, and in many instances, these objects do not have any visible casting defects which could have led to their being withdrawn from circulation.

iv) Evidence of metalworking

The final means by which a 'founder's hoard' can be recognised is through the presence of objects or fragments related to the metalworking process (Table 8). These may be related to all aspects of the casting process. Primary evidence of metalworking may include raw material in the form of ingot metal, though, less obviously, any of the objects included may have been fragmented in readiness for recycling. This primary evidence also includes mould fragments, and the by-products associated with the casting process may be included, such as casting jets or waste drops. In addition, there may be secondary evidence in the form of objects used to add the finishing touches in the manufacturing process, such as hammers or whetstones.

Altogether, only two hoards out of twenty-three studied had no evidence whatsoever of any association with metalworking. One was the axe hoard from Aylesford, Kent, which contained only complete socketed axeheads amongst its contents. The other was one of the mixed category hoards more commonly associated with the 'Carp's Tongue Complex', the small hoard from Cliffe-at-Hoo, Kent, though again it must be remembered that the very presence of fragmentary material might be sufficient to associate this hoard with the metalworking process. All the others had at least one inclusion which represented some form of primary evidence for metalworking. This, without exception, was in the form of ingot metal, though casting jets and mould fragments may have been included in association. In this respect, then, a demonstrable link with the practice of metalworking was apparent in almost every individual case.

The traditional interpretations: conclusions on their validity

From the evidence so far available, to associate the 'Carp's Tongue' hoards with the process of metalworking seems quite acceptable. The presence of ingot metal and casting jets alongside large numbers of objects which have reached the end of their useful life, or which would have required a considerable expenditure of effort in order to return them to serviceable condition supports the theory, as does the inclusion of so many fragmentary objects. In the process of recycling metal, this fragmentation would have been a necessary prerequisite to the smelting process. One can hardly place a complete leaf-shaped sword in a crucible, after all. It has also been argued through the analysis of impurity patterns in Ewart Park bronzes that the metal alloys used had been recycled (Northover, 1982).

Our expectations of what a 'founder's hoard' should look like are largely confirmed by the material evidence. But there are anomalies that cause one to question the possibility that these were routine stockpiles of material which, for some reason or another, were abandoned by the metalworker. Miscast objects which have been subject to finishing and sometimes to considerable use prior to discarding are found alongside good castings which have seen little if any utilisation. There are therefore inclusions which have been removed from circulation prematurely.

This peculiar fact tends to support the Burgess thesis. Bronze implements seem to have been discarded before their useful life is over, thus suggesting that bronze is not a scarce material. Because so much is in production, objects are sufficiently low in value to allow them to be returned to the stockpile on a regular basis. The presence of new castings might strengthen the argument that these objects are no longer wanted, that something - perhaps the introduction of iron - is causing a drop in demand.

Such an interpretation may conveniently explain the details of these hoards, but it seems inconsistent with the wider view, for it utilises the quasi-commercial image of the Bronze Age that was attacked so successfully in the work of Rowlands, Bradley and others.

Burgess argues that the over-production of bronze leads to crisis, and that supply is reduced in order to increase its value. However, when it is the possession and the consumption of bronze which is the driving force behind society, then the strength of this argument is much reduced. There are two crucial assumptions that are implicit in the work of Burgess: firstly, that bronze is freely available to consumers, and secondly, that the metalworkers are free to control its supply. If bronze is so crucial to the establishment and maintenance of political power, then is this a likely scenario?

To address this question, one must move beyond a restrictive study of the metalwork hoards themselves. When one wishes to assess the availability of bronze on a wider scale, one must consider all the available material evidence. And, of particular relevance in this process, is a study of the relationship between metalwork finds and settlement contexts.

The settlement evidence

Concentrations of Later Bronze Age metalwork hoards appear to occur in areas in which contemporary settlement appears to have been a likely possibility, if not a certainty. The Shoebury area of Essex, for example, has yielded a number of hoards and evidence for Late Bronze Age settlement (Crowe, unpublished). But when hoards are found, they do not appear to have been abandoned on the actual settlement sites themselves. This might seem like a sweeping generalisation, but when the evidence is considered in detail, the complementary relationship is remarkably consistent. The only exceptional example yet known in the area dominated by the 'Carp's Tongue' hoards is the Petter's Sports Field hoard (Needham, 1991). In Essex and Kent, such associations between metalwork hoards and settlement sites are unknown. Even the context of the Minnis Bay hoard (Ref. No. 19) which was once believed to have been deposited in a Late Bronze Age settlement, is now considered to be questionable (Champion, 1980).

The manner in which many of these hoards were found demonstrates this well. Late Bronze Age hoards tend to be found accidentally, through metal detector use or accidental discovery. They are hardly ever recovered through careful excavation of a known archaeological sites. This may be attributed to their being associated with settlement sites which have been badly denuded and virtually obliterated as a result of long-term plough erosion, but this does seem unlikely. Even discoveries made at a comparatively early date, such as the hoard from Leigh II, have been associated with later excavation of the surrounding area which revealed little if any information of further human activity on the site.

This complementary relationship is further supported by settlement evidence from Essex, and, to a lesser extent, Kent. Three such sites from Essex should be considered; those from Loft's Farm (Brown, 1988a), Mucking North Ring (Bond, 1988) and Springfield Lyons (Buckley and Hedges, 1987).

Loft's Farm was situated further inland than the hoards studied, but the comparative paucity of settlement evidence available suggests that it should be subject to consideration. The site comprised two structures surrounded by a double set of ditches, and in total only one fragment of metalwork was recovered. This was a crushed body fragment of a socketed axe. Despite this evidence of on-site fragmentation, which might be seen as indicative of preparing a worn-out implement for recycling, no traces pertaining to metalworking activity were recovered.

The dominance of flint implements, lack of bronze objects and metalworking debris, apparent concentration on pastoral activities and also the comparatively small size when considering this site alongside other contemporary examples allowed the excavator to argue that Lofts Farm was likely to have been a low status site (Brown, 1985). This position in the social hierarchy might imply limited access to exotic materials such as bronze. Consequently, the apparent lack of scrap bronze becomes instantly comprehensible. Because the material is scarce, it will therefore be considered valuable and therefore even the most insubstantial fragments will be retrieved for recycling.

The evidence from Lofts Farm allows a counter-argument to be presented against the interpretation presented in Burgess (1979). For, if bronze was suffering over-production at this time and too much surplus metal was flooding the market, then why is it not percolating downwards in some quantity to 'low status' sites such as Loft's Farm? The lack of bronze from Loft's Farm suggests instead that either the supply of bronze is being controlled so that it is not reaching these sites in the first place, or that all surplus material is being carefully collected together and recycled. In either case, the evidence no longer allows one to uncritically accept Burgess' theories behind hoard deposition.

A comparison should now be made with the 'high status' site of Springfield Lyons (Buckley and Hedges, 1987). The superiority of this site can be inferred by its greater structural significance, for the complex at Springfield Lyons comprised a large roundhouse surrounded by several smaller buildings. These were enclosed by a ditch and internal rampart, and one entrance had indications of a gatehouse in association. In addition, a quantity of mould debris was recovered, an indication of bronzeworking having taken place on the site, and this evidence might again be used to demonstrate a place higher up on the hierarchical scale than Loft's Farm, especially since this debris suggested that the objects being manufactured here were in fact leaf-shaped swords, i.e. high status objects. But even though there was this evidence for the actual process of bronzeworking, no fragments of bronze whatsoever were recovered from the site.

At the third example, Mucking North Ring, there was again a striking absence of bronze, and once more the objects recovered were represented by nothing more than isolated fragments. The blade of a socketed axe was recovered, along with a fragmentary

bronze bar, a fragment of sheet metal and a solidified globule of bronze. These fragments were found along with mould debris, indicating that the breakage and subsequent recycling of bronze objects was taking place on site.

Though the evidence from Kent is not nearly as comprehensive, it shows a strikingly similar situation. Champion's summary of Kentish settlement sites reveals similarly meagre levels of bronze finds (Champion, 1980). Mill Hill, Deal, which was excavated in 1934, revealed in the ditch fill finds of a pin, a bead, and a 'blade edge', perhaps the cutting edge of a socketed axe. Alongside these was found a mould fragment for a ring, and from a pit within the interior of the site was recovered a bronze ring which may have been cast in this same mould. Another early excavation of a Late Bronze Age settlement at Richborough, revealed the blade of a socketed axe.

The vast quantities of bronze being included in the 'Carp's Tongue' hoards are thus being matched by an almost negligible amount of this metal in settlement contexts. On the one hand, we face evidence for the discarding of bronze in hoards on a massive scale, while at the same time settlement evidence argues that it was being carefully retrieved, conceivably in order to recycle it. The 'Carp's Tongue' hoards do not offer us unequivocal evidence for the large-scale dumping of bronze in order to preserve its value in an ever over-saturated market. Instead, these large collections of material appear to be anomalous deposits which run counter to all other available evidence.

In view of this, I would argue therefore that our interpretation of the 'Carp's Tongue' hoards of Essex and Kent should differ little from the model we apply to the rest of Late Bronze Age Britain. The presence of these hoards results from the consumption of bronze on a large scale. However, the manner of this consumption differs markedly from that which is seen in such practices as the large-scale discarding of swords in the Thames, for example. The link with the process of metalworking is undeniable in these hoards, and it is this association with a 'secular' activity which will be confronted in detail during the following chapter.

Chapter Five: An Examination of the 'Carp's Tongue' Hoards

1) A Role for the 'Founder's Hoards' in the Structuring of Human Relations

Though the evidence so far does seem to favour the possibility that 'founders' hoards' are a by-product of a secular practice, this is only true if the hoards are considered outwith a wider archaeological context. Associated with this interpretation is the assumption that the burying of raw material on this grand scale is indicative of problems in the bronze-working industry. This makes the theory proposed by Burgess seem attractive (Burgess, 1979), i.e. that economic crisis in the industry, caused by excessive amounts of bronze in circulation, has resulted in the abandonment of large quantities of bronze. Reference to evidence gleaned from other sources, e.g. settlement sites, seems to suggest, however, that such an explanation is inappropriate. The substantial collections of bronze represented by the metalwork hoards are matched by almost negligible amounts on settlement sites. This situation is almost the opposite of the one we might expect were the scenario described by Burgess correct. If bronze was freely available and as good as worthless, then large numbers of bronze objects would surely be turning up in both hoards and settlement contexts alike. This is not happening, and the apparent inconsistency should lead us to accept that the answers to the problem of metalwork hoarding may lie elsewhere, outwith the realm of the purely utilitarian.

To link the 'founders' hoards' with acts of deliberate deposition is hardly novel. Taylor previously used such an explanation in his discussion of the metalwork hoards of southern England (Taylor, 1993, 103). In Taylor's view, hoards were important as collections of raw material. Of prime concern was the amount of bronze present, for it was necessary that a required weight and/or volume should be represented among the contents. Taylor saw bronze as playing an integral role in the way in which political power was obtained and maintained in the Late Bronze Age of southern England (Taylor, 1993, 103). This explanation allows us to see the practice of hoarding as having a structural role to play in reproducing the society that created it, and plays down the possibility of it having been born out of industrial crisis.

In many respects, Taylor's arguments provide the most convincing explanations yet for the existence of Late Bronze Age metalwork hoards in south-east England, and his theories can also be applied to the problem posed by the virtual absence of bronze finds on settlement sites. Since the ability to discard large quantities of bronze can be seen as integral to maintaining of political power, it stands to reason that even tiny fragments of the

metal will be seen to possess an intrinsic value and so they will be retrieved. If they are not recycled, then they may be used to add extra weight to a hoard which is being accumulated for deposition by an individual or perhaps a group of individuals. In this scenario, it is the presence of the bronze itself that is the important factor (Taylor, 1993, 103). The quantity of metal included takes precedence over its form, and so it is immaterial how these hoards are constructed. Taylor makes no attempts to identify whether or not certain categories of material are favoured for inclusion over others: whether hoards are formed from collections of ingot metal or from collections of broken implements, the end result will be the same.

It is this view that I wish to call into question. Can it be said that it is the presence of the bronze itself which is of paramount importance, or can some internal logic be seen within the hoard contents? To address this question, hoards from the counties of Essex and Kent were considered. The detail required to establish the patterns of fragmentation noted in the following section seemed unnecessary at this stage in the proceedings, and so information was obtained as much through reference to documentary sources and archive material as through reference to the actual hoards themselves. The aim of this initial examination of the hoards was to establish whether certain categories of artefact were favoured for inclusion over others.

2) Restricted Category Hoards And Mixed Category Hoards

Structural variation in the 'Carp's Tongue' hoards was easily apparent in the material of Essex and Kent. Two groups could be defined, divided on the basis of the number of material categories included among the contents. One of these groups comprises the traditional 'founders' hoards': collections of bronze which are characterised by the wide variety of artefact categories amongst their contents. Such hoards are described as 'mixed category hoards' for the purpose of this thesis, but - though seen as representative of the 'Carp's Tongue' Complex - they were not the only type of hoard to be encountered. Instead, a number of hoards contrasted markedly with the mixed category hoards in that their contents were restricted to one or two categories of material. The artefact categories present would invariably be socketed axes, or ingot metal, or a combination of the two, and these hoards are sufficiently numerous to be considered worthy of differentiation from the mixed category hoards. These 'restricted category hoards' have, for the purpose of this thesis, been called the 'Group I' hoards (App. 3.1).

a) The Distribution of Group I Hoards in Essex and Kent

Taylor suggests that Late Bronze Age hoards should be viewed as collections of bronze in which the presence of the metal itself is of more importance than the actual form taken by the hoard contents (Taylor, 1993, 103). The existence of the restricted category hoards argues against this possibility, however, for their presence in such large numbers suggests that on some occasions, efforts were being made to create hoards of metalwork composed

entirely of one or perhaps two categories of material. This suggestion is further supported by the fact that it is always the same categories which are chosen for inclusion, i.e. socketed axes and/or ingot metal.

The possibility of deliberate selection becomes even more likely given the fact that the Group I hoards demonstrate a distinct geographical bias in their distribution. They are virtually all confined to the county of Essex, though isolated examples have been recovered from Kent (e.g. the Aylesford socketed axe hoard, and the possible ingot metal hoard from Herne Bay). The discrepancy in numbers apparent between Essex and Kent is sufficiently dramatic to offer a strong argument against the possibility that differential recovery is responsible for the biased distribution of Group I hoards.

Two different traditions of hoard deposition therefore appear to be manifesting themselves in Essex and Kent. While the deposition of mixed category hoards is common to both counties, restricted category hoards are also being abandoned in considerable numbers in Essex. Whether it can really be assumed that the mixed category hoards and the restricted category hoards belong to unrelated depositional strategies remains uncertain, however, and this is a problem which will be addressed once the mixed category hoards have been considered in greater detail. At present, it seems quite reasonable to state that there is strong evidence to support the suggestion that stringent efforts have been made to ensure that the contents included in certain hoards were restricted to one or two categories of material, a situation which gives us the Group I restricted category hoards.

b) Variation in Hoard Size of the Group I Hoards

The existence of the restricted category metalwork hoards means that Taylor's theories regarding hoard deposition must be questioned to some extent. If the emphasis is on gathering together as much bronze as possible for deposition, then surely the form taken by this bronze will be irrelevant. It is possible, however, to envisage a scenario in which Taylor's interpretation would still appear valid. If, as Taylor suggests, acts of deposition functioned as competitive events which could determine the status individuals or groups, there will be an escalation in the hoard size over time. Early on in this process, though, hoards may still be comparatively small, and therefore those gathering together the contents may have more opportunity to favour certain categories and exclude others. But as hoards become ever larger in the competition for prestige, then there may come a time when the favouring of some categories over others becomes a luxury which can no longer be justified. If this argument is to be supported, then those hoards which focus exclusively upon one or two categories of material should surely be smaller than their mixed category counterparts.

Some of the Group I hoards are indeed small. The Southchurch II hoard (Ref. No. 10), for example, comprised only five fragments of ingot metal, while the Kentish axe hoard from Aylesford (Ref. No. 14) consisted of four socketed axes. These examples are, however, unusual. Instead, Group I hoards come in a wide variety of sizes, from the small examples mentioned above to the massive Ashdon hoard, now lost, which included 'almost a hundredweight' of rough metal (National Bronze Index). The selective favouring of specific categories of material is therefore occurring even in hoards that are of a size which rivals many of the mixed category hoards. This realisation should be sufficient to make us view Taylor's theories regarding the composition of the 'founders' hoards' with some caution.

3) The Mixed Category Hoards

The very existence of the Group I hoards causes doubts to arise regarding Taylor's characterisation of Late Bronze Age metalwork hoards (Taylor, 1993, 103). The Group I hoards do support Taylor's theories in one respect, in that their variation in hoard size can be used to argue that an inflationary cycle of hoard deposition was indeed occurring, in Late Bronze Age Essex at least. The same cannot be said of Kent, however, where Group I hoards are rare. Other aspects of Taylor's argument cannot be readily supported with reference to the Group I hoards, in particular his assumptions regarding the composition of the 'Carp's Tongue' hoards. With hoards of ingot metal and/or socketed axes showing a distinct geographical bias and varying so considerably in size and weight, it seems feasible to suggest that these restricted category hoards are the manifestations of a different depositional strategy to that seen in the mixed category hoards. In the latter, the nature of the contents may indeed turn out to be less important, and we may see a more convincing physical manifestation of the scenario envisaged by Taylor. Just how disparate both traditions actually are, however, cannot be assessed without detailed consideration of the mixed category hoards.

Mixed category hoards dominate the hoard record in Kent, though a number also occur in Essex. These hoards fulfil more closely our expectations of a 'Carp's Tongue' hoard, for they include representatives of a number of different artefact categories, and their contents have often been subject to a considerable degree of fragmentation. In total, they they are more numerous than the Group I hoards. These hoards are essentially similar, but when it is possible to subdivide them further into three subgroups on the basis of hoard size and number of artefact categories present . The mixed category hoards varied greatly in size (Fig. 2). At one extreme there were hoards that were very small in size. Such hoards, represented, for example, by the hoards of Shoebury II and Cliffe-at-Hoo, comprised less than 15 objects amongst their contents, and might have been classed as 'personal' hoards using traditional terminology. These contrasted with massive hoards, like those of Grays Thurrock I, Leigh II and Minster, which included between 180 and 300 different pieces within their contents. These two extremes were deemed sufficiently dramatic to allow them

to be assigned to different groups: the Group II hoards (small mixed category hoards (App. 3.ii)) and the Group IV hoards (large mixed category hoards (App. 3.iv)). Occupying the middle ground between these two extremes was a third group, the Group III hoards (intermediate mixed category hoards (App. 3.iii)).

Like the Group I restricted category hoards, mixed category hoards showed distinct patterns in their distribution. The greatest variation in hoard size was apparent in Essex, where the majority of both the Group II and the Group IV hoards were recovered. These extremes in hoard size are markedly rarer in Kent, where only one Group II and one Group IV hoard have yet been discovered. Though the Minster hoard quite clearly deserves its place among the Group IV hoards, it is considerably smaller than its Essex counterparts. The people of Kent were, it seems less prone to excesses in terms of hoard deposition than their counterparts in Essex, with the Kentish hoards being rather more uniform in size.

It is now possible to characterise the different depositional practices occurring in the two counties. In Essex, two types of hoard are apparent. One focuses exclusively upon socketed axes and/or ingot metal, while the other includes representatives from a number of different artefact categories. Individual hoards belonging to both groups vary considerably in the number of items present, and therefore in the total weight of the hoard contents. The Kentish material can be seen to contrast with this. Here, the majority of the metalwork hoards recovered to date have included representatives of a wide range of artefact categories, and while these may vary in size, and therefore in weight, the differences between the largest and the smallest hoards are not as as extreme as they are in Essex. Small hoards of less than a dozen items occur on occasion in both counties, but the largest hoard so far recovered in Kent - the Minster hoard - is significantly smaller than those from Essex. The Minster hoard included only 171 items amongst its contents, compared to the 300 items occurring in the Grays Thurrock I hoard and the 224 items in the Leigh II hoard.

The greater degree of consistency seen in the Kentish hoards might suggest that the inflationary cycle, if that is what it were, which can be identified in the Essex Group I hoards is not operating here. In the Essex mixed category hoards, though, we see an entirely different picture, one which seems similar to that seen in the restricted category hoards. Taylor's theories regarding escalations in bronze consumption are more strongly supported here, especially since some of the Essex mixed category hoards constitute 'super-hoards' which are amongst the largest in the British Isles (e.g. Grays Thurrock I and Leigh II).

While it is possible to see the logic in Taylor's interpretation, and to argue that the application of his theories can be used to gain insight into the nature of hoard deposition in Essex, it seems unwise to give anything more than tentative support for this possibility. Since the deposition of these hoards cannot be dated in anything more than a rough and approximate sense, their chronological relationships must remain ambiguous. Thus we

cannot say whether Group IV hoards like Grays Thurrock I predated Group II hoards like Grays Thurrock II, for example. As a result, it is impossible to state with any certainty that proof of any escalation in consumption exists. Though it can surely be argued that such a theory could provide a feasible explanation which neatly explains the vast discrepancy of hoard sizes seen in the Essex material.

4) Evidence of Internal Structure in the Mixed Category Hoards

The existence of the the Group I hoards suggests that at least some of the Late Bronze Age metalwork hoards of Essex, and to a lesser extent, Kent, were constructed in specific ways. In these hoards, attention appears to have been paid to the nature of the contents, and representatives of artefact categories considered inappropriate were excluded. As a result, such hoards are composed entirely of ingot metal, or socketed axes, or a combination of both categories. The next step is to see whether similar patterns can be isolated in the mixed category hoards. Are there any indications that the contents of these hoards were subject to similar processes of deliberate selection?

One feature of the mixed category hoards merits brief recapitulation before the problem is addressed in earnest. This is the apparent relationship between the size of the hoards and the number of categories included in the contents (Figure 2). It was certainly true to say that the larger the hoard, the more categories would be present. Typically, Group II hoards might be expected to include representatives of three or four different artefact categories (App. 3.ii), while Group III hoards might include between five and seven (App. 3.iii) and Group IV hoards would invariably include more than ten (App. 3.iv). These are flexible guidelines and not hard and fast rules, as there were a few instances where hoards included an unusually high number of categories amongst their contents (e.g. the Group II hoard of Shoebury II, and the Group III hoard of Minnis Bay).

The detailed consideration of hoard contents required for this part of the work was restricted to those hoards which were physically evaluated for the purposes of this thesis. It was impractical to study the entire range of hoard material from both counties, and since a comparative of study of two disparate areas was considered appropriate, it was decided that specific portions of Essex and Kent would be compared. In both counties, the coastal strips which bordered the Thames estuary were selected (Fig. 3), for a high proportion of the hoard populations appeared to be concentrated here. In addition, all the Group IV hoards, several of the Group I and Group II hoards, and also a significant proportion of the Group III hoards were located in these zones, thus allowing a comparison to be made between hoards which contrasted with one another in many respects.

In terms of the artefact categories included, it was instantly apparent that two categories of material dominated the hoard contents (Figs. 4-6), and this dominance appears to be consistent, irrespective of the size of the hoard. These dominant categories were socketed

axes and ingot metal, the same categories that were encountered in isolation in the Group I hoards. However, in the mixed category hoards, additional items accompanied these dominant categories, and the range of these differs significantly according to the size of the hoard. In the small Group II hoards, socketed axes and ingot metal are commonly accompanied by small tools and weaponry, with less frequent inclusions being winged axes and decorative fittings (Fig. 4a-b). In the Group III hoards, winged axes and decorative fittings (including weapons fittings such as chapes and sword pommels) become common inclusions, with metalworking debris such as mould fragments and casting jets being less frequently encountered (Fig. 5a-d). All the categories mentioned above are consistently included in the Group IV hoards, and other items often accompany them, too, including body ornament (e.g. bracelets) and cauldron fittings (Fig. 6).

These general tendencies appear to hold in both counties. Some degree of local variation is, however, apparent. Relative proportions of the dominant categories do vary, but this variation occurs between hoards, and does not appear to be related to either hoard size or place of origin. Secondary categories may show similar variation between one hoard and another, particularly in the Group III hoards. While some Group III hoards included several fragmentary or complete winged axes (e.g. Shoebury I, Whitstable), in others this category was entirely absent (e.g. Southchurch I, Allhallows II). In other secondary categories, there are some indications of broader regional trends, particularly in small tools and weaponry, and these trends are visible in all three mixed category groups. In both counties, small tools and weapons are likely to be deposited in roughly similar amounts, or with weaponry appearing slightly dominant. However, the emphasis on weaponry is in many cases noticeably greater in many of the Kentish hoards (e.g. All Hallows II, Borstal, and Minster).

Small tools are a category which merit a more detailed consideration, for they illustrate a potential relationship between the size of a hoard and the number of artefact categories selected for inclusion. For, as hoards increase in size, so too do the range of small tool types present (Figs. 7-9). In the Group II hoards of both Essex and Kent (Fig. 7), the small tool type represented will invariably be the socketed gouge (e.g. Grays Thurrock II, Leigh I, Cliffe-at-Hoo). In the Group III hoards (Figs. 8a-c), gouges are supplemented or even replaced by representatives from a wider range of tool types, including socketed knives, hog-backed knives, chisels and sickles. But it is only in the massive Group IV hoards that all the small tool types listed above are found in association with one another (Fig. 9). Here, socketed gouges occur alongside tanged chisels, mortising chisels, hog-backed knives, sickles, tanged and socketed knives, etc. A comparison between the Group IV hoards of Essex and Kent demonstrates that a wider range of small tool types is present in Essex, though it is still true to say that in comparison to the smaller Kentish Group III hoards, Minster includes a broader selection of small tool types. But one contrast to note in the Kentish material must be the Minnis Bay hoard. Here, a selection of small tools is included which rivals, if not surpasses, anything seen in even the Group IV hoards from

Essex. Because of its differences, it may be appropriate to consider Minnis Bay as an isolated example of a depositional strategy which differs from the norm, a possibility which will be reconsidered towards the close of Chapter Five.

While proportional increases in hoard size and the range of objects representing a specific category is seen most clearly among small tools, a similar pattern can also be seen to a lesser extent in weaponry. It is especially apparent in the Group II hoards of Essex, where weaponry is represented only by the socketed spearhead. The Kentish Group II hoard from Cliffe-at-Hoo shows less restriction, with a fragment of sword blade accompanying a socketed spearhead. Decorative fittings such as chapes and pommels are absent from all Group II hoards, though, appearing only in the larger Group III and Group IV hoards.

From the evidence presented so far, it seems quite justified to argue that processes of selection and exclusion are taking place during the creation of the mixed category metalwork hoards. Though it was suggested that the mixed category hoards might result from an depositional strategy completely unrelated to that which generated the Group I hoards, a marked emphasis on socketed axes and ingot metal in the former argues against this possibility.

If certain categories are favoured over others, then why do the mixed category hoards include a variety of secondary categories in addition to socketed axes and ingot metal? If we assume that Taylor is right in his suggestion that hoards increase in size over time because of competitive pressure between social groups or individuals to dispose of more and more bronze in acts of competitive consumption, then the inclusion of additional categories might seem inevitable. Though certain categories might have been preferred, others could have been incorporated into the hoards as and when required. And yet we should be cautious about accepting this possibility. Regional patterning in secondary categories could indicate, for example, that guidelines were operating which meant that the mixed category hoards should be constructed in a certain way. Consider, for instance, the greater emphasis on weaponry seen in the Kentish hoards. It could be argued, admittedly, that the limited presence of unusual categories such as cauldron fragments and body ornament in the larger hoards might indicate a need to include as much metal as possible within the hoard contents. In such a situation, representatives of artefact categories which were not normally selected for inclusion might be incorporated into the hoards in order to bulk up their size. This possibility cannot be discounted, but the occasional presence of unusual items in some of the smaller hoards might suggest that there were times when the inclusion of such material was considered acceptable.

While part of Taylor's argument can be regarded as remaining potentially valid, i.e. that the deposition of metalwork hoards may have been occurring as a competitive event, resulting, in Essex at least, in an inflationary cycle characterised by the deposition of larger

and larger hoards, one part of his theory must be reassessed. Given the evidence obtained through a cursory study of the 'Carp's Tongue' hoards of Essex and Kent, it cannot be argued that bronze hoards are created with the sole purpose of amassing as large a collection of scrap metal as possible, with little if any attention being paid to the form taken by this metal. Instead, it seems quite feasible to suggest that the 'founders' hoards' have been created in a quite specific manner. Emphasis is placed upon certain categories of material, and even those categories of material included only rarely in metalwork hoards may have been included deliberately on occasion.

From just this brief consultation of the material, it has been possible to argue the case for there being some kind of loosely defined underlying structure to the 'Carp's Tongue' hoards. This subject is something that I wish to readdress at a later point, but before doing so it is necessary to further examine the potential relationship between the 'Carp's Tongue' hoards and the metalworking process which has been seen by so many as being inextricably linked with their creation.

5) 'Carp's Tongue' hoards and the metalworking process

Already, evidence has been presented which allows some kind of a connection to be made between the 'Carp's Tongue' hoards and the practice of metalworking (Table 8). Fragments of moulds, casting jets and in some cases solidified waste spill are represented in a number of hoards, and pieces of ingot metal made up a significant proportion of the total contents in the vast majority of the hoards studied. It is perhaps equally significant, though, that many of the objects present in these hoards survive only in a fragmentary and incomplete form. The presence of fragmentary objects has been used as an indicator by which secular hoards can be differentiated from votive hoards (Bradley, 1988), and even in early attempts at hoard classification, the 'founders' hoards' were characterised as such because they were dominated by broken and incomplete objects. There is nothing wrong in assuming a connection between hoards of broken objects and the metalworking process, for fragmentation is a necessary prerequisite to recycling. Such fragmentation is instigated for purely practical reasons. It would, for example, be impossible to place a leaf-shaped socketed sword within a crucible for recycling without breaking it up into manageable pieces first.

What, however, defines a 'manageable piece'? It might be thought that a minimum of effort would be employed during the fragmentation process, and that an object would be broken up just enough for its component pieces to fit within a crucible. However, this minimal level of fragmentation might not have been in the metalworker's best interests. Instead, it may have been more advantageous to reduce objects into even smaller fragments. Two reasons for this can be suggested. Firstly, by making fragments as small as possible, it is possible to cram more into the melting pot and thus obtain a larger amount of molten metal at the end of the smelting. Secondly, by subjecting an object to a

significant degree of fragmentation, one will expose a greater surface area to heat. This will ensure that the heat transfer from the hearth or furnace will be more efficient, and will enable the bronze to reach a uniformly molten state more quickly.

A dominance of small fragments which expose much surface area might therefore suggest to us that a hoard's contents had in fact been drawn directly from a metalworker's stockpile. One of the tasks of the forthcoming section is to try and ascertain whether such fragments can be found in these hoards. If so, then what proportion of the total hoard size will they represent? To address this question, the degree of fragmentation seen in representatives of each artefact category must be established. But perhaps of equal importance will be the identification of any different methods of fragmentation employed. Can specific methods of destruction be isolated? The identification of such methods and their repeated manifestation in the hoards of a specific geographical area or in members of a certain category of artefact might suggest that objects could not be broken up in an entirely haphazard manner. And finally, if different methods of fragmentation can be isolated, then can comparisons be made between the fragmentation patterns seen in more than one artefact category? If such comparisons could be made, then it might be possible to suggest that certain categories were viewed as similar or even equivalent on the basis of the methods employed to fragment them.

It stands to reason that any discernible patterns will appear stronger and more convincing where larger populations of objects are available for comparison. As a consequence, there were certain categories of artefact which proved more valuable to this study than others, for they were included in comparatively greater numbers. Any discussion relating to the observations made amongst the artefact categories present in the 'Carp's Tongue' hoards must take this into account. The artefact categories will therefore be considered in descending order of numerical importance. The initial observations will be made with reference to the dominant artefact category, i.e. the socketed axe. Ingot metal will not be considered at this stage, for it cannot technically be described as an 'artefact' category. Observations relating to this category will, however, be included for comparison at a later point.

Following a summary of the patterns noted in the dominant category will come discussions which focus upon the secondary categories: small tools, weaponry and weapons fittings, and winged axes/palstaves. This will be followed by brief considerations of categories which occur only rarely in these hoards, such as personal ornament, cauldron fragments and miscellaneous decorative fittings. Ingot metal and metalworking debris will then be examined, before any attempt is made to either highlight any recurring fragmentation patterns. Finally, the findings will be used to try and ascertain the relationship between the contents of the 'Carp's Tongue' hoards and the metalworking process.

The Dominant Artefact Category in the 'Carp's Tongue' Hoards: Socketed Axes

With at least one example present in virtually every hoard studied, and with many hoards having between 25% and 60% of their total contents composed of socketed axes, it seemed natural to use this category as a yardstick by which others could be judged. Socketed axes vary greatly in size, from more diminutive examples such as those from Bexley Heath (15/24) and Minnis Bay (19/05) to the massive axehead from Grays Thurrock I (02/33). Their weight range shows similar contrast, the two smaller examples above weighing 99.0g and 83.5g respectively, while their massive counterpart weighs 551.9g. The majority of axeheads appear to lie somewhere between 150g and 350g in weight, however. This represents a large amount of raw material, concentrated in a form which, as it stands, does not seem immediately suitable for recycling. For recycling of the metal to be undertaken, some degree of breakage would therefore be expected in all but the most diminutive of axeheads. This breakage might be expected to take on quite a specific form. Socketed axeheads are composed of a hollow-sectioned mouth and body, and a solid-sectioned blade. In a situation where bronze was sufficiently scarce to encourage recycling, but plentiful enough to allow the metalworker to be selective in those fragments chosen for re-use, the following pattern might be expected. First of all, the hollow-sectioned body might be separated from the solid-sectioned blade. Pieces broken from the body would be thin in section and would possess a large surface area, qualities which would make them ideal candidates for recycling. The blade, by contrast, with its thick section, would be more difficult to fragment, and would require more heating in order to fully return it to the molten state. We might therefore expect the body to be preferred for recycling, while the blade was discarded. If the 'Carp's Tongue' hoards are composed of rejects from the metalworker's stockpile, then it is likely that the axe population would be dominated by lower blades and cutting edges. We can also suggest that the inclusion of upper body fragments would have depleted the amount of metal available for recycling, for these are the pieces that would logically be used up first. With this in mind, it is possible to suggest that - if the fragmentary axe populations of these hoards are derived from the leftover portion of a metalworker's stockpile - they will show the following pattern: they will be dominated, first of all, by a large number of blade fragments, accompanied perhaps by any isolated small mouth and body fragments which proved excess to requirement.

1) Type I - Complete Socketed Axes

Before examining the fragmentation methods employed on socketed axeheads, the relative numbers of complete and fragmentary axeheads should be considered (Table 9). Though the fragmentary nature of the 'Carp's Tongue' hoard contents is often stressed in the literature, socketed axes were often recovered in a complete or virtually complete state. The majority of these complete specimens were undamaged (Type Ia), though others

displayed cracking and sometimes minor breakage around the mouth (Type Ib). In a number of cases, this seems likely to have resulted from damage associated with use (e.g. Grays Thurrock I 02/06, 02/11; Minster, 20/11, 20/13) for the metal shows cracking without any associated deformation of the metal, and sometimes shows outward distortion of the section. In other examples, minor damage around the mouth was associated with hammer indents and minor deformation of the section. Such damage might have resulted from efforts to remove a tightly wedged haft (e.g. Grays Thurrock I, 02/32). More substantial amounts of the mouth and upper body had broken away in other cases (Type 1c), and it is hard to determine whether such breakage (as illustrated by examples from Grays Thurrock I (02/12), Leigh II (05/16) and Minster (20/32)) resulted from damage sustained through use or damage resulting from deliberate destruction. Often, as in the Minster example, these breaks are associated with an unusually thin wall section. Use-related breakage seems highly likely in these examples, for the discrepancy in wall thickness would have meant that the object was predisposed to breakage at the point where the metal was thinner.

Whether the Type Ic axeheads were broken as a result of natural or artificial agencies is of little consequence, though. What is of prime importance is that little, if any, effort appears to have been put in to reutilise their metal content, a characteristic which they share with their complete and unbroken counterparts. In some cases, large portions of one side wall and/or one face may be missing, portions which roughly equate to a 'long mouth fragment' (see Type VII). But such fragments really take up a small amount of bronze when one considers what might have been available, had the entire hollow-sectioned portion of the axehead been requisitioned for recycling. In summary, it is possible to contrast these Type Ic axeheads from their fragmentary counterparts by the fact that there has been no attempt made to divide the object across its vertical axis.

2) Type II - Complete Crushed Socketed Axes

The majority of the socketed axes which remained complete at their point of deposition had been subject to little damage apart from that sustained through use. Some of the Type Ia axeheads showed chisel marks around the mouth, blemishes that seem likely to have ensued during the removal of the haft (e.g. Grays Thurrock I, 02/12; Leigh II, 05/04), while in some of the Type Ib axes mild deformation and minor breakage suggested that greater force was required to loosen the haft (e.g. All Hallows I, 12/03). It is also possible that some of the more severe breakage noted in the Type Ic axeheads resulted from having to use a substantial degree of force to separate axehead and haft.

This can be contrasted with a few isolated examples which show evidence of having been crushed over their entire length (Aveley, 01/07; Grays Thurrock I, 02/35; Bexley Heath, 15/25; Minster, 20/04, 20/28; Stoke-at-Hoo, 21/09). Crushing and deformation of the section is common in many of the fragmentary pieces, and often seems to be an

inevitable side-effect of the fragmentation process. However, in these examples it seems to have served no real purpose, for the perpetrators have failed to carry out their destructive actions to any logical conclusion. Fragmentation of the object has not occurred, and the amount of bronze which has been removed from the original object is often virtually negligible. In the case of one Type II axehead from Stoke-at-Hoo (21/09), hammering had resulted in breakage at the mouth, but both fragments were included in the hoard, and these have been rejoined in recent times. Adjoining fragments of socketed axes are virtually unknown in these hoards, so we must ask ourselves whether the piece might have been left cracked but intact in antiquity, with breakage occurring during or after deposition.

The presence of pieces such as these should make us question the motives of those who were responsible for this damage. Crushing of the section must have been carried out following the removal of the haft, and perhaps it was undertaken in order to close off the mouth. In practical terms, this act of closure means that it is impossible to insert a new haft, and it may have been carried out as a symbolic indication that an object's life had come to a close. The fact that such effort was invested in this act of closure might suggest that there may have been much more meaning in the way in which objects were treated prior to deposition than has previously been supposed.

3) Types III-V: Socketed Axes Subject to Lateral Fragmentation

The main method of fragmentation seen in socketed axeheads involved the division of the socketed axehead along a line parallel with the mouth, an action which divided the mouth and body of an axehead from its cutting edge. It has already been suggested that this might have been the most efficient way to fragment an axehead if recycling of the constituent metal was intended. The solid-sectioned blade, which would be more difficult to return to a molten state than the thin-sectioned fragments of body and mouth, could be discarded, and the metal of the mouth and body re-utilised. This practice would result in the division of the axehead just above the cutting edge, and a marked bias towards the cutting blade fragments.

Such a pattern is evident in the Type IV axeheads. They demonstrate breakage of the axehead into two unequal portions, with the mouth and upper body comprising perhaps two thirds of the original length of the piece, and the blade and cutting edge making up the remainder. A number of blade fragments appear to result from this method of fragmentation (e.g. Leigh II, 05/31-34; Borstal, 16/14), and this should be seen as consistent with our expectations. What might strike us as surprising, though, is the presence of several instances where the very portion of the axehead that we might expect to be kept aside for recycling has in fact survived (e.g. Borstal, 16/06, 16/07). The most extreme instance of this fragmentation method occurs in the small Group II hoard of Shoebury II. Here, one example (17/02) has had just the cutting edge removed at a point just below the start of the hollow section. And, even more intriguingly, there is in this

same hoard an axehead which, though surviving complete, appears to have suffered at least the beginnings of a similar process of fragmentation (17/01). A depression is evident over the cutting edge on one face, while on the other a deep crack runs through the bronze, following a line which cuts the blade off from the adjoining body. For some reason, this process of destruction was abandoned, and the axehead placed within the hoard in its complete state.

In the Type IV axeheads, the manner in which the axeheads have been divided runs according to our expectations. The nature of the fragments selected for inclusion within the hoards, however, does not. In reality, though, fragments which show this method of breakage are outnumbered by those which display Type III or Type V breakage patterns. Type III fragments, like their Type IV counterparts, showed division of the axehead into unequal portions. In these examples, however, it is the lower body and the cutting edge which comprise the larger fragment, with only the upper third of the object, around the mouth, having been removed (e.g. Grays Thurrock I, 02/47; Borstal, 16/08). Unlike the Type IV fragments, which are included as both blade and mouth fragments, Type III fragments are almost invariably represented by the blade. It is conceivable that a number of the isolated mouth fragments encountered could have been by-products of this method of breakage, but in only one instance is there a socketed axe which survives only as its mouth and upper body alone (Minster, 20/48). The body/blade fragments produced by this method of fragmentation are, however, comparatively numerous, and their presence in such numbers might be considered surprising, for much of the hollow-sectioned portion of the axehead still remains attached to the blade, and has not been removed for recycling.

The final method of fragmentation noted in the socketed axe population shows division of the axe into two roughly equal portions. Whereas Type IV blade fragments appear to have been removed from the body close to the point where the hollow-section of the socket begins, Type V blade fragments often have some of the lower body remaining intact above the cutting edge (e.g. Grays Thurrock I, 02/49-53; Minster, 20/54-63). Once again, breakage does not seem to have been carried out with the sole intention of recovering a maximum amount of metal for recycling.

4) Type VI - Fragmentary Axeheads Subject to Longitudinal Division

The fragmentary socketed axes which conform to the breakage patterns described in Types III-V still represent in many instances a significant portion of the original axehead. We could surmise that in these examples the metal has not been sufficiently fragmented to allow a return to the crucible, and this initial supposition is further supported by the presence of socketed axes which show additional fragmentation. This next phase of reduction is demonstrated by those axe fragments which have been subject to division as a result of hammering down the centre of the face. This has resulted in cracking of the metal and in many cases, further fragmentation of the object.

Such longitudinal breakage appears to have taken place following the initial process which divided the mouth from the blade. Following the premise that the upper body of a socketed axe is more likely to be recycled and the solid-sectioned blade discarded, it comes as no surprise to learn that the majority of the fragments which show Type VI breakage are upper body fragments. This method of breakage is perhaps best illustrated by fragments from Bexley Heath (15/32) and Stoke-at-Hoo (21/14). In these examples, the remains of two faces survive along with the intervening upper surface, these fragments quite clearly representing a Type V upper body fragment which has been subject to division down the centre of each face. In other examples, the division appears to have taken place down either side of the object, leaving the face of the object intact (Grays Thurrock I, 02/44; Leigh II, 05/20).

It was suggested earlier that the most logical way to recycle a complete or virtually complete socketed axehead would be to separate upper body and blade, and to re-utilise only the metal content of the hollow-sectioned body. In this scenario, the metalworker would be less likely to make use of the blade, because its solid section would be less easy to recycle in comparison with the thin-walled portions of the mouth and body. If hoards were created as an inevitable by-product of the metalworking process, and composed of material deemed unsuitable for recycling, then a heavy bias towards the inclusion of blade fragments might be expected. Instead, there is evidence to suggest that much potentially recyclable material was never utilised. The fragmentation methods employed have produced blade fragments which still retain much of the lower body of the axehead, and the inclusion of Type IV and Type V upper body fragments demonstrates that the contents of these hoards are not confined to fragments discarded because the process of recycling them would have proved too labour-intensive. The presence of these latter fragments might suggest that the supply of bronze is sufficiently plentiful to allow some wastage of raw material, but there are some indications that at times even unlikely fragments were broken up in preparation for re-use. For example, there are three fragmented cutting edges which have, like the other Type VI fragments, been subject to longitudinal division (Grays Thurrock I, 02/68; Leigh II, 05/37, 05/38). These fragments suggest that, on occasion, even the solid-sectioned cutting edges might be broken up and re-utilised as and when required.

5) Type VII-IX: Miscellaneous Small Fragments

The most intensive levels of fragmentation in socketed axeheads were seen among the members of these groups. Three groups could be distinguished. The first of these, the Type VII group, now survived as long, slender slivers of the mouth and upper body. They measured typically between c. 35 and 55mm in length (e.g. Leigh II, 05/53-57; Minster, 20/40-41). The breaks at either side were often straight and clean, and traces of hammering were often seen along the broken edges (Leigh II, 05/54). Distortion of the section was identified on occasion, too (Grays Thurrock I, 02/87). The nature of the breaks and the

associated deformation suggests that these 'long mouth fragments' resulted from the further fragmentation of upper body fragments which had been broken up in a manner similar to that seen in the Type VI or Type V fragments.

The Type VIII 'short mouth' fragments are more difficult to assess. Often, the breaks appear rougher and less regular (Grays Thurrock I, 02/100; Minster, 20/46). This might suggest that at least some of these fragments could have resulted from use-related damage similar to that seen in the Type Ib complete axeheads. However, there are examples where distortion of the section and hammering near the breaks suggests that such fragments were created through the deliberate breakage of larger pieces (Leigh II, 05/66, 05/68). At least some of these Type VIII fragments may therefore have resulted from the division of Type VII fragments into two portions. Perhaps this possibility is supported best by two fragments from Grays Thurrock I, 02/77 and 02/78. These fragments are adjoining, though the break appears to have occurred in recent times. The lower portion in particular reveals hammer indents and shows signs of distortion, suggesting that the metal was weakened through hammering in antiquity. In this instance, the destructive act was not carried out to its logical conclusion, for though cracking of the metal is likely to have occurred in antiquity, actual fragmentation seems to have taken place at a later point. A similar method of dividing fragments might have resulted in many of the Type VIII and also the smaller Type IX fragments which are present in these hoards.

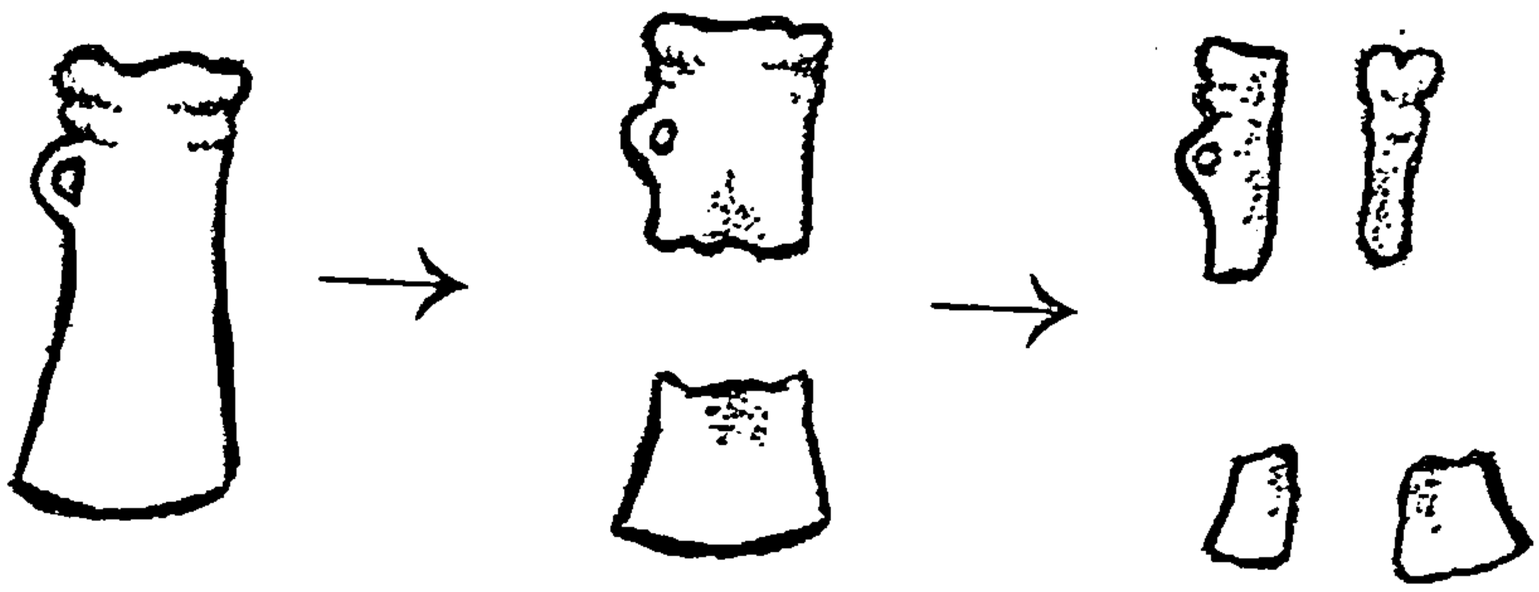
Alongside the mouth fragments described above, body fragments of socketed axes were also encountered. The majority of these were small in size, and could conceivably have been produced using the fragmentation methods outlined above. However, some larger body fragments were encountered among the Type IX axe fragments. On rare occasions, a substantial portion of the axehead survived. A fragmentary wing-decorated socketed axe from Grays Thurrock I shows this well (02/45). Here, both the mouth and the blade have been removed, leaving the middle portion of the piece intact. Another example from Minster (20/69) is similar, and both fragments suggest that, while division into two pieces seems to be the dominant method employed in the early stages of axe fragmentation, there may have been instances where axeheads were subdivided into three. Such examples are rare, however, with the majority of body fragments having been subject to a far greater degree of fragmentation than was seen in these two examples.

6) General Patterns Observed in Socketed Axe Fragments and their Relationship with the Recycling Process

To describe the 'Carp's Tongue' hoards as 'founders' hoards' automatically encourages the preconception that the contents will have been reduced to the level of scrap metal. A detailed examination of the socketed axe population suggests that this straightforward assumption cannot really be justified. The physical condition of socketed axeheads varies considerably, with a number of examples remaining complete and

undamaged. Others, though broken, retain a substantial amount of their original extent. In some cases, use-related breakage seems likely, particularly in those virtually complete axeheads where irregular cracking and breakage has occurred around the mouth and upper body, i.e. in those parts of the axehead where the casting is thinnest and therefore at its most weak. Contrasting with these examples, there are numerous instances where the axehead is represented by only a tiny fragment of mouth or body, or - more rarely - cutting edge. Amongst the smallest of these fragments, there are examples which are irregular in shape, and which have no evidence of any hammering in association with the broken edges, and it is likely that these also resulted from use-related breakage. The majority of fragmentary axeheads, however, appeared to have suffered deliberate breakage, often bearing hammer indents in association with the broken edges. These fragments show a significant diversity in size and weight (Figs. 10-12), but the method by which they have been obtained from a complete axehead seems to remain consistent. This method can be summarised as follows (see *fig. a).* A complete axehead is, first of all, subject to division along its horizontal axis. Two pieces may be produced, though on occasion division into three appears to have occurred. There appears to have been some individual choice apparent in the nature of this division, with some axeheads having been divided into two roughly equal portions, while in others division is unequal. One thing is clear, though. Division of the axehead is not carried out with the sole intention of separating the hollow-section body and mouth from the solid-sectioned blade. This confounds logical expectation, for it is this method of division which would make most sense in a metalworking context. Instead, large portions of the lower body are left adjoining the blade in many instances, which suggests that little effort is being made to remove the hollow-sectioned portions of the axe that would be easier to recycle. From this it could be argued there is sufficient bronze available to allow a substantial amount of wastage during the fragmentation process.

fig. a



Lateral division of the axehead is followed by longitudinal division of the resulting upper and lower body fragments. This results once again in the surviving portion of the axehead being divided into two, producing a fragment which comprises roughly a quarter of the original axehead. As expected, this method of division is more frequently encountered in upper body/mouth fragments. However, fragmented cutting edges are not unknown, and this casts doubt on the assumption stated above, i.e. that there is sufficient bronze available for the metalworker to allow potentially recyclable material to be discarded. To fragment these cutting edges, a substantial amount of labour would have been required, and their presence suggests that there were times when utilisation of even this portion of the axehead was required to augment the supply of raw metal.

The subdivided cutting edges noted above are small and compact in size, as the section narrows considerably towards the cutting edge. Subdivided upper body fragments, by contrast, would still occupy a substantial amount of space within a crucible, and the presence of yet smaller fragments of mouth and body demonstrates that these pieces were also subject to more intensive reduction. Subdivided upper body fragments still retain the vestigial traces of their hollow section, and the next step in the fragmentation process transforms these into a series of flat pieces of bronze. Some of these remain substantial in length, and these fragments may then have been subject to further subdivision, producing smaller mouth fragments and body fragments.

At what stage might these socketed axe fragments have reached a size compatible with recycling? It is logical to suggest that no unnecessary fragmentation will have been undertaken, and that as soon as the desired size was achieved, no further destruction would have taken place. If this is the case, then only the smallest of the fragments encountered will represent 'scrap metal', i.e. material which has reached a size compatible with recycling. A large number could then fit within a crucible, and these fragments would possess a large surface area in relation to the thickness of the section, a quality which would facilitate the return of the metal to a molten state. Indeed, the smallest fragments noted do seem to possess these desirable attributes. Candidates for inclusion among this select group include the 'short mouth' fragments (Type VIII), the smaller body fragments (Type IX), and also the subdivided cutting edge fragments (Type VI). Some of the 'long mouth' fragments may also have been eligible for inclusion, too, but since a number of the 'short mouth' fragments appear to have originated through the further division of 'long mouth' fragments, we should perhaps view these latter pieces as lying outwith this group of material.

7) Additional Trends

While it is possible to suggest that the degree of fragmentation is something which can be directly linked with metalworking, some more ambiguous trends can be identified which cannot be so readily explained through reference to the metalworking process. Brief mention of one such trend has already been made with reference to the Type Ib axeheads. These objects had been crushed along their length, though they remained complete and had not been subject to fragmentation prior to deposition. It was suggested that crushing of the socket may have been carried out in order to close the mouth and thus prevent the insertion of a new haft. Such an action could have been undertaken as a symbolic way of demonstrating that an object's life had come to an end.

It was apparent, though, that closure of the mouth had in some instances been achieved through another method. This was through the insertion of a number of fragments into the socket of the axehead, a practice that could effectively block the mouth and once again prevent the insertion of a haft. In some instances, blocking of the socket entailed nothing more than the placing of a small piece of ingot metal into the base of the socket (e.g. Leigh II, 05/09, 05/11, 05/12). For these examples, alternative explanations can be offered, explanations which question whether closure of this socket was really intended. Pieces of ingot metal could conceivably have strayed into the object and corroded into place over time. Or perhaps pieces of rough metal, or even molten metal (e.g. Borstal, 16/14), could have been placed deliberately into the base of the socket in antiquity, perhaps as a means of adding extra weight to the lower part of the blade. In other instances, blocking of the mouth has quite clearly been intended, as can clearly be seen in examples from Leigh I (04/02) Southchurch I (09/01) and Borstal (16/04, 16/05).

Explanations for this might be sought in the metalworking process. By in-filling the axehead with a number of tiny fragments, the space contained with the axehead is being utilised to its maximum potential. The fragmentary objects wedged inside are objects which have a large surface area exposed in relation to their section - a property which will assist in their conducting heat efficiently and enable them to return to the molten state after a roughly similar time has elapsed. In this situation, we can see the complete socketed axe which holds them as functioning as a vessel in which these tiny fragments can be stored, a bronze crucible which can then itself situated within a clay crucible. This bronze vessel will itself assist in conducting heat to its contents, and it will ultimately become a part of the molten metal along with those pieces placed inside it.

Though such an idea seems plausible, there are quite obvious disadvantages. While the use of a complete socketed axe as some kind of inner crucible does mean that a large amount of bronze will be concentrated in a small area, with sufficient air circulating between the fragments to allow efficient heating, two problems are evident. Firstly, it seems quite likely that the space within a crucible would be utilised just as efficiently, if not

more so, if a larger number of smaller of fragments were included instead of a complete axehead. Secondly, by leaving the solid-sectioned blade *in situ* (as in Leigh I, 04/02), one would be left with a substantial piece of bronze which retained its solid state after all else around it has become molten. There are in-filled examples where the blade has been removed, and in these examples in-filling could make sense from a metalworking perspective (e.g. Southchurch I, 09/01; Borstal 05/04 and 05, and, especially, Grays Thurrock I, 02/37). Even so, these seem rather substantial pieces of bronze to be placed in a crucible, particularly when comparisons are made with those smaller fragments that occur in such large numbers in some hoards.

8) Processes of Selection

One final aspect of the socketed axe population of these hoards remains to be discussed, namely the nature of those fragments chosen for inclusion. One thing became apparent during the study of these hoards: none of the socketed axe fragments were adjoining. Upper body fragments were not included alongside their adjoining blade and cutting edge fragments, and even tiny mouth and body fragments appeared to be entirely discrete, having lost all their neighbouring fragments. In only two instances were adjoining fragments noted, and these were not entirely unproblematic. The first example was a complete socketed axe from Stoke-at-Hoo, Kent (21/09). This was a Type Ib axehead, complete but crushed, from which a small mouth fragment appeared to have broken away during crushing. This had been glued back into place in recent times, and as a result it was impossible to determine whether the piece had broken in antiquity, or in recent times. It is conceivable that while cracking had occurred in the past, actual breakage had only occurred during recovery or as a result of later handling. In Grays Thurrock I, this situation can be seen in two socketed axe fragments (02/77, 02/78). These were adjoining fragments, and in this instance recent breakage was a virtual certainty, as the shared edge revealed fresh metal in both examples. All other fragments appeared to occur in complete isolation, something which is most striking in two socketed axe fragments, again from Grays Thurrock I (02/84, 02/85). These fragments probably belonged to the same wing-decorated 'south-eastern' type socketed axe, one representing the far left hand side of one face, the other representing the far right hand side of what appears to have been the same face. The intervening portion is, however, missing. Since large numbers of these small fragments were included in hoards like Grays Thurrock I, and since no adjoining pieces are included, one must conclude that some kind of deliberate selection was taking place, perhaps being undertaken by the metalworker during the process of fragmentation.

Secondary Artefact Categories in the 'Carp's Tongue' Hoards: Small Tools, Weaponry and Winged Axes/Adzes

Though socketed axes are without question the most commonly encountered artefact category occurring in the mixed category hoards, they are invariably accompanied by representatives of a wider range of material. The nature of these accompanying categories vary, but several appear to be encountered on a regular basis. They are present in varying numbers in most of the Group III hoards, and are consistently included in greater numbers in the Group IV hoards. In the context of this thesis they are termed the 'secondary artefact categories' and they include small tools, weaponry (and weapons fittings) and winged axes.

1) Small Tools

Small tools are represented by a number of different implement types, including gouges, chisels, knives, sickles, hammers and hog-backed knives. Each of these types will be dealt with individually, in descending order of importance. The perceived importance of a tool type will be determined by the regularity with which it has been included in the hoards, rather than by its dominance in numerical terms.

a) Socketed gouges

These objects were the most frequently encountered of all the small tool types. They were regular inclusions in the Group II hoards, being absent only in the Essex hoard of Shoebury II, which had no small tool types represented amongst its contents. Socketed gouges were present in all of the Essex Group III hoards, and in 6 out of the 8 Kentish Group III hoards. In addition, they were well represented amongst the contents of the Essex Group IV hoards, though, perhaps unexpectedly given their frequency elsewhere, no gouges were included in the Minster hoard.

(i) Complete Socketed Gouges

Complete socketed gouges were more frequently encountered in Kentish hoards (All Hallows II, 13/14-15; Bexley Heath, 15/47; Cliffe-at-Hoo, 17/46; Minnis Bay, 19/28-29; Stoke-at-Hoo 21/21; Whitstable 23/17-18), though occasional complete examples were also recovered from Essex (Grays Thurrock I, 02/121; Grays Thurrock II, 03/02). When deposited complete, socketed gouges were almost invariably undamaged and in good condition, though there were rare examples of gouges which showed a similar type of damage to that described in the Type Ib socketed axeheads. In these examples, damage to the mouth had occurred, either through use or through the removal of the haft. There was

also an isolated example from Kent of a socketed gouge which had been hammered around the mouth and around the base of the blade (All Hallows I, 12/27). This had effectively closed the socket and had caused severe distortion of the object's profile. Much of the rear wall of the piece had also broken away, though it is unclear whether this breakage resulted from the crushing, or whether it had been sustained previously, perhaps through use.

(ii) Fragmented Socketed Gouges

One example from Kent (Stoke-at-Hoo, 21/22) and the majority of Essex gouges had been subject to some degree of fragmentation, though the extent of this destruction varied significantly. For example, a socketed gouge from Southchurch I (09/27) was deposited virtually complete, having had only the lower portion of its blade removed (c.f. the Type V socketed axeheads). This was, however, exceptional, with the majority of fragmented gouges instead showing a substantial degree of fragmentation. In some examples, the piece had been divided laterally into two roughly equal portions (Grays Thurrock I, 02/122-125; Stoke-at-Hoo, 21/22), a method of division which is reminiscent of the Type VI socketed axeheads. There were additional examples, though, where fragmentation had been carried out more intensively. Socketed gouges from the hoards of Leigh II (05/79) and Vange (11/25) were represented by fragments that must only have comprised a third of the original extent of the object, and another example from Leigh I (04/06) is fragmented to such an extreme degree that even its identification as a socketed gouge must remain to some extent conjectural.

(iii) Blocking of the Mouth in Socketed Gouges

Like socketed axeheads, socketed gouges showed closure of the socket on more than one occasion. In one example, this had occurred as a result of crushing (All Hallows I, 12/27). More commonly encountered, though, was the practice of blocking the socket. This latter practice was restricted to examples from Essex, and to specimens from Leigh II (05/78) and Southchurch I (09/27) in particular. The example from Leigh II appeared to have been filled with clay or soil, and a fragmentary bracelet had been wedged into this matrix. The Southchurch I example had by contrast been in-filled with molten metal. While it could be argued that this piece was a failed casting, in which the clay core had been omitted, both the condition of the object and the nature of the in-fill argued against such a possibility. No traces of any seams survived on the gouge, and the surface of the metal appeared to have been subject to hammer working. This strongly suggested that the object had been finished in preparation for use. The in-fill also appears quite different in character to the bronze which surrounds it. A line of demarcation is clearly discernible between the wall of the object and the central portion of the piece, something which would surely not have been apparent had the solid section been the result of a casting defect.

b) Knives

Though knives were absent from the Group II hoards studied, they were frequently included in the Group III hoards, and they are also present in considerable numbers in the Group IV hoards. In smaller hoards, knives are most often represented by the 'Thorndon' type socketed knife, characterised by its ribbed blade and hollow-sectioned, riveted hilt. Other types may be included, though. These include tanged double-edged examples (Grays Thurrock I, 02/133, 133), and also types which have only a single cutting edge to the blade (e.g. Borstal, 16/21, and the 'Urnfield' type knife from Grays Thurrock I, 02/131-141).

(i) Complete versus Fragmentary Knives

Though knives were represented in nine out of the twenty-two 'Carp's Tongue' hoards studied, only one complete example was recovered, a tanged knife from Grays Thurrock I (02/133). In all other instances, the knives had been subject to fragmentation.

Knives were broken across the blade, but the resulting portions varied considerably in length and therefore weight. This contrast is at its most marked in the Grays Thurrock I hoard, where large lengths of knife blade (02/130, 02/131) were placed in a hoard alongside small ones (02/129, 02/132). No attempts to separate blade from socket or tang could be discerned, with hilt fragments almost invariably being included in association with an adjoining portion of blade.

Knives were fragmented by bending or by hammering, or perhaps by a combination of the two. Some examples show a bend to the profile which might indicate that at least the initial stages of the fragmentation process, i.e. the division of the knife into two or three pieces, might have been carried out using an individual's brute strength alone (Grays Thurrock I, 02/131, 02/134, 02/136). In other instances, hammer indents are associated with the breaks, suggesting that additional force was imposed to fragment the piece (Grays Thurrock I, 02/130). Some of the smaller fragments show no distortion of the profile (Grays Thurrock I, 02/132; Borstal, 16/21), and it seems likely that this method of fragmentation will have been executed using a hammer. But while some examples (Grays Thurrock I, 02/132) show possible hammer indents in association with the break, in others it is more difficult to isolate clear evidence of such activity.

Fragments of knife blade vary greatly in length. Unlike many of the artefact types encountered in these hoards, e.g. socketed axes, it was impossible to define a series of actions which could have produced these fragments. There was no evidence to suggest that knives were divided in a manner similar to socketed axes, i.e. by initial division into two roughly equal portions, followed by further subdivision. Instead, a wide range of

fragments are apparent, varying in length from between 20 and 100mm. The majority do, however, seem to measure less than 70mm. It may certainly be the case that - as has been suggested already for socketed axes - only the smaller fragments were considered to be suitable candidates for recycling. Unfortunately, since knife fragments occur in comparatively small numbers, the amount of information obtained through their study is insufficient to determine whether or not this is a feasible suggestion. It is possible, though, that a later reappraisal of this material may be possible, following observations made in other bladed objects such as sickles or swords.

(ii) Additional Observations

Crushing of the socket has already been highlighted in association with both socketed axes and socketed gouges, and it is a practice which is also found on occasion in 'Thorndon' type socketed knives. In socketed knives, this crushing is not always associated with fragmentation (Grays Thurrock I, 02/127, 02/129), but breakage can result (Leigh II, 05/85; Minnis Bay, 19/34, 19/35).

One final aspect that should be noted before moving on concerns the poor condition of the cutting edge seen in examples from All Hallows I (12/26), and Southchurch I (09/29). Though some blunting and notching of the cutting edge should be expected from use and also from subsequent loss of loose corrosion products, the condition of these pieces seemed markedly worse than others (c.f. Grays Thurrock I, 02/128, 130, 131, 02/135; Leigh II, 95/86; Minnis Bay, 19/34). In those instances where the condition of the edge is particularly poor, deliberate damage to the edge or even its removal as part of the reduction process should not be discounted.

c) Chisels

Chisels are encountered less often than other small tool types such as gouges and knives, but they can nonetheless be considered frequent inclusions in the Kentish Group III hoards and also in the Group IV hoards of both counties. The types of chisel selected for inclusion do, however, vary. In the Kentish Group III hoards, the socketed chisel (All Hallows II, 13/13) or the socketed axe-like chisel (Minnis Bay, 19/17, 19/18) are favoured. In the Group IV hoards of both counties, though, these socketed types are absent, the chisel instead being represented by a few examples of the tanged variety.

The degree of fragmentation also seemed to vary between these types. Where socketed chisels were included, they remained complete (All Hallows II, 13/13; Bexley Heath, 15/46; Minnis Bay, 19/19). Socketed axe-like chisels, by contrast, were subject to lateral division into two roughly equal portions (Minnis Bay, 19/17. 19/18), and in both these examples, only the lower body and cutting edge of the object were represented. Tanged chisels showed evidence of a similar method of division. In a tanged chisel from Grays

Thurrock I only the tang remained (02/116), while the two tanged chisel fragments from the Minster hoard were represented by the blades (20/80, 20/81). Fragmentation beyond this point of initial division did occur, evidence for this occurring in two examples from the Grays Thurrock I hoard (02/117, 02/118). Here, two chisel blades are present which have been subject to further subdivision. One appears to have been divided laterally (02/117), while the other has been subject to longitudinal subdivision (02/118).

d) Sickles

Sickles are infrequent inclusions in these hoards, occurring as isolated fragments in 6 of the Group III and Group IV hoards. Several fragments were, however, included in the Leigh II and the Minnis Bay hoards. In terms of their physical characteristics, sickles are like knives to some extent, for they comprise a thin-sectioned blade as opposed to a hollow-sectioned socket, and so we may surmise that the fragmentation processes used upon them will bear more similarities to the destruction methods seen in the knife population than those observed in socketed axes, gouges, etc.

There was one instance of a sickle which had been deposited in complete and unbroken form. This example came from the Minnis Bay hoard (19/30), a hoard which is outstanding for both the wide variety of small tool types occurring and also the excellent condition of these pieces. Minnis Bay also produced two more sickle fragments which may originally have been part of the same object (19/31, 19/32). If so, then an intervening portion of the blade is now missing. Similar instances of pieces which, though not adjoining, are likely to have come from the same parent object are represented in the Grays Thurrock I hoard. They include socketed axe fragments 02/84 and 02/85, and 'Urnfield knife' fragments 02/139,140 and 141. In all these pieces, efforts appear to have been made to avoid the presence of adjoining fragments, and it is possible that similar efforts were made with regards to the Minnis Bay sickle.

Fragmentation of sickles seemed in many cases to consist of division between blade and butt. The fragmentary sickle from Minnis Bay mentioned above had been subject to breakage of this kind, as had the fourth and final sickle fragment from this same hoard (19/33). Another sickle fragment from Leigh II was represented only by the butt (05/ 81), and it is possible that a similar method of division between butt and blade had been in operation here. Finally, the unusual 'palstave-sickle' fragment from Southchurch I once more showed similar separation between butt and blade, again with only the butt surviving. But while this method of division is frequently encountered, it cannot be interpreted as being universal. In other instances, sickles appear to have been divided up into three or perhaps four roughly equal portions, perhaps as a prerequisite to further fragmentation (Grays Thurrock I, 02/142; All Hallows 1, 12/28). In this artefact category, too, methods of division may vary according to local tradition or even personal preference.

In most examples, sickles have been broken up into large fragments that still comprise a substantial amount of the object's original extent. However, there are instances where sickle fragments appear to have been subject to a far greater degree of fragmentation. In such cases, the blade appears to have been further subdivided into a number of small fragments (e.g. Leigh II, 05/80, 05/82; Vange, 11/28; Minster, 20/82).

e) Socketed Hammers

The next small tool type to be considered is the socketed hammer, which is an infrequent inclusion in the Group III hoards of both counties, and a consistent inclusion in all three of the Group IV hoards. Socketed hammers are likely to have had a variety of uses, particularly in activities such as woodworking and metalworking, and it was possible to distinguish two distinct types. The first of these was a small lightweight type, as typified by an example from Leigh II (05/88). Judging by the shape of its working face, it can be suggested that such an object could have been responsible for the fine hammer work seen on many bronze objects, and also for the more intrusive hammer indents seen on many of the broken edges of fragmentary objects. The second type of hammer is a much heavier type (Grays Thurrock I, 03/143; Minnis Bay, 19/61). Such an implement may also have been used, on occasion, during the fragmentation of objects, as some of the fragmentary objects from Grays Thurrock I clearly testify (e.g. socketed axeheads 02/35 and 02/55). In these objects, larger hammer indents are likely to have been caused by the impact of a larger striking surface, similar to those present on these more heavy-duty hammers.

Hammers are occasionally included in a complete, undamaged state (Grays Thurrock I, 03/143; Minnis Bay, 1961). They are, however, more frequently encountered in a fragmentary condition. Most often, they appear to have been broken up laterally and divided into a mouth/upper body and a lower body fragment, in a similar manner to socketed axes, socketed gouges, etc. Examples from Grays Thurrock I (02/144), Leigh II (05/58), Vange (11/30) and Minster (20/136) all show subdivision of this kind, and this comprises almost 50% of the total hammer population. Smaller fragments may be encountered, though. A hammer fragment from Grays Thurrock I (02/145) has been subject to longitudinal subdivision, and a probable hammer fragment from the Borstal hoard survives only as a small mouth fragment. Another possible hammer fragment from Leigh II (05/59) consists only of the striking platform and the area immediately above it.

f) Hog-backed Knives

Hog-backed knives are traditionally seen as an integral part of the 'Carp's Tongue' package, but little thought appears to be spared for considering the role they may have played amongst the material culture of the Late Bronze Age. They are considered here amongst the small tools category, as they seem likely to have had a domestic function,

perhaps as a hand-held scraping implement. Hog-backed knives occur in both Group III and Group IV hoards in Kent, but are restricted to the Group IV hoard of Leigh II in Essex. Seven examples were encountered altogether, four of which survived as complete objects. The others had been subject to longitudinal division down the centre of the piece, a process which resulted in the production of two roughly equal pieces. In this category of material, there were no clear patterns of preference discernible. A preference towards the inclusion of complete as opposed to fragmentary examples could not, for example, be defined with reference to either geographical distribution, or to hoard size. Leigh II did include two out of the three fragmented hog-backed knives amongst its contents (05/133, 05/134) but it also included a complete example (05/132). And, while the majority of the hog-backed knives included in the Kentish hoards were complete, the example recovered from Minnis Bay had been fragmented, even though this hoard seems otherwise outstanding in terms of the excellent condition of its small tool population.

g) Other Small Tool Types: Mortising Chisels, Trunnion Chisels and Punches

A rare tool type encountered in the hoards studied was the mortising chisel, characterised by its blunt, leaf-shaped blade. Two examples of mortising chisels were securely identified among the contents of the Minnis Bay hoard (19/25, 19/26), while a third possible example was present in the Grays Thurrock I hoard (02/120). The Minnis Bay examples were in excellent condition, having been deposited complete and apparently having seen little if any use prior to their removal from circulation. These contrasted with the Grays Thurrock I specimen. This had been much reduced from its original form, surviving only as a small portion of socket along with the adjoining upper blade.

Another unusual form of chisel was the trunnion chisel, a small tool type which can be seen in its entirety in the Isle of Harty hoard. There were no fragments which could be securely identified as trunnion chisels, though there was one potential candidate from the Grays Thurrock I hoard (02/119). If this was a trunnion chisel, then it seems likely to have been a failed casting, a possibility which is supported by the fact that the piece still retains its casting seams.

Finally, the punch must be considered. It is, once again, a small tool type which was only rarely encountered, only one having been recovered, among the outstanding selection of small tools present in the Minnis Bay hoard (19/27). Like the mortising chisels from Minnis Bay described previously, it was complete and quite possibly unused.

2) Weaponry

The other category of material to be included in significant numbers in the 'Carp's Tongue' hoards is weaponry. Weapons - unlike small tools, which are represented by a variety of types - comprise only swords and spearheads, though the swords were often

accompanied by accoutrements associated with their presentation, i.e. scabbard chapes and decorative fittings. Though these fittings are found in smaller numbers, their reasonably consistent presence in the Group III and Group IV hoards makes it appropriate to include them in this section.

a) Swords (see Table 10)

Two types of sword were represented in these hoards. The first of these is the straight-bladed 'Carp's Tongue' sword; the type-object which has given its name to the industrial complex of which these hoards are seen as an integral part. This has traditionally been seen as a foreign type imported from continental Europe, and it contrasts with the indigenous leaf-shaped varieties which dominate these hoards. Of these indigenous forms, the Ewart Park sword is by far the most common, but some more unusual varieties have been noted. These include the 'Dartford' type socketed sword (Dartford, 15/13; Minnis Bay, 19/37), the 'frame-hilted' sword (Leigh II, 05/94) and the peculiar hollow-sectioned sword (Grays Thurrock I, 02/147 and Minster, 20/92). All these examples share the same basic leaf-shaped form, differing only in the method by which the hilt plates were attached.

With one possible exception, complete swords were unknown in the hoards studied, this exception being the socketed sword from Minnis Bay (19/37). The unique place occupied by this object is perhaps sufficient to encourage us to question the identification of this object as a 'sword'. The Minnis Bay socketed sword undoubtedly possesses the basic appearance of a leaf-shaped sword, but its proportions seem quite wrong. It could never have functioned as a slashing object, for it is too short. Instead, it seems more likely to have been a thrusting implement: a dagger, perhaps, or even a knife. Its resemblance to a leaf-shaped sword is worthy of consideration, though, and the visual similarity may have been quite intentional. It is possible that the socketed sword was a weapon intended for close combat with an enemy, but it seems equally feasible to suggest that it functioned as a heavy-duty knife, for use perhaps in the slaughter of animals. Thus by resembling a sword, a comparison was being made between those objects used to slaughter livestock with those used to slaughter the enemy in battle.

This only instance of a complete sword may therefore not even have been perceived as a true sword during its lifetime. This possibility is further supported by the fact that only sword fragments occur in other hoards. The sizes of the fragments did, however, vary considerably, with three main groups occurring within the material (Table 10). The first group was made up of larger fragments, measuring over 75g in weight. These consisted of the Type III blade fragments (e.g. Minnis Bay, 19/42; Minster, 20/95; Stoke-at-Hoo, 21/24) and a significant number of the Type II large hilt and upper blade fragments (Leigh II, 05/90, 05/91; Minster, 20/89). These were outnumbered, though, by fragments which weighed between 25 and 75g in weight (Figs. 13-14). Again, this group is dominated by blade fragments (the 'Type IV' fragments), with some of the smaller hilt and upper blade

fragments also lying within this weight range. Smaller fragments such as these did not represent the ultimate conclusion of the destructive process, however. In some hoards, small blade fragments weighing less than 25g were found, and in these same hoards fragmentary tang and shoulder fragments might also be included. As with the other artefact categories already discussed, swords seem to display varying degrees of fragmentation, and once again this may suggest that only a small proportion of the material included has actually been reduced sufficiently to allow recycling to take place.

Two types of fragmentation could be isolated amongst the sword population. The first tends to be associated with the larger fragments, i.e. the larger Type II fragments, and also blade fragments of Type III and, sometimes, Type IV. In these examples, distortion of the profile is apparent, but there are no traces of any tool marks at either break, with breakage in these cases appearing to have taken place through the use of human strength alone. Such fragments can be contrasted with other examples where hammer indents can quite clearly be identified at the breaks. In other examples, a combination of these two methods seems to have been used. In such instances, the piece appears to have been bent initially by hand, but hammering has then taken place in association, perhaps as a means of completing the fragmentation process. Alternative interpretations are possible, though. For instance, a sword may have been broken initially into two or three large pieces, followed by further reduction into smaller fragments through hammering at a later stage. It is possible that these two different processes were undertaken by different individuals. Initial division might have been carried out by the original owner of the sword, as a means of signalling that its useful life had come to an end, and it may be no coincidence that several of the Thames finds contemporary with these hoards have themselves been fragmented in a similar fashion (Burgess and Colquhoun, 1989). Following this primary act of destruction, the resulting fragments may then have been passed on to the metalworker for further fragmentation linked with the recycling process. Though this is a feasible suggestion, its validity cannot really be supported with any overwhelming degree of confidence. It is, for example, equally realistic to suggest that the metalworkers were given the swords in their complete form before themselves using a combination of both methods in the destructive process.

It was noted earlier that adjoining fragments of socketed axes were unknown in these hoards. Any such examples showed evidence of recent breakage, and those fragments which did appear to have come from the same object had lost the intervening pieces which had once lain between the surviving portions. This apparent aversion to the inclusion of neighbouring pieces was less evident in swords. While adjoining fragments still remain unusual, they are nonetheless included in several hoards (Grays Thurrock I, 02/156; All Hallows II, 13/18; Bexley Heath, 15/48). The inclusion of such adjacent fragments does, however, appear to be restricted to the Ewart Park sword, for no instances of adjoining Carp's Tongue fragments were recorded.

b) Scabbard Chapes, Sword Pommels and Decorative Fittings

Now an examination of the sword population has been concluded, it is the turn of those objects intended to embellish them to be discussed. The most familiar of these decorative items is the purse chape (Grays Thurrock, 02/187; Minster, 20/121), and it is this which is most frequently encountered amongst the weapons fittings identified here. However, it also seems likely that a number of the decorative fittings encountered in these hoards might have been intended as decorations for sword or scabbard. The bag-shaped fittings included in the hoards of Leigh II (05/121, 05/122) and Stoke-at-Hoo (21/28) may have been a local oversized variant of the purse chape, and the lozenge-shaped fitting (Leigh II, 05/120), semicircular fitting (All Hallows II, 13/23; Borstal, 16/20) and small horned-terminal fitting (02/212) could all have functioned as sword pommels. In addition, it seems reasonable to suggest that some sheet bronze fittings may have been intended as ornamentation for a scabbard (Grays Thurrock I, 02/209). Bugle-shaped objects may also have been an integral part of the warrior's accoutrements (Minster, 20/130-132), functioning perhaps as fittings for belt or baldric. The solid-sectioned bronze ring, long associated with weapons hoards in Scotland and the north, may also have served a similar purpose (Leigh II, 05/123, 05/125).

Isolated examples of purse chapes and sword pommels are regularly included in the Kentish Group III hoards, but the Southchurch I hoard of Essex is the only Group II or III Essex hoard which includes a chape amongst its contents. Southchurch I also included a fragmentary bugle-shaped object, an inclusion unparalleled in the other Essex hoards. Generally speaking, the Group III hoards of both counties included only one or perhaps two examples of weapon fittings among their contents. Indeed, it was only in the large Group IV hoards of Essex that a wide range of such fittings was encountered. Grays Thurrock I, for example, had amongst its contents a purse chape (02/186), a possible sword pommel (02/212), a decorative plaque (02/209) and a bronze ring (02/211), while Leigh II had a bag-shaped fitting (05/121), a bag-shaped mount (05/122), a lozenge-shaped fitting (05/120) and bronze rings (05/123-125). This variety contrasted with the range of weapons fittings included in their Kentish equivalent, the Minster hoard. Here, only the purse chape (20/121) and the bugle-shaped object (20/130-132) were represented.

The decorative fittings listed above take up little space, and possess a large surface area, properties which would be appropriate to aiding successful recycling. Though they are light in weight and would hence provide little in the way of raw material, their diminutive size ensures that they could be added to a crucible with little if any change of form. Crushing might be advantageous, but these items in their complete form weigh as little and take up as little room as the smallest of axe or sword fragments. We might therefore expect that weapons fittings would require only minor modification prior to recycling. In other words, they would either be deposited complete, or would be subject only to damage which is sufficient to reduce their volume, i.e. crushing or folding.

The majority of these items were indeed deposited intact or virtually intact. Some showed damage which was likely to have been use-related (e.g. the purse chape from Whitstable, 23/24), while others appeared to have been damaged through removal from the host object (e.g. the sword pommel from Borstal, 16/30). There were, however, some notable exceptions where deliberate fragmentation appeared to have taken place. The Minnis Bay hoard yielded a bronze ring which had been subject to much distortion (19/66) and the Leigh II hoard included a similar ring which had been broken into four roughly equal portions in antiquity (05/123). All four pieces had been included the hoard. There was in addition a scabbard chape from Minster which had been broken up prior to deposition (20/121). It had been crushed, and subdivided along its length. Similar longitudinal division was apparent in the small horned terminal from Grays Thurrock I (02/212) and the decorative scabbard fitting from this same hoard (02/209). One final example of fragmentation amongst weapons fittings can be seen in the bugle-shaped object from Southchurch I (09/48). This had been subject to such a high degree of fragmentation that only one terminal survived, making even its identification difficult. Once again, then, a similar situation is occurring in weapons fittings as has already been identified in socketed axes and some small tool types. A basic method of fragmentation can be established, and this involves the division of an object into two pieces, but in some instances fragmentation is continued to a more extreme conclusion.

c) Spearheads (see Table 11)

The other type of weapon to be included in the 'Carp's Tongue' hoards was the socketed spearhead. In Essex, spearheads are preferred for inclusion in the Group II hoards, but in the larger hoards of both counties, the sword tends to dominate. It is hard read much into this bias towards the sword, however. Since swords have been broken up into a number of fragments of which only a few - if any - adjoining pieces survive, then it becomes impossible to judge how many complete objects may be represented by the entire sword population. Indeed, it seems quite feasible to argue that the fragments we see within these hoards represent only a limited number of individual objects. Fragmentation in this manner hardly seems surprising in a metalworking context. Swords are large objects, and in their complete form they will take up much room in storage and will also be impossible to recycle. The reduction of the complete sword into smaller pieces is therefore required, and a large number of fragments are likely to result from this process. Butcher implied, in his discussion of the Grays Thurrock I hoard, that a number of the fragments present might have originated from one 'Carp's Tongue' sword (Butcher, 1922). Whether it is right to argue that all these fragments come from one object alone cannot be established, but what is graphically demonstrated in the accompanying photograph of this sword is the large number of small fragments could be obtained from just one object (Butcher, 1922, 106). Like socketed axeheads, complete spearheads are much smaller is size and more compact in shape than swords. On account of this, they will occupy less room when stored, and may also require less fragmentation before they are reduced sufficiently to allow recycling.

This may indicate why spearheads, unlike swords, were often deposited complete. Complete examples were more frequently encountered in the Group II and smaller Group III hoards, i.e. Shoebury II (07), All Hallows I and II (12 and 13), and Cliffe-at-Hoo (17). But though this association between complete spearheads and smaller hoards was marked enough to be described as a trend, some discrepancies were apparent. The Group II hoard of Leigh I, for example, contained a spearhead which had been much fragmented prior to inclusion (04/07), and complete spearheads were included in the Group IV hoards of Grays Thurrock I and Minster.

As with other types of socketed implement, the methods of breakage occurring in spearheads varied, though once again patterns of reduction could be identified. The separation of blade and socket was identified in several examples from both counties (the Type II breakage pattern, illustrated by Grays Thurrock I, 02/190, Southchurch I, 09/44 and Borstal, 16/31). It is possible that this breakage was unintentional, having occurred during the separation of spearhead and shaft. However, in the smaller fragments occurring, deliberate breakage was evident. And amongst this category of material, differences in the fragmentation methods employed appeared to be occurring on a regional basis, with spearheads from Essex having been subject to a greater degree of fragmentation than their counterparts in Kent. In Kent, fragmentary spearheads often retained a significant amount of the objects' original extent ('Type III' breakage), and division into two roughly equal portions was apparent in several examples (Bexley Heath, 15/46, 15/50). In Essex, however, fragments seem noticeably smaller, and are likely to comprise only a third or even a quarter of the objects' original extent ('Type IV' breakage, as seen in Leigh II, 05/109-116).

Spearheads have usually been divided laterally, across the blade, but there are instances where further subdivision has occurred on the longitudinal axis ('Type V' breakage). This is particularly outstanding on blade fragments (e.g. Southchurch I, 09/45; Borstal,16/32, Whitstable, 23/25). Similar longitudinal breakage can however be seen in socket fragments. In some examples, it is hard to determine whether this damage was accidentally inflicted, i.e. through use or during removal of the haft (e.g. Borstal 16/33, 16/34). In some examples, though, socket fragments have been crushed and distorted (Grays Thurrock I, 02/191-193; Southchurch I, 09/47), indicating that deliberate destruction has occurred. Subdivided blade and socket fragments are small in size and light in weight, and they are present only in those hoards which show excessive fragmentation in other artefact categories.

Blocking of the socket was seen in socketed spearheads, but it was unusual, occurring only in two Kentish examples, from Borstal (16/31) and Minster (20/124). While this shows similarities with trends seen in other artefact categories, e.g. socketed axes, some of the other patterns of destruction identified, such as crushing of complete objects, were not

reflected within this body of material. However, excessive mutilation of fragmentary spearheads was noted on occasion. In Essex, there were instances where distortion of the midrib and/or the socket had occurred as a result of hammering over much of the object's length (e.g. Grays Thurrock I, 02/191, 192 and 198; Leigh II, 05/109, 110, 112 and 117), But since these pieces were all fragmentary, it was hard to establish whether or not this distortion had been a natural result of the reduction process. It was obvious, though, that some spearhead fragments had been subjected to more intensive hammering than others, and these were consequently more distorted. Since the degree of distortion varies so much, then perhaps it can be argued that, in spearheads, as in other artefact categories, damage might be inflicted which was over and above that required for fragmentation.

3) Winged Axes and Adzes (see Table 12)

Though the numbers present are small, winged axes may still be regarded as a frequent inclusion in the hoards studied. Winged axes were present in a significant number of Group III hoards, and in all the Group IV hoards. In addition, the related winged adze was represented in two Essex hoards; the Group II hoard of Shoebury II, and the Group III hoard of Vange.

a) Winged Axes

Like socketed axes, winged axes might survive in complete or in fragmentary form, and neither hoard size nor geographical location appeared to have had any bearing on whether they had been fragmented or not. Instead, complete and fragmentary winged axeheads often appeared to co-exist alongside one another in a number of hoards (e.g. Grays Thurrock I, Shoebury I, Minnis Bay, and Minster) though there are other hoards where winged axes are represented only by fragments.

Fragmentation in winged axes appears to follow a consistent pattern. In the majority of pieces, the objects showed fragmentation across the short axis, at a point just beneath the wings. This method of fragmentation (Type II) divided the object into two roughly equal pieces, comprising butt and blade respectively. There were some exceptions to this rule, however. The Type III fragments, for example, comprise less than half the object's original extent, and may demonstrate initial breakage of the object into three roughly equal pieces. These can be contrasted with the smaller fragments that are likely to have been formed through further fragmentation of Type II fragments. In some extreme cases, this more intensive fragmentation has been followed by further longitudinal division of the fragment (Leigh II, 05/75).

Fragmentation in winged axes mirrors in many respects the reduction methods observed in socketed axeheads. And, again consistent with the findings made in other artefact categories, only a very tiny portion of winged axe fragments appear to have been

subject to the intense level of fragmentation seen, for example, in the smallest of the socketed axe fragments. In other words, only a small number of winged axe fragments have been reduced to a size suitable for recycling. In winged axes, the lack of such fragments is hardly surprising. Much time and effort must have been invested in the act of fragmenting a solid-sectioned object such as a socketed axe blade or a winged axe. Since this task was so laborious, then perhaps it was only undertaken when the individual responsible knew that the resulting fragments would be used. Or perhaps such fragments were deliberately favoured for recycling because of the effort required to produce them, effort which would have been wasted had the bronze not been re-utilised.

A number of the winged axeheads studied had suffered deliberate damage to the wings, with the removal of one or more of the wings evident on several specimens. This damage was more often apparent on fragmentary objects (e.g. Grays Thurrock I, 02/113; Leigh II, 05/74; All Hallows I, 12/18, 12/19; Minster, 20/71), but was also seen in a complete winged axehead from Minnis Bay (19/21). This may have been the result of efforts made to loosen the wings from around the haft, but it seems just as feasible to suggest that it was deliberately inflicted as a means of making the axehead unusable. Such a possibility is supported by the fact that, in some examples, the wings still survived at least partially intact, despite having suffered considerable distortion through hammering (Leigh II, 05/75; Whitstable, 23/16). This damage perhaps equates to the crushing or blocking of socketed axeheads, and once again it may be seen as a symbolic means of ending an object's working life. Similar intentions may be behind the Type II butt fragment from Whitstable (23/16), within the wings of which a small stone (possibly a fragment of iron ore) had been placed. The presence of this stone seems more likely to have resulted from a deliberate act of inclusion prior to crushing, rather than by its wedging into place through natural agencies, and its insertion is something which mirrors even more closely the blocking of the socket seen in socketed objects.

One final example must be considered in this section, and this is a fragment of winged axe from Leigh II upon which gratuitous damage had been inflicted at some point during the fragmentation process. This item (05/74) is covered on both sides by a large number of small tool marks. Some of these marks are likely to have been associated with the removal of the wings, but the majority appear quite unrelated to the fragmentation process. This situation is similar to that seen in a socketed axe blade fragment from the same hoard (05/30) where once again the small tool marks occurring appear to be excessive.

b) Winged Adzes

These variants on the winged axe are restricted to the Essex hoards. They are rare, occurring in isolation in the Group II hoard of Shoebury II, and the Group III hoards of Shoebury I and Vange. They were all deposited in a complete or nearly complete state, and had not been subject to the fragmentation processes discussed above.

Artefact Categories Occurring On An Occasional Basis

The final group of artefact categories to be discussed are those which can only be described as rare inclusions. Such items may be consistently included in the Group IV hoards, though in small numbers, but they are found only rarely in the smaller hoards.

a) The Decoration of the Body - Bracelets/Armlets, Other Decorative Items, Razors

1) Bracelets

Bracelets or armlets are the form of personal ornament most commonly encountered. They were represented in reasonable numbers in three hoards: the two Group IV hoards of Essex - Grays Thurrock I and Leigh II - and the Group III hoard of Minnis Bay, Kent. Another isolated example was recovered from the Shoebury I hoard, and may - along with palstave 06/18 - represent the remnants of an earlier hoard recovered in antiquity and incorporated within the later collection of material for some reason.

Bracelets were always recovered in a fragmentary state. A fairly substantial portion of the object still survived in most cases, comprising perhaps a third or even a half of the object's original extent, and in virtually every case (excluding only Leigh II, 05/126 and Minnis Bay, 19/51), the terminal still remained. No adjoining fragments were present, and no two pieces in the hoards appeared to have come from the same object.

In only one of the three hoards - the Leigh II hoard - had a greater degree of fragmentation been achieved amongst some of the bracelet population. Here, two examples (05/129, 05/130) now survived only as very tiny fragments. Such a situation may seem slightly surprising, as one might expect that the reduction of a bracelet to a half or a third of its original extent would be sufficient to allow recycling of the metal to take place. The evidence from Leigh II, though suggests that this may not be the case. Instead, even these objects may be subject to a further degree of fragmentation before they can be recycled, and this seems quite consistent with findings made in other artefact categories.

2) Other Decorative Items - Beads, Rings, Pins and Buttons

Each of these items was encountered in isolation, and thus it is considered appropriate to discuss them in only general terms. Minnis Bay included a small bronze bead (19/63), and Leigh II had a finger ring amongst its contents which appeared to be a miniature

version of the bracelets noted above, with a knobbed terminal present (05/131). In two hoards - Grays Thurrock I and Borstal - fittings were present which seem likely to have functioned as buttons (Grays Thurrock I, 02/213, Borstal, 16/36). This identification is based on observations made with reference to the Grays Thurrock example, which has a loop on the rear of the piece. It is a little more difficult to demonstrate this with regards to the Borstal fitting, though, as the means of attaching this object appears only as two insignificant lumps of bronze, apparently as a result of a casting defect. One final piece deserves mention - a bronze fragment from the Borstal hoard which is described as a 'bead' in museum records (16/37). However, the solid section and swollen shape of the object seem more reminiscent of a Middle Bronze Age pin, and it is argued here that this is indeed what the Borstal fragment is.

All these pieces are very small in size and consequently insubstantial in weight. Some are complete - the Minnis Bay bead, the Borstal button, for example - while others appear to have been broken roughly in half, i.e. the Leigh II finger ring and the Grays Thurrock I 'button'. In the case of the Leigh II ring, the nature of the fragmentation is particularly interesting because it matches that seen in the larger bracelet fragments which the object itself so closely resembles. The only instance where more intensive fragmentation can be inferred is in the possible pin fragment from Borstal, where only a small amount survives. Intensive fragmentation in this instance is appropriate, for a Middle Bronze Age pin in its complete form would have been a substantial piece which required a large degree of fragmentation prior to recycling.

3) Toilet Equipment, e.g. Razors

Only three razors were encountered amongst the hoards studied. Two examples were included in Grays Thurrock I (02/207, 02/208), while a third was present in the Minnis Bay hoard (19/62). With such a small number occurring, it is impossible to determine any regularised patterns of destruction which might be occurring, and indeed no one overwhelming method can be isolated. Of the Minnis Bay example, only the handle survives, while in Grays Thurrock the two razors are represented by a fragmentary blade and a fragment of adjoining blade and tang respectively. Therefore the only definite conclusions that can be made are that these objects have been subject to fragmentation, and that the resulting pieces are thin in section and light in weight (12g or less).

b) Palstaves (see Table 12)

The precursor of both the winged axe and the socketed axe, the palstave is a rare inclusion in the 'Carp's Tongue' hoards. Isolated examples of palstaves were recovered in the Group III hoards of Shoebury I hoard, Essex (06/18) and Dartford, Kent (18/11). Two out of three Group IV hoards also included palstave fragments, again as lone inclusions (Leigh II, 05/77; Minster, 20/70).

Only one of the palstaves included among the hoards studied survived in a complete form. This was the example from Shoebury I (06/18) and it represented a Middle Bronze Age type. Its excellent condition and its presence alongside a Middle Bronze Age bracelet (06/21) makes one wonder whether it were plundered from an earlier hoard recovered in antiquity. Hoards of Middle Bronze Age palstaves have been found more recently in Essex (e.g. the Burnham-on-Crouch hoard, described in Britton, 1959) and it seems reasonable to suggest that similar finds were uncovered in antiquity. The remarkably fine condition of the Shoebury I palstave also supports the possibility that it came from an earlier hoard, especially when it is compared with the poorly preserved palstave fragments occurring in other hoards. These fragmented palstaves have been broken in a manner which appears to mirror quite closely the reduction methods seen in winged axes. In other words, the objects have been broken along the lateral axis, with blade and butt having once again been separated to form two roughly pieces of roughly equal size. The one exception to this is the palstave fragment from Leigh II (05/77), in which only the middle portion survives, with both blade and butt now missing. This appears to represent division into three pieces as opposed to two, but it should be noted that the more intensive fragmentation seen in the Type IV and Type V winged axe fragments is absent from the palstave population.

c) Cauldrons

Essex has produced one hoard - the Hatfield Broad Oak hoard (Davies, 1979) - which is quite outstanding in the quality of the cauldron fittings surviving amongst its contents. However, this example lay towards the north of the county, outwith the study area, and elsewhere this category of material was only poorly represented. Two hoards included fragments which could be confidently ascribed to cauldrons: Grays Thurrock I, Essex, and Minnis Bay, Kent. In the first of these hoards, two fragments were present, one a fragment of staple (02/221), the other a fragment of sheet bronze which had been repaired in antiquity (02/220). The Minnis Bay hoard again included a fragmentary staple (19/59), and also had in addition a series of sheet bronze roundels (19/67-72) which seem likely to have come from the base of a bucket.

In each instance, these fragments are small and insubstantial in size. While the staple fragment from Grays Thurrock I weighs a reasonable amount (40.8g), the other cauldron fragments contribute much less raw metal to the hoard (02/220 weighs 3.4g; 19/59 14.4g, and 19/67-72 between 0.2 and 0.4g). In the case of the sheet bronze roundels from Minnis Bay, it is hard to see just why these objects have been stockpiled, because even their collective contribution to the hoard is almost negligible.

d) Miscellaneous Items

This group consisted mainly of decorative fittings which would originally have embellished objects of unknown form or function. They are usually formed from sheet

bronze, or represent thin-sectioned castings. As a result, they are extremely light in weight, the weight range covered by the members of this group varying between 2 and 15g. Some objects, such as the grooved socket from Grays Thurrock I, remained complete, but had been crushed over their length, presumably to reduce the amount of space occupied by the piece. The majority had been fragmented to some degree, and in some cases, fragmentation had been accompanied by folding, again, we must assume, to reduce the volume taken up by the object.

These fragments are small, and this, combined with the associated crushing and folding which appears to have been inflicted on them as a means of reducing the space occupied by such pieces, suggests that they can be seen as fragments which are ready for recycling (c.f. the cauldron and razor fragments described above).

One exception to this might be the 'flanged collar' from the Minster hoard (20/122). This survives complete, and is easily the heaviest item recorded in this entire group. It is also the one which is least suitable for recycling in its present form. However, it weighs just 25.8g, and though heavier and more substantial in comparison to the sheet bronze fragments noted above, it still weighs little more than, say a small socketed axe or gouge fragment. A greater degree of fragmentation might have been expected, though, and so it might be questioned as to whether this item can in fact be described as being fully prepared for recycling.

Metalworking Debris

The final group of material to be discussed includes ingot metal and casting debris, i.e. casting jets and reservoirs, waste spill and mould fragments. The importance played by these categories within the hoards varies: ingot metal - like socketed axes - should be considered a dominant category, while casting debris is included on an infrequent or even occasional basis. Unlike all the other categories considered previously, none of these can really be considered artefact categories, representing instead raw material or metallic by-products of the casting process, though some pieces of ingot metal may have seen secondary use as striking/cutting platforms or heavy-duty hammers. Some of the trends previously noted, then, (e.g. the deliberate destruction of those parts of the object required for it to function properly) will obviously not be encountered. Instead, it is likely that the only way in which these pieces of metalworking debris can be compared with the artefact categories discussed previously will be in terms of the size and weight of the fragments produced as a result of fragmentation.

a) Ingot metal

The obvious starting place in this group is ingot metal, because it plays such a vital role in the composition of the 'Carp's Tongue' hoards. Some Group I hoards may be

composed entirely of ingot metal (e.g. Shoebury III, and Southchurch II), and it always occurs in large quantities in the mixed category hoards (with the exception only of the Minnis Bay hoard). It is interesting to note that fragments of ingot metal may be re-utilised as tools on some occasions. One example, from the Minster hoard (20/146) had a series of deep scores on one face, which may have been caused by secondary use as a cutting platform. Others had rounded edges associated with burring which suggested re-utilisation as a hammer (Grays Thurrock I, 02/245). It is conceivable that these latter pieces may have been used to fragment some of the other objects in these hoards, the indents produced being far more substantial than those caused by even the largest of hammers.

Ingot metal is in almost every case represented by the round copper ingots commonly known as copper 'cake'. Only one exception was encountered, the fragment of cruciform-sectioned ingot from Grays Thurrock I, which was described as 'tin' in the National Bronze Index. Later research has, however, has revealed it to be of a bronze alloy which has an unusually high tin content (Sealey, pers. comm.).

The majority of the ingot metal encountered was in fragmentary form, with only two complete copper ingots recorded. Both of these came from the Bexley Heath hoard, and both varied considerably in both size, and consequently, in weight (15/52, 15/55). These different dimensions of ingot were represented in the fragmentary material included in the other hoards, too. Some fragments clearly represented portions of the thicker, more substantial ingots (e.g. Bexley Heath, 15/68; Stoke-at-Hoo, 21/38), while others are markedly thinner (e.g. Grays Thurrock I, 02/169).

Ingot metal fragments were irregular in shape, which might suggest that breakage was caused by pouring cold water on the hot metal, causing it to shatter. There were, however, indications that these breaks may at least have been partially induced through artificial means. Some fragments showed likely chisel marks in association with the breaks (Borstal, 16/42), and in a number of the larger pieces, fragmentation appeared to have been carried out so that the resulting piece roughly comprised a quarter or perhaps a third of the object's original extent (Borstal, 16/41; Minster, 20/143). Had fragmentation been left entirely to the natural effects of cold water hitting hot metal, then its results would surely have been more random. Further research could clarify this issue, as the crystalline structure of the bronze would indicate whether heating occurred slowly (as would be expected were the bronze left to cool naturally before fragmentation) or quickly (as would result were shattering induced through pouring water upon a still-hot piece of ingot).

Fragmentation had occurred in almost all of the ingot metal encountered, and, as in the other artefact categories studied, the degree of fragmentation varied considerably. Since copper ingots so obviously vary in thickness, any comparison of fragment size is best carried out by comparing weight (Figs. 15-18). As in any other category of material, it was possible to establish preferences towards the inclusion of fragments that occupied a

certain weight range. In a few cases these portions weighed between 700 and 1000g, and they represented approximately a half to a third of the original ingot (e,g, Grays Thurrock I, 02/233, 02/235, Minnis Bay, 19/81). In most hoards, though, ingot metal fragments were smaller, tending to weigh between 200 and 500g. This, however, still comprised a substantial portion of the ingot, and perhaps we should not be surprised by the presence of fragments which have been reduced yet further, some weighing less than 20g. Once again, we can surmise that it is this material, and only this material, which is has reached a size compatible with smelting within a crucible. And, as with other artefact categories, these small fragments are localised in their distribution. When they are present they may occur in large numbers, as in Grays Thurrock I, Leigh II and Southchurch I (the latter two hoards being dominated by such fragments). However, in many hoards such small fragments occur only in isolation, if indeed they occur at all.

b) Casting jets

Casting jets are an inevitable by-product of the casting process, for they are formed through the build-up of excess bronze in the pouring channels and reservoir of the mould during casting. Examples are included in all the Group IV hoards, and are infrequently encountered in the smaller Group III hoards. They vary in form, and it is often difficult to establish the nature of the original object to which they would once have been attached. It is possible to suggest, however, that some may have been produced during the casting of socketed axes, since the base of the jet closely resembles the scars left following the removal of similar jets from axeheads (e.g. Stoke-at-Hoo, 21/30). Other examples combine a smaller reservoir with two feeders (e.g. Grays Thurrock I, 02/226), and it is likely that this was formed during the casting of a socketed object such as a gouge or spearhead. Others are more ambiguous, such as the casting jet with multiple feeders from Grays Thurrock I (02/225).

Casting jets vary greatly in form, and as a result they also vary in both their ease of fragmentation and in their suitability for recycling. Many can be compared, in terms of their dimensions, with some of the smaller ingot metal fragments, for they are thick, solid-sectioned pieces which may prove more difficult to recycle than, say a broken-up body fragment of a socketed axe. Moreover, they will require more energy investment in their fragmentation, as they are invariably awkward in shape, offering no obvious planes of fracture. Presumably, then, they were fragmented whenever possible (e.g. Grays Thurrock I, 02/225) but were otherwise placed within a crucible intact as and when they were required. Certainly, their small numbers, both among the contents of these hoards and among Late Bronze Age finds in general, suggests that they were as likely to be recycled as any other object, and indeed transforming even the largest of casting jets or reservoirs to its molten state would have been no more problematic than the recycling of any other solid-sectioned object, such as a socketed axe blade, winged axe fragment or piece of ingot metal.

c) Waste Spill

In addition to casting jets, the hoards of Grays Thurrock I and Leigh II also included amongst their contents some amorphous bronze fragments which seemed to have been formed through the solidification of spilt molten bronze (Grays Thurrock I, 02/228-331; Leigh II, 05/151-2, 221-4). In only one case had the piece been sufficiently large to render fragmentation necessary (02/228), all other pieces of waste being characterised by their small dimensions and thin section. In these latter examples, further fragmentation prior to recycling would not have been required.

d) Mould Fragments

Two fragments of bronze moulds were encountered amongst the contents of the hoards studied, from the hoards of Grays Thurrock I (02/224) and Stoke-at-Hoo (21/29). Both had come from socketed axe moulds.

These moulds had been fragmented in a way which bore similarities to the fragmentation methods noted amongst socketed axeheads, the Grays Thurrock I example representing an upper body fragment, the Stoke-at-Hoo example a subdivided cutting edge. It is possible that the similarity in fragmentation methods deliberately mirrors those seen in the socketed axes themselves, though unfortunately, since these moulds are recovered in such small numbers, it is hard to view this possibility with anything more than caution.

Discussion

Now each of the artefact categories included in the Carp's Tongue hoards has been discussed in detail, the next step is to try and establish the relationship between the hoard contents and the metalworking process. It has been possible to identify patterns within the material which can be used to improve our knowledge of both the degree of fragmentation, and the methods used to induce this fragmentation. It was noted that trends and patterns were identified most clearly amongst the socketed axes, as they form the dominant artefact category, and so once again this category of material will form the central core of this section. However, it should now be possible to draw together the observations made in other artefact categories in order to identify any underlying trends that indicate comparative - and indeed contrasting - strategies.

It is the presence of fragmentary material within the 'Carp's Tongue' hoards which has encouraged interpretations that link them with the metalworking process. And yet, using the evidence provided by the socketed axe population of Essex and Kent, it was possible to suggest that only a small percentage of the socketed axe fragments present had been reduced to

a size suitable for re-melting. When one considered the incidence of smaller axe fragments - i.e. the mouth and body fragments showing Type VII, Type VIII or Type IX breakage patterns, and the fragmented cutting edges of the Type VI type - it became apparent that they only occurred in significant numbers in five of the twenty-five hoards studied (Fig. 5a-g). These included all three of the Group IV mixed category hoards (Grays Thurrock I, Leigh II and Minster). Other hoards which showed unusually high numbers of small fragments were the Essex Group III mixed category hoards from Southchurch I and Vange, and the Kentish Group III mixed category hoard from Borstal.

Of the secondary artefact categories, small tools seem likely to have undergone a less prolonged fragmentation process than that apparent in the socketed axe population. In comparison with socketed axes, they are significantly smaller in size, a difference which can clearly be demonstrated by comparing the difference in weight apparent in these categories. While socketed axes often occupy a weight range between 200g and 400g, representatives of the small tool types will weigh much less. Complete socketed gouges, for example, show a weight range of between 38.2g and 78.2g. Hog-backed knives are also insubstantial in weight when compared to a socketed axe, the complete examples from All Hallows II and Bexley Heath weighing 71.8g and 98.6g respectively. Following the initial stages of fragmentation, the majority of the small tool types are of a similar weight to the largest of the socketed axe fragmentary mouth and body fragments. Some, such as the tanged chisel fragments included in the Grays Thurrock I hoard, weigh much less. With tang fragments weighing only 11.9g (02/118) and 8.1g (02/119), they scarcely even seem worthy of recycling, for they weigh even less than the small Type VIII and Type IX socketed axe mouth and body fragments mentioned above.

Such observations are based only on weight alone, however, and when the volume taken up by such objects is taken into account, the situation must be reconsidered. Many small tool types are light because they have a thinner wall section than that found in socketed axes. While small tools are invariably smaller than the majority of socketed axeheads, they may nonetheless have taken up too much room - even when divided into two pieces - to be placed within a crucible. Indeed there are instances where further subdivision of small tool fragments has taken place. Socketed gouges have been subject to further subdivision (Leigh II, 05/79; Vange 11/26), as have socketed hammers (Grays Thurrock I, 02/145; Leigh II 05/89), knives (Leigh II, 05/85; Southchurch, 09/31), sickles (Leigh II, 05/80, 05/81, 82; Vange 11/28) and even tanged chisels (Grays Thurrock I, 02/117, 02/118). The presence of these smaller fragments might once again suggest that - as with the socketed axes - only a very small portion of the small tool population had actually reached the conclusion of the fragmentation process.

Amongst representatives of the other secondary artefact category - weaponry - a similar situation can be identified. Socketed spearheads, like small tools, may be included within these hoards in either complete or fragmentary form, but again there are instances where the degree of fragmentation is markedly more intensive. Swords, however, are invariably fragmented

prior to inclusion in the hoards. The size of these fragments differs considerably, and once more the smaller fragments tend to be concentrated in specific hoards.

Methods of Fragmentation in a Metalworking Context

It became apparent during the course of this work that specific methods of fragmentation were consistently employed upon the objects included in the 'Carp's Tongue' hoards. It was amongst the large socketed axe population that the patterns stood out most clearly, and once again the conclusions isolated from the study of this group can be used as a yardstick by which other artefact categories can be judged.

Socketed axes might be included within the 'Carp's Tongue' hoards in either complete or fragmentary form. This flexibility was also apparent in many of the secondary artefact categories, too. A number of the small tool types were included as complete objects, including socketed gouges, axe-like chisels, hammers and knives, and there were numerous instances where winged axes and socketed spearheads were also deposited intact. The only category which was not encountered as a complete object was the sword. In only one instance was a complete sword recovered, this being the socketed sword from the Minnis Bay. Its unique survival as a complete object might be attributed to the fact that it was included amongst a hoard which is exceptional for the large proportion of complete objects occurring, or - and perhaps a more likely explanation - because it was perceived by its users as a heavy duty knife rather than a sword.

It was mentioned above that a dominant method of fragmentation could be identified within the socketed axe population. This comprised lateral division of the object into two roughly equal portions. This primary division was followed by subdivision down the longitudinal plane, and in many cases evidence of hammering was found in association with the breakage. The amount of distortion resulting from this varied significantly, with some objects showing little if any damage other than a few isolated hammer indents, while others suffered a large amount of crushing and distortion of the section. Once again, similar methods of fragmentation could be identified amongst other artefact categories. In the smaller socketed objects, i.e. amongst small tool types such as socketed gouges, axe-like chisels and hammers, and also amongst socketed spearheads, lateral division into two roughly equal portions was the form of fragmentation most frequently encountered. Winged axes were also broken in this fashion. Further subdivision of the fragments was less frequently encountered amongst these artefact types, though there were examples of both winged axes and socketed spearheads which had suffered longitudinal subdivision in a manner which mirrored the breakage patterns amongst the smaller socketed axe fragments.

While the methods of fragmentation employed appeared to be consistent between socketed axes and a number of the secondary artefact categories, a different form of breakage could be identified amongst a certain group of material. Swords and knives were the artefact categories

which formed the core of this group, and it is the physical properties of these objects which must have led to their differentiation. The objects noted previously - socketed axes, socketed small tools, and socketed spearheads - are shorter, more compact pieces. These contrast with knives, and in particular, swords, which tend to be considerably greater in length. It should therefore come as no surprise to learn that the method of fragmentation consistently employed among these bladed artefact categories comprises lateral division of the blade into a number of smaller fragments. In these objects, fragmentation has resulted from a combination of hammering and brute force. Some sword and knife fragments show bending and twisting of the section and profile, while in other examples, little if any distortion is apparent. In these fragments, hammer indents may be associated with the broken edges. It could be suggested that these different methods of breakage were instigated by different individuals at different stages of the fragmentation process. The initial breakage, comprising the fragmentation of the object into two or three large pieces, might have been undertaken by the owner of the sword, an action undertaken as a means of symbolically ending the object's use-cycle. The resulting fragments might then have been passed on to the metalworker for further reduction until the object had reached a size compatible with recycling. During this latter process, a hammer would have been employed to facilitate the fragmentation.

In the majority of cases, the fragmentation methods employed within each category are on the whole consistent. However, two categories of object were more problematic: sickles, and socketed spearheads. In both categories, there were instances where the fragmentation methods employed mirrored the initial step of those seen in the socketed axe and small tool populations, i.e. division into two equal pieces. A number of spearhead fragments had also subsequently been subject to lateral subdivision, which seemed to support the possibility that, during fragmentation, these objects had been treated in an equivalent fashion to socketed and winged axes and to most of the small tool types. There were other instances, though, where both spearheads and sickles had been divided across the blade into a larger number of fragments, in a manner which resembled the breakage seen in swords and knives.

It is possible that the variation seen in the fragmentation of spearheads and sickles might in fact reflect a conceptual problem experienced by those who were given the task of breaking up the objects. Sickles are small tools, employed in the harvesting of grain. However, in terms of their physical properties, they share more in common with bladed objects, i.e. swords and knives, for they comprise a long, thin piece of metal which has been subject to sharpening along one edge. Spearheads, on the other hand, are socketed objects, with similar physical properties to socketed tools such as gouges and hammers, in that they comprise a hollow-sectioned casting fixed in place upon a wooden haft. In terms of their use, however, they should be grouped along with other weapons, such as swords. The methods of fragmentation employed in the destruction of these two categories might therefore be used to establish whether it was the physical properties of the casting which determined the manner of the fragmentation, or the original function of the object. This information might therefore be used to gain a better understanding of the processes which lay behind the organisation of these

hoards. Unfortunately, the situation does not prove sufficiently clear-cut to allow any firm conclusions to be made. In some cases, sickles are broken into two roughly equal pieces, a process which may demonstrate a conceptual link between these objects and other small tool types. However, in other instances they are broken up into a larger number of fragments, and this action may instead indicate that long bladed objects were grouped together according to their physical properties and broken up in the appropriate manner. Spearheads, similarly, are in some instances subdivided into two in the manner of socketed axes and small tools, a method of division which may be linked to the nature of the casting, which is long, and hollow-sectioned, and which possesses an inherent plane of weakness along the length of the midrib which may be exploited by the metalworker during fragmentation. In other instances, spearheads are broken up into smaller pieces along their length, a practice which may reflect an equivalence with other forms of weaponry. It might therefore be the case that the method of fragmentation varies according to the context of the destruction, or even perhaps the personal preferences of the craftsman responsible.

Of those objects included on an occasional basis, it is only bracelets which clearly show persistent patterns in terms of the manner of their fragmentation. Once again, these objects are most frequently broken into two roughly equal pieces. Other objects which fall amongst this group tend to be represented only by very small fragments, which suggests that they are more likely to have been included as pieces of scrap metal rather than as representatives of their particular category. Cauldron fragments, in particular, might be viewed in this manner. Some of the smaller decorative fittings appear to have been included as complete objects, but these items are often small in size and thin in section. Fragmentation prior to recycling may not have been required, and our own perceptions should not be clouded by the fact that these objects appear to us as complete, undamaged objects. While they represent complete castings, they would undoubtedly once have been part of a much larger composite object, the form of which must remain unknown to us. The fragmentation of this larger object might have been just as labour intensive and significant to those responsible for its destruction as, for example, the fragmentation of a socketed axehead or a sword. To perceive these fittings as complete and undamaged might therefore be an error on our part, and this would suggest that, like the cauldrons, such objects are included for their value as pieces of bronze rather than for the value of what they once represented.

A study of those artefacts included within the 'Carp's Tongue' hoards -whether on a frequent, infrequent or occasional basis - demonstrated that while the methods of fragmentation remained relatively consistent, the degree of fragmentation varied considerably. In most categories of artefact, there were instances where the fragments were far smaller in size, examples of this being apparent in the populations of socketed axes, winged axes, socketed gouges, socketed hammers, socketed knives, swords, socketed spearheads, bracelets, moulds and ingot metal. It is suggested that it is these fragments - and only these fragments - which represent examples of metalwork which has been reduced to a size compatible with recycling. In other categories of material, such as cauldrons, the only fragments occurring appear to have

reached this level of destruction prior to inclusion. It seems feasible to suggest that it is only at this stage that the fragments will have lost their meaning, having been included as pieces as raw metal rather than as representatives of the original categories from which they once come, and it is surely significant that such fragments occurred in greater numbers within specific hoards, namely the Group III hoards of Southchurch and Vange (Essex) and Borstal (Kent), and the Group IV hoards of Grays Thurrock I and Leigh II (Essex).

Additional Trends Which Have no Direct Link with the Metalworking Process

While the degree of fragmentation suffered by an object is something which allows clear links to be made with recycling, there are more ambiguous trends apparent within the material which cannot be seen as inevitable results of the metalworking process. These include the crushing of complète socketed objects, the blocking of the mouths of socketed objects, the removal or blocking of the wings in winged axes, and the removal of the cutting edges in swords and knives.

The first of these, the crushing of complete objects, was identified occasionally amongst socketed axes (those displaying the 'Type Ib' reduction pattern) and socketed gouges. In the vast majority of hollow-sectioned objects, there appeared to be a direct link between the crushing and distortion of an object's section and its fragmentation. In other words, crushing was an almost inevitable by-product of the fragmentation process. While it might be argued that crushing of even a complete object might be undertaken as a means of conserving space by minimising an object's volume, the evidence obtained from the hoard contents in general argues against this being the determining factor. Firstly, the crushing of whole objects occurs on a very infrequent basis. If objects were crushed in order to save space during storage, then surely we would find that the majority of the complete objects included in the hoards would have been treated in this manner. Secondly, it can be argued that merely crushing an object is not going to transform it into material fit for recycling, as all the other evidence suggests that a long and arduous process of fragmentation is required before a piece may be deemed suitable for a return to the crucible. It can therefore be suggested that the crushing of a complete object serves no useful purpose to the metalworker, so other explanations must be sought which can account for it.

Another more ambiguous feature was the blocking of the socket seen in a number of socketed axes, socketed gouges and socketed spearheads. Here, the mouth of the socket would be in-filled through the insertion of a number of foreign fragments. In some cases (Borstal, 16/04 and 16/05), the entire socket might be filled in this manner. In other examples, the insertion had clearly taken place prior to crushing (Grays Thurrock I, 02/37). Once again, this can be seen as an act which seems to go against the trend which can be identified within these hoards, i.e. that fragmentation leads towards the production of a small piece of bronze in which surface area is maximised and wall thickness minimised in order to facilitate recycling.

Though crushing of the section and blocking of the mouth are, on the face of it, two entirely different practices, they may be seen as having a common result in that they prevent re-use of what might still be a serviceable object. When the mouth of a hollow-sectioned object is closed in this manner, the insertion of a new haft or haft becomes impossible, and the implement is therefore rendered useless. Since this process seems to play no logical role in the recycling process, it might therefore be argued that it is undertaken for more symbolic reasons. For example, closing the mouth by crushing or blocking might instead be undertaken as a symbolic way of demonstrating that an object's life had come to an end.

If this were to be the case, then perhaps there may be instances of similar practices occurring in other artefact categories. Such destruction is in fact apparent, in both winged axes, and bladed objects, i.e. swords and knives.

In terms of the fragmentation methods employed in their destruction, winged axes share many characteristics with their socketed counterparts. However, the crushing and blocking seen in socketed axes cannot be replicated in these objects, which are solid in section. The nearest equivalent to the symbolic closing of the mouth seen in socketed axes would have to be destruction or blocking of the wings, and indeed there is evidence for this practice in a number of both complete and fragmentary winged axes. A number of winged axes had wings which had been partially or totally removed, and one example from Whitstable even had a small pebble wedged tightly between one set of wings (23/16). This latter example must remain to some extent problematic, for it is possible that the pebble's positioning can be attributed to nothing more than post-depositional accident.

Similar evidence for deliberate destruction can be within the sword population, where deliberate removal of the blade has taken place. This is particularly marked amongst the 'Carp's Tongue' swords, where the blade edges have on several occasions been removed on either side of the midrib. In one example, this damage is so severe as to have resulted in the survival of nothing more than a small length of midrib (Vange, 11/33). While such damage is undoubtedly more marked amongst the 'Carp's Tongue' swords, there are a number of Ewart Park sword and also knife fragments which show blades on which damage appears too severe to have resulted merely from wear and tear. It therefore seems likely that these bladed objects were also subjected to the deliberate destruction of those parts which were necessary for them to function properly.

In all these cases, then, there is evidence to suggest that - alongside the more systematic methods of destruction employed to reduce a complete object into raw metal - there were in addition more symbolic ways of transforming an object. Such methods might have been employed in a more public manner to demonstrate that the object's life was ended, that it was in fact 'dead'. Similar public displays of violence against castings consigned to the metalworker might be indicated by a socketed axe fragment and a winged axe fragment from Leigh II, which

had suffered unusually severe mutilation, at a point which may have followed the main fragmentation process. It is evidence like this which shows that these hoards have a symbolic dimension, and this allows further doubt upon the relentlessly utilitarian explanations which have previously been created to account for their presence.

Chapter Six: The 'Carp's Tongue' Hoards and the Metalworking Process in Their Social Context

Previous explanations for the 'Carp's Tongue' hoards have used the fragmentary nature of the contents to associate these deposits with the metalworking industry (Burgess, 1979). A detailed examination of the physical condition of these hoard contents does indeed suggest that there is at least some link with metalworking, for when the fragmentation methods identified in Chapter Five are carried out to their conclusion, the end result is the creation of pieces of metal which have been suitably reduced in size to be placed within a crucible.

It is because these hoards are so obviously dominated by fragmentary material that there has been a tendency to dismiss them as hoards of 'scrap' metal, valued only as raw material. In this context, the form taken by this raw material becomes irrelevant. Bradley, for example, has suggested that the act of breaking up an object and transforming it into scrap obliterates its original meaning (Bradley, 1985). But to state that fragmentation destroys meaning seems inadequate, for at what point in the destructive process does this loss of meaning occur? Is it when the object is first reduced from its complete state? Or is it at an even earlier point in the proceedings, perhaps when any organic components such as hafts or hilt plates have been removed?

The suggestion that the 'Carp's Tongue' hoards are composed of material which has lost its original meaning can be challenged following closer study. Clearly, these hoards had been structured in quite specific ways, with deliberate emphasis on certain artefact types. These biases were apparent in all the hoards, irrespective of hoard size, and irrespective of the degree of fragmentation of the contents. This strongly suggests that certain categories were favoured for inclusion in both their complete and fragmentary forms, and this would surely not be the case were the meaning of the category destroyed through fragmentation. Instead, the meaning of an artefact category may survive much, if not all, of the fragmentation process.

If there is some point in the fragmentation process where the meaning of the object is erased then it is more likely to be towards its conclusion, at the point where the pieces are finally broken down to a size compatible with a return to the crucible. I would argue that these fragments are the only ones which can be viewed as truly representing the kind of material that would have constituted the metalworker's stockpile, and they play only a minor role in these hoards. Because these tiny pieces are outnumbered by complete objects and large fragments, it is inappropriate to argue that these hoards are composed solely of scrap metal left over from recycling. They cannot accurately be described as representing a 'metalworker's stockpile', though a strong link with metalworking cannot be denied. The dominance of ingot metal, and the presence of mould fragments and casting jets suggests that the metalworking process plays a strong role in the creation of these hoards. Metalworking cannot be dismissed as irrelevant when interpreting them. Instead, it plays a vital role in achieving an understanding of them. But instead of viewing the hoards as a natural by-product of the metalworking industry, we

should instead see them as collections of material which make deliberate reference to the metalworking process.

As well as rethinking the relationship between the 'Carp's Tongue' hoards and Late Bronze Age metalworking, we should start to question our perceptions of the metalworking 'industry' itself. While it is often described in terms which would not seem inappropriate in a modern, industrial context (Burgess, 1968b and 1979), we should instead view it as an activity which is itself be bound by traditional rules. There may be certain ways in which a metalworker is expected to behave if the job is to be carried out correctly. Ethnographic studies on the ritual and symbolic practices which are associated with iron-smelting in Africa can demonstrate just how complex the relationship between the practical and the ritual aspects of this 'industry' may be (Schmidt and Mapunda, 1997). Here, the authors describe the processes involved in ensuring that a furnace is properly prepared prior to smelting. The symbolism that is inherent within the metalworking process in these African societies, and which will be considered in more detail later, means that certain ritual practices must be undertaken during the creation of an iron furnace if desirable levels of productivity are to be achieved. From a British Late Bronze Age perspective, it does not therefore seem unreasonable to suggest that other aspects of the metalworking process will be as rigorously bound by traditional beliefs and expectations. The act of fragmenting a worn-out object, the task of selecting material for recycling and the process of casting may all have had to have been carried out in a specific time-honoured fashion. Such a possibility is supported by evidence obtained from the 'Carp's Tongue' hoards, where consistent patterns of fragmentation amongst members of the same artefact category demonstrate that breakage is carried out in a regularised fashion.

There are two ways in which our understanding of the Late Bronze Age may be increased through a study of these hoards, then. The first is through obtaining an insight into the symbolic aspects of the metalworking process; the second is in establishing how the metalworking process may have been referenced in a symbolic fashion for the activities which accompanied the creation and deposition of the metalwork hoards. Evidence for symbolic elements in these hoards can be demonstrated with reference to a number of objects which had suffered damage quite unrelated to the fragmentation processes. Socketed objects such as axes, gouges and spearheads were found with their sockets crushed or blocked through the insertion of foreign objects, winged axes had on occasion had their wings removed, and swords - and perhaps knives - suffered deliberate damage to the cutting edges.

The Deposition of Ingot Metal and Mould Debris in a Wider Context

Reference to evidence obtained through a study of the mixed category 'Carp's Tongue' hoards has suggested that metalworking may have been used a source for material props and for imagery in activities that lay outwith a purely secular realm. Now this suggestion has been made, it seems appropriate to establish whether or not there is further evidence to support this possibility.

A suitable place to begin such a quest is with the Group I hoards of ingot metal. It was established in the early part of Chapter Five that hoards composed purely of ingot metal were recovered in considerable numbers, particularly in Essex. The existence of these hoards demonstrates that, for some reason, ingot metal might be exclusively selected for burial on some occasions. And in some cases, the circumstances surrounding the burial of this ingot metal can seem, by our standards, bizarre, as the hoard from Southchurch II clearly demonstrates. This was a small hoard, comprising six pieces of ingot metal and a complete pottery vessel. Records of the find indicate that the six lumps of metal were arranged around the shoulders of the pot (Pollitt, 1953, 58). Nothing was found within the pottery vessel, but it is possible that it may originally have contained something which had not survived to the present day, perhaps even some kind of food or drink. The circumstances in which this ingot metal was recovered leads one to think of the 'personal' hoards of north-west Scotland, in one example of which a group of swords were apparently driven point downwards into a peat-bog (Coles, 1959-60). In contemporary literature, we have no difficulties in recognising such hoards as resulting from an act of votive deposition. Ingot metal hoards from south-east England are a different case entirely, though. Because their contents are so fundamentally different in nature (ingot metal as opposed to weaponry) and their context of deposition so different (dry land as opposed to peat bog), hoards like Southchurch II have been ignored as potential examples of votive deposition.

The existence of ingot metal hoards, and particularly those whose contents were arranged deliberately like those of Southchurch II, suggests that the raw material from which bronze objects are constituted may be utilised as a resource for acts of deliberate deposition. It is not the only by-product of casting process which may be used in such a manner, though, for mould and crucible debris may also be utilised in this way.

Evidence of the deliberate deposition of mould debris can in fact be found on settlement sites in the study area of Essex and Kent. Though finds of bronze were extremely rare on such sites, evidence of bronze working was recovered from some of them in the form of mould debris. Perhaps the most outstanding instance of this was recorded from the site of Springfield Lyons. This site revealed no finds of bronze whatsoever, but the mould fragments indicated that those who had lived there had manufactured Ewart Park type swords (Needham, 1987). Crucible fragments were also recovered here. These metalworking byproducts were found in two discrete deposits, placed in either terminal of the northernmost section of the enclosure ditch. The densely packed nature of these deposits led Needham to suggest that they had been deliberately placed there, and their position in the primary ditch fills offered the possibility that they had been intended as foundation deposits. Needham raised the possibility, too, that this material had been stockpiled elsewhere, before being subsequently relocated (Needham, 1987, 12).

This evidence from Springfield Lyons can be used to compare the situation occurring on other settlement sites. In Essex, comparisons can be made with the sites of Lofts Farm

(Brown, 1988a) and Mucking North Ring (Bond, 1988). Lofts Farm bore little in the way of either metalwork or metalworking debris, producing only one fragment of socketed axe from the entire site (Brown, 1988a, 280). This fragment was recovered amongst the southernmost ditch fills, and this might once again encourage us to wonder if the object had been deliberately discarded in this location. However, one fragment of socketed axe is hardly sufficient to demonstrate a trend, and so its presence must be treated with caution, if not open skepticism. It is possible, for instance, that although all fragmentary material was scrupulously removed from the interior of the settlement, a piece that accidentally strayed into the ditch fill was left to lie where it fell.

The third of the Essex settlement sites, that of Mucking North Ring, does however demonstrate parallels with Springfield Lyons. Finds of mould debris were once again recovered here, and again they were recovered from one of the terminals of the northernmost ditch (Needham, 1988, 21-22). The mass dumping suggested by the Springfield mould debris was not repeated here, though. Instead, the mould debris appears to have accumulated through a series of sporadic acts of deposition.

Evidence for Kent is not so comprehensive, but the site at Mill Hill, Deal, did reveal finds of fragmentary metal objects and also mould debris (Champion, 1980). These finds are recorded as having been recovered amongst the ditch fill (Champion, 1980, 237). Their exact position remains unknown, but it is possible - since excavation of the ditch appears to have taken place only in the area of the eastern terminals and in some stretches of its southern extent - that once again there was a bias towards deposition in the vicinity of the terminals.

The indications are that there was a tendency to place casting debris within the terminals of enclosure ditches on Late Bronze Age sites in Essex and Kent. The nature of this deposition may vary. In the case of Springfield Lyons, a collection of material has been gathered together and placed within the ditch in one or perhaps two isolated acts of deposition. The situation in Mucking North Ring differs, in that deposition here takes the form of the occasional discarding of mould material. This may represent the discarding of a token portion of the casting debris into the ditch terminal, perhaps as an offering associated with the casting process. The isolated mould fragments from Mucking strongly suggest that not all of the by-products produced during casting end up in the ditch, as the few fragments recovered on the site must surely represent only a small portion of the original amount. It is apparent then, that while some of the casting debris is retained for deposition in the ditch terminal, the majority of this material is being gathered up and removed from the settlement site.

The presence of metalworking debris on settlement sites suggests that metal objects are being created and also used in their vicinity. And yet there is a real dearth of bronze fragments on these same sites. It therefore seems likely that concerted efforts were made to remove fragmentary bronze objects from these settlements. This might suggest that, once an

object is broken up, beginning the process which will ultimately result in its being recycled, it is no longer considered acceptable in a domestic context. Thus fragmented objects, along with the by-products of the casting process, become dangerous and ambiguous substances which can manipulated during acts which lie outwith the realms of day-to-day secular practice. The ambiguity associated with fragmentation might relate to the fact that the original meaning of the object no longer holds. The category changes, as the artefact is transformed into raw metal. Perhaps, during the process of fragmentation, the object enters a state of limbo, where it is neither of one state nor the other. It can no longer be the thing it once was, and yet neither has it achieved the status of scrap metal.

These half-objects might be represented by the larger fragments present in the 'Carp's Tongue hoards (laterally divided socketed axes, large sword blade fragments, etc.). They have started the journey which will transform them into scrap metal, and yet have not progressed far enough to be treated as such. Their original meaning may still cling to them, and this may be why they must be discarded carefully and in specific ways, and why their presence on settlement sites must be avoided.

To further investigate this possibility, I will consider a settlement site which, while lying outwith the immediate study area, still falls within the area covered by the 'Carp's Tongue' Complex. This is the site of Petter's Sports Field, Surrey (Needham, 1990). Here, excavation of the site revealed two 'Carp's Tongue' hoards. The objects were recovered in a manner which suggested that they had been stored in two separate organic containers, probably leather bags (Needham, 1990, 104), and their location was the eastern terminal of the northern enclosure ditch (Needham, 1990, 127) .

A comparison with the site of Springfield Lyons should now be undertaken (Buckley and Hedges, 1987). In both sites, a collection of material associated with the metalworking process was placed within a ditch terminal. The nature of this metalworking debris differed markedly, however. At Springfield Lyons, it was material associated with the actual casting process which was recovered (Needham, 1987, 11-12). At Petters Sports Field, it was metal objects which had been subjected to fragmentation. In the former, the deposits were composed of debris associated with the initial stages of an object's use-cycle, while in the latter, it was fragmentary objects which had come to the end of their use-cycles.

Before any assumptions with regards to the events that might have resulted in the deliberate deposition of metalworking debris, further examples should be sought of instances where metalworking debris was recovered in unusual circumstances. Though drawing analogies between sites which are spread over a wide geographical - and perhaps chronological - extent is something that must be done with care, some knowledge of the wider picture might prove beneficial to our understanding of the 'Carp's Tongue' hoards. Two examples were in fact found: the Late Bronze Age metalworking debris from Dainton, Devon, and the 'settlement' site of Heathery Burn Cave, Co. Durham.

A Potential Association between Metalworking Debris and Human Skeletal Material at Dainton, Devon

Excavation at the site which serves as my first example - that of Dainton, Devon - took place in an area of well-preserved Bronze Age landscape, with field boundaries and cairns surviving (Needham, 1980). Quarrying in the vicinity had already affected this site, and in the late 1970's, limited rescue excavation was finally undertaken here.

The main focus of the excavation was centred upon three cairns. However, a high density of pottery was noted in the area which surrounded the south-eastern quadrant of cairn S2, and this was deemed significant enough to merit further attention. Excavation revealed a pit in-filled with metalworking debris, which included mould fragments from the manufacturė of socketed spearheads and ferrules, and also crucible fragments. Cairn S2 had itself produced fragments of human bone, and thus we find at this site a potential association between human skeletal material and metalworking debris.

Chronological relationships are unfortunately difficult to establish here. The metalworking debris appears to date to Hawkes' Late Bronze Age I, i.e. the Wilburton Complex, but the relative dates of cairn and pit cannot be easily understood. It was suggested by the excavator that the field system and the cairns show a long period of use. In detail, some changes must have taken place. The locations of the huts may have shifted, new land may have been utilised, and old fields discarded as their soil became exhausted. But in general terms the organisation of the land remained consistent (Silvester, 1980, 179-80). Human remains appear to have been incorporated into this agricultural landscape, placed within cairns that were formed through the accumulation of field clearance debris. This act returned the dead to the land which once they had tilled, and thus they themselves became an integral part of the landscape.

This is the backdrop against which the finds of metalworking debris must now be considered. Though one cannot confidently determine the relative dates of cairn and pit, it has been suggested, through reference to the pottery types recovered, that both features are broadly contemporary. This in turn suggests that the latter of these two features deliberately referenced the former. Unfortunately, the details which would allow a greater understanding of the chronological relationship between cairn and pit are lacking in the published excavation report. The distribution map which shows the southern portion of cairn S2 and the location of the finds recovered in its vicinity does indicate some degree of overlap between the limits of the cairn and the mould debris (Needham, 1980, 180), but while it is possible that the mould debris had been deliberately incorporated within the cairn material, it seems more likely that these mould fragments had been dislocated from their original place of deposition, i.e. the pit, at a much later point in time. Only reference to detailed section drawings of S2 would reveal which explanation is likely to be the correct one.

In some respects, then, Dainton is destined to remain ambiguous, but the site should nonetheless be considered as having the potential to enhance our understanding of the Late Bronze Age. Despite the chronological difficulties, other aspects of the site beg explanation. What, for instance, of the vast quantities of pottery recovered to the south-east of Cairn S2? One of the two interpretations proposed by Silvester does little to address this problem, for he suggests that the metalworking debris may have been deposited in this location following its removal from a nearby settlement site (undiscovered, or perhaps destroyed) and gives no insights into how such a large quantity of this material might have been accumulated. However, his alternative suggestion seeks to explain the presence of both metalworking debris and pottery in close proximity. Perhaps, he argues, the area around S2 was being used as a 'temporary activity area', where metalworking took place away from the settlement, and with which the broken pottery vessels may have been associated.

But there is another way of interpreting this site, one which openly confronts the peculiarities and the ambiguities which make it so striking. It seems quite feasible to suggest that cairn S2 originated through the accumulation of field clearance, and that the feature later became a repository for human remains. Those responsible for the burial of the metalworking debris were aware of the site's association with the dead, and may have deliberately brought together two substances which were considered polluting or dangerous, i.e. human remains and by-products of the casting process. The purpose which lay behind this act of deposition is less easy to identify, however. The removal of metalworking debris from the settlement may have been routinely undertaken as a means of excluding an unacceptable substance from a domestic context. However, it is equally appropriate to suggest that the metalworking debris was buried near the cairn as part of a commemorative event associated with the deceased. The material was clearly not left here on a casual basis. Instead, we find a deposit of material similar in some ways to that from Springfield Lyons. A number of mould and crucible fragments have been gathered together - perhaps over a period of time - and then placed within a pit in what appears to be a single act of deposition. This act may have been undertaken to honour the ancestors whose remains still occupied the lands within which the living resided, and may have been accompanied by feasting which involved the entire community. The possibility that feasting played a part in the activities which culminated in the burial of the casting debris is after all supported by the presence of the pottery which occurs in such large quantities here.

Heathery Burn Cave: Settlement Site or Place of Votive Deposition?

The second example I have chosen is that of Heathery Burn Cave, Co. Durham, arguably one of the most ambiguous Late Bronze Age Sites in mainland Britain. Quarrying which took place along the floor of a natural cave revealed a thin band of gravel, sealed beneath a layer of limestone (Greenwell, 1894). During the quarrying process, a series of discrete deposits were recovered within this gravel layer, and their locations were later plotted by Greenwell. Amongst the material recovered was a large assemblage of

metalwork, which included wagon fittings, gold ornaments, swords, spearheads and a cauldron. The nature of this metalwork, which includes high status objects in largely unbroken condition, suggests that Heathery Burn Cave had been the site of a number of votive deposits. And yet this possibility has been largely ignored within archaeological literature. The reason for this may lie in the fact that, alongside these 'high-status' objects, there were recovered tools (socketed axes, gouges, chisels) and metalworking debris. Also taken as evidence of domestic activities were finds of bone tools, including pins and needles. In addition, the presence of midden material was noted, i.e. broken pottery, animal bone and charcoal. But most unusual of all was the presence of human skeletal material, in the form of several disarticulated fragments and - according to Greenwell - one complete skeleton. This combination resulted in the following interpretation: the Heathery Burn Cave was settled by a group who sought shelter during a period of conflict. They hid their most valued possessions there for safekeeping, and ultimately abandoned it, after one of their number was killed during a flash flood which struck the site (Greenwell, 1894).

A historical narrative like this seems naive from a twentieth century viewpoint, and yet the role of Heathery Burn Cave as a settlement site has never been challenged in the literature. It therefore seems appropriate to mount such a challenge within the context of this chapter. What if Heathery Burn Cave was viewed in the Late Bronze Age as a natural feature in which votive offerings could be discarded? This could explain the presence of a series of discrete groups of material which included high-status objects, tools, metalworking debris, and even human skeletal remains. Some comparison could even be made with the Broadward hoards, in context, and, to a lesser extent, in content. The Broadward hoards, many of which are believed to have been votive offerings (Burgess, Coombs and Davies, 1972), are often associated with deposition in a wet context, and while the Heathery Burn Cave does not actually constitute a body of water as such, it is almost as inaccessible as a lake or a marsh. The swords and wagon-fittings from Heathery Burn, for example, were located towards one end of the cave, beyond a stretch of passageway which dropped to c.1m in height in one place. To reach the place in which this material was deposited, one would therefore have had to crawl along on hands and knees at one point.

Though Heathery Burn did reveal a number of objects which might be viewed as high-status, previous interpretations have probably been influenced by the fact that alongside these objects were recovered tool types and metalworking debris more usually associated with a 'founder's hoard'. If, however, one accepts that such material can be utilised in a votive context, then the Heathery Burn cave deposits appear to make more sense. We see categories of material common to both the Broadward and the 'Carp's Tongue' hoards, i.e. weaponry, incorporated with material more frequently associated with the 'Carp's Tongue' hoards (socketed axes, small tools, metalworking debris). But the metalwork in this instance has been placed in the same context as the bones of the dead, and also the residual material which is left over from the large scale consumption of food, i.e. pottery and animal bones.

Metalworking as Metaphor in the Late Bronze Age of south-east England

The sites of Dainton and Heathery Burn Cave provide us with two instances where by-products of bronze casting have been recovered in association with human skeletal material. This juxtaposition encourages one to wonder whether it is possible that metalwork, and the metalworking process, might have had a more profound role within Late Bronze Age society than has previously been thought.

It was argued during the course of Chapter Three that the language used during exchanges between human beings is underpinned by metaphor (Lakoff and Johnson, 1980). Metaphor allows certain concepts to be expressed through verbal analogy with activities or experiences familiar from routine existence. This is true of the twentieth-century industrialised society in which we live, as Lakoff and Johnson demonstrate (Lakoff and Johnson, 1980), and anthropological studies of small-scale societies suggest that metaphor is an equally important part of linguistic interaction (Crocker, 1977; Howe, 1977). Since linguistic exchanges form the backbone of any human interaction, then we can assume that metaphor will have played an equally important role in both the routine and the ritual practices that took place in the Late Bronze Age. Though linguistic evidence can never be recovered by the archaeologist, the survival of material props may yield some insights into the basic themes which were considered important. It is in the realm of ritual practice where such information may be most accessible to the archaeologists. Here, those concepts which colour the language of routine practices will be employed, though their presentation is likely to be more explicit than would normally be the case in day-to-day existence. The use of routine imagery is hardly surprising, for it is with recourse to such imagery that extraordinary circumstances, such as death, can be more readily understood. To the archaeologist, this means that the material props used in such ritual practices may be similar, if not identical, to those employed in daily life, though the context of usage will differ. Such material props might be more familiar to the archaeologist as 'symbols', and the identification of such symbols might allow one to identify instances of metaphor within the material record.

Such symbolism in the field of metalworking itself can be demonstrated through reference to ethnographic studies carried out in Africa. The work of Schmidt and Mapunda has already been briefly mentioned, but it is perhaps more appropriate to present their observations in more detail at this point (Schmidt and Mapunda, 1998). Throughout this paper, which gathers together detailed information about the rituals which accompany African iron-smelting, one underlying metaphorical comparison can be continually identified. Obvious comparisons are clearly being made between the productivity of the furnace on one hand and female reproductivity on the other. The furnace is often referred to as a feminine entity, and the iron which is produced there as a child which is 'born' within her womb. A number of ritual practices further serve to reinforce the idea of the furnace as a sexually reproductive female form. In many examples, collections of sexually symbolic objects are gathered together and

placed in a pit that lies within the floor of the furnace as a means of ensuring that the furnace is properly 'fertilised' (Schmidt and Mapunda, 1997, 77), while in others children enter the furnace prior to use, and in some cases leave offerings or medicene before being pulled from within in a symbolic 'birth' which will ensure that the furnace also will be fruitful (Schmidt and Mapunda, 1997, 78-82). Often, the terminology employed for the furnace will make reference to the female reproductive organs, and in some cases, aspects of the female form, i.e. breasts, are built into the form of the furnace itself (Schmidt and Mapunda, 1997, 77). The importance of this metaphor stretches beyond the realm of iron-smelting, too. Fragments of slag may be re-utilised as amulets, and the furnace may be used in rituals employed to improve fertility (Schmidt and Mapunda, 1997, 79-80).

Judging from the examples cited above, the importance of the metalworking process in a wider context cannot be underestimated when considering the African Iron Age material, and it may well be the case that the metalworking process was an equally pervasive metaphor in Late Bronze Age Britain. But in the case of the British Late Bronze Age material, I would like to suggest that the form taken by this metaphor differs markedly from the reproductive metaphor which is so clearly apparent in the African iron-smelting tradition. In the British Late Bronze Age, metaphorical comparisons can be made between the life cycle of a human being and the use cycle of a bronze implement. In this context, the death of an individual may be equated with the 'death' (through fragmentation) of a bronze object. Though this association seems quite tenuous when loosely plucked out of thin air, I hope to demonstrate that the evidence available is quite sufficient to make this seem plausible. By starting with this basic premise, I intend to interpret the 'Carp's Tongue' hoards in a novel way, and use the findings to revise our assumptions about the Late Bronze Age in a wider sense.

To undertake such a task requires first of all an understanding of how the use cycle of a metal object might invite metaphorical comparison with the human life cycle. Such an understanding can only come about by breaking down the use-cycle of an object into phases. Once these are isolated, then possible parallels with the human life cycle might become apparent.

The point of origin for any bronze object begins in the creation of the alloy from which it will be cast. This comes about through the mixing together of the constituent parts: copper, tin and lead. It seems likely, though, that the formation of raw bronze in this period was comparatively unusual, and that much of the bronze in circulation was composed of recycled metal (Northover, 1982). The formation of the alloy appears to have led directly into the creation of objects, for virtually no examples of bronze ingots have survived (the one exception being the small fragment of high tin bronze from Grays Thurrock I, 02/232). During the casting process, molten bronze will be poured from a crucible into the appropriate mould, and then - following a period of cooling - the mould will be opened so that the object inside can be retrieved. Moulds may be reusable, like the stone axe mould from Petters Sports Field, or they may be destroyed during their removal, as in the clay mould fragments which have been

recovered from a number of sites, including Springfield Lyons and Mucking North Ring. Following separation from the mould, the bronze object must now be subject to further finishing. Clay cores must be removed from socketed objects, any surviving chaplets, casting jets and seams must be trimmed. Any required annealing or cold working must be undertaken, cutting edges must be ground and sharpened, and the surface must be finely hammered and perhaps ground in order to improve the appearance of the object. After this process, the object will be ready for fitting with a haft or hilt, and will then be ready to begin its useful working life. Throughout this life, it may be circulated far beyond its point of origin, may change owners a number of times, and may be called upon to play various roles in both secular and ritual spheres until at last it is deemed unworthy of further use. At this point it is returned to the metalworker, perhaps as a complete composite object with haft or hilt in place, perhaps as only the metal component. The metalworker then reduces the object to a fragmentary form, following the procedures described in Chapter Five, until at last it reaches a size compatible with a return to the crucible. Then it will be reduced to molten metal, which will then be used to cast a new implement, and thus the cycle begins all over again.

Perhaps the two stages of this cycle which should be viewed as having potential importance as a source for analogy are the initial casting process and the destruction of worn-out objects in preparation for recycling. The raw materials for the manufacture of bronze are copper, lead and tin, and perhaps the presence of copper ingots in such numbers in the 'Carp's Tongue hoards' does suggest - despite Northover's arguments to the contrary - that the infusion of fresh bronze into the supply is an important part of the metalworking process in the Late Bronze Age. By applying vast quantities of heat to these three constituent metals, what was once solid becomes a molten liquid. This liquid may then be cast into the desired shape, and the mould within which it was poured is broken to reveal the object in a virtually completed form. It is the control over this process of transformation from solid to liquid to solid which may have been the source of the ambiguity and the mystique which appears to have surrounded the smith in many anthropological and historical contexts, i.e. the ability to change the very nature of a substance through the intervention of fire. The way in which old, worn-out objects could be transformed into shining new ones through similar actions might have been similarly mysterious, for, through the imposition of the same transformative process, these useless items are, in a sense, being reborn.

It should now be possible to establish how these two key stages of the metalworking process can be linked with the human life cycle (Figure 19). The early stages of the casting process could be associated with the early stages of human life, while the closing stages could be linked with death. For comparisons can also be made between the death of an individual and the 'death' of a bronze object at the end of its life. Both share a similar change in physical state. Like a scrapped object, the body fragments, either through natural agencies, or through the deliberate actions of those who must deal with the corpse. Such a comparison might be seen at its most powerful in the act of cremation, where the body changes state and becomes fragmented through the imposition of heat and fire.

Now these potential associations have been identified, confirmation must be obtained through reference to material evidence. Actual physical remains which might support the ideas described above are, unfortunately, rare, but they are not entirely lacking in the material record. Instead, comparisons between the deposition of metalworking debris which took place on the sites of Springfield Lyons and Petters Sports Field suggest that the metaphorical associations described above may have some validity. The mould debris from Springfield Lyons was located at primary levels within the ditch terminals, and this led Needham to suggest that these two deposits may have formed 'foundation' deposits associated with the opening phase of occupation. By contrast, the hoards of fragmented metalwork from Petters Sports Field, again situated in a ditch terminal, lay within the later levels of the ditch. It was in fact suggested by the excavator that the ditch may have been deliberately infilled, and that the deposition of the hoards may have immediately preceded this levelling process (Needham, 1990, 129). The placing of the metalwork hoard at Petters Sports Field may therefore have been an integral part of the activities carried out to mark the end of occupation on the site.

The evidence obtained from the sites of Springfield Lyons and Petters Sports Field does tend to support the possibility that the different stages in a metal object's life might be used as metaphorical comparisons with key events that are experienced by a community or an individual. Such events might have included the establishment - or abandonment - of a dwelling-place, or, even more dramatically, important personal events such as birth or death. When evidence from a more extensive geographical area is consulted, however, this neat association between casting and the early stages of life, and fragmentation/recycling and death cannot be established. In Dainton, it must be remembered, human skeletal material was found in close association with casting debris, a combination which creates a juxtaposition between the earliest stages of the metalworking process, and the final stages of a human life. This suggests that there are no clear-cut rules in operation. Constructing detailed comparisons may therefore rob us of more general trends that may be occurring on a larger geographical scale. One such trend that can be supported is that casting debris was viewed as an ambiguous and potentially polluting substance which had to be disposed of in a specific way. Evidence from settlement sites in the 'Carp's Tongue' heartlands of south-east England argues in favour of this possibility, and the deliberate deposition of metalworking waste at Dainton, and to a lesser extent Heathery Burn, indicates that such a claim is also strongly supported by evidence from elsewhere in the British Isles.

On a more localised scale, however, there are instances where possible association is apparent between the human life cycle and life cycle of a bronze object. Such a comparison can be demonstrated in the Carp's Tongue heartlands of south-east England, where it may certainly be the case that casting and scrapping are processes which are seen to mirror stages of the human life, and this is fundamental to our understanding of the bronzeworking industry in these areas. Until recently, the manufacture of bronze implements has been seen

as an industrial process, rooted exclusively in the secular domain. It is becoming increasingly apparent, though, that by reducing the industry to such a utilitarian level, the complexity is stripped from a practice which is more likely to have occupied a position which bridged secular and ritual realms within Late Bronze Age society,

Structure and Variation in the Carp's Tongue Hoards

It has been argued that metaphorical associations may be made between the life cycle of a human being and the use cycle of a bronze object in the Late Bronze Age of south-east England. With this in mind, the 'Carp's Tongue' hoards should be re-assessed, for if secular practices familiar from everyday life are a source of the metaphors employed during ritual activities, then an investigation of these hoards might be able to establish the relationship between secular and ritual practice during the Late Bronze Age.

During the opening section of Chapter Five, it was argued that there was no one type of hoard which could be called a 'Carp's Tongue' hoard. Late Bronze Age hoards from Essex and Kent varied greatly, in the number of artefact categories selected for inclusion, in the size of the hoards, and in the physical condition of the objects present. A basic division was possible between those hoards which were restricted to one or two artefact categories (the 'Group I' hoards), and those mixed category hoards which had a wider selection of artefact categories included amongst their contents (hoards from Groups II-IV).

In the Group I hoards, the categories chosen for inclusion were remarkably consistent. These hoards were made up entirely of ingot metal, entirely of socketed axes, or of a combination of these two categories. Hoards of ingot metal are composed of material which belongs to the earliest stage of the metalworking process. At this point, the metal has not been alloyed with the required amounts of tin and lead, and the copper itself must in most cases be roasted before it can be used, a process which removes sulphide inclusions (Tylecote, 1990). In this pure state, the raw metal can be considered useless without further preparation, and it may therefore be in an ideal state to represent the opening stages of the casting process.

Perhaps the Group I hoards of ingot metal are deposits which mark activities linked with moments of foundation or creation, the end products of acts akin to the deposition of mould debris in the ditch terminal at Springfield Lyons. Following this supposition, a possible explanation might be put forward for the Group I hoard of Southchurch II (Ref. No. 08). This hoard consisted of six fragments of ingot metal, arranged around the shoulders of a complete pottery vessel that appeared to be devoid of any contents. It could be speculated that this hoard represents the remains of a small offering. The pot may, for example. have contained some edible substance, perhaps even a portion of the year's seed grain, which rotted away over the centuries, leaving only an enigmatic combination of pot and ingot metal.

Mixed hoards of ingot metal and socketed axes are, however, more problematic. If the association between creation/germination and ingot metal were to hold true for these hoards, then the socketed axes included might be expected to be in an unused, or even an as-cast, state. A number of the ingot metal/socketed axe hoards have not survived to the present, but a few can still be considered. An example of such a hoard can be found in the hoard from Boreham II (Plantation Road), Essex (Buckley, Brown and Greenwood, 1986). This hoard - which was recovered outside the study area - consisted of three socketed axes, found in association with 'some' ingot metal. One of these axes is now lost, but drawings of the others have been published, and they are sufficiently detailed to allow some observations to be made regarding these objects. One still retained casting flash around the loop and the collar, but its blade had been expanded and the axe had presumably been used. The other had been broken, though the nature of this damage cannot be determined from the drawings. It is possible that the damage is use-related, but it cannot be ruled out that the object had not been deliberately broken. Another Group I hoard, that of Shoebury III, was dominated by ingot metal, but the crushed lower body and blade of a socketed axe was also included, along with a crushed sheet metal fitting. Shoebury III demonstrates an association between ingot metal - drawn from the opening phases of the casting process - and scrapped objects which have been placed in the hoard at the end of their use-cycle. There is a juxtaposition here between the opening phases and the closing phases of a metal object's life, suggesting that these ingot metal/axe hoards are generated by an entirely different set of selective principles than their ingot metal counterparts. By mixing different items like ingot metal, complete socketed axes and/or scrapped socketed axes, these restricted category hoards can be used to state different things in entirely different circumstances.

Group I hoards are virtually unknown in Kent, the only exceptions being the possible ingot metal hoard from Herne Bay, and the socketed axe hoard from Aylesford (Ref. No. 14). Here, mixed category hoards are dominant, and the artefact category which is outstanding in its numbers is once again the socketed axe.

Why might the socketed axe play such an important role in both the Group I hoards of Essex and the mixed category hoards of both counties? Socketed axes vary much in form, and it seems likely that these differences demonstrate different places of origin. What is rarely considered during discussions concerning the socketed axe is, however, the possibility of variety of function. Axes may have been employed as weapons, or as tools. They may have been used to clear trees or scrub for the creation of new agricultural land, or for the requisition of the timber required to build houses, etc. In this respect, they may have been viewed as the primary tools whose use precluded any other activity. Ground, for example, needed clearing and tilling before planting, and trees required to be felled before the construction of a dwelling-place could begin. Because axes play such an integral part in these primary activities, they may be closer to the ingot metal than we might have thought. But if they also function as weapons, then their role suddenly becomes more ambiguous. An object which is viewed as creative in some of its roles can become on other occasions an

object of destruction. An axe could excel in tasks which range from the slaughter of animals for food to the killing of an enemy in battles. If the axe was called upon to perform such a wide range of activities, then it is small wonder that we see it achieving such prominence in the ritual sphere over an extensive period of time which stretches from the Neolithic to the Late Bronze Age. Socketed axes are numerous inclusions in the 'Carp's Tongue' hoards, and perhaps their frequency reflects their universality. Much is made of the important role played by 'elite' weapons such as swords and spearheads, but perhaps axes should be viewed in an equally important light. The axe, since it could function as a tool or as a weapon, may have been the weapon most easily accessible to those who had insufficient social standing to procure high status weaponry. Socketed axes may have been given as gifts by elites to those who were subordinate to them in the community. It may even be reasonable to suggest that gaining possession of a socketed axe was a symbolic way of achieving adulthood, for on receipt of such an object, an individual may have become fully integrated into a community, called upon to carry out certain duties as required, such as tending the land and defending the group and its territory.

If such symbolic importance was attached to the socketed axe, then its numerical dominance within the mixed category hoards would be easier to understand, as would its regular presence within restricted category hoards. An ambiguity of meaning might be considered appropriate in an object associated with, on the one hand, the creative process of producing foodstuffs, and, on the other, the slaying of enemies in battle, and this ambiguity might not be out of place within the context of these hoards. The place of ingot metal in the primary phases of bronze production has been highlighted, and this must now be contrasted with the fragmented objects with which it is associated. The contrast between these two groups of material should not be viewed with consternation, for the metalworking process, we must remember, is essentially cyclical. Had these metal fragments not been withdrawn from circulation and deposited within a hoard, then they would surely have been melted down and recycled.

The idea which should therefore be seen as having primary importance is therefore that of the use-*cycle*. Once a metal object has finished its useful life, it returns to the manufacturer, who melts it down and re-uses the metal, again and again. By this method, worn-out objects are rejuvenated, transformed into molten metal and then re-created as a shining new implement. Thus the juxtaposition of material which references all stages of the use-cycle - ranging from raw material drawn from the start of the casting process to fragmentary objects which have been broken up in preparation for recycling - may have been a deliberate intention of these hoards.

So far, attention has been drawn to those items in the hoards which may represent cyclical activities. Ingot metal and objects reduced to fragments for recycling are drawn from either end of the casting process, socketed axes can be seen as objects which may have dual roles in creative and destructive activities. What of the other items which make up these

hoards? Small tools, for example, may be included as complete objects or may be broken up into large fragments which still represent much of the object's original extent. Since the majority had not reached the stage at which recycling was feasible, it was suggested that they still retained their original meanings. The presence of small tools is easy to explain in this context, because they once again represent another cyclical process, that of the agricultural cycle. It is these objects which are, after all, primarily involved with the transformation of natural products into materials fit for human consumption. Sickles are used to cut grain during harvesting, knives may be used for the slaughtering and butchery of animals. Even the socketed swords of the 'Dartford' type (Dartford, 18/13; Minnis Bay, 19/37) may be associated with similar activities. Chisels and gouges are perhaps more ambiguous. It is not unreasonable to assume that such objects were used in carpentry, but evidence from the surfaces of many of the socketed axes studied showed that they might also be employed in the initial stages of the fragmentation process. Both chisel and gouge indents on the upper bodies of axes indicate that such objects may have been used to remove the binding which held the axehead in place upon the haft, and it is also possible, judging from the chisel marks seen around the mouths of some socketed axes, that similar implements were used to assist in the removal of the clay core after casting.

If the 'Carp's Tongue' hoards deliberately reference routine practices of a cyclical nature, then it can be argued that the three categories of material discussed so far are logical inclusions. This explains the presence of the two dominant material categories - socketed axes and ingot metal - and it also allows us to understand why one of the secondary artefact categories - small tools - is selected for inclusion. What of the other secondary artefact category, weaponry? The presence of weaponry within these hoards might be used to support the possibility that these hoards are related to ritual practice, for weapons may be used as indicators by which votive hoards can be differentiated from 'secular' hoards. The weapons included within the 'Carp's Tongue' hoards tend not to be viewed as potential votive offerings, however, as they have been subject to a significant amount of fragmentation prior to inclusion in the hoard. It was suggested in Chapter Five, though, that in the majority of swords and spearheads, this fragmentation had not been carried out to a point at which the metal could be recycled. Therefore though the intervention of the metalworker appears to have been required in many cases to render these objects suitable for inclusion in the hoards, fragmentary weapons may still have been seen to embody those qualities and values that they had once had as complete objects. The presence of weaponry seems entirely compatible with hoards that reference cyclical activities associated with processes of creation and destruction. Weapons are the ultimate implement of destruction, for it is through their use that human life can be ended. However, they can also be seen as enabling objects, for their possession, or the achievement of their possession, may bring new privileges to the wearer, and bring about changes in the way this individual is viewed by others in the community. In close association with the weapons themselves are those objects used to decorate scabbards and baldrics. If an individual may be judged by the quality of the weaponry which they are entitled to carry, then the presentation of the

weaponry may be equally important. Hence the inclusion of accoutrements such as scabbard chapes and pommels.

Thus the presence of all the dominant and secondary material categories can be explained. It is more difficult, however, to define the role played by those artefact categories which are included on only an occasional basis. It is possible to explain the presence of unusual items such as razors, cauldron fittings, and personal ornament by invoking similar arguments to those established above. Cauldrons, for example, are likely to be involved in feasting, a communal activity which could be part of the festivities which are associated with the deposition these hoards. It is not at all clear, though, that artefact categories such as these, which occur in such limited numbers in the larger hoards, can be seen as representing the complete objects from which they came. Many of them survive only as tiny fragments, which seem quite likely to have reached the stage of fragmentation at which recycling would have been possible. It is therefore difficult to say whether they were included as representatives of the complete objects from which they had originally come, or whether they were included because they represented - along with the smallest fragments of socketed axes, socketed spearheads and swords, etc. - metal fit for recycling. This material might well represent 'scrap' metal, fragments from which all meaning has been erased and which now awaits a return to the crucible.

The primary source of reference in the 'Carp's Tongue' hoards is the metalworking process, which is represented by both ingot metal and scrap metal, items from either end of the cycle. This is augmented by objects drawn from the agricultural cycle, and objects which may have a greater symbolic function such as socketed axes and weaponry. A symbolic function for these hoards can surely be envisaged, but what kind of event may have resulted in their generation?

The variety of these hoards has already been demonstrated, and this may be a key to identifying their purpose. It is reasonable to suggest that a Group I hoard of ingot metal was created for a different purpose than a Group IV mixed category hoard. It has already been suggested that the deposition of ingot metal may be related to creative processes such as the start of the agricultural cycle, and that comparisons may have been made between the process of transformation undergone by a metal object during recycling and that of the human body during death. Could we therefore argue that the mixed category metalwork hoards functioned as some kind of funerary offering?

Such a possibility can be supported to some extent. Mortuary ritual is still a subject of mystery in the Late Bronze Age, and in those few instances where human remains have been recorded, some tenuous association with metalwork may be present. The evidence from Dainton and Heathery Burn Cave has already been discussed in detail, but further instances have been recorded, in particular with some of the Broadward hoards. One particularly outstanding example of this came from Duddingstone Loch, Edinburgh (Coles, 1959).

Perhaps more importantly, a similar connection appears to have come from a hoard within the study area, that of Minnis Bay. When this site was excavated, two fragments of human skeletal material were recovered from pits located close to the gravel bank in which the metalwork hoard had been placed (Worsfold, 1943, 39), though in this case, it must be pointed out that, with the levels of information available, the chronological relationship between the hoard and the human bone fragments must remain uncertain.

The examples quoted above are, unfortunately, insecure, but they might suggest a potential connection between Late Bronze Age metalwork hoards and funerary activities. Traditional hoard interpretations make it easy for us to conceive of a funerary association with the Broadward hoards, while firmly relegating the 'Carp's Tongue' hoards to the realm of industrial practice. But similarities can be demonstrated between these two hoard groups, and thus it should be possible to see the 'Carp's Tongue' hoards as originating in some kind of ritual practice. Such a possibility is further supported by the recent discovery in Essex of five deposits of cremated human bone, believed to be associated with the Late Bronze Age settlement at Boulder's Green (Brown, 1998b, 7). These were unurned burials, placed in small pits, and no grave goods were recorded in association.

An alternative interpretation can therefore be constructed which links the metalwork of hoards of Essex and Kent with the paucity of human remains in the area. This is as follows: funerary rituals are conducted through a discourse which employs metaphors derived from routine activities, in particular the metalworking process and the agricultural cycle. In this manner, the transformation of the corpse, which probably undergoes cremation, can be understood by comparing it to the processes of transformation which occur during the recycling of worn-out objects, and to the regeneration that is such a fundamental part of the agricultural year. There are in addition objects added to these hoards which do not appear to be associated either with metalworking or agriculture, such as weaponry, ornaments, and perhaps socketed axes. These may be symbols of status included either to emphasise the social standing of the deceased, or of the mourners, or perhaps both groups.

Playing a key role in the creation of these hoards, and perhaps in the act of deposition, too, is the metalworker. It is this individual who has the power to regenerate worn-out bronze objects by changing their state. The process requires the input of large amounts of heat, something which may also allow a metaphorical comparison with cremation to be made. Certain objects seem to require an alteration of state by the metalworker prior to their inclusion in the hoards (most notably, swords) while others may be deposited intact (e.g. socketed axes). These complete objects may be drawn from another source, and their inclusion may suggest that the creation of these hoards was a communal activity. The presence of fragmented weapons might suggest that while the warrior elite were present, their role in these communities is downplayed. Instead those activities which were vital to community life are emphasised, i.e. the transformation of crops, timber and livestock into food, clothing and housing. Since neither hoards nor human remains are recovered from

settlement contexts, and since these two categories of material appear to be mutually exclusive, we can envisage the deposition of both in related ceremonies which employed metaphors derived from day-to-day life and which may have crossed considerable expanses of space and also time in the process of their completion.

One final cautionary afterthought must, however, be stated. Earlier on in the course of Chapter Five, it was noted that the 'Carp's Tongue' hoards had suffered over-simplification in the literature. In reality, these hoards showed much variation in terms of the number of categories chosen for inclusion, the number of objects present, and the physical condition of these objects (complete as opposed to fragmentary). This strongly suggests that, attractive as it might seem to identify these hoards as displaced grave goods, to describe them all in that manner might be just another case of gross oversimplification. The small Group II hoards in Essex may relate to an entirely different set of practices than the massive Group IV hoards of the same county. And the deposition of the Group I restricted category hoards may once again have been carried out with different intentions from those which generated the mixed category hoards. It is also possible that the deposition of single finds can be interpreted in a similar fashion, though deposition here took place on a smaller scale, and perhaps on a more regular basis.

What this should teach us is that the study of 'Carp's Tongue' hoards and the deposition of Late Bronze Age metalwork is far from finished. There is much we fail to understand, and new finds should encourage us to modify our interpretations. New discoveries serve to emphasise the need for open-mindedness, for they may demonstrate how familiar resources like metalwork can be used in an unfamiliar way. Take, for example, a recent find from Monkton, Kent (Barber, pers. comm.). Excavation at this site revealed a complete bronze sickle, which had been placed within a pit lined with complete, unworked flint nodules. This type of deposit, previously unrecorded in the area and perhaps even unique, may have been linked with a creative event such as the start of the agricultural year, and its discovery serves to remind us that anomalies are still to be expected when dealing with the Late Bronze Age in Essex and Kent.

Chapter Seven: The Wider View and Conclusions

i) The 'Carp's Tongue' Hoards and Their Broadward Counterparts

Analogy and comparison has already been made between material from Kent and Essex and evidence drawn from further afield. However, a comparison is perhaps in order between the 'Carp's Tongue' hoards and the 'Broadward' hoards, the other classic hoard group which supposedly represents a complementary depositional strategy to the 'founders' hoards' of the 'Carp's Tongue' Complex.

In contemporary thought, these two groups of hoards can be seen as best demonstrating the ritual/secular divide which currently governs literature concerned with the Late Bronze Age. The Broadward hoards, predominated by weaponry, recovered from wet contexts and including amongst their contents the peculiar 'barbed' spearheads, are invariably ascribed to ritual practices (Burgess, Coombs and Davies, 1972). These characteristics supposedly allow a marked contrast with the 'Carp's Tongue' hoards, and this alleged contrast is something that I wish to challenge.

Burgess, Coombs and Davies discussed the Broadward hoards in depth, and published drawings of a number of these hoards in this same article (Burgess, Coombs and Davies, 1972). These drawings are sufficiently detailed to allow a good impression of the characteristics of the Broadward hoards to be obtained. Once again, we see fragmentation of the contents, but contrast can be made with the 'Carp's Tongue' hoards in the manner of this fragmentation. Adjoining fragments may be present, and swords, in particular, appear to have been broken off into longer lengths than their counterparts in 'Carp's Tongue' contexts. However, there are similarities, too. For, while weapons dominate the Broadward hoards, this does not mean that other categories of artefact are excluded. Reference to a number of the Broadward hoards instead demonstrates that small tools and socketed axes may included within the contents. The Broadward hoard itself, found in Shropshire during the drainage of a marshy field, included a tanged chisel amongst its contexts. And the Willow Moor hoard, again from Shropshire, and once again recovered during field drainage, revealed around 150 spearheads along with a socketed axe and a few whetstones.

The 'Broadward hoards' may indeed be seen as complementary to the 'Carp's Tongue' hoards, though perhaps not in the same way as might be anticipated. For the categories included in the Broadward hoards are not entirely dissimilar to those encountered in the 'Carp's Tongue' hoards, though the emphasis could not be more different. While Carp's Tongue hoards are dominated by categories of object drawn from secular activities, the Broadward hoards are dominated by weaponry. However, weaponry is a frequent inclusion

in the 'Carp's Tongue' hoards, and, conversely, small tools and socketed axes may be included in the Broadward hoards, albeit in small quantities. Other categories are common to both hoards, such as ornamental items such as bracelets and Carp's Tongue 'bric-a-brac' such as bugle-shaped objects and 'flanged collars'.

Further examination of the 'Broadward' phenomenon reveals that it is only those hoards at the most north-westerly extreme of their distribution which show such a contrast with their 'Carp's Tongue' counterparts. Other examples closer to the 'Carps Tongue' region suggest that a hybrid between a 'typical Broadward' and a 'typical Carp's Tongue' hoard is apparent, something which is perhaps represented best by the Yattendon hoard, Berkshire. Here, spearheads once more dominate, but these are accompanied by a comparatively high number of tool types. These include socketed axes, tanged chisels, socketed gouges and tanged and socketed knives. Yattendon thus represents a combination of those traits seen as typical of the 'Broadward' hoards and those seen as typical of the 'Carp's Tongue' hoards, something which may be seen as befitting in a hoard which lies between those areas in which both groups are seen at their most extreme. Similarly, the Watford hoard, Herts. (Coombs, 1979) can be shown to demonstrate some kinship with the more westerly Broadward hoards. Here, we see a hoard which shows many of the expected 'Carp's Tongue' characteristics - foreign items such as bugle-shaped objects and decorative fittings, a comparatively high proportion of socketed axes and small tools, and inclusion of ingot metal. There is, however, a disproportionately large concentration of weaponry. This category included two swords, which had been bent and broken deliberately, though they were deposited in a largely complete state, a situation which contrasts greatly with that occurring in similar hoards from Essex and Kent.

A comparison between these two hoard groups thus suggests that the Broadward and Carp's Tongue hoards should be seen as two extremes at either end of a continuum, rather than as two discrete groups. The same categories of material are included, but they are utilised in different ways, and emphasised to a greater or lesser extent in either group. Fragmentary material (and incomplete fragmentary material, at that) is included in both groups, though there does appear to be some difference in the nature of this fragmentation. Therefore, to ascribe one group of hoards to ritual practices and the other to secular practices seems short-sighted on the basis of hoards contents and degree of fragmentation.

These extremes may be better understood with reference to the hoards of north-west France. Similarities between the material from south-east England and north-west France have been drawn in both Briard (1965) and Burgess (1968b). In a number of ways, such comparisons are quite justified by the evidence available. French 'Carp's Tongue' hoards do resemble their English counterparts, with similar artefact categories included. However, they differ in that they show a greater emphasis on items associated with adorning the body. They included a greater number, and a larger variety, of ornaments, including bracelets, pins, and other items which would have been used to adorn men, women, or even, in some

cases, horses. Thus we have a greater emphasis on those objects which would visibly pronounce the status of an individual.

These hoards suddenly make the Group III hoard from Minnis Bay, Kent, seem less unique. This hoard stood out among the Group III hoards by the wide range of categories included, something which seemed quite disproportionate to its size (in comparison with the Group IV hoards). These categories included a large number of ornaments, while socketed axes and ingot metal were downplayed. Minnis Bay seemed out-of-place amongst its counterparts in Kent and Essex, and yet when compared to the French hoards, it does not seem particularly unusual. Perhaps, then, Minnis Bay demonstrates clearly that if we really want to understand the form of the 'Carp's Tongue' hoards, and the motivations which lay behind their deposition, we must consider south-east England in a wider context. Similarities with the rest of mainland Britain and also with north-west France should be examined.

Since this thesis was primarily concerned with the detailed study of selected hoards from Essex and Kent, such a consideration can only be undertaken in a cursory manner. However, even such a superficial consideration can suggest several points which might be used as pointers for further research. In many ways, the 'Carp's Tongue' hoards of Essex and Kent show a greater degree of similarity with hoards in north-west France than they do with hoards of north-west Britain. If hoards are attributed to secular practices, then such similarity does not seem ambiguous. If, however - as is argued here - such hoards are seen as deliberate deposits associated with activities that contemporary archaeologists would describe as rooted in 'ritual', then such similarities are more difficult to explain. Or are they? In terms of the artefacts included in the 'Carp's Tongue hoards' we see parallels between French and English examples. Socketed axes are encountered in French hoards, winged axes and Carp's Tongue swords are included in their English counterparts. While it may be suggested that the objects derived from the continent are imported into England only for their scrap value, such a possibility can be discounted by the fact that winged axes and 'Carp's Tongue' swords have had such a positive influence on the decorative motifs seen on 'south-eastern' socketed axes and Thames-Gundlingen swords. Exchanges are obviously taking place between north-west France and south-east England, and while we can see the physical manifestations of these exchanges in the form of foreign artefact types, there are other aspects of such exchanges that we cannot hope to isolate archaeologically. With reference to Gregory's hierarchy of gifts (Gregory, 1982, 49-50), we can infer that the the networks which brought these bronzes into south-east England may have been used to complete more profound links between communities separated physically by the English Channel. The possibility of alliances being forged through the exchanges of marriage partners, cannot, for example, be ruled out. Is it small wonder, then, that similarities can be seen? The decoration of artefacts make reference to continental forms, and therefore we cannot be surprised that ritual practices also reference activities practised on the continent.

The passive role this might suggest for south-east England is unfair. With the exception of Minnis Bay, the 'Carp's Tongue' hoards of Essex and Kent can be seen to possess their own distinct identity. And, of course, the process of assimilation may have worked in both directions. Witness, for example, the large numbers of socketed axes occurring in some French hoards, such as the example from Amiens, Somme (contents listed in Evans, 1931). At the same time, too, evidence suggests that practices associated more frequently with mainland Britain were still being carried out in the extreme south-east of England. Deposition of weaponry is occurring to a limited extent in both counties, the most dramatic example perhaps being the Broadness 'hoard' from Kent, where it is possible that a series of small-scale depositions were made in a very limited area.

If, therefore, hoard deposition is the physical manifestation of some kind of ritual activity in the Late Bronze Age, then such ritual activity may be quite eclectic in the metaphors and symbolism employed. Bronze is a metal which, in south-east England, must be brought in from outwith the locale (Barrett and Bradley, 1980a). Therefore the exchange networks forged between those to the north and west and those to the east must be an integral part of maintaining stocks of the metal. The successful acquisition of bronze may itself have become a means of achieving and maintaining political status as a result, on an individual or a community level, something which is suggested by the 'core-periphery' model created by Barrett and Bradley in the early 1980s (Barrett and Bradley, 1980a). The long-distance movement of bronze may be envisaged as a series of short-distance exchanges, and yet it seems highly likely that representatives from a community would have travelled considerable distances, by land or sea, in the process of forming an alliance with another group. They would thus have been exposed to different cultural practices, and may have made use of such knowledge when conducting ritual activities at home. Since status may have been achieved through links with other groups, the manipulation of material which was deemed to be of foreign origin and the introduction of symbolism drawn from foreign sources may have been integral to maintaining the separateness of an elite. And yet, what seems evident in the Carp's Tongue hoards is their utilisation of items drawn from familiar contexts, something which may downplay the hierarchy within a group and emphasis instead those practices which are undertaken for the good of the community as a whole.

What this tells us is that the practice of metalwork deposition is a complex issue, and one which as yet poorly understood. Broad trends are apparent within the material, but these trends cannot really be considered in isolation. Active reference is made to those practices elsewhere. Thus, in the 'Carp's Tongue' hoards we have predominantly indigenous material being employed as a resource in a depositional process similar (though not identical) to that seen in north-west France. Likewise, the Broadward hoards include material which might be expected in a 'Carp's Tongue' context, and a series of hoards which appear to be hybrids of both groups (roughly corresponding to the 'Series 2' hoards of Burgess, Coombs and Davies, 1972).

ii) The place of the 'Carp's Tongue' Complex in a long term history of depositional practices

'Founder's hoards', best represented by those characteristic of the 'Carp's Tongue Complex' and the 'Wilburton Complex', were seen by Hawkes in his 1960 scheme as indicative of a change in the organisation of metalworking. However, when a long-term view of hoard deposition in mainland Britain is made, it becomes apparent that these traditional indicators of the Late Bronze Age are not in fact the first manifestations of this type of hoard. Instead, we find that hoards which demonstrate a similar emphasis on the inclusion of small tools and agricultural implements are deposited in south-west England during the Taunton phase of the Middle Bronze Age (Hawkes' MBA 2). Such hoards may be best illustrated by the examples from Monkton, Somerset, and Taunton Workhouse, Somerset (for details, see Smith, 1959b).

But such hoards appear to be very localised in their distribution, and a very different form of deposition is evident elsewhere in southern England. This is the period in which Smith's 'Ornament Horizon' dominated. Hoards of this group were restricted in the categories chosen for inclusion, with palstaves being augmented by various forms of body ornament, including 'quoit-headed pins' and 'Sussex loops'.

Essex and Kent, however, displayed a more conservative range of material in comparison to some of the more westerly hoards. In both counties, the traditional palstave+ornament hoards associated with the 'Ornament' horizon are replaced by hoards of palstaves or hoards of ornaments. Both categories of material are found, but they are not found together. Though traditional interpretations have described the palstave hoards as 'traders' hoards' (the hoard from Burnham-on-Crouch, Essex, comprised six palstaves still in an unfinished condition), a votive explanation seems increasingly plausible. With such small palstave hoards becoming a recurring phenomena in both areas, and with these hoards showing evidence of deliberate placing of the contents, the votive argument becomes increasingly stronger. The Burnham-on-Crouch hoard, Essex (Britton, 1959) is one well-published example of such a hoard, and recorded finds of palstaves and groups of palstaves are numerous in Essex. More recent excavation of a similar hoard from St. Mildred's Bay, Kent, revealed 10 palstaves, two of which were fragmented. These lay in a row, cutting edges vertical, and pointing inshore (Perkins, 1991), and the excavator suggested that they may have been placed in some kind of an organic container such as a birch-bark basket prior to their deposition. At a period roughly equating to this in chronological terms, gold torcs and armlets were being deposited in the Medway. Several finds of such artefacts are recorded by Roach Smith (1874). At the time of the hoard's initial publication, these objects were described as 'Roman' in character, but illustrations suggest that they are of Middle Bronze Age date. Thus, while hoards elsewhere combine ornaments and palstave, in the areas studied, both categories are mutually exclusive. It can therefore be argued that such hoards contrast greatly with their Late Bronze Age counterparts in that they are very rigidly

defined in terms of the categories included. The flexibility of contents seen in later hoards is not evident.

With reference to the wider situation, it seems feasible to suggest that the deposition of bronze hoards was occurring in a complementary manner to the deposition of material related directly to the agricultural cycle. The latter appears to have been utilised in settlement contexts, with instances of deliberate deposition suggesting that such debris is already being employed in the process of structuring relations between human agents (Barrett, 1989). At this point in time, however, the deposition of bronze does not appear to be linked with the agricultural cycle.

It is only later on, in the period defined as 'Late Bronze Age' by the nature of its metalwork, that hoards of bronze appear to actively reference the agricultural cycle. In doing so, one might suggest that the agricultural cycle is being referenced in a more abstract manner. It is no longer the products of this cycle which are being directly represented - rather the means by which these products are obtained. Though it is possible that such products are still being referenced in activities of which we are not yet aware in archaeological terms.

The first indication of mixed category hoards comes with the Wilburton Complex. Some doubt was raised at an earlier point in this thesis as to the validity of this complex, and perhaps reference to the material from Essex and Kent might help assist in establishing whether there are solid grounds to these doubts in the hoard evidence. Wilburton material is very rare in the area studied, two hoards only occurring. The example from Ugley, Essex is quite unlike any other hoard in the area. It comprised a sword and two razors, and the emphasis on weaponry and on toiletry equipment is not matched in any other hoards examined. In this respect it is ambiguous, but it is interesting nonetheless on two counts. Firstly, it should be noted that the sword, while remaining complete, had been broken up into several pieces. Secondly, the one surviving object - a razor - was unfinished and in addition displayed a serious casting flaw that would surely have jeopardised its use.

The Sturry hoard, Kent, is more helpful in assessing the place of the Wilburton Complex (Ref. No. 22). Socketed axes (of the specifically Wilburton 'indented' variety) were included, along with end-winged axes, a median-winged axe, and a palstave. These were augmented by socketed gouges, a fragmentary knife, a number of spearheads and a solitary fragment of ingot metal. There are a number of traits which can be compared favourably with the 'Carp's Tongue' hoards. Axes, of all varieties, are a dominant feature, with small tools and ingot metal additional inclusions. However, this hoard does not share all the characteristics of a 'Carp's Tongue' mixed category hoard: weaponry plays a far greater role, the contents are largely complete, and no objects were included that had not yet been completed ready for use. Sturry therefore suggests that it belongs to a closely related form of depositional strategy, and yet its differences are significant enough to argue that it is

not sufficiently similar to the 'Carp's Tongue' hoards to be part of the the same process. It might therefore be feasible to argue that Sturry does in fact represent some kind of 'proto'-Carp's Tongue hoard. It is also possible to argue, if the Sturry hoard can be seen as some kind of precursor to the 'Carp's Tongue' mixed category hoards, that we can see quite clearly where the 'Carp's Tongue Complex' is coming from. There is nothing alien about it - rather it further expands and explores strategies of deposition established at an earlier point in time.

iii) The transition to iron

Traditionally, the end of the Bronze Age and the transition into the Iron Age is seen as a traumatic event which has a profoundly detrimental effect on the bronze-working industry. The deposition of hoards such as those occurring in the 'Carp's Tongue Complex' is seen as a symptom of this time of upheaval. And yet, if our perception of these hoards changes, the transition to iron need not seem quite so drastic.

It seems quite feasible to argue, given the evidence available, that iron-working was occurring during the late Bronze Age. Gingell describes a mixed hoard of bronze and iron from Melksham, Wilts. (Gingell, 1979, 246), and cites further examples of iron 'lumps' from additional Late Bronze Age hoards. One of these is in fact the Minnis Bay hoard, though following an examination of this deposit, I could find no clear evidence of this. The piece of markesite included as part of the hoard contents may, however, be what he was referring to. Markesite is a form of iron ore, but it could be suggested that its function - like pyrites -may have been as a form of 'strike-a-light', rather than as a raw material from which to produce iron. The evidence given by the material included in the Melksham hoard, and of course in the Llynfawr hoard, does suggest, though, that a significant competence in the manufacture of iron was achieved by the close of the Bronze Age.

A possible scenario to explain the transition may therefore run as follows: the bronze-working industry may have become interwoven with the agricultural cycle as a source of metaphors through which profound aspects of human existence could be understood. Bronze was also important in that through its acquisition and consumption, political power could be maintained. Perhaps the siphoning off of bronze into the ritual sphere gradually led to an increased reliance on iron in the domestic sphere. In time, bronze lost its primary role in the production of implements by which agricultural products were harvested and transformed. Since the agricultural cycle was such an important source of symbolism and metaphor, the role of bronze was ultimately downplayed, though it never lost its importance as a decorative material used to enhance the appearance of high status objects such as dagger-scabbards. However, there may have been a decrease in the status achieved through the manipulation of bronze and the establishment of exchange networks. Iron was, after all, more widely available in its naturally occurring form.

Contrary to the traditional interpretations, we need not envisage a dislocation in terms of the depositional strategies employed. It has been argued that the Carp's Tongue hoards made extensive use of metaphors derived from the agricultural cycle, and though these were utilised in association with those drawn from the subject of metalworking, it was the products of the agricultural cycle which would ultimately dominate. The implements by which these products were obtained and transformed from their naturally occurring state were instead downplayed. Such a change is best illustrated by the evidence from Wessex hillforts described in detail by Hill (Hill, 1989), but there are also hints of similar changes having taken place in Essex. A recent find from Broom Wood, Stock, revealed four complete pottery vessels, containing a residue of charred grain, which had been buried near the head of a spring (Couchman, 1978, 77-78). This deposit, dated to the Iron Age, is clear indication that a change in depositional practices occurred between the Late Bronze Age and the Iron Age.

Whereas the 'Carp's Tongue' hoards may have downplayed social difference through the employment of symbolism drawn from activities which benefited the community as a whole, by the Iron Age these differences may have been clearly visible. For the deposition of fine metalwork in the form of weaponry still takes place, and these objects are not subject to fragmentation before their deposition. The intervention of the metalworker, which seems to have been a required in order to transform a sword into a form suitable for inclusion in a hoard, is no longer deemed necessary.

iv) Summary and Conclusions

As the earlier chapters of this thesis demonstrated, there have been major changes evident in interpretations of the British Later Bronze Age over recent years. In particular, there has been a switch in perception with regards to the way in which metal objects were consumed during this period. Whereas the emphasis was once placed firmly on the accumulation of wealth, it is now focussed instead upon the way in which such wealth may have been visibly and publicly consumed. This radical change has not coloured all aspects of Later Bronze Age metalwork studies, however, and some aspects of the subject remain rooted firmly in a traditional discourse, most notably the classification of bronze artefacts and their subsequent assignment to particular chronological phases.

As a result, current interpretations appear to possess something of a dichotomy. On the one hand, new thinking shapes the way in which bronze is consumed, while on the other, traditional approaches still appear to restrict interpretations which relate to the manufacture of these objects. In effect, a division has been created between ritual and secular practices of the Later Bronze Age, and activities occurring in either sphere thus appear to be generated by an entirely different set of rules. Finds which can be ascribed to 'ritual' practices can be defined by their refusal to conform to a logic which we can readily understand from our own

twentieth century perspective. By contrast, there appears to be an underlying assumption within the archaeological literature that those deposits which relate to everyday activities will be generated by a set of universal logical rules that will make as much sense to us as they did to those who generated them in the first place. An ideal illustration of this dichotomy can be seen in the different ways in which metalwork has been abandoned during the Later Bronze Age. Deposits of fine metalwork in riverine contexts cannot be explained as a rational act when viewed from a twentieth century economic viewpoint, and hence a ritual explanation must be invoked in order to account for their presence. By contrast, the dry land hoards of the 'Carp's Tongue' Complex appear to fulfil all the criteria of a scrap metal hoard buried for storage and later re-use. Thus they can be safely ascribed to the 'domestic' sphere.

It seems likely, however, that continuing to support such an uncritical acceptance of the ritual/secular dichotomy results in an oversimplified interpretation of Later Bronze Age society. The presence of the same artefact types, e.g. swords, in both dry land and wet deposits should be regarded as a warning against such an oversimplification, as should the complimentary nature of dry land and riverine deposits. Efforts have been made to explain such problems (Bradley, 1988), but a more in-depth examination of the evidence raises further doubts. In Essex and Kent, for example, vast quantities of bronze buried in the form of hoards is matched by a virtual absence of this same material from contemporary settlement sites. Explaining the dry land hoards as evidence of crisis in the bronze industry, as suggested by Burgess (1979) therefore seems inadequate.

It was the aim of this thesis to break down this ritual/secular divide. The 'Carp's Tongue' hoards were examined as potential 'ritual' deposits which utilised categories of artefact drawn from activities associated with 'domestic' or 'secular' activities. Thus the presence of socketed axes, small tools and metalworking debris alongside weaponry becomes acceptable within these hoards. The possibility of deliberate selection of objects for inclusion is further supported by the fact that these hoards show deliberate structuring, with certain categories of object being favoured for inclusion over others. In particular, there is a marked bias - in Essex, especially - towards the inclusion of socketed axes and ingot metal.

It has been argued that it is the inclusion of the metal itself that is important (Taylor, 1993). However, I would argue that this is not the case, and that instead the favouring of certain categories of artefact is quite deliberate. By considering the domestic environment as a source from which potential metaphors can be drawn in order to understand more metaphysical concepts, attempts to interpret the structure of these hoards can be made.

There is an undeniable association between the 'Carp's Tongue' hoards and the metalworking process. This is borne out by the presence of ingot metal, casting jets, mould fragment and waste debris within the hoards. It is further supported by the damage sustained by the fragmentary objects included within the hoards. These fragments show evidence of regularised practices employed to break them up into smaller pieces, and this

fragmentation, often associated with evidence of hammering, appears consistent with the reduction of objects into a form compatible with a return to the crucible.

However, it was apparent that the degree of fragmentation varied considerably within hoard contents. Some objects had been subject to a higher degree of fragmentation than others, and this meant that a direct association with metalworking was difficult to establish. At what stage was it possible to return an object to the crucible? In theory, it will be more efficient to melt a crucible filled with tiny fragments of bronze, rather than, say, two upper body or blade fragments of a socketed axe, for in the former the thinner section and larger surface area exposed will facilitate a return to the molten state. Indeed, some fragments did fulfil such criteria, but these were comparatively rare and were largely confined to the larger hoards. It is therefore argued that while the methods of destruction employed upon these objects are consistent with the transformation of complete objects into scrap metal, the majority of artefacts present were withdrawn from circulation before the logical conclusion of this process had been reached. In many cases, they may never have reached the metalworker's stockpile, instead being set aside for inclusion in the hoards. This explanation might account for some anomalous traits within the material, such as the inclusion of socketed axes which had been subject to crushing without any associated breakage, and the presence of complete socketed objects which had the mouths of their sockets blocked through the inclusion of foreign objects. Those regularised processes of destruction employed may have had their symbolic aspects, too, for particular emphasis appears to have been made upon the destruction of those attributes which allowed an object to function successfully. Socketed objects, such as axes, gouges, spearheads and - to a lesser extent, knives - have their sockets crushed or blocked, winged axes have their wings removed, bladed objects, such as swords, knives, sickles and spearheads, are broken along their length. Such breakage is a necessary part of the recycling process, but it is possible that this act took on a more symbolic aspect. By destroying those parts of the object which allowed use, the object was being 'killed' symbolically. Such an explanation may explain why some complete socketed objects have their mouths closed through crushing or blocking, why some socketed and winged axes have had only the cutting edges removed, and why some bladed objects - particularly 'Carp's Tongue' swords - have had their blade edges deliberately removed or damaged.

A close relationship between the metalworking process and the 'Carp's Tongue' hoards can thus be envisaged, and yet the inclusion of complete objects suggests that the metalworker may not have been given sole responsibility for generating the contents. These hoards contained complete as well as fragmentary objects, and while the range of complete objects is dominated by heavily worn material, this is augmented by objects which were discarded while remaining in good condition, and some which had never seen use, though no casting flaws are evident which might have prevented this.

In summary, then, the 'Carp's Tongue' hoards contain a wide range of material, but this is nonetheless dominated by fragmentary artefacts that appear to have sustained damage consistent with preparation for recycling. This, combined with the consistent presence of ingot metal among the hoard contents, suggests that the metalworker had an integral part in the accumulation of these hoards, and also perhaps in the acts that led up to their deposition.

We can therefore envisage the 'Carp's Tongue' hoards as functioning in a similar manner to the wetland hoards of the Broadward Complex, and the deposits of fine metalwork in riverine contexts, They are likely to have been deliberate deposits undertaken for 'ritual' or religious purposes, and yet they are fundamentally different to their more illustrious weapons-dominated counterparts. They utilise artefacts drawn from day-to-day contexts, and many of these artefacts required the transforming actions of the metalworker prior to their inclusion.

If a ritual/secular dichotomy is discarded, then this blurring of definitions should not be viewed as unusual. When dealing with those whose survival is dependent upon the success of the agricultural cycle, the requisition of objects drawn from this cycle and their transformation into metaphors and symbols utilised in the ritual realm seems logical enough. And the intervention of the metalworker should come as no surprise, either. It has been argued convincingly that the manipulation of bronze as a resource during the Later Bronze Age was significant in establishing and maintaining political power. In addition, the activities of the bronzeworker may be a significant source of metaphors by which more complex issues of life and death may be understood. The ambiguity of the metalworker's place within society has been noted in many historical and anthropological contexts. This should not be considered surprising, for they transform raw metal and broken objects into brand new ones through actions which may seem magical to those unfamiliar with the technological processes involved. By applying vast amounts of heat, scrap bronze is returned to its molten state, and is then used to create brand new objects. This transformation process may then be used as a metaphor by which other ambiguities may be understood, such as the agricultural cycle, where the 'death' of the natural world during winter is followed by regeneration during spring. This comparison may then be further extended to cover the human life cycle.

Evidence for the disposal of the dead during the Late Bronze Age is sadly lacking, and yet there are indications that at least some of these hoards may have functioned as votive deposits intended to commemorate the dead. In some cases elsewhere in the British Isles, there are direct links between the metalworking process, the agricultural cycle and human skeletal material (Heathery Burn Cave, Co. Durham, and Dainton, Devon). In Essex, cremations unaccompanied by any kind of grave goods have been recovered, and some hoards may have been buried in association with the burial of such remains. Hoard contents include representatives of objects at all stages of their life cycle, and may thus perhaps be physical manifestations of a worldview which regarded the human life as a transient part of

an unending cycle. Hence the dead were returned to the land which suffered death and rebirth on an annual basis, and their passing was marked by rituals which utilised metaphors drawn from an agricultural cycle which underwent this same cycle, and metalworking, where the intervention of a human agent was able to control a similar cycle. Such an interpretation would serve to explain a number of the irregularities and anomalies apparent within the Later Bronze Age.

To describe all bronze hoards as displaced funerary deposits may in itself be an over-simplification, however. It has been noted that much variation exists within the supposedly homogeneous group that is the 'Carp's Tongue' Complex: hoards vary greatly in size, in contents, and in the physical condition of these contents. It could therefore be argued that the 'Carp's Tongue' hoards are the physical representations of a similarly wide-ranging series of practices. While the events with which they were associated are likely to have varied greatly in form and content, the basic metaphors and symbols employed remain consistent.

This alternative explanation for the 'Carp's Tongue' hoards is, I believe, one which can explain many of the inconsistencies apparent not only in these deposits, but also in other aspects of Late Bronze Age archaeology which seem to defy explanation. When the traditional division between ritual and secular is broken down, the gulf of difference once placed between the hoards and their 'Carp's Tongue' counterparts becomes less significant, and the dislocation of tradition once perceived between the Bronze Age and the Iron Age becomes similarly weaker. In a wider sense, such a change in perception may lead to more questions than can possibly be addressed during the scope of this thesis, but it encourages the creation of a narrative for the Later Bronze Age which is more invigorating than one constrained through its adherence to traditional definitions which demand a rigid demarcation between ritual and secular activities.

Appendix I: Decorative Forms Encountered on 'South-Eastern' Type Socketed Axes

The following list details the different decorative motifs encountered on the 'south-eastern' type axes studied. A 'south-eastern' type axe in the context of this thesis is considered to be one which fulfils the following criteria: the body should have a narrow, slightly waisted shape; the body section should be rectangular or sub-rectangular over much of its length; the mouth should be sub-rectangular or squarish in section, and should have a rounded appearance, with multiple collar mouldings present (two, three or more). The uppermost collar moulding should be larger and more substantial than those other mouldings present, and the upper end of the loop should merge with the lowermost collar mouldings.

On socketed axes which fulfilled the above criteria, the following decorative forms were noted:-

Group I: Plain-bladed forms. Here, no decoration is apparent upon the exterior surfaces of the axehead, though internal ribs are often present. Examples of this form include: Bexley Heath, 15/12-15/29 inclusive.

Group II: Pellet-decorated Forms. In this group, one or more raised pellets have been employed to decorate the upper body of the axehead. Examples of single-pellet decoration include Grays Thurrock I, 02/13-12/15 inclusive, and Minster, 20/17. Multiple pellet decoration includes examples where two or three pellets are aligned horizontally (Grays Thurrock I, 02/11 and Grays Thurrock I, 02/12; All Hallows II, 13/02), and there are also instances where vertical and horizontal arrangement is apparent (Leigh II, 05/06). Both faces of the axehead often share the same decorative motif, but some exceptions to this rule are evident (Leigh II, 05/06).

Group III: Wing-decorated Forms. Wing-decoration is one of the most common forms of embellishment on 'south-eastern' type socketed axes. However, the nature of the decoration does not appear to be rigidly defined. Several sub-groups are apparent, and several of these appear to utilise motifs often used in isolation on other 'south-eastern' examples. The following sub-groups can be isolated:-

i) Unaccompanied Wing-decoration, of winged axe derivation. This group includes all those examples which show only basic use of the wing motif. In such axeheads, two crescentic ribs define either side of the upper body on both faces. The degree of curvature varies from one axehead to another, with some examples possessing straighter wings than others. For example, the angular appearance of the wing-decoration on axeheads from Leigh II (05/11) and Borstal (16/05) differs markedly from the more crescentic form which is more commonly encountered (as in Grays Thurrock I, 02/38, and Stoke-at-Hoo, 21/13).

ii) Unaccompanied Wing-decoration, of indented socketed axe derivation. Though wing-decoration is said to have been influenced by exposure to the continental winged axe, in some examples the inspiration is more likely to have come from the indented socketed axe of the Wilburton Complex, examples of which can be seen in the Sturry hoard (23/01-03

inclusive). Some of these examples are differentiated only be a noticeable step in section (as, e.g. Borstal, 16/05; Stoke-at-Hoo, 21/03). In others, however, reference to the indented socketed axe can be more obviously identified. A number of axeheads from the Isle of Harty hoard have the wing decoration lying lower down the body, below the level of the loop. This is a characteristic is never found in winged axes, where the loop is always situated in the vicinity of the wings, but it is commonly encountered in the indented socketed axe.

ii) Wing-and-pellet decoration. This decorative form combines the basic wing-decorated form with one or two raised pellets which are placed centrally in the face. In the single pellet form, the pellet occupies the roughly triangular space which lies between the wings and the collar (Leigh I, 04/03; Minster, 20/34). This is the decorative form which predominates within the group, but in one example from Whitstable (23/05), the upper pellet was accompanied by another situated lower down the body.

iii) Wing-decorated ribbed forms. In some examples, the crescentic or angled wing-decoration is replaced by a straight rib. They can be set apart from the Group 4 Ribbed examples by the fact that the area of the axehead defined by the ribs closely matches that which would have been emphasised in a wing-decorated example (e.g. Minster, 20/12). Furrows may be employed instead of ribs in some instances (Bexley Heath, 15/05, 15/06; Minster, 20/13) and there are additional similarities to the Group 3ii axeheads in that pellet decoration may be used in conjunction with the ribs (Minster 20/11, 20/13). In a few isolated examples, it is hard to establish whether the decorative form was developed with reference to winged/indented socketed axes, or to the converging rib decoration seen on some Yorkshire/South-Welsh ribbed axes. For example, axeheads from Leigh I (04/01) and Dartford (18/02) possess a central rib which is flanked on either side by slightly curving ribs/wings. The Leigh I example seems to demonstrate closer affinity to converging rib decoration, while the Dartford example, by contrast, appears to have more kinship with wing-decorated axeheads.

iv) Wing-decorated Variant. This group encompasses the more unusual forms of wing-decoration which were encountered amongst the study material. In some examples, a double set of ribs is used to define the extent of the wings (Grays Thurrock I, 02/09, 02/45). while in others a raised saltire may occupy the central portion of the face which lies between both wings (Minnis Bay, 19/07). There are also some instances where the wings have been amalgamated to some degree, a decorative form which makes the central portion of the face stand proud from its surroundings (Grays Thurrock II, 02/07).

Group 4: Ribbed Forms. In a number of references, this form is considered sufficiently different to be deemed a type in itself: the 'Southern English' type (Needham, 1991). However, for the purposes of this thesis, it was considered sufficiently similar to the 'south-eastern' type axe in basic form (i.e. shape, cross-section, treatment of the collar) to be viewed as such. Unlike South-Welsh and Yorkshire axes, ribbed 'south-eastern' axes vary significantly in the number of ribs present. Some possess as few as three ribs (All Hallows I, 12/07; Minster, 20/07; Stoke-at-Hoo, 21/12), but most examples possess five or six ribs, and more in some cases (e.g. Grays Thurrock, 02/06; Minnis Bay, 1801). The

presence of as many as nine ribs has been recorded (Minnis Bay, 18/05) and these commonly occupy the whole extent of the face, defining in addition the junctions between the faces and the upper/lower surfaces of the axehead. These ribs vary greatly in their length (c.f. Minnis Bay, 18/01 and 18/03) but all tend to run parallel with one another. In those few occasions where converging ribs are apparent, it can be difficult to establish whether rib-decoration or wing-decoration is present, and it is possible that some of the Group 3iii axeheads could be considered to bear a closer affinity to the ribbed 'south-eastern' axeheads than they do to the wing-decorated axeheads with which they have been grouped for the purposes of this work.

Group 5: Other Forms. This category is intended for those examples which cannot be easily placed within any of the groups noted above, and is represented by axeheads from Borstal (16/01) and Minster (20/18). In both examples, a small decorative motif lies just beneath the mouth in the central portion of the face, and appears to merge with the lowermost collar moulding. In the Borstal example, the motif is a small loop, while in the Minster axehead it is a chevron-type device. Both forms may be related, and both may be variations on the single-pellet motif, for they occupy a similar position on the axehead and take up a similar amount of space.

Appendix 2: The Incidence of Casting Defects in the Objects Studied (Refer also to Table 5)

2(i) Socketed Axes

Note:-Where a socketed axe is complete or virtually complete, the entry is marked by an asterisk (*)
In fragmentary objects where insufficient information is available pertaining to certain stages of an object's use-cycle, a question mark (?) will be entered in the appropriate location, or the appropriate entry may be prefixed by a similar question mark.

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Aveley / 01/01	Misaligned core; uneven mouth	Significant	Yes	Yes	Yes
Aveley / 01/02 *	No visible defects	-	Yes	?Yes	No
Aveley / 01/03 *	Uneven mouth	Minor	Yes	Yes	No
Aveley / 01/04 *	No visible defects	-	Yes	?Yes	No
Aveley / 01/05 *	Uneven mouth	Minor	Yes	Yes	No
Aveley / 01/06 *	No visible defects	-	Yes	Yes	No
Aveley / 01/07 *	Misaligned core; uneven mouth	Significant	Yes	Yes	?
Aveley / 01/08	Uneven mouth; holes in casting	Minor	Yes	Yes	No
Grays Thurrock I / 02/01 *	Waisted loop; hole in casting	Minor	Yes	Yes	-
Grays Thurrock I / 02/02 *	Uneven mouth; pitted surface	Unknown	Yes	Yes	No
Grays Thurrock I / 02/03 *	No defects visible.	-	Yes	Yes	No
Grays Thurrock I / 02/04 *	Hole in casting; cracking of metal	Significant	Yes	Yes	Possible
Grays Thurrock I / 02/05 *	Uneven mouth; hole in casting	Minor	Yes	Yes	No
Grays Thurrock I / 02/06 *	Uneven mouth; waisted loop	Minor	Yes	Yes	No
Grays Thurrock I / 02/07 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/08 *	Uneven mouth	Minor	Yes	Yes	Yes
Grays Thurrock I / 02/09 *	No defects visible	-	Yes	Yes	No
Grays Thurrock I / 02/10 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/11 *	Hole in casting	Minor	Yes	Yes	Yes
Grays Thurrock I / 02/12	Misaligned core	Significant	Yes	Yes	Yes
Grays Thurrock I / 02/13 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/14 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/15 *	Uneven mouth; notched blade	Significant	Yes	Yes	No
Grays Thurrock I / 02/16 *	Uneven mouth; pitted metal; hole in casting	Minor	Yes	Yes	No

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Grays Thurrock I / 02/17 *	No defects visible	-	Yes	Yes	No
Grays Thurrock I / 02/18 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/19 *	Uneven mouth; hole in casting	Minor	Yes	Yes	No
Grays Thurrock I / 02/20 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/21 *	No defects visible	-	Yes	Yes	No
Grays Thurrock I / 02/22 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/23 *	Pitted metal	Significant	Yes	Yes	?Yes
Grays Thurrock I / 02/24 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/25 *	Pitted metal; holes in casting	Significant	Yes	Yes	No
Grays Thurrock I / 02/26 *	Notched blade	Significant	Yes	Yes	No
Grays Thurrock I / 02/27 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/28 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/29 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock I / 02/30 *	Pitted metal	Minor	Yes	Yes	No
Grays Thurrock I / 02/31 *	Notched blade	Significant	Yes	Yes	No
Grays Thurrock I / 02/32 *	Pitted metal	Minor	Yes	Yes	No
Grays Thurrock I / 02/33 *	Notched blade	Significant	Yes	Yes	No
Grays Thurrock I / 02/34	Uneven mouth	Severe	Yes	Yes	No
Grays Thurrock I / 02/35	Notched blade	Significant	Yes	Yes	?
Grays Thurrock I / 02/36	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/37	No visible defects	-	Yes	?	No
Grays Thurrock I / 02/38	Misaligned core	Minor	Yes	?	No
Grays Thurrock I / 02/39	Uneven mouth	Minor	Yes	?	No
Grays Thurrock I / 02/40	No visible defects	-	Yes	?	No
Grays Thurrock I / 02/41	Misaligned core; uneven mouth	Significant	Yes	?	No
Grays Thurrock I / 02/42	Uneven mouth	Minor	Yes	?	No
Grays Thurrock I / 02/43	Uneven mouth	Minor	Yes	?	No
Grays Thurrock I / 02/44	Misaligned core; holes in casting	Significant	Yes	?	?
Grays Thurrock I / 02/45	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/46	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/47	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/48	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/49	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/50	No visible defects	-	Yes	Yes	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Grays Thurrock I / 02/51	Misaligned core	Minor	Yes	Yes	?
Grays Thurrock I / 02/52	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/53	Misaligned core	Significant	Yes	No?	?
Grays Thurrock I / 02/54	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/55	?Mismatched mould valves	Minor	Yes	Yes	?
Grays Thurrock I / 02/56	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/57	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/58	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/59	Misaligned core	Severe	Yes	Yes	?
Grays Thurrock I / 02/60	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/61	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/62	Misaligned core	Significant	Yes	No	?
Grays Thurrock I / 02/63	Misaligned core	Significant	Yes	No	?
Grays Thurrock I / 02/64	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/65	Misaligned core	Significant	Yes	Yes	?
Grays Thurrock I / 02/66	Misaligned core; notched blade	Significant	Yes	Yes	?
Grays Thurrock I / 02/67	No visible defects	-	Yes	Yes	?
Grays Thurrock I / 02/68	No visible defects	-	No	No	-
Grays Thurrock I / 02/69	Misaligned core	Significant	?	?	?
Grays Thurrock I / 02/70	Misaligned core	Significant	?	?	?
Grays Thurrock I / 02/71	Misaligned core	Significant	?	?	?
Grays Thurrock I / 02/72	No visible defects	-	?	?	?
Grays Thurrock I / 02/73	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/74	Misaligned core; ?hole in casting	Severe ?	?	?	?
Grays Thurrock I / 02/75	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/76	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/77	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/78	Misaligned core	Significant	?	?	?
Grays Thurrock I / 02/79	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/80	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/81	Uneven mouth	Minor	Yes	?	?
Grays Thurrock I / 02/82	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/83	Uneven mouth; mismatched mould valves	Minor	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Grays Thurrock I / 02/84	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/85	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/86	Misaligned core; uneven mouth	Significant	Yes	?	?
Grays Thurrock I / 02/87	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/88	Misaligned core; uneven mouth	Significant	Yes	?	?
Grays Thurrock I / 02/89	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/90	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/91	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/92	Uneven mouth	Minor	Yes	?	?
Grays Thurrock I / 02/93	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/94	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/95	Misaligned core; uneven mouth	Significant	Yes	?	?
Grays Thurrock I / 02/96	Misaligned core; uneven mouth	Significant	Yes	?	?
Grays Thurrock I / 02/97	Misaligned core	Significant	Yes	?	Yes
Grays Thurrock I / 02/98	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/99	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/100	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/101	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/102	Misaligned core	Significant	Yes	?	?
Grays Thurrock I / 02/103	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/104	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/105	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/106	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/107	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/108	No visible defects	-	Yes	?	?
Grays Thurrock I / 02/109	Misaligned core	?Severe	?	?	?
Grays Thurrock II / 03/01 *	Uneven mouth	Minor	Yes	Yes	No
Grays Thurrock II / 03/02 *	Uneven mouth; pitted metal; cracking	Significant	Yes	Yes	No
Grays Thurrock II / 03/03	Misaligned core; uneven mouth; holes in casting	Significant	Yes	?	No
Leigh I / 04/01 *	No visible defects	-	Yes	Yes	No
Leigh I / 04/02 *	Uneven mouth	Minor	Yes	Yes	No
Leigh I / 04/03 *	Uneven mouth	Minor	Yes	Yes	No
Leigh I / 04/04 *	No visible defects	-	Yes	Yes	No

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Leigh II / 05/01*	Mismatched mould valves	Minor	Yes	Yes	No
Leigh II / 05/02*	Uneven mouth	Minor	Yes	Yes	No
Leigh II / 05/03	No visible defects	-	Yes	Yes	?
Leigh II / 05/04 *	Pitted metal	Minor	Yes	Yes	No
Leigh II / 05/05	No visible defects	-	Yes	Yes	?
Leigh II / 05/06 *	Uneven mouth	Minor	Yes	Yes	No
Leigh II / 05/07 *	Uneven mouth	Minor	Yes	Yes	No
Leigh II / 05/08 *	Uneven mouth; misshapen loop; mismatched mould valves	Minor	Yes	Yes	No
Leigh II / 05/09 *	No visible defects	-	Yes	Yes	No
Leigh II / 05/10 *	Uneven mouth	Minor	Yes	Yes	No
Leigh II / 05/11 *	Misaligned core; holes in casting	Significant	Yes	Yes	Yes
Leigh II / 05/12 *	Uneven mouth	Minor	Yes	Yes	No
Leigh II / 05/13 *	No visible defects	-	Yes	Yes	No
Leigh II / 05/14 *	Mismatched mould valves	Minor	Yes	Yes	No
Leigh II / 05/15 *	No visible defects	-	Yes	Yes	No
Leigh II / 05/16	No visible defects	-	Yes	Yes	No
Leigh II / 05/17	Misshapen loop	Minor	Yes	?	No
Leigh II / 05/18	Misaligned core	Significant	Yes	?	No
Leigh II / 05/19	Misaligned core; uneven mouth	Severe	Yes	?	No
Leigh II / 05/20	Misaligned core	Significant	Yes	?	No
Leigh II / 05/21	No visible defects	-	Yes	?	?
Leigh II / 05/22	No visible defects	-	Yes	Yes	?
Leigh II / 05/23	Misaligned core	-	Yes	Yes	?
Leigh II / 05/24	No visible defects	-	Yes	Yes	?
Leigh II / 05/25	No visible defects	-	Yes	Yes	?
Leigh II / 05/26	Misaligned core	Significant	Yes	Yes	?
Leigh II / 05/27	No visible defects	-	Yes	Yes	?
Leigh II / 05/28	Misaligned core	Significant	Yes	Yes	?
Leigh II / 05/29	No visible defects	-	Yes	?	?
Leigh II / 05/30	No visible defects	-	Yes	Yes	?
Leigh II / 05/31	No visible defects	-	Yes	Yes	?
Leigh II / 05/32	No visible defects	-	Yes	Yes	?
Leigh II / 05/33	No visible defects	-	Yes	Yes	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Leigh II / 05/34	No visible defects	-	Yes	Yes	?
Leigh II / 05/35	Misaligned core	Significant	Yes	Yes	?
Leigh II / 05/36	No visible defects	-	Yes	?No	?
Leigh II / 05/37	Hole in casting	?Severe	Yes	Yes	?
Leigh II / 05/38	No visible defects	-	Yes	?No	?
Leigh II / 05/39	?Misaligned core	-	Yes	?	?
Leigh II / 05/40	No visible defects	-	Yes	?	?
Leigh II / 05/41	No visible defects	-	Yes	?	?
Leigh II / 05/42	No visible defects	-	?	?	?
Leigh II / 05/43	Misaligned core	Significant	Yes	?	?
Leigh II / 05/44	No visible defects	-	Yes	?	?
Leigh II / 05/45	No visible defects	-	?	?	?
Leigh II / 05/46	No visible defects	-	?	?	/
Leigh II / 05/47	Misaligned core	Significant	?	?	?
Leigh II / 05/48	No visible defects	-	?	?	?
Leigh II / 05/49	Misaligned core	Significant	?	?	?
Leigh II / 05/50	No visible defects	-	?	?	?
Leigh II / 05/51	No visible defects	-	?	?	?
Leigh II / 05/52	No visible defects	-	?	?	?
Leigh II / 05/53	No visible defects	-	Yes	?	?
Leigh II / 05/54	Misaligned core	Significant	Yes	?	?
Leigh II / 05/55	Uneven mouth; misaligned core	Significant	Yes	?	?
Leigh II / 05/56	No visible defects	-	Yes	?	?
Leigh II / 05/57	Misaligned core	Significant	Yes	?	?
Leigh II / 05/58	No visible defects	-	Yes	?	?
Leigh II / 05/59	No visible defects	-	Yes	?	?
Leigh II / 05/60	No visible defects	-	Yes	?	?
Leigh II / 05/61	No visible defects	-	Yes	?	?
Leigh II / 05/62	No visible defects	-	Yes	?	?
Leigh II / 05/63	No visible defects	-	Yes	?	?
Leigh II / 05/64a	No visible defects	-	Yes	?	?
Leigh II / 05/64b	No visible defects	-	Yes	?	?
Leigh II / 05/65	Misaligned core	Significant	Yes	?	?
Leigh II / 05/66	No visible defects	-	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Leigh II / 05/67	Misaligned core	Significant	Yes	?	?
Leigh II / 05/68	Misaligned core	Significant	Yes	?	?
Leigh II / 05/69	No visible defects	-	Yes	?	?
Leigh II / 05/70	Misaligned core	Significant	Yes	?	?
Leigh II / 05/71	Misaligned core	Significant	Yes	?	?
Leigh II / 05/72	Misaligned core	Significant	Yes	?	?
Leigh II / 05/73	No visible defects	-	Yes	?	?
Shoebury I / 06/01 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/02 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/03 *	Misshapen loop	Minor	Yes	Yes	No
Shoebury I / 06/04 *	Misshapen loop	Minor	Yes	Yes	No
Shoebury I / 06/05 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/05 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/06 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/07 *	Misshapen loop	Minor	Yes	Yes	No
Shoebury I / 06/08 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/09 *	Uneven mouth; pitted metal	?Significant	Yes	Yes	No
Shoebury I / 06/10 *	No visible defects	-	Yes	Yes	No
Shoebury I / 06/11	Misaligned core	Significant	Yes	Yes	Yes
Shoebury I / 06/12	No visible defects	-	Yes	Yes	No
Shoebury I / 06/13	No visible defects	-	Yes	Yes	No
Shoebury I / 06/14	No visible defects	-	Yes	Yes	No
Shoebury II / 07/01 *	No visible defects	-	Yes	Yes	No
Shoebury II / 07/02 *	Uneven mouth; hole in casting	Minor	Yes	Yes	No
Shoebury III / 08/01	No visible defects	-	Yes	Yes	?
Southchurch I / 09/01	No visible defects	-	Yes	?	?
Southchurch I / 09/02	No visible defects	-	Yes	?	No
Southchurch I / 09/03	Misaligned core	Significant	Yes	?	?
Southchurch I / 09/04	Mismatched mould valves	Minor	Yes	Yes	?
Southchurch I / 09/05	No visible defects	-	Yes	?No	?
Southchurch I / 09/06	No visible defects	-	Yes	Yes	?
Southchurch I / 09/07	No visible defects	-	Yes	?	?
Southchurch I / 09/08	No visible defects	-	Yes	?	?
Southchurch I / 09/09	Misaligned core	Significant	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Southchurch I / 09/10	Misaligned core	Significant	Yes	?	?
Southchurch I / 09/11	No visible defects	-	Yes	?	?
Southchurch I / 09/12	No visible defects	-	Yes	?	?
Southchurch I / 09/13	No visible defects	-	Yes	?	?
Southchurch I / 09/14	No visible defects	-	Yes	?	?
Southchurch I / 09/15a	No visible defects	-	Yes	?	?
Southchurch I / 09/15b	No visible defects	-	Yes	?	?
Southchurch I / 09/16	?Misaligned core	-	Yes	?	?
Southchurch I / 09/17	No visible defects	-	Yes	?	?
Southchurch I / 09/18	No visible defects	-	Yes	?	?
Southchurch I / 09/19	No visible defects	-	Yes	?	?
Southchurch I / 09/20	No visible defects	-	Yes	?	?
Southchurch I / 09/21	Misaligned core	Significant	Yes	?	?
Southchurch I / 09/22	No visible defects	-	?	?	?
Southchurch I / 09/23	Misaligned core	Significant	?	?	?
Southchurch I / 09/24	Misaligned core	Significant	?	?	?
Vange / 11/01	No visible defects	-	Yes	Yes	?
Vange / 11/02	No visible defects	-	Yes	Yes	?
Vange / 11/03	No visible defects	-	Yes	Yes	?
Vange / 11/04	No visible defects	-	Yes	Yes	?
Vange / 11/05	No visible defects	-	Yes	Yes	?
Vange / 11/06	No visible defects	-	Yes	Yes	?
Vange / 11/07	No visible defects	-	Yes	Yes	?
Vange / 11/08	No visible defects	-	Yes	Yes	?
Vange / 11/09	Misaligned core	Significant	Yes	Yes	?
Vange / 11/10	No visible defects	-	Yes	Yes	?
Vange / 11/11	No visible defects	-	Yes	Yes	?
Vange / 11/12	No visible defects	-	Yes	Yes	?
Vange / 11/13	No visible defects	-	Yes	Yes	?
Vange / 11/14	Uneven mouth	Minor	Yes	?	?
Vange / 11/15	No visible defects	-	Yes	?	?
Vange / 11/16	No visible defects	-	Yes	?	?
Vange / 11/17	Uneven mouth	Minor	Yes	?	?
Vange / 11/18	No visible defects	-	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Vange / 11/19	No visible defects	-	Yes	?	?
Vange / 11/20	No visible defects	-	Yes	?	?
Vange / 11/21	No visible defects	-	?	?	?
Vange / 11/22	No visible defects	-	?	?	?
Vange / 11/23	No visible defects	-	Yes	?	?
All Hallows I / 12/01 *	No visible defects	-	Yes	Yes	No
All Hallows I / 12/02 *	Uneven mouth	Minor	Yes	Yes	No
All Hallows I / 12/03	No visible defects	-	Yes	Yes	No
All Hallows I / 12/04 *	No visible defects	-	Yes	Yes	No
All Hallows I / 12/05 *	Uneven mouth; missing loop; hole in casting	Severe	Yes	Yes	Yes
All Hallows I / 12/06 *	?Pitted metal	Significant	Yes	No	No
All Hallows I / 12/07	Misaligned core	Significant	Yes	?	No
All Hallows I / 12/08	No visible defects	-	Yes	?	No
All Hallows I / 12/09	Misaligned core	Significant	Yes	?	?
All Hallows I / 12/10	No visible defects	-	Yes	Yes	?
All Hallows I / 12/11	No visible defects	-	Yes	Yes	?
All Hallows I / 12/12	No visible defects	-	Yes	Yes	?
All Hallows I / 12/13	Misaligned Core	Significant	Yes	?No	?
All Hallows I / 12/14	Misaligned Core	Significant	Yes	Yes	?
All Hallows I / 12/15	No visible defects	-	Yes	Yes	?
All Hallows I / 12/16	No visible defects	-	Yes	Yes	?
All Hallows II / 13/01 *	Missing loop; holes in casting	Severe	Yes	Yes	No
All Hallows II / 13/02 *	No visible defects	-	Yes	Yes	No
All Hallows II / 13/03 *	Uneven mouth	Minor	Yes	Yes	No
All Hallows II / 13/04	No visible defects	-	Yes	Yes	No
All Hallows II / 13/05	Misaligned core	Significant	Yes	Yes	Yes
All Hallows II / 13/06	Misaligned core; uneven mouth	Significant	Yes	Yes	Yes
All Hallows II / 13/07	Uneven mouth; notched blade	Significant	Yes	Yes	No
All Hallows II / 13/08	Misaligned core; uneven mouth; holes in casting	Significant	Yes	?	?
All Hallows II / 13/09	Misaligned core	Significant	Yes	?	?
All Hallows II / 13/10	Misaligned core	Significant	Yes	?	?
All Hallows II / 13/11	No visible defects	-	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?		Evidence of use-related Breakage?
All Hallows II / 13/12	Misaligned core; uneven mouth	Significant	Yes	?		?
Aylesford / 14/01 *	No visible defects	-	Yes	Yes	No	
Aylesford / 14/02 *	No visible defects	-	Yes	Yes	No	
Aylesford / 14/03 *	No visible defects	-	Yes	Yes	No	
Aylesford / 14/04 *	Uneven mouth; ?misaligned core	?Significant	Yes	Yes	No	
Bexley Heath / 15/01 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/02 *	Holes in casting	Minor	Yes	Yes	No	
Bexley Heath / 15/03 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/04 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/05 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/06 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/07 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/08 *	Pitted metal	Significant	Yes	Yes	No	
Bexley Heath / 15/09 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/10 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/11 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/12 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/13 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/14 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/15 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/16 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/17 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/18 *	Uneven mouth; holes in casting	Minor	Yes	Yes	No	
Bexley Heath / 15/19 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/20 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/21 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/22 *	No visible defects	-	Yes	No	?No	
Bexley Heath / 15/23 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/24 *	Uneven mouth	Minor	Yes	Yes	No	
Bexley Heath / 15/25	Misaligned core; misshapen loop	Significant	Yes	Yes	?Yes	
Bexley Heath / 15/26 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/27 *	Uneven mouth; pitted metal	Minor	Yes	Yes	No	
Bexley Heath / 15/28 *	No visible defects	-	Yes	Yes	No	
Bexley Heath / 15/29 *	No visible defects	-	Yes	Yes	No	

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Bexley Heath / 15/30	No visible defects	-	Yes	Yes	?
Bexley Heath / 15/31	Misaligned core; uneven mouth	Significant	Yes	?	?Yes
Bexley Heath / 15/32	Misaligned core	Significant	Yes	?	?
Bexley Heath / 15/33	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/34	Misaligned core	Significant	?	?No	?
Bexley Heath / 15/35	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/36	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/37	?Notched blade	?Significant	Yes	Yes	?
Bexley Heath / 15/38	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/39	No visible defects	-	Yes	Yes	?
Bexley Heath / 15/40	No visible defects	-	Yes	?No	?
Bexley Heath / 15/41	Misaligned core	Significant	Yes	?No	?
Bexley Heath / 15/42	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/43	Notched blade	Significant	Yes	?No	?
Bexley Heath / 15/44	Misaligned core	Significant	Yes	Yes	?
Bexley Heath / 15/45	Misaligned core	Severe	?No	No	?
Borstal / 16/01 *	Uneven mouth; ?misaligned core	Significant	Yes	Yes	No
Borstal / 16/02	Uneven mouth; ?hole in casting	Minor	Yes	Yes	?Yes
Borstal / 16/03	Misaligned core; uneven mouth	Significant	Yes	Yes	?Yes
Borstal / 16/04	?Missing loop	Severe	Yes	?	No
Borstal / 16/05	Misaligned core	Significant	Yes	?	No
Borstal / 16/06	Misshapen loop	Minor	Yes	?	No
Borstal / 16/07	Misaligned core; uneven mouth	Significant	Yes	?	No
Borstal / 16/08	No visible defects	-	Yes	Yes	?
Borstal / 16/09	Misaligned core	Significant	Yes	Yes	?
Borstal / 16/10	No visible defects	-	Yes	?	?
Borstal / 16/11	Misaligned core	Significant	Yes	Yes	?
Borstal / 16/12	No visible defects	-	Yes	?	?
Borstal / 16/13	No visible defects	-	Yes	Yes	?
Borstal / 16/14	Misaligned core	Significant	Yes	Yes	Yes
Borstal / 16/15	No visible defects	-	Yes	Yes	?
Borstal / 16/16	Misaligned core	Significant	Yes	?	?
Borstal / 16/17	Misaligned core; uneven mouth	Significant	Yes	?	?
Borstal / 16/18	No visible defects	-	Yes	?	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Borstal / 16/19	Uneven mouth	Minor	Yes	?	?
Borstal / 16/20	No visible defects	-	Yes	?	?
Cliffe-at-Hoo / 17/01 *	Uneven mouth; ?misaligned core	?Significant	Yes	Yes	No
Cliffe-at-Hoo / 17/02 *	No visible defects	-	Yes	Yes	No
Cliffe-at-Hoo / 17/03	Misaligned core; holes in casting; crack in metal	?Severe	Yes	?Yes	?Yes
Cliffe-at-Hoo / 17/04	No visible defects	-	Yes	Yes	?
Cliffe-at-Hoo / 17/05	Misaligned core	Significant	Yes	Yes	?
Dartford / 18/01 *	Holes in casting	Minor	Yes	Yes	No
Dartford / 18/02 *	Uneven mouth	Minor	Yes	Yes	No
Dartford / 18/03 *	Uneven mouth	Minor	Yes	Yes	No
Dartford / 18/04	Misshapen loop	Minor	Yes	?	No
Dartford / 18/05	Uneven mouth	Minor	Yes	?	No
Dartford / 18/06	Misaligned core	Significant	Yes	?	No
Dartford / 18/07	Misaligned core	Significant	Yes	Yes	?
Dartford / 18/08	No visible defects	-	Yes	Yes	?
Dartford / 18/09	No visible defects	-	Yes	?	?
Minnis Bay / 19/01 *	Uneven mouth	Minor	Yes	Yes	No
Minnis Bay / 19/02 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/03 *	Uneven mouth; slight pitting in metal	Minor	Yes	Yes	No
Minnis Bay / 19/04 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/05 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/06 *	Uneven mouth; misshapen loop; holes in casting	Minor	Yes	Yes	No
Minnis Bay / 19/07 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/08 *	No visible defects	-	Yes	Yes	Yes
Minnis Bay / 19/09 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/10 *	No visible defects	-	Yes	Yes	No
Minnis Bay / 19/11	No visible defects	-	Yes	Yes	?
Minnis Bay / 19/12	Misaligned core	Significant	Yes	Yes	?
Minnis Bay / 19/13	Misaligned core; uneven mouth	Significant	Yes	?	?
Minnis Bay / 19/14	No visible defects	-	Yes	?	?
Minnis Bay / 19/15	Uneven mouth	Minor	Yes	?	?
Minnis Bay / 19/16	No visible defects	-	No	No	No

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Minster / 20/01 *	No visible defects	-	Yes	Yes	No
Minster / 20/02 *	Uneven mouth	?Minor	Yes	Yes	Yes
Minster / 20/03 *	No visible defects	-	Yes	Yes	No
Minster / 20/04 *	No visible defects	-	Yes	Yes	No
Minster / 20/05 *	Uneven mouth	Minor	Yes	Yes	No
Minster / 20/06 *	Mismatched mould valves	Minor	Yes	Yes	No
Minster / 20/07 *	Uneven mouth; mismatched mould valves	Minor	Yes	Yes	No
Minster / 20/08 *	No visible defects	-	Yes	Yes	No
Minster / 20/09	No visible defects	-	Yes	Yes	?
Minster / 20/10	No visible defects	-	Yes	Yes	No
Minster / 20/11 *	No visible defects	-	Yes	Yes	No
Minster / 20/12 *	No visible defects	-	Yes	Yes	No
Minster / 20/13	Misaligned core	-	Yes	Yes	Yes
Minster / 20/14 *	Uneven mouth; pitted metal	?Minor	Yes	Yes	No
Minster / 20/15 *	No visible defects	-	Yes	Yes	No
Minster / 20/16 *	No visible defects	-	Yes	Yes	No
Minster / 20/17 *	No visible defects	-	Yes	Yes	No
Minster / 20/18 *	Misaligned core	Significant	Yes	Yes	Yes
Minster / 20/19 *	No visible defects	-	Yes	Yes	No
Minster / 20/20 *	No visible defects	-	Yes	Yes	Yes
Minster / 20/21 *	No visible defects	-	Yes	Yes	No
Minster / 20/22 *	No visible defects	-	Yes	Yes	No
Minster / 20/23 *	No visible defects	-	Yes	Yes	No
Minster / 20/24	Misaligned core	Significant	Yes	Yes	?Yes
Minster / 20/25 *	No visible defects	-	Yes	Yes	No
Minster / 20/26 *	No visible defects	-	Yes	Yes	No
Minster / 20/27 *	Holes in casting	Minor	Yes	Yes	No
Minster / 20/28	No visible defects	-	Yes	Yes	No
Minster / 20/29 *	Uneven mouth	Minor	Yes	Yes	No
Minster / 20/30 *	Misaligned core; uneven mouth	Significant	Yes	Yes	No
Minster / 20/31 *	Fissure in metal	Minor	Yes	Yes	No
Minster / 20/32	Misaligned core	Significant	Yes	Yes	?
Minster / 20/33	No visible defects	-	Yes	?	No

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Minster / 20/34	Uneven mouth	Minor	Yes	?	No
Minster / 20/35	Uneven mouth	Minor	Yes	?	?
Minster / 20/36	Misaligned core	Significant	Yes	?	No
Minster / 20/37	Uneven mouth; ?misaligned core	?Significant	Yes	?	No
Minster / 20/38	No visible defects	-	Yes	?	No
Minster / 20/39	Misaligned core	Significant	Yes	?	No
Minster / 20/40	No visible defects	-	Yes	?	?
Minster / 20/41	No visible defects	-	Yes	?	?
Minster / 20/42	No visible defects	-	Yes	?	?
Minster / 20/43	Misaligned core	Significant	Yes	?	?
Minster / 20/44	Uneven mouth	Minor	Yes	?	?
Minster / 20/45	No visible defects	-	Yes	?	?
Minster / 20/46	No visible defects	-	Yes	?	?
Minster / 20/47	Misshapen loop	Minor	Yes	?	?
Minster / 20/48	No visible defects	-	Yes	?	?
Minster / 20/49	Uneven mouth	Minor	Yes	?	?
Minster / 20/50	No visible defects	-	Yes	Yes	?
Minster / 20/51	No visible defects	-	Yes	Yes	?
Minster / 20/52	Misaligned core	Significant	Yes	Yes	?
Minster / 20/53	No visible defects	-	Yes	Yes	?
Minster / 20/54	Misaligned core	Significant	Yes	Yes	?
Minster / 20/55	No visible defects	-	Yes	Yes	?
Minster / 20/56	No visible defects	-	Yes	Yes	?
Minster / 20/57	No visible defects	-	Yes	Yes	?
Minster / 20/58	Misaligned core	Significant	Yes	Yes	?
Minster / 20/59	No visible defects	-	Yes	Yes	?
Minster / 20/60	No visible defects	-	Yes	Yes	?
Minster / 20/61	Misaligned core	Significant	Yes	Yes	?
Minster / 20/62	No visible defects	-	Yes	Yes	?
Minster / 20/63	No visible defects	-	Yes	Yes	?
Minster / 20/64	Misaligned core	Significant	Yes	Yes	?
Minster / 20/65	No visible defects	-	Yes	Yes	?
Minster / 20/66	No visible defects	-	Yes	Yes	?
Minster / 20/67	No visible defects	-	Yes	Yes	?

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Minster / 20/68	No visible defects	-	Yes	Yes	?
Minster / 20/69	No visible defects	-	Yes	?	?
Stoke-at-Hoo / 21/01 *	No visible defects	-	Yes	Yes	No
Stoke-at-Hoo / 21/02 *	No visible defects	-	Yes	Yes	No
Stoke-at-Hoo / 21/03 *	Uneven mouth; pitted metal	Minor	Yes	Yes	No
Stoke-at-Hoo / 21/04	Misaligned core; uneven mouth; holes in casting	Significant	Yes	Yes	Yes
Stoke-at-Hoo / 21/05 *	Uneven mouth	Minor	Yes	Yes	No
Stoke-at-Hoo / 21/06 *	No visible defects	-	Yes	No	No
Stoke-at-Hoo / 21/07 *	Uneven mouth; holes in casting	Minor	Yes	Yes	No
Stoke-at-Hoo / 21/08 *	Uneven mouth	Minor	Yes	Yes	?Yes
Stoke-at-Hoo / 21/09 *	Uneven mouth	Severe	Yes	Yes	No
Stoke-at-Hoo / 21/10 *	Uneven mouth	Minor	Yes	Yes	No
Stoke-at-Hoo / 21/11 *	Uneven mouth; misshapen loop; pitted metal	Minor	Yes	Yes	No
Stoke-at-Hoo / 21/12	Misaligned core	Significant	Yes	?	No
Stoke-at-Hoo / 21/13	Misaligned core	Significant	Yes	?	No
Stoke-at-Hoo / 21/14	Misaligned core	Significant	Yes	?	?
Stoke-at-Hoo / 21/15	No visible defects	-	Yes	Yes	?
Stoke-at-Hoo / 21/16	Misaligned core; uneven mouth	Significant	Yes	Yes	?
Stoke-at-Hoo / 21/17	No visible defects	-	Yes	Yes	?
Stoke-at-Hoo / 21/18	Misaligned core; notched blade	Significant	Yes	Yes	?
Stoke-at-Hoo / 21/19	Misaligned core	Significant	Yes	Yes	?
Stoke-at-Hoo / 21/20	No visible defects	-	Yes	?	?
Sturry / 22/01 *	No visible defects	-	Yes	Yes	No
Sturry / 22/02 *	No visible defects	-	Yes	Yes	No
Sturry / 22/03 *	Uneven mouth	Significant	Yes	Yes	No
Whitstable / 23/01 *	Uneven mouth	Minor	Yes	Yes	No
Whitstable / 23/02 *	Uneven mouth	Minor	Yes	Yes	No
Whitstable / 23/03 *	No visible defects	-	Yes	Yes	No
Whitstable / 23/04 *	No visible defects	-	Yes	Yes	No
Whitstable / 23/05 *	Uneven mouth	Minor	Yes	Yes	No
Whitstable / 23/06 *	No visible defects	-	Yes	Yes	No
Whitstable / 23/07 *	Uneven mouth	Minor	Yes	Yes	No

Hoard/Catalogue No.	Nature of Defect	Severity	Object subject to finishing?	Object subject to use?	Evidence of use-related Breakage?
Whitstable / 23/08	Misaligned core	Significant	Yes	?Yes	?
Whitstable / 23/09	No visible defects	-	Yes	?	No
Whitstable / 23/10	Misaligned core; uneven mouth	Significant	Yes	?	?
Whitstable / 23/11	Misaligned core	Significant	Yes	?	?
Whitstable / 23/12	Misaligned core; hole in casting	Significant	Yes	Yes	?
Whitstable / 23/13	No visible defects	-	Yes	Yes	?
?Whitstable / 23/14	No visible defects	-	Yes	?	?

Appendix 3: A List of the Later Bronze Age Metalwork Hoards of Essex and Kent

All information comes from the National Bronze Index or the National Monuments Record for the counties of Essex and Kent. In those exceptional circumstances where the information comes from another source, appropriate references are included in association with the name of the hoard. Those hoards actively referenced throughout this thesis are highlighted in bold print, those hoards which are known only through documentary sources, or which have lost a substantial proportion of their contents, are highlighted in italics.

For the purpose of this thesis, the hoard record has been subdivided into various groups based upon the size of the hoard, and the number of artefact categories present. Before any such grouping is undertaken, a more detailed summary of the artefact categories employed must be given. While certain categories are self-explanatory, others may include a number of recognised artefact types. These categories include:-

1) Socketed Axes.

2) Winged Axes - this group also incorporates winged adzes.

3) Palstaves.

4) Small Tools - this category covers any implement used in either the domestic or the agricultural sphere, including socketed gouges, chisels, mortising chisels, punches, hammers, sickles, knives, hog-back knives and fish-hooks.

5) Weaponry - this category includes swords and spearheads.

6) Weapon Fittings - included here are scabbard chapes, sword pommels, rings and other items likely to be associated with the adornment of the sword or its scabbard.

7) Ornament - this group covers items of personal adornment such as bracelets and finger rings.

8) Decorative Fittings - this group includes assorted decorative items which would once have been used to embellish clothing or other items, e.g. buttons, bugle-shaped objects, looped fittings.

9) Other fittings - this category includes unusual decorative items such as the horned terminal from Shoebury II and the grooved socket from Grays Thurrock I.

10) Cauldrons - any fragments which are deemed likely to have been part of a cauldron or bucket are included here.

11) Scrap Metal - items of fragmentary or crumpled sheet bronze fitting are included in this category, as are fragments of bronze rod or wire.

12) Metalworking - included in this category are items associated with, or by-products coming from, the metalworking process, including mould fragments, casting jets and metal spill.

13) Ingot Metal - including fragments of copper and tin ingots.

1) The Group I hoards

The criteria for defining these hoards are as follows:-
1) A limited number of categories of material must be present, one or two being an acceptable figure.
2) The hoards should be composed entirely of socketed axes or ingot metal, or perhaps a combination of the two.

Essex

Name of Hoard	Contents	Context
Ashdon	*A large quantity of rough metal, no artefacts recorded*	*No details known*
Boreham II (Plantation Road)	3 socketed axes, 'some' pieces of ingot metal	No details known
Danbury	'Some brass celts'	No details known
Dunmow	4+ socketed axes/axe fragments	No details known
NR Dovercourt	15 socketed axes	Found 'near' a pottery vessel
Felsted II	3 socketed axes	No details known
Fyfield	*Socketed axes and large quantity of ingot metal*	*No details known*
High Roothing	12 socketed axes, 12 lumps of ingot metal	No details known.
Little Oakley	Socketed axes	Found in a large earth bank
Rivenhall	*2+ socketed axes*	*No details known*
Southchurch II (Thorpe Bay)	6 lumps of ingot metal	Found arranged around the shoulders of a pottery vessel. The
Thundersley	*Socketed axes and ingot metal*	*No details known.*

Additional Candidates for Likely Inclusion Amongst the Essex Group I hoards are:-

Shoebury I	Ingot metal, crushed socketed axes, scrap metal strip	No details known
Panfield	*Socketed axes, ingot metal, 'numerous other specimens'*	*No details known*

Kent

Name of Hoard	Contents	Context
Aylesford	**4 socketed axes**	**Found in a sand drift**

An Additional Candidate for Likely Inclusion Amongst the Kent Group I hoards is:-

Herne Bay	3 lumps of ingot metal, fragment of metal spill	Pieces recovered from a ploughed field. They lay in a straight line, and may be a dispersed hoard.

2) The Group II Hoards - the small mixed category hoards

The criteria for defining these hoards are as follows:-
1) Between three or four categories of material are usually represented, with small tools and/or weaponry being included in addition to socketed axes and/or ingot metal.
2) The hoard should be small in size, including no more than 15 items among its contents, of which less than ten should be actual objects, as opposed to ingot metal fragments. In size, it therefore matches closely the 'personal' hoard, as defined in traditional interpretations of Bronze Age metalwork hoards.

IIa: Essex

Name of Hoard	Categories Included	Number of Categories	Number of Items
Barling (Crowe, pers. comm.)	Socketed axes, metalworking, scrap metal, small tools	4	10
Fingringhoe	Socketed axes, small tools, weapon fittings, ornament, ingot metal	5	12
Grays Thurrock I	Socketed axes, ingot metal, small tools	3	13
Leigh I	Socketed axes, weaponry, small tools, ingot metal	4	8
Little Baddow	Socketed axes, winged axes small tools, ingot metal	4	12
Shoebury II	Socketed axes, winged axes, weaponry, decorative fittings, ingot metal	5	9

IIb: Kent

Name of Hoard	Categories Included	Number of Categories	Number of Items
Cliffe at Hoo	Socketed axes, weaponry, Small tools	3	6
Hoaden	Socketed axes, winged axes, weaponry ingot metal	4	7

3) The Group III Hoards - the intermediate mixed category hoards

The criteria for inclusion in this group are as follows:-
1) Hoard contents number between 15 and 100 items
2) The number of different categories of material included should ideally number between five and seven.

IIIa: Essex

Name of Hoard	Categories Included	Number of Categories	Number of Items
Arkesden	*Socketed axes, winged axes, palstaves, weaponry, metalworking, ingot metal*	*6*	*50*
Billericay	*Socketed axes, small tools, weaponry scrap metal, ingot metal*	*5*	*15+*
Boreham I	Socketed axes, small tools, weaponry, scrap metal, ingot metal	5	38
Chrishall	*Socketed axes, small tools, weaponry, cauldron, ingot metal*	*5*	*30+*
Grays Thurrock - Thurloe Walk	*Socketed axes, small tools, weaponry, ornament, scrap metal, ingot metal*	*6*	*38*
Hatfield Broad Oak	Socketed axes, small tools, weaponry, cauldron, ingot metal	6	61
Rayne	Socketed axes, winged axes, palstave, small tools, ingot metal	5	17
Shoebury I	**Socketed axes, winged axes, weaponry, ornament, ingot metal**	**5**	**28**
Southchurch I	**Socketed axes, small tools, weaponry weapons fittings, decorative fittings, ingot metal**	**6**	**63**

IIIb: Kent

Name of Hoard	Categories Included	Number of Categories	Number of Items
All Hallows I	Socketed axes, winged axes, small tools, weaponry, ingot metal	5	38
All Hallows II	Socketed axes, small tools, weaponry, weapon fittings, ingot metal	5	25
Bexley Heath	Socketed axes, small tools, weaponry, ingot metal	4	78
Borstal	Socketed axes, small tools, weaponry, weapon fittings, decorative fittings, metalworking, ingot metal	7	66
Dartford	Socketed axes, winged axes, palstave small tool, weaponry, ingot metal	6	33
Isle of Harty	Socketed axes, small tools, ornament, decorative fittings, other fittings, metalworking ingot metal	7	32
Marden	Socketed axes, small tools, weaponry, weapon fittings, cauldron, metalworking, decorative fittings	7	27
Monkton II (Barber, pers. comm.)	Socketed axe, weaponry, weapon fittings ornament, cauldron, scrap metal, ingot metal	7	51
Minnis Bay	Socketed axes, winged axes, small tools, weaponry, weapon fittings, ornament cauldron, scrap metal, metalworking, ingot metal	10	86
Saltwood	Socketed axes, small tools, weaponry, weapon fittings, ornament, decorative fittings, ingot metal	7	50
Shuart (Perkins, 1988)	Socketed axes, small tools, weaponry, cauldron, ingot metal	5	23
Stoke-at-Hoo	Socketed axes, small tools, weaponry, weapon fittings, metalworking, ingot metal	6	52
Stourmouth	Socketed axes, small tools, weaponry, ornament, metalworking, scrap metal, ingot metal	7	31
Sturry	Socketed axe, winged axe, small tool weaponry, weapon fittings, ingot metal	6	17
Whitstable	Socketed axes, small tools, weaponry, metalworking, ingot metal	5	52

4) The Group IV Hoards- the large mixed category hoards

Group IV hoards can be differentiated from the other groups by their vast size. While it is practical to define them in terms of including 100 items or more, in reality the smallest of these hoards was substantially bigger than the largest of the Group III hoards, including among its contents 171 different items. The number of categories included also tends to be larger.

IVa: Essex

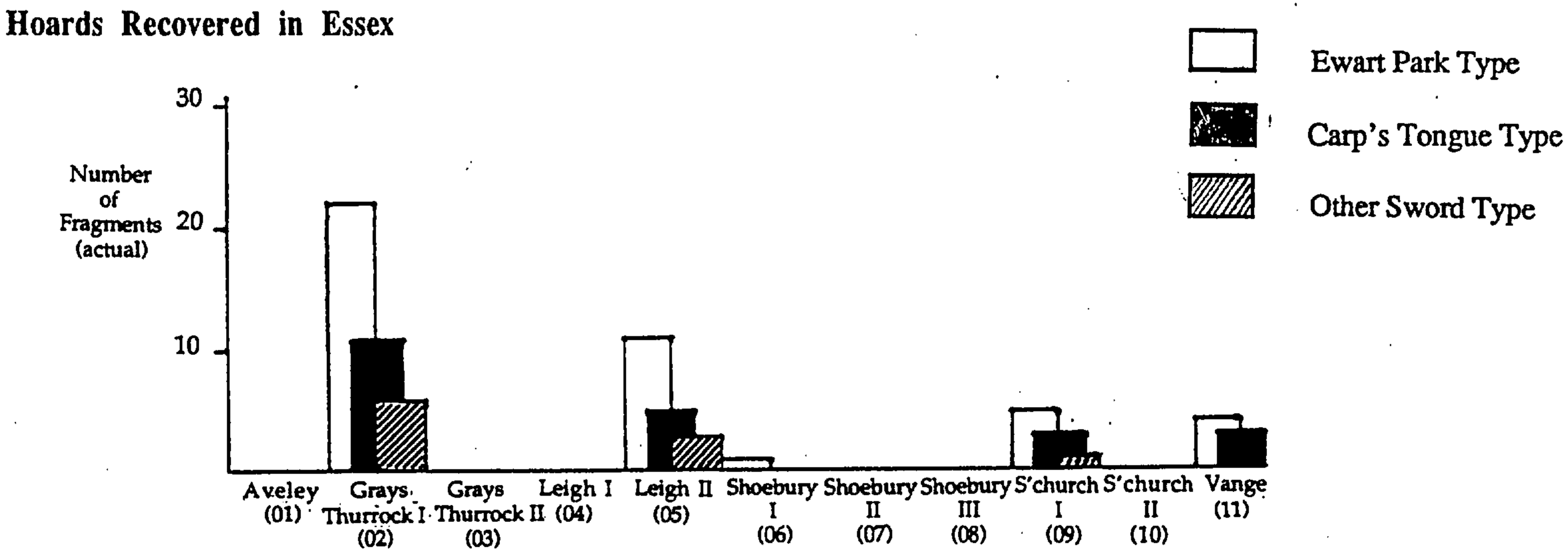
Name of Hoard	Categories Included	Number of Categories	Number of Items
Grays Thurrock I	Socketed axes, winged axes, small tools weaponry, weapon fittings, ornaments decorative fittings, other fittings, cauldron, metalworking, scrap metal, ingot metal	12	300
Leigh II	Socketed axes, winged axes, palstaves small tools, weaponry, weapon fittings, ornament, cauldron, metalworking, scrap metal, ingot metal	11	225

IVb: Kent

Name of Hoard	Categories Included	Number of Categories	Number of Items
Minster	Socketed axes, winged axes, palstaves, small tools, weaponry, weapon fittings, decorative fittings, other fittings, metalworking, ingot metal	10	171

Appendix Four: Figures and Tables

Fig. 1: The Numbers of Leaf-Shaped and 'Carp's Tongue' Sword Fragments Occurring in the Hoards Studied



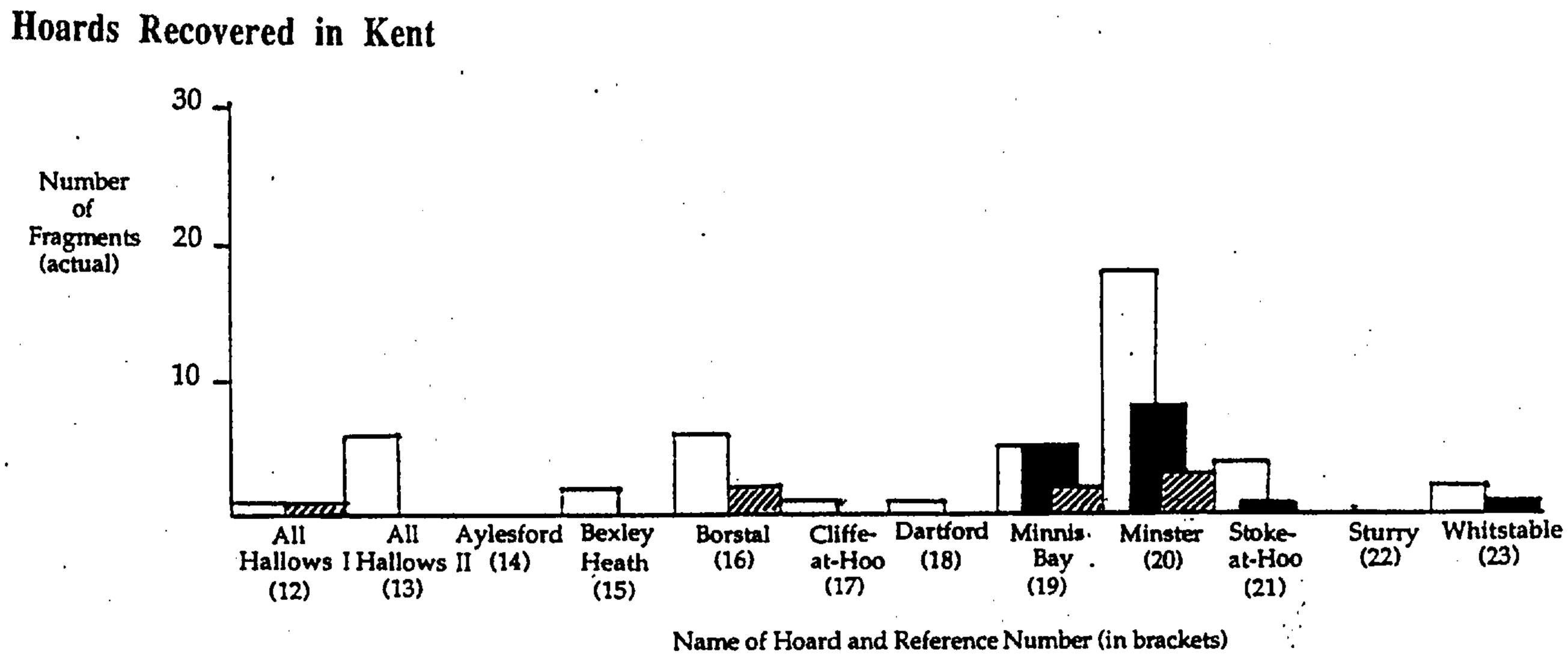
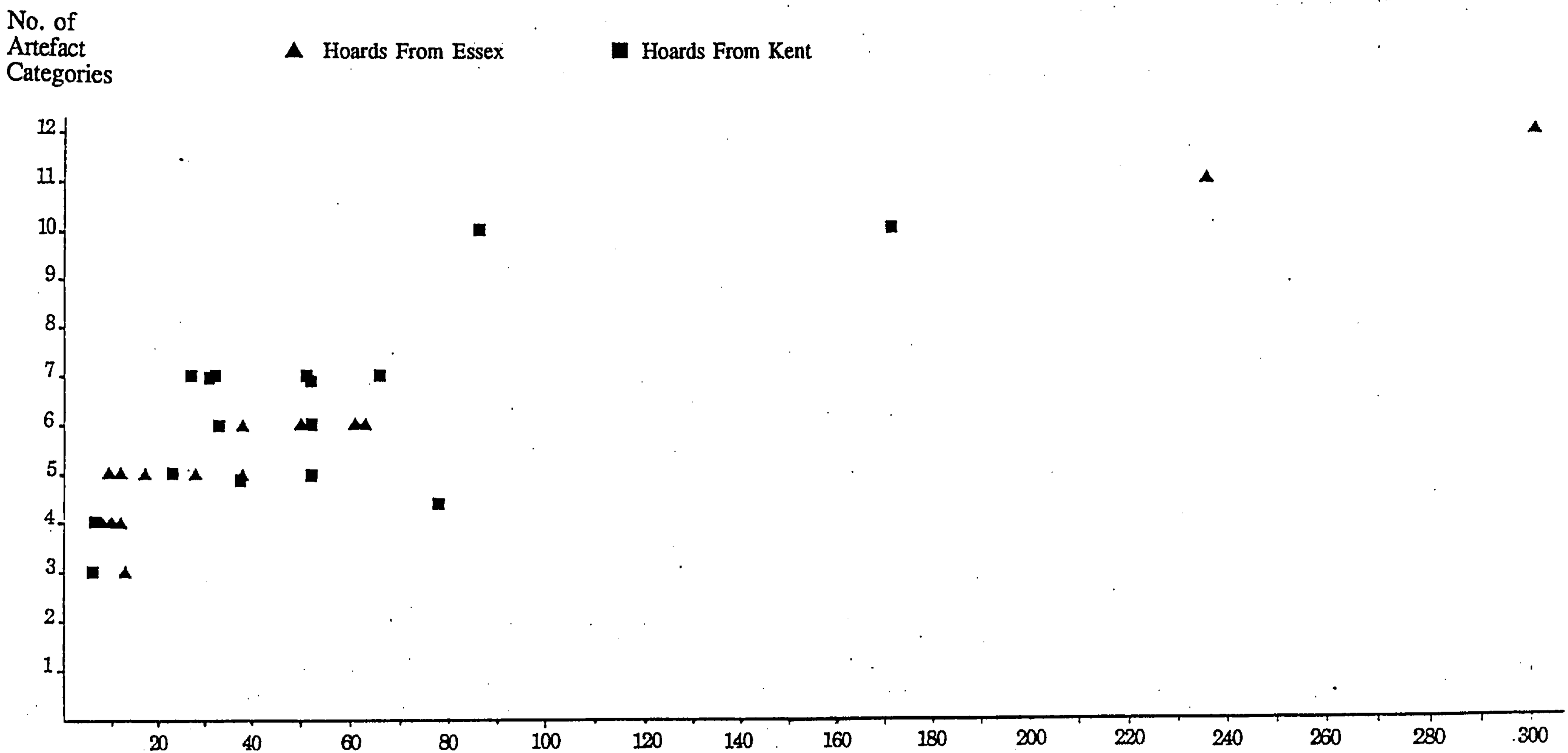


Fig. 2: The Relationship Between Hoard Size and the Number of Artefact Categories Occurring in the Mixed Category Hoards



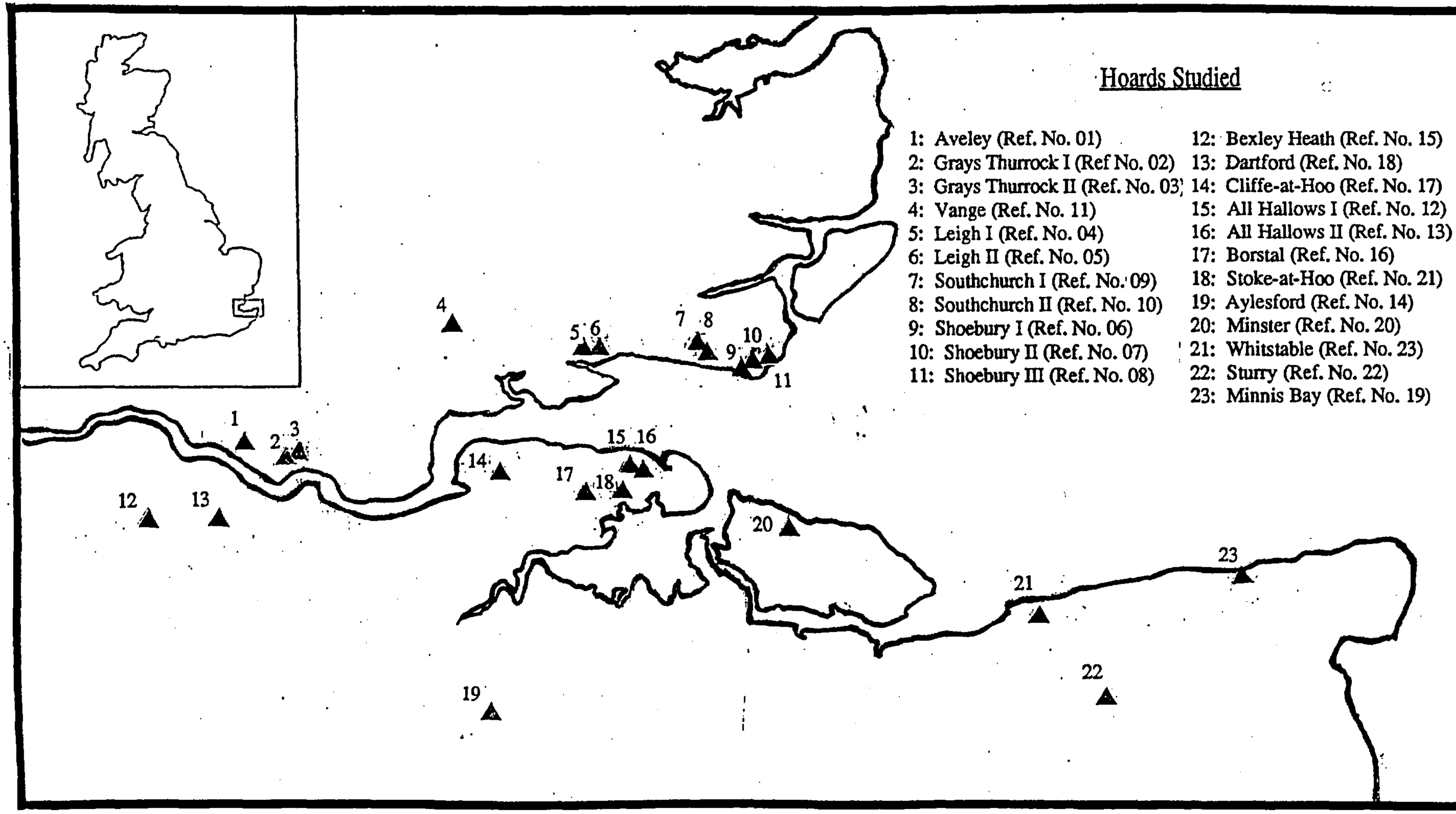
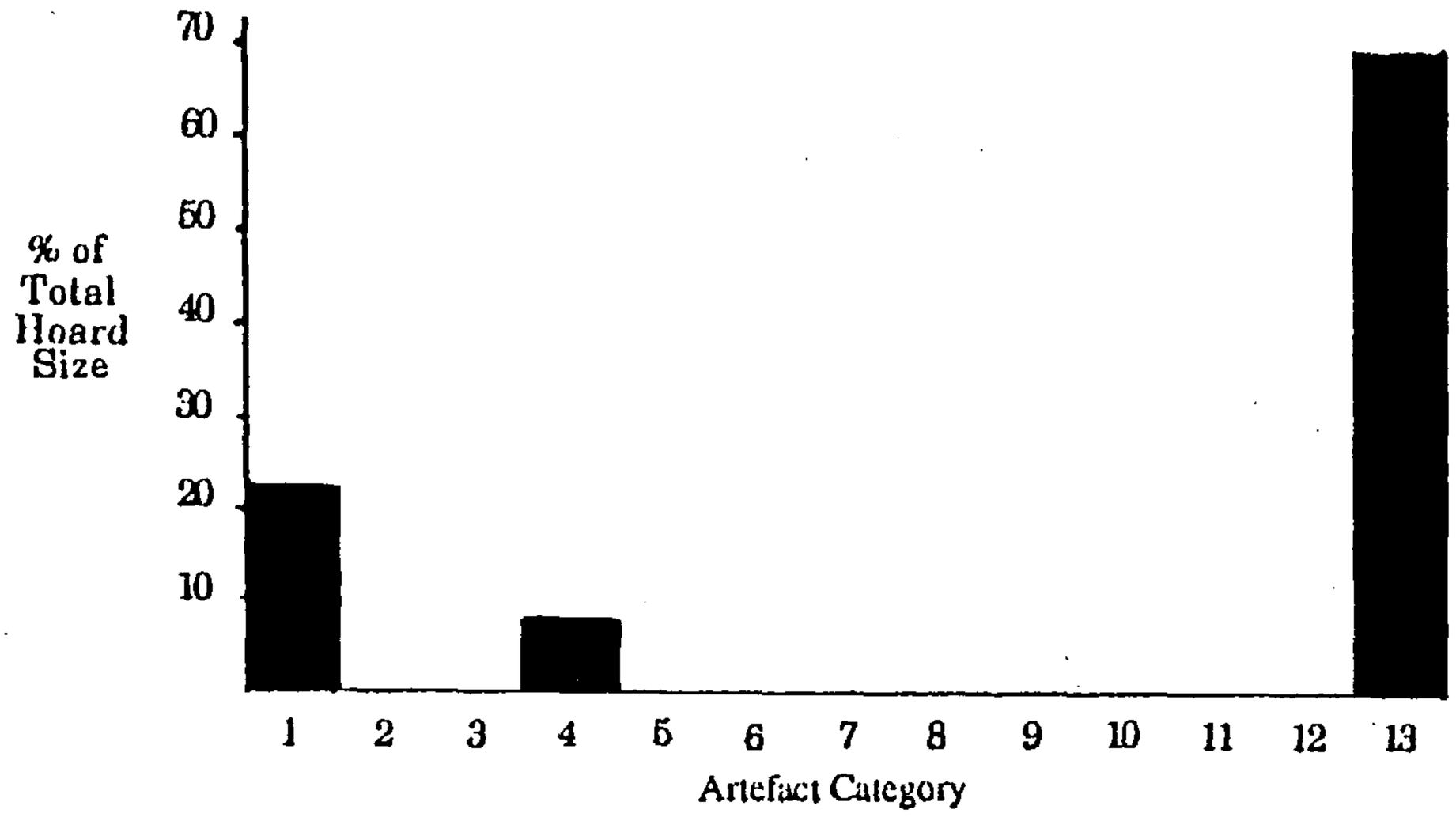


Fig. 3: Distribution Map Showing the Locations of the Hoards Studied

Fig. 4(a): The Artefact Categories Represented in the Group II Mixed Category Hoards of Essex

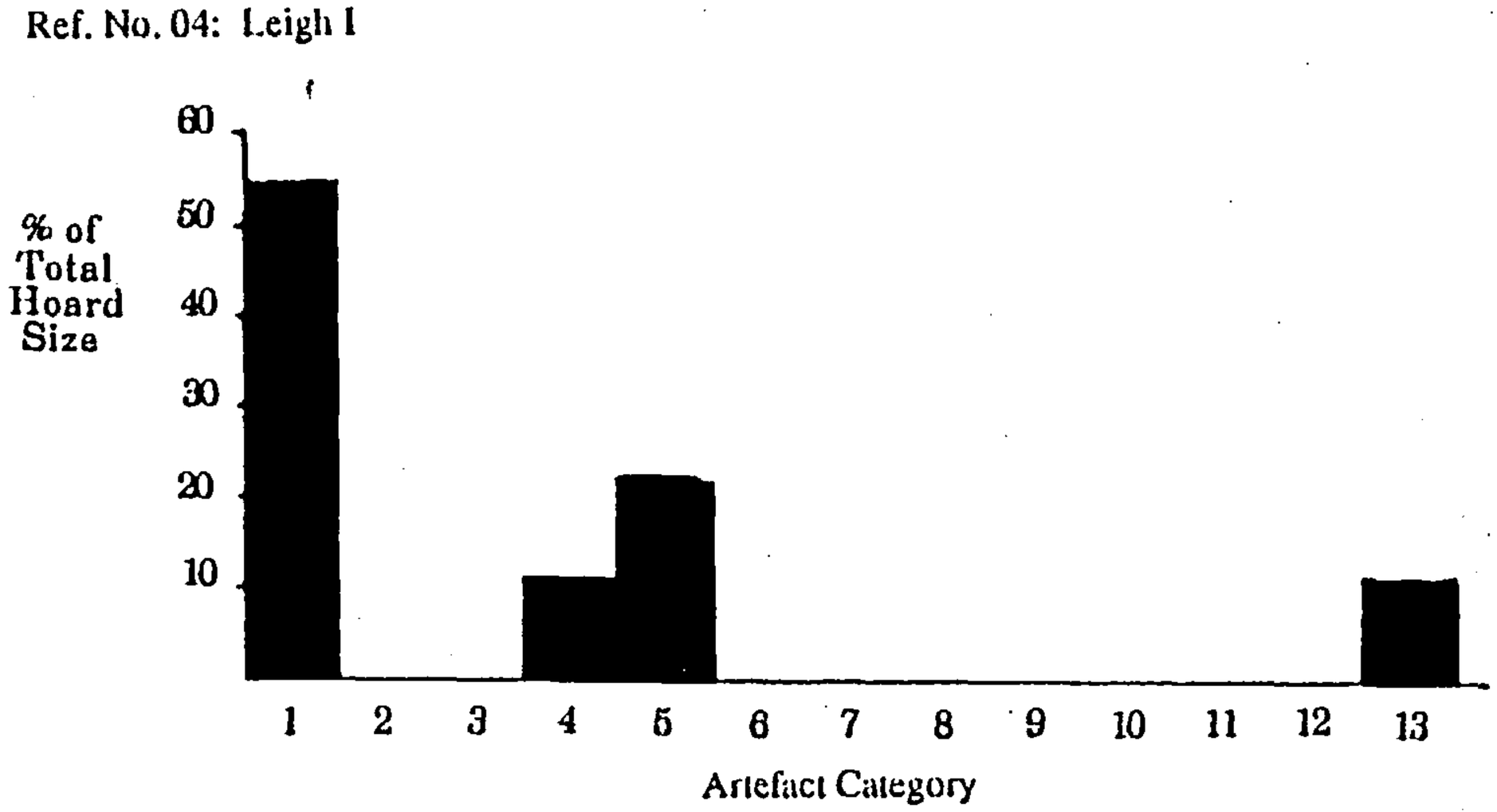
Ref. No. 03: Grays Thurrock II



Key to Artefact Categories

1 - Sockeled axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Ref. No. 04: Leigh I



Ref. No. 07: Shoebury II

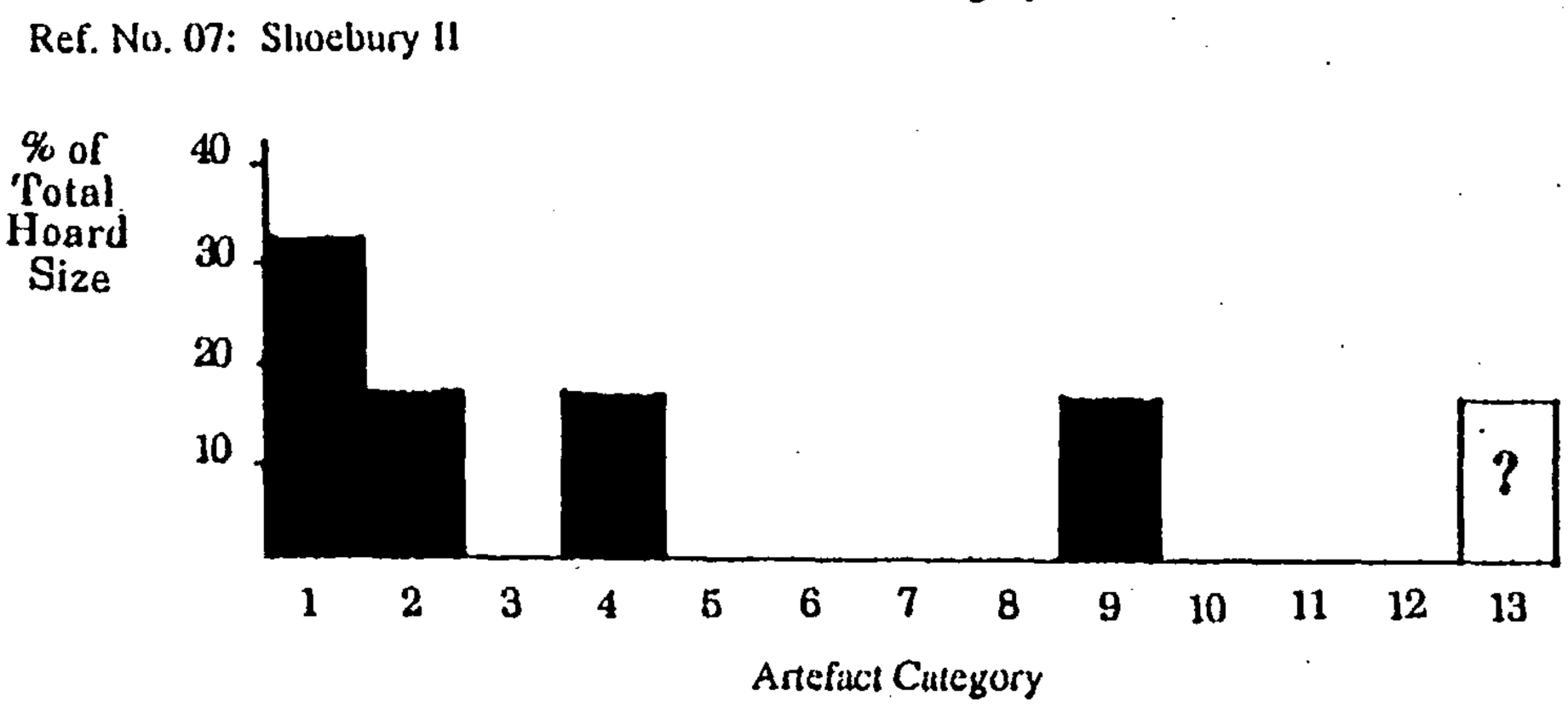
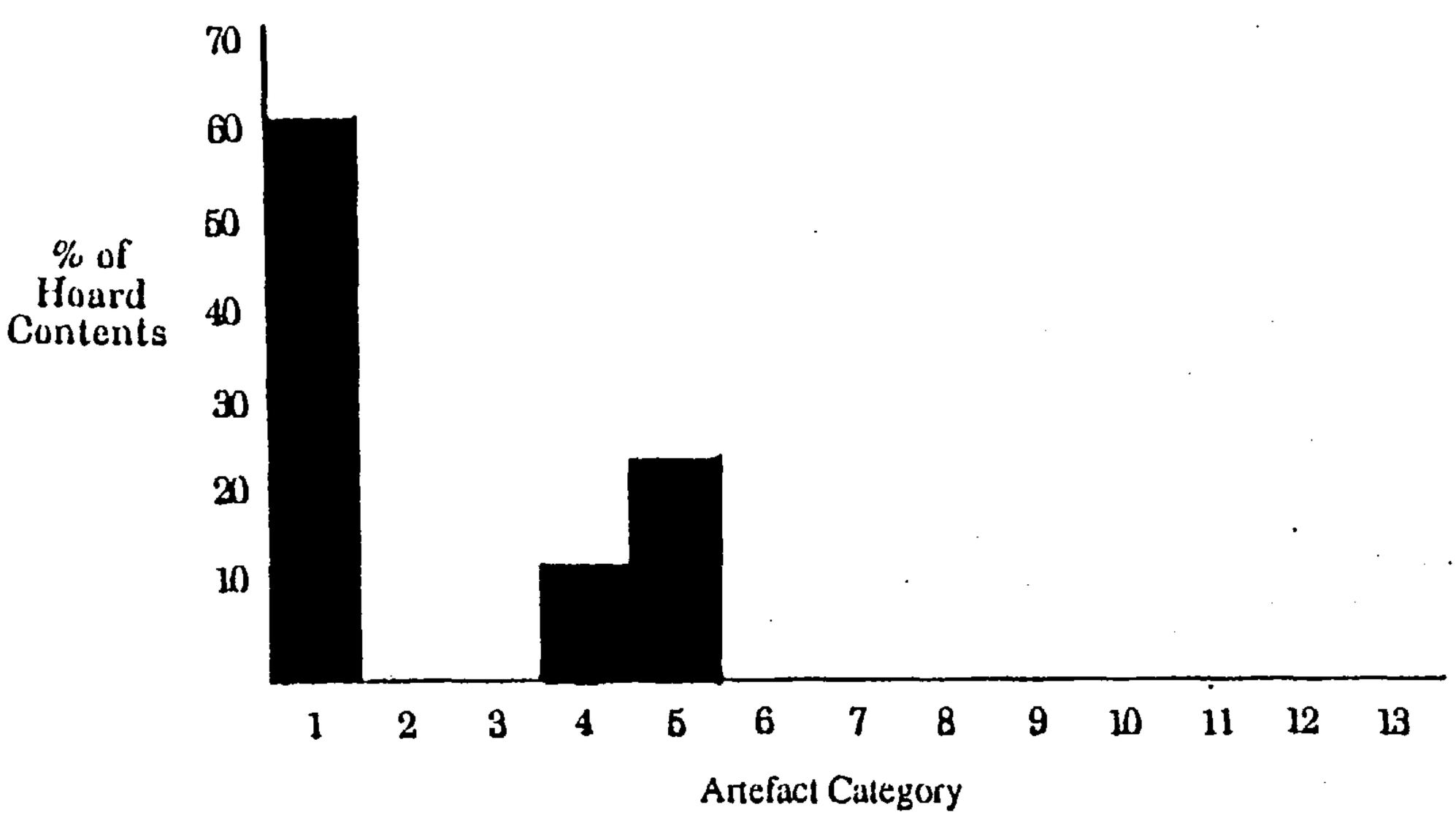


Fig. 4(b): The Artefact Categories Represented in the Group II Mixed Category Hoards of Kent



Key to Artefact Categories

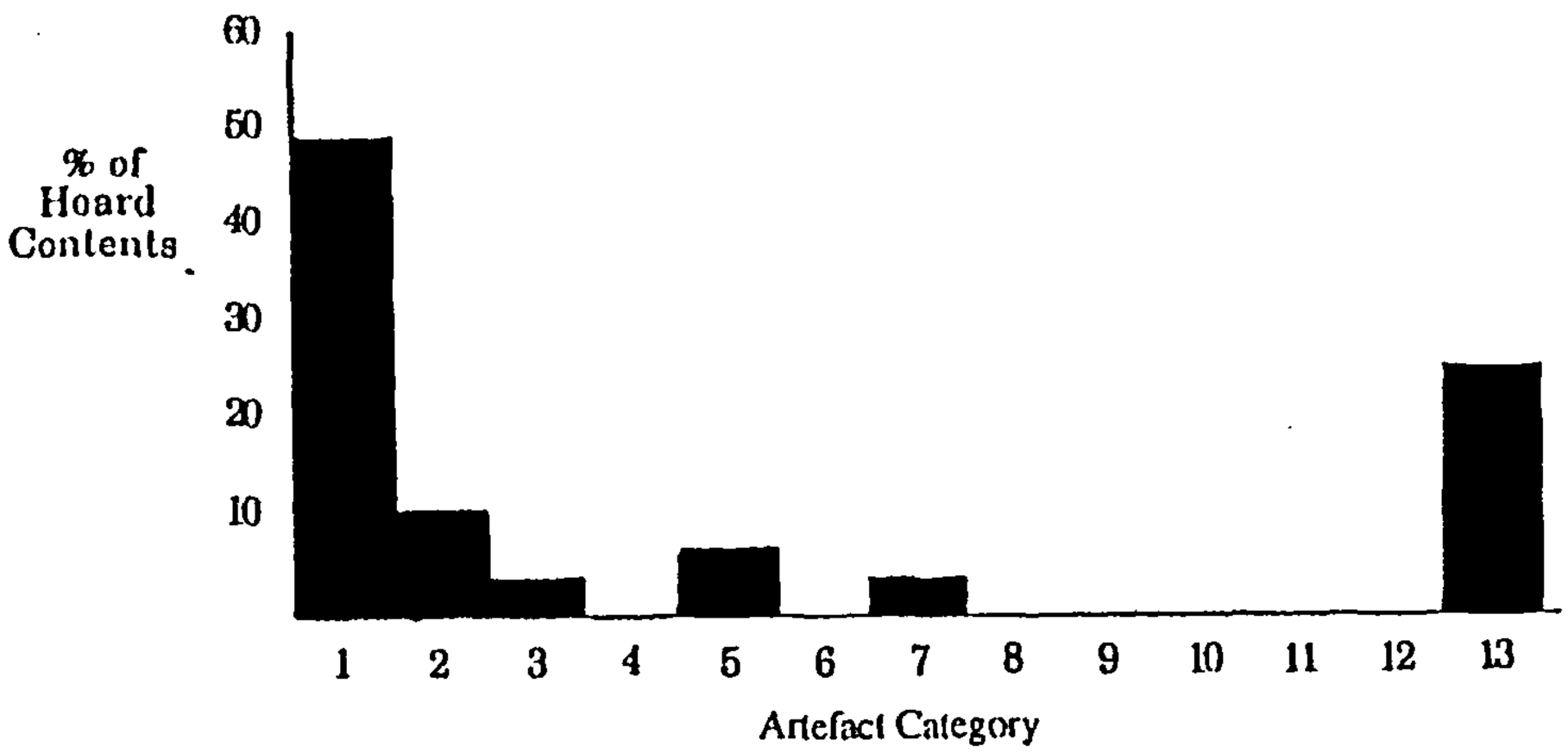
1 - Socketed axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Fig. 5(a): The Artefact Categories Represented in the Group III Mixed Category Hoards of Essex

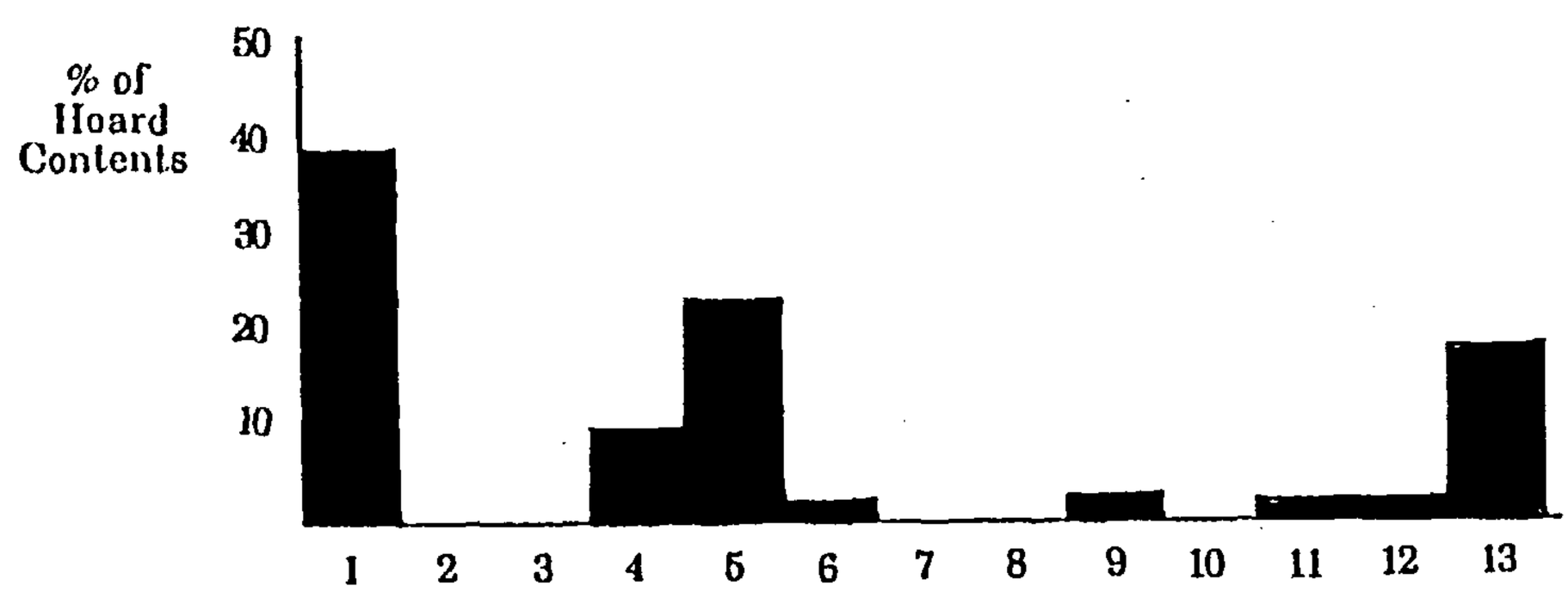
Key to Artefact Categories

1 - Socketed axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Ref. No. 06: Shoebury I



Ref. No. 09: Southchurch I



Ref. No. 11: Vange

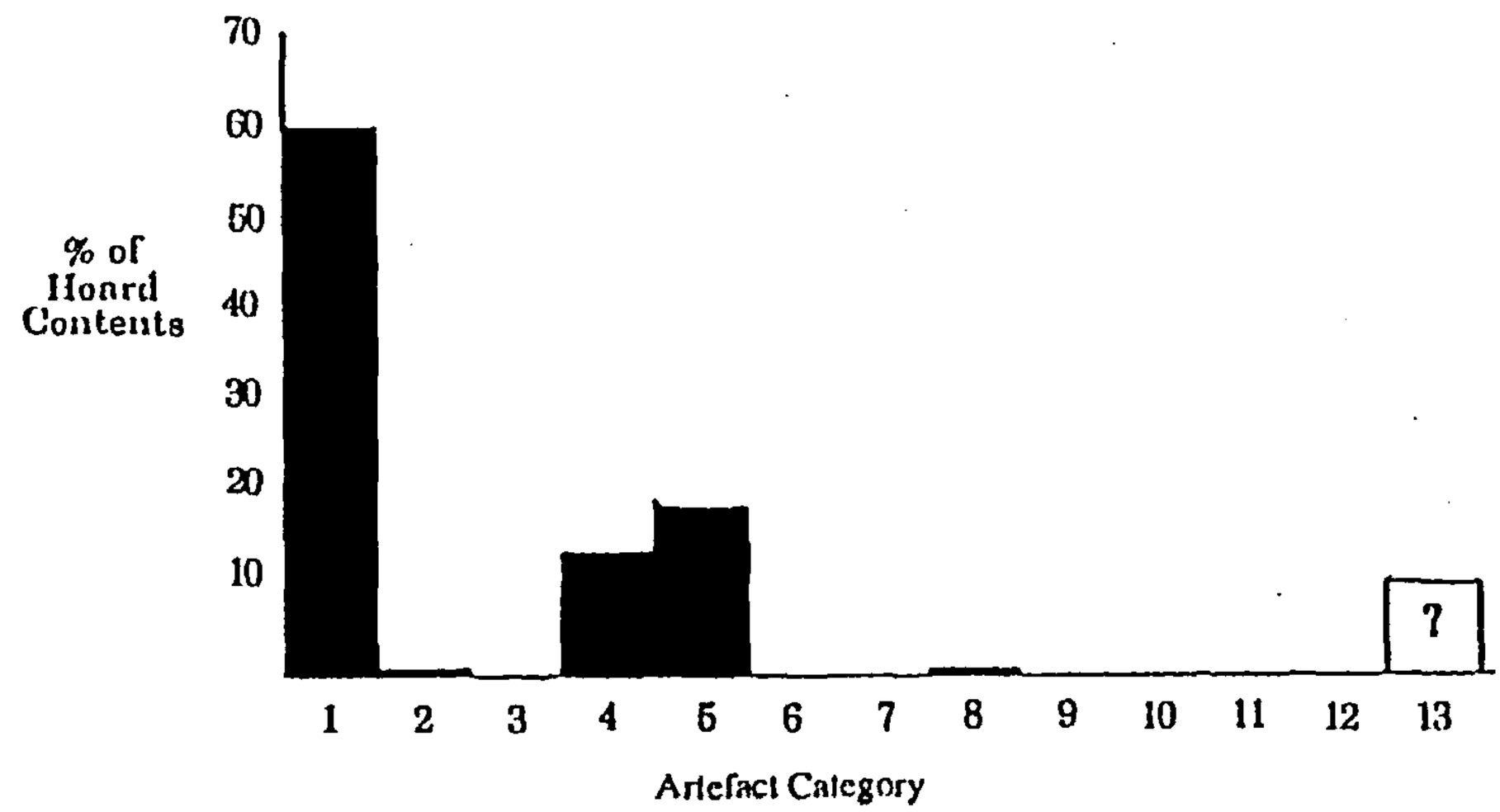
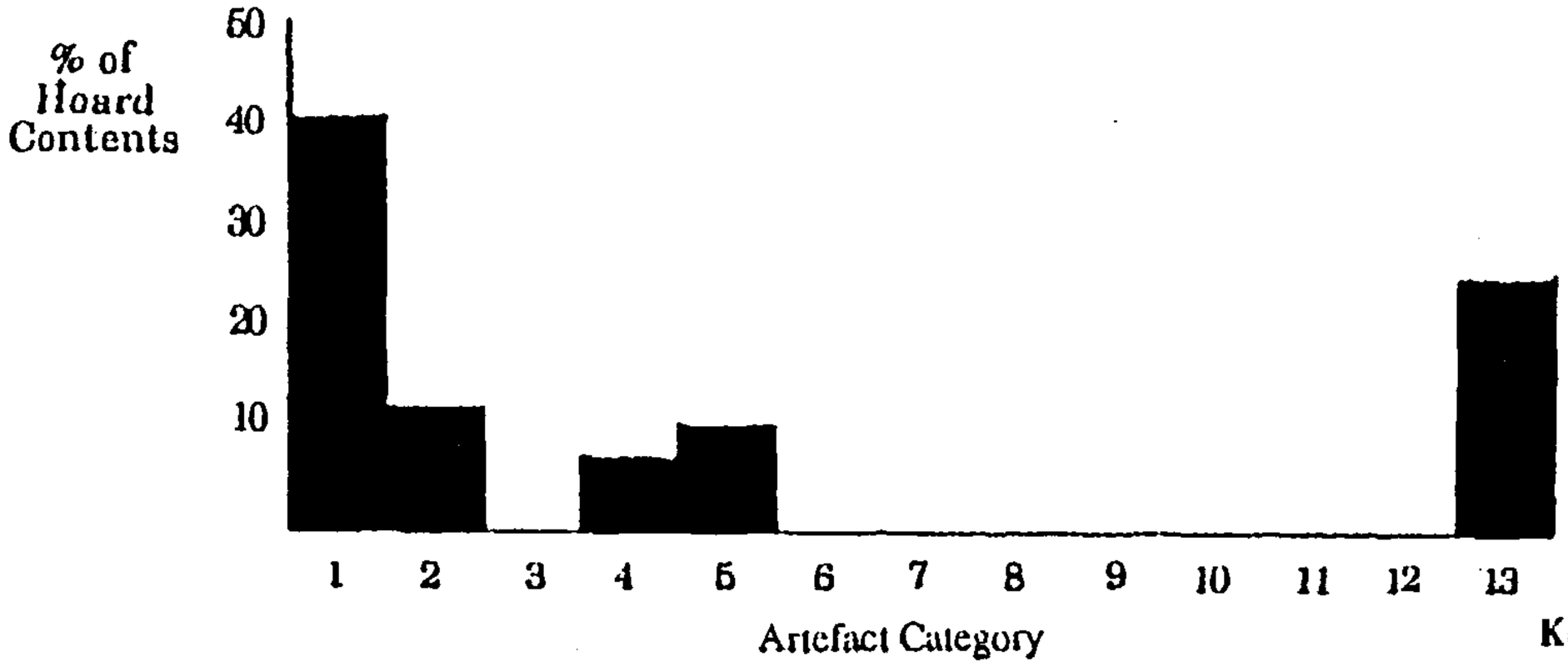
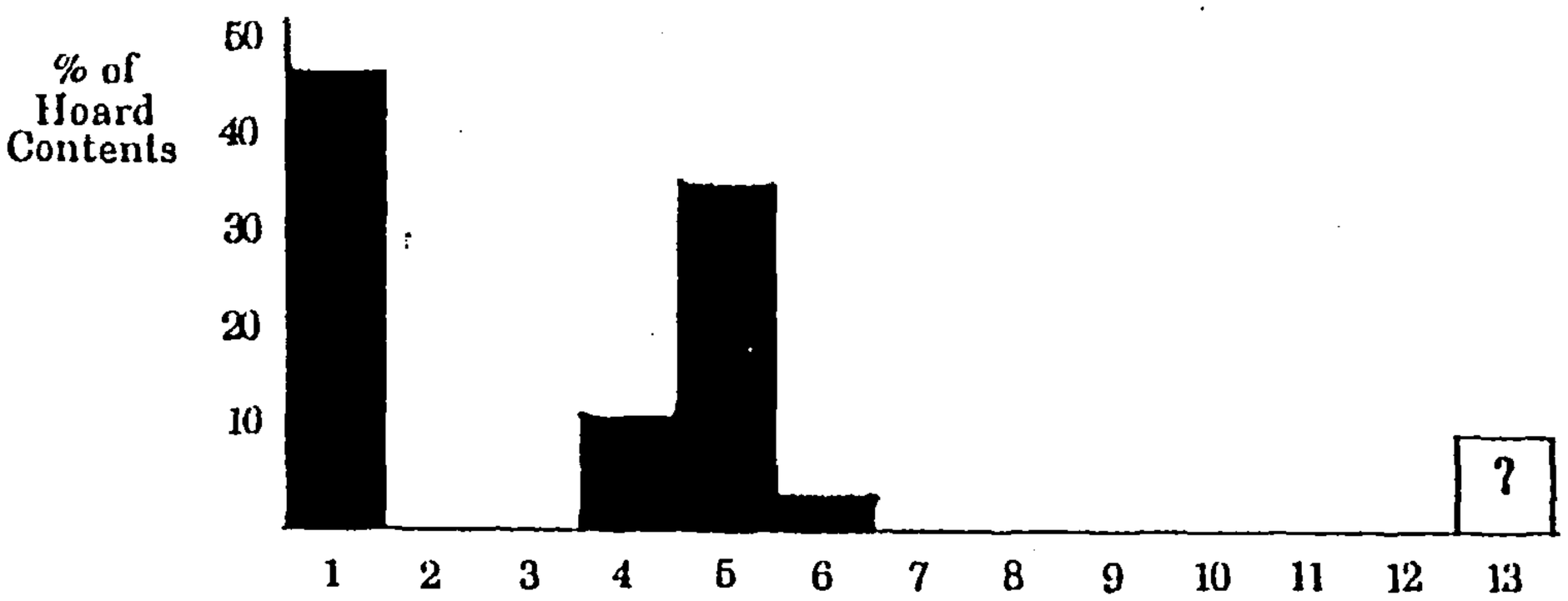


Fig. 5(b): The Artefact Categories Represented in the Group III Mixed Category Hoards of Kent (i)

Ref. No. 12: All Hallows I



Ref. No. 13: All Hallows II



Key to Artefact Categories

1 - Socketed axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Ref. No. 15: Bexley Heath

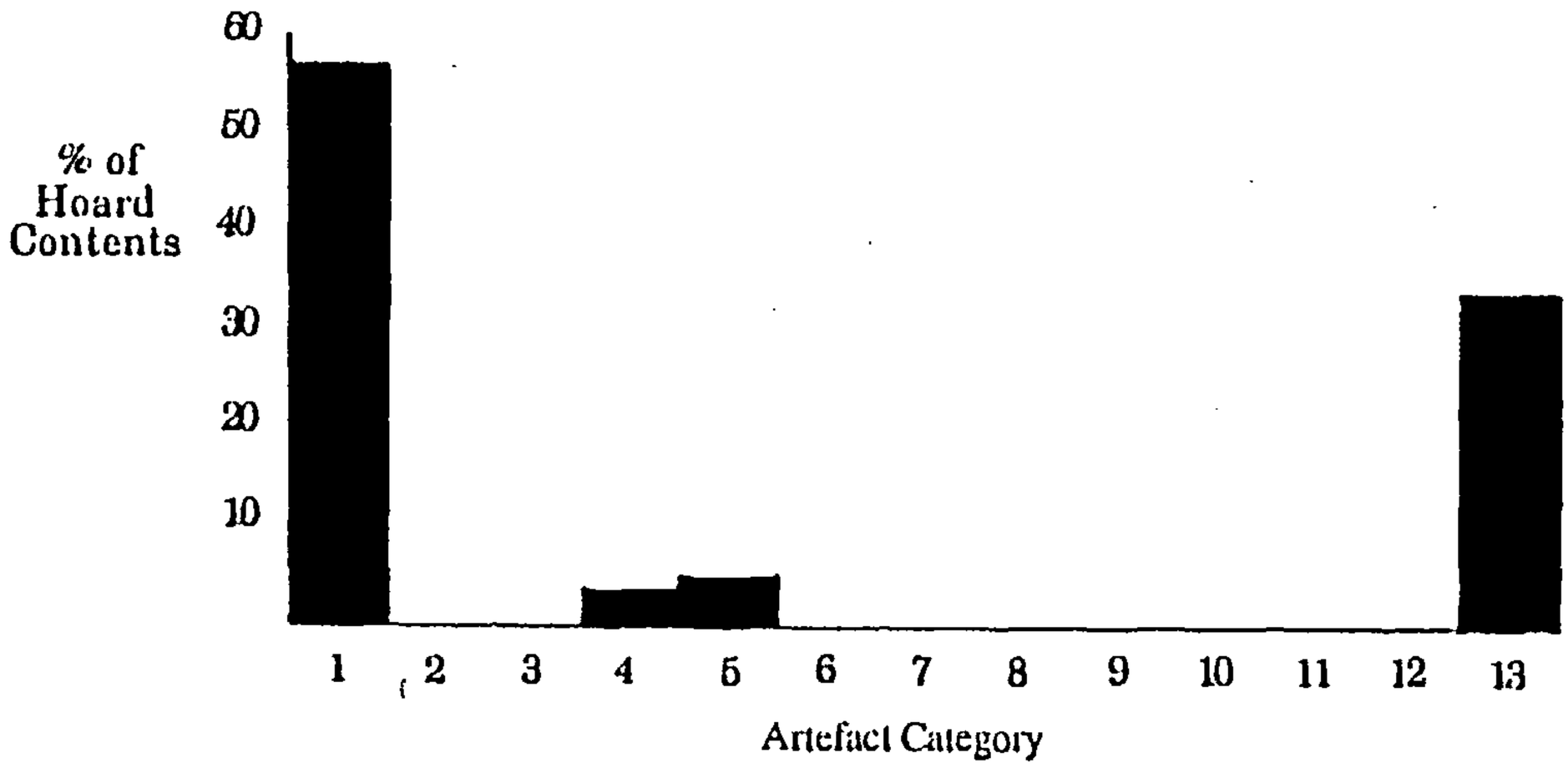
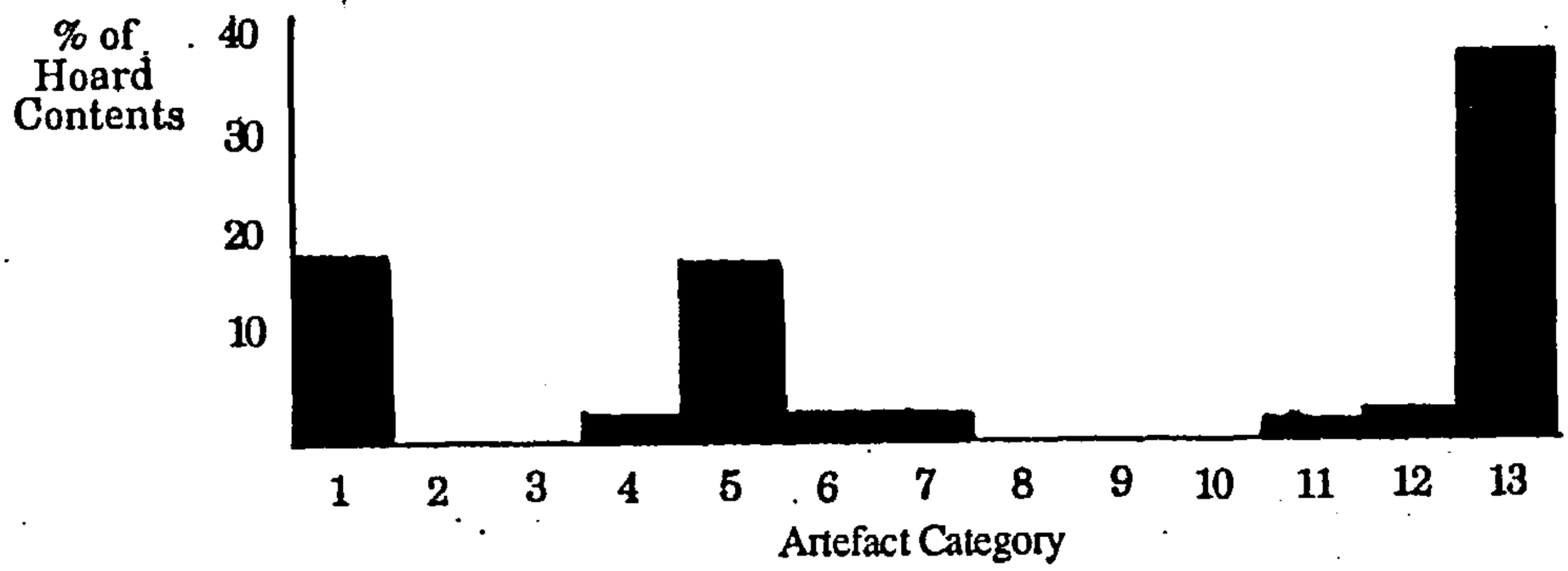


Fig. 5(c): The Artefact Categories Represented in the Group III Mixed Category Hoards of Kent (ii)

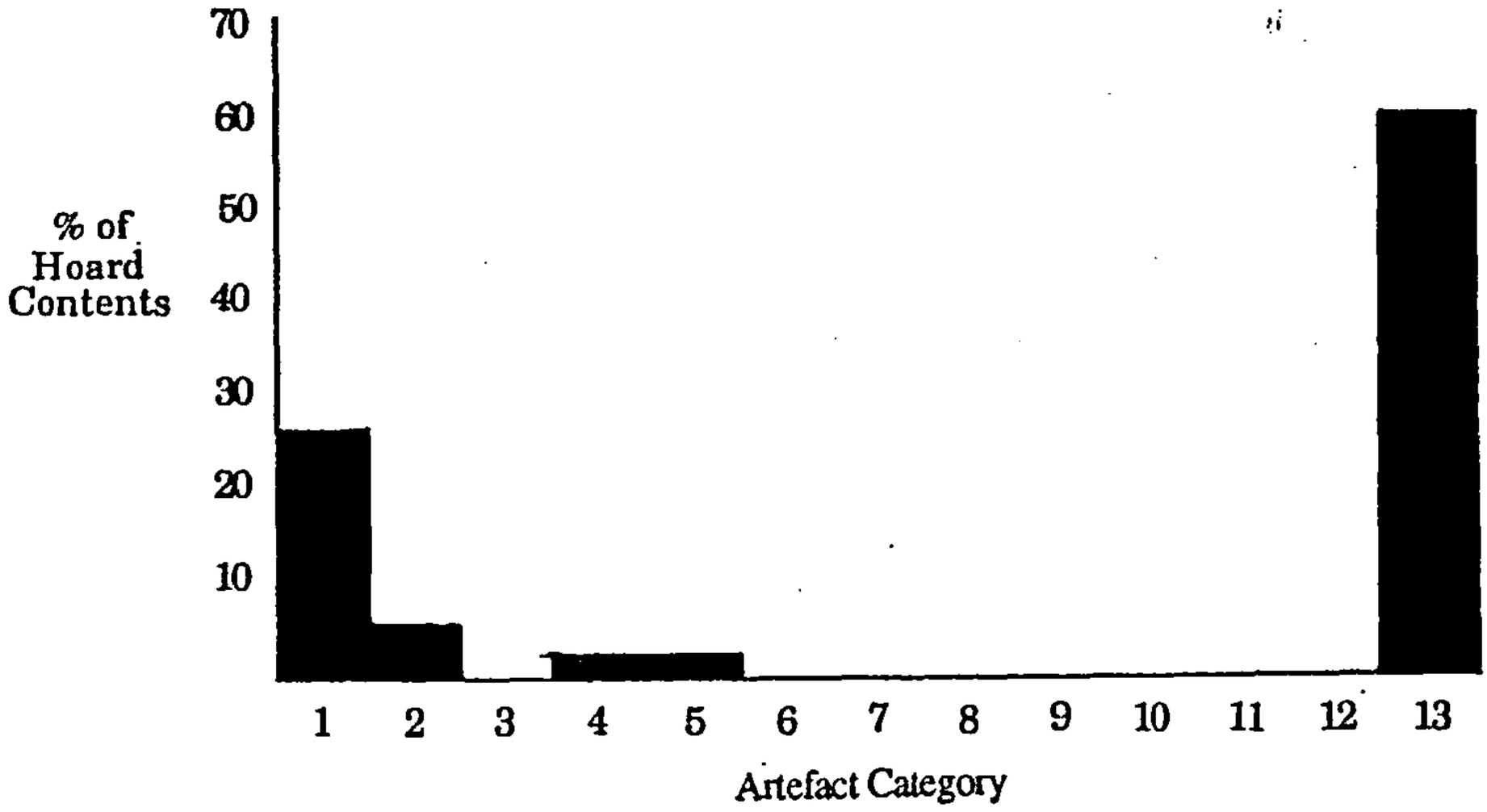
Key to Artefact Categories

1 - Socketed axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Ref. No. 16: Borstal



Ref. No. 18: Dartford



Ref. No. 19: Minnis Bay

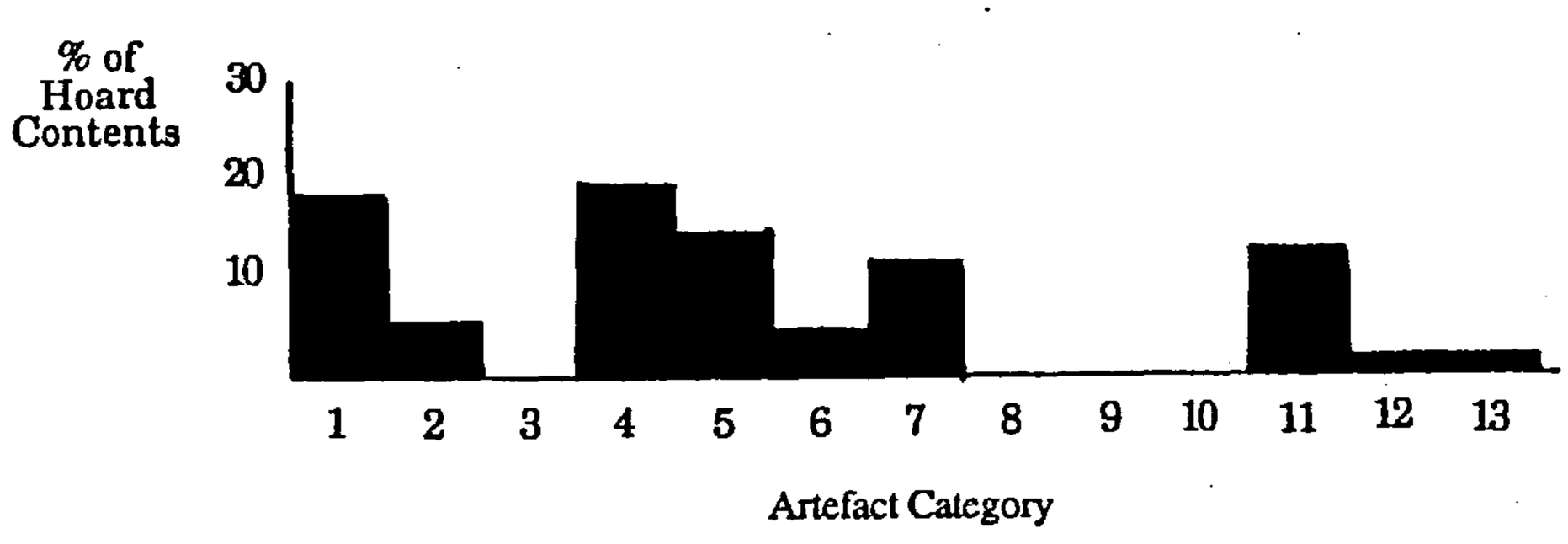
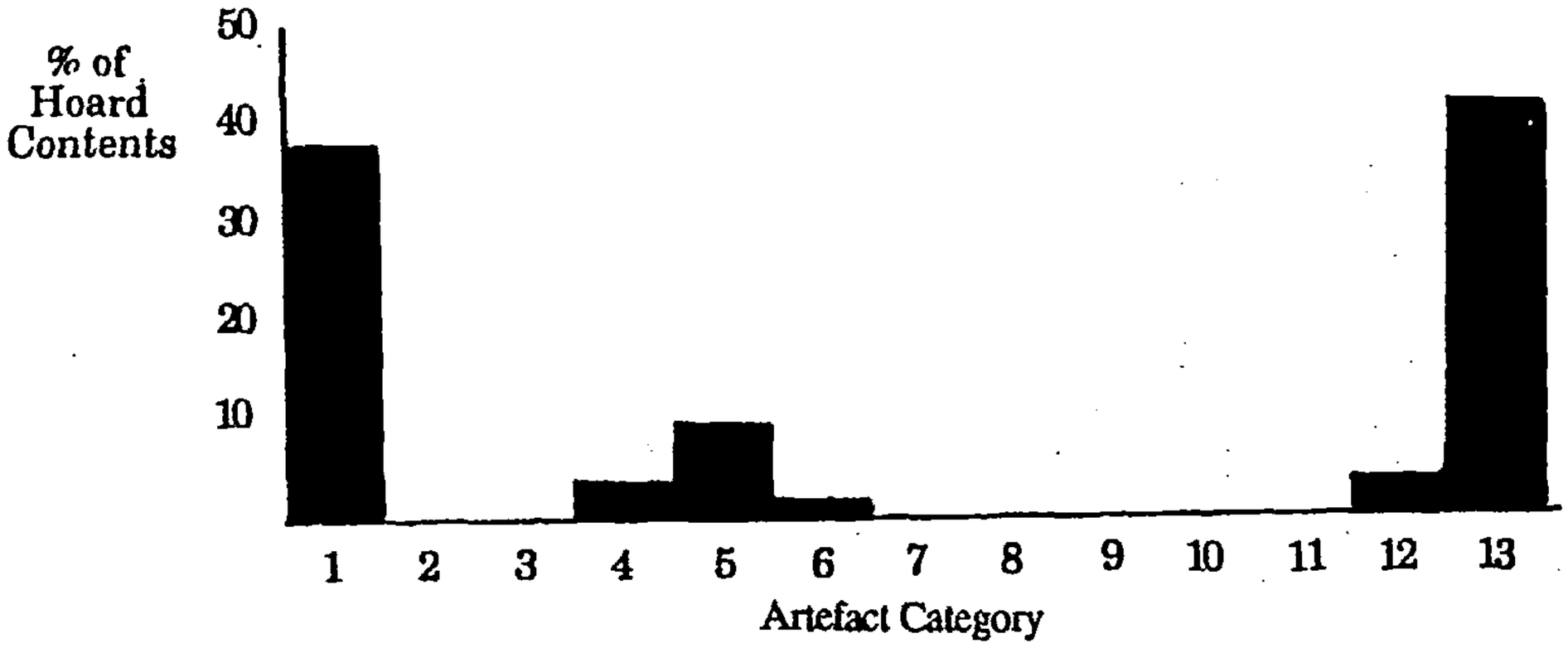


Fig. 5(d): The Artefact Categories Represented in the Group III Mixed Category Hoards of Kent (iii)

Key to Artefact Categories

1 - Socketed axes
2 - Winged Axes
3 - Palstaves
4 - Small Tools
5 - Weaponry
6 - Weapon Fittings
7 - Ornament
8 - Decorative Fittings
9 - Other Fittings
10 - Cauldrons
11 - Scrap Metal
12 - Metalworking
13 - Ingot Metal

Ref. No. 21: Stoke-at-Hoo



Ref. No. 23: Whitstable

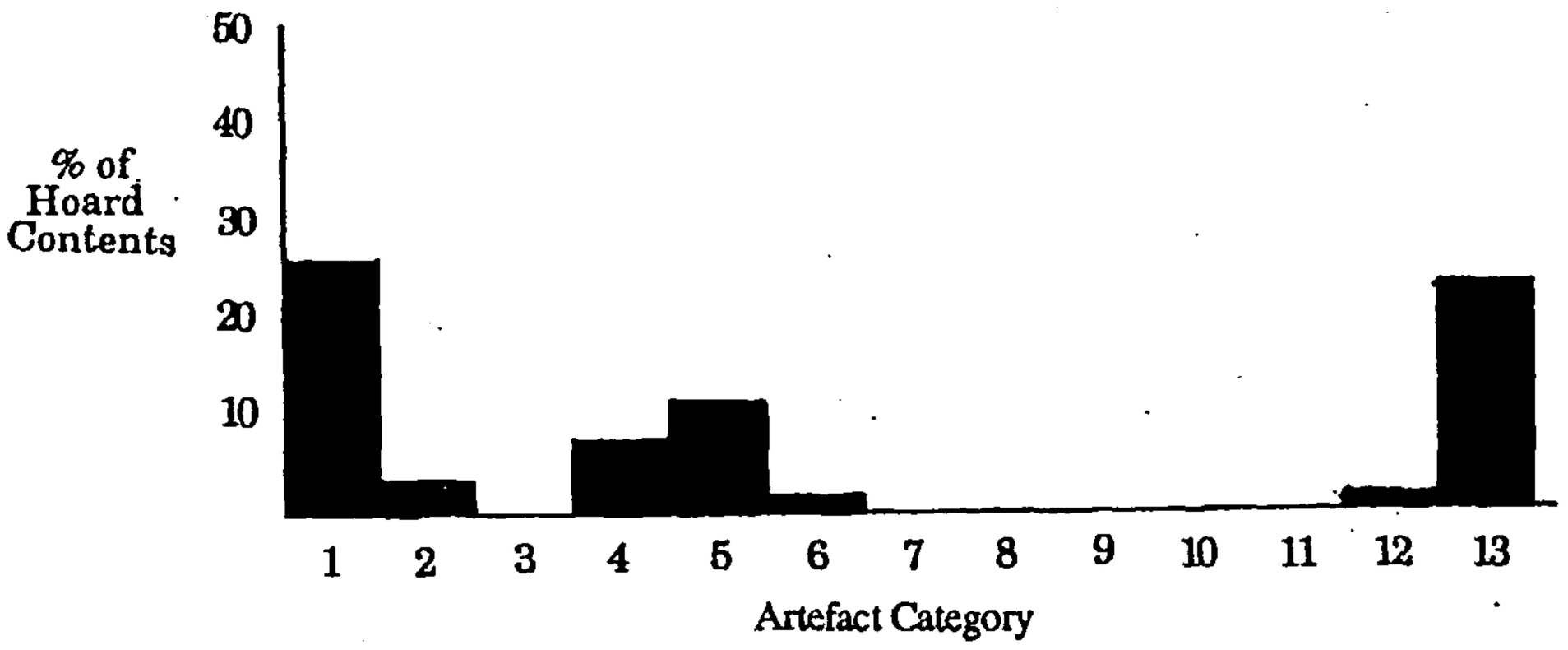


Fig. 6: The Artefact Categories Represented in the Group IV Mixed Category Hoards

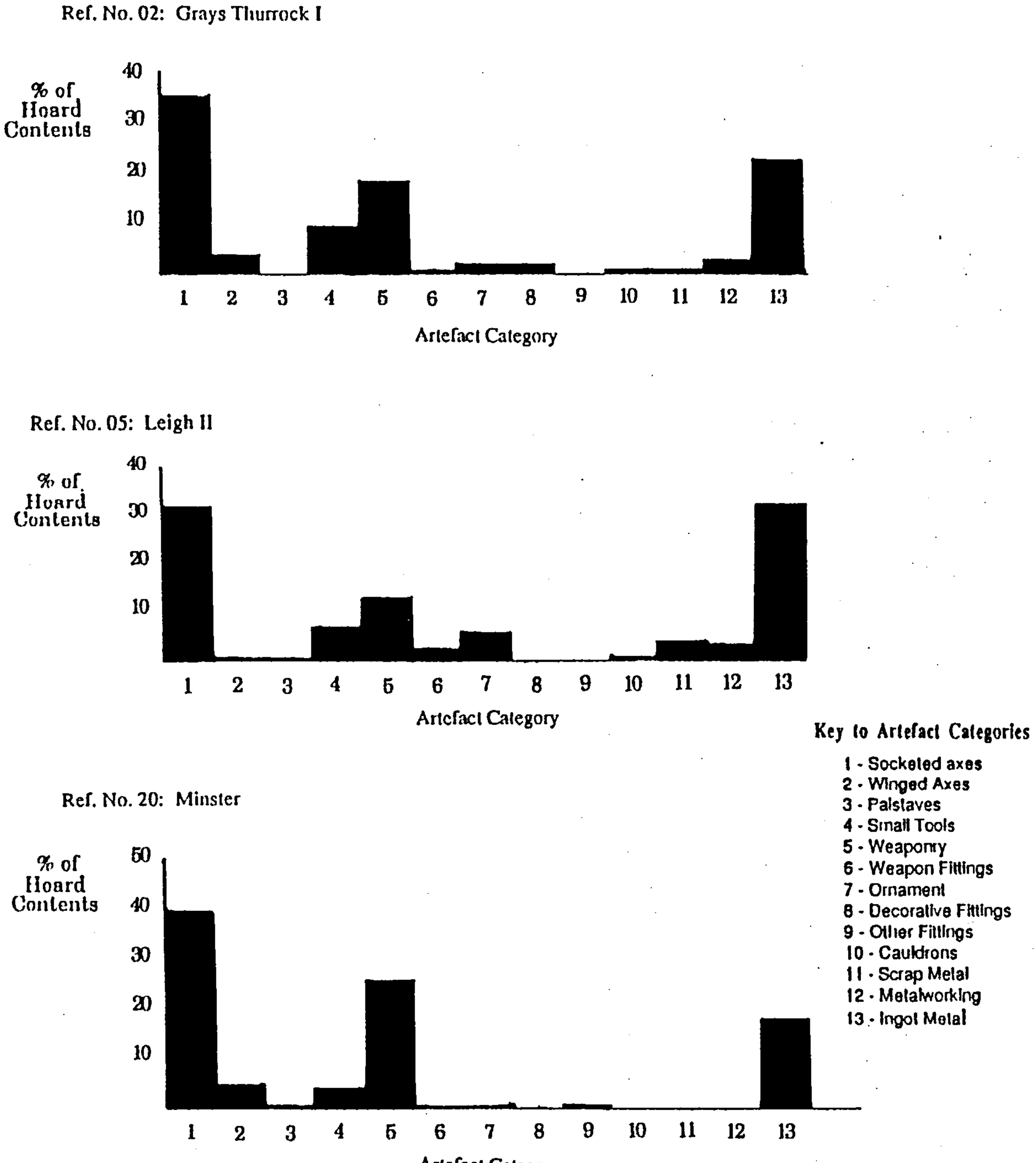
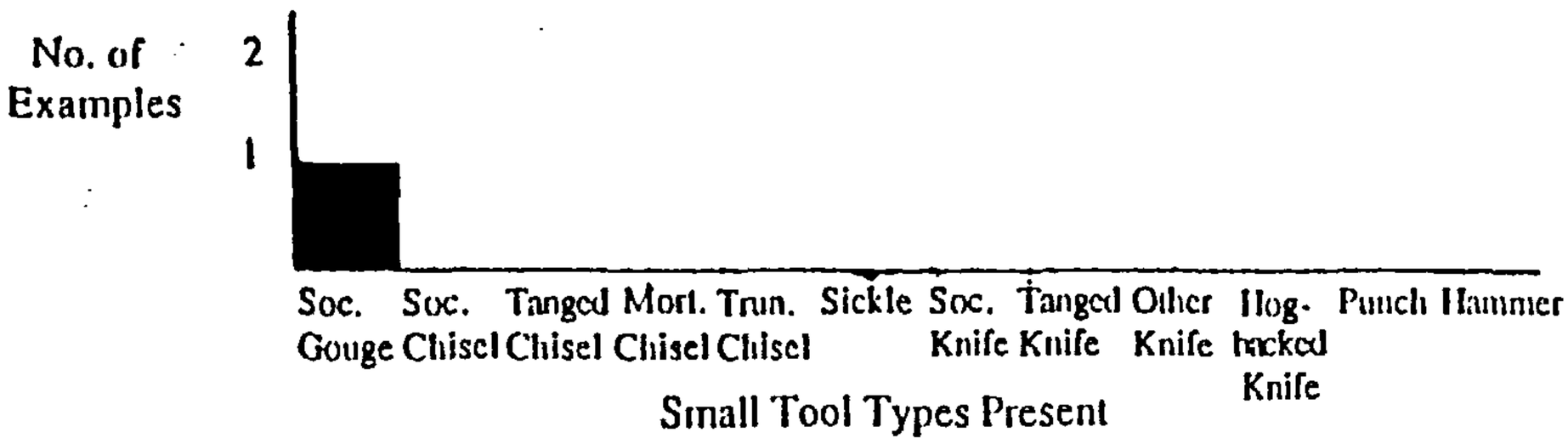


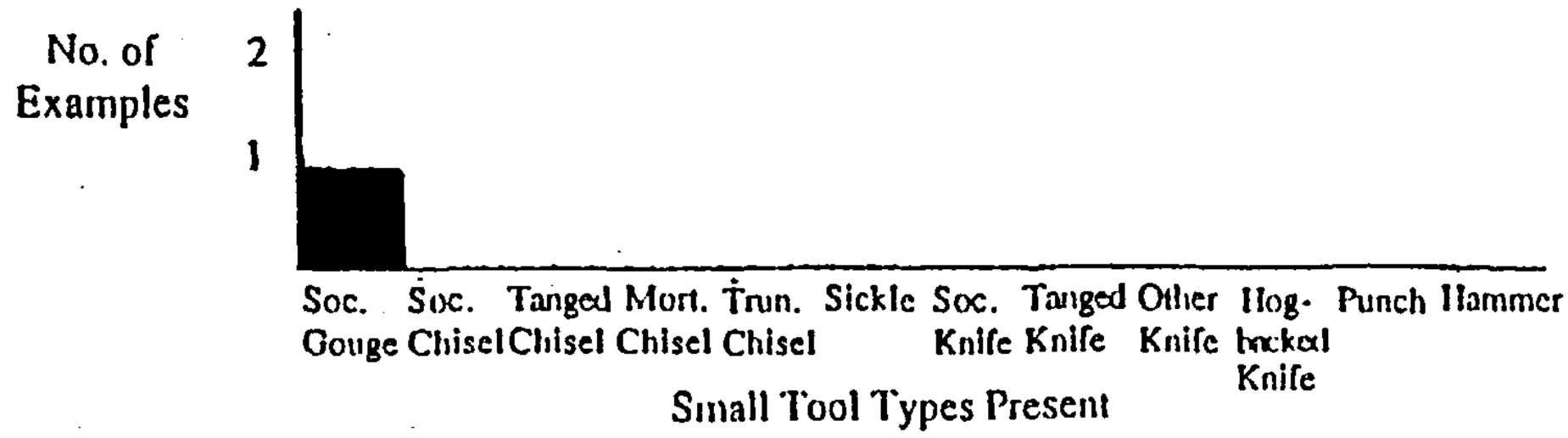
Fig. 7: The Range of Small Tool Types Present in the Group II Mixed Category Hoards

1) Essex

Ref. No. 03: Grays Thurrock II



Ref. No. 04: Leigh I



Ref. No. 07: Shoebury II - No Small Tool Types Present

2) Kent

Ref. No. 17: Cliffe-at-Hoo

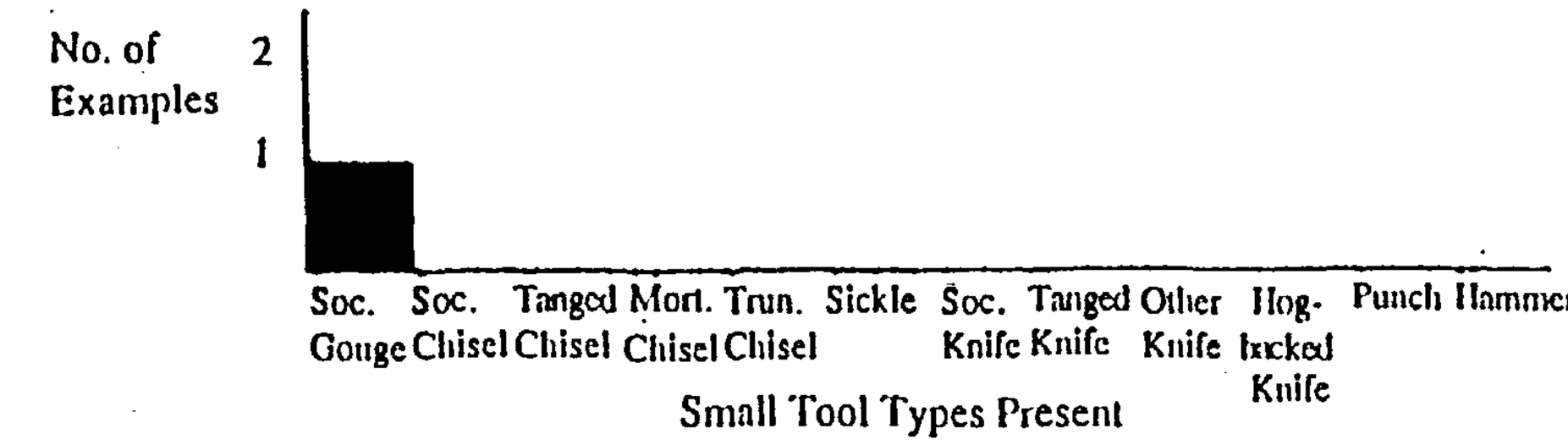
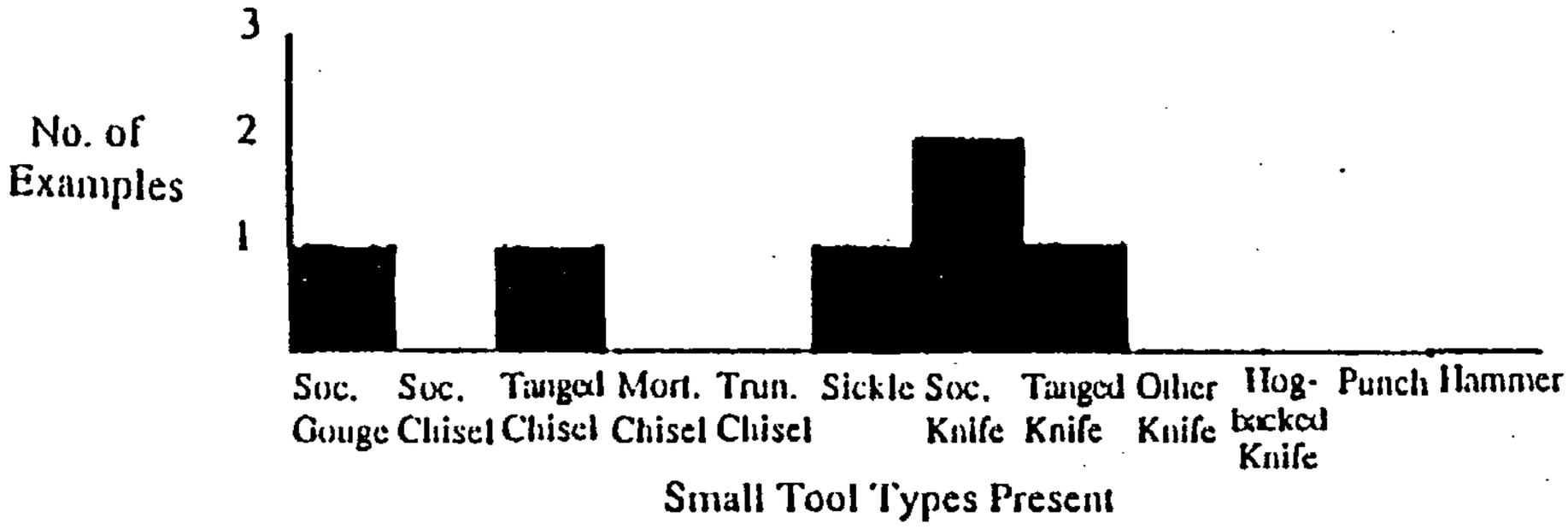


Fig. 8(a): The Range of Small Tool Types Present in the Group III Mixed Category Hoards of Essex

Ref. No. 06: Shoebury I - No Small Tool Types Present

Ref. No. 09: Southchurch I



Ref. No. 11: Vange

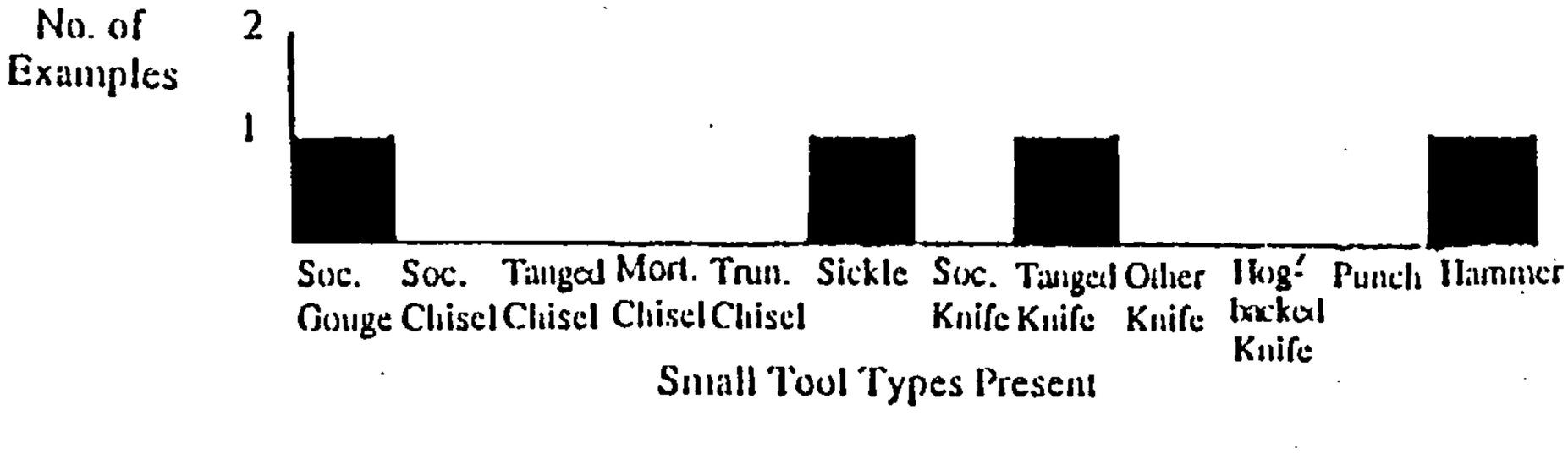
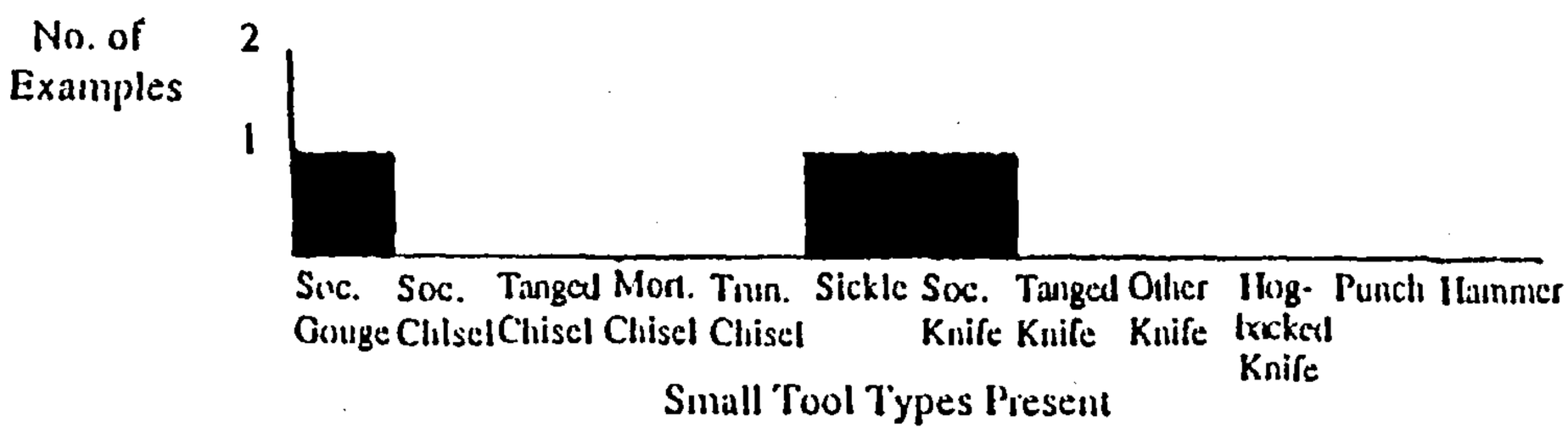
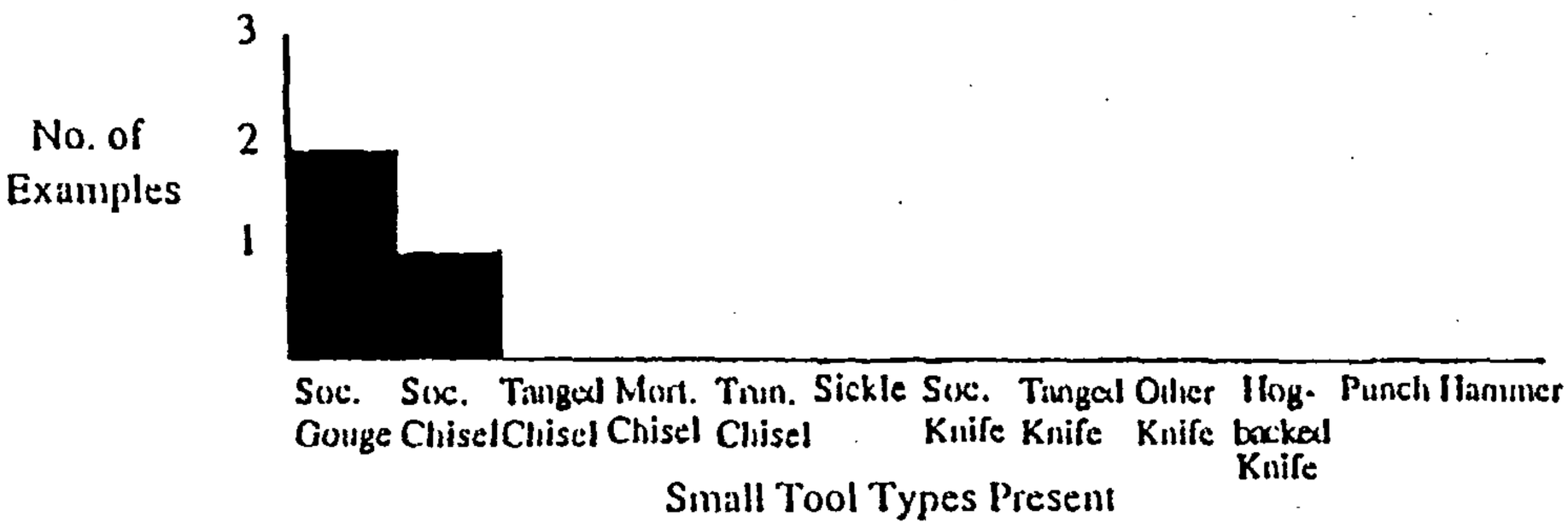


Fig. 8(b): The Range of Small Tool Types Present in the Group III Mixed Category Hoards of Kent (i)

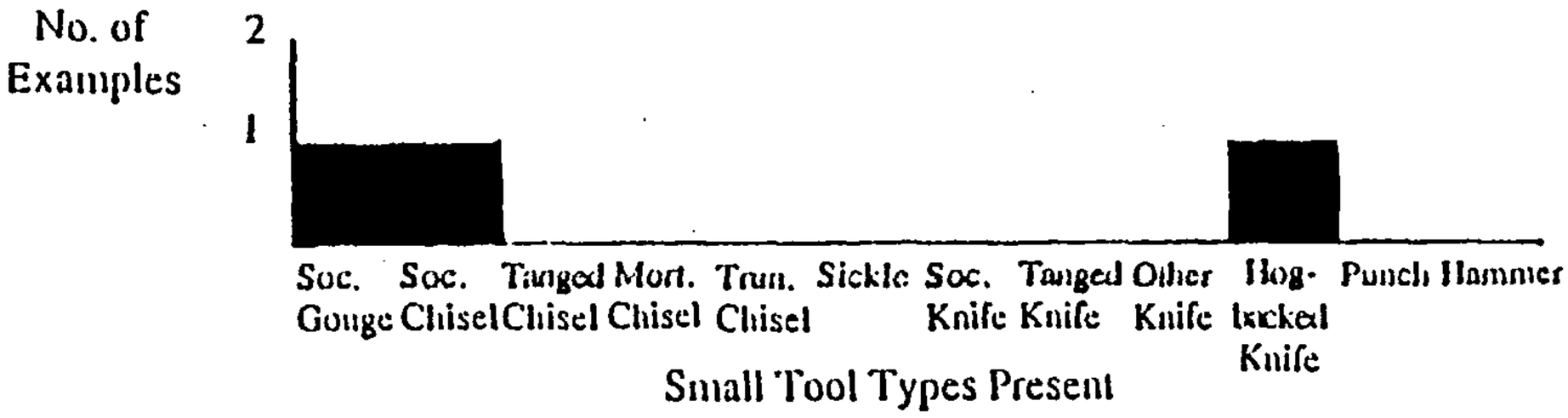
Ref. No. 12: All Hallows I



Ref. No. 13: All Hallows II



Ref. No. 15: Bexley Heath



Ref. No. 16: Borstal

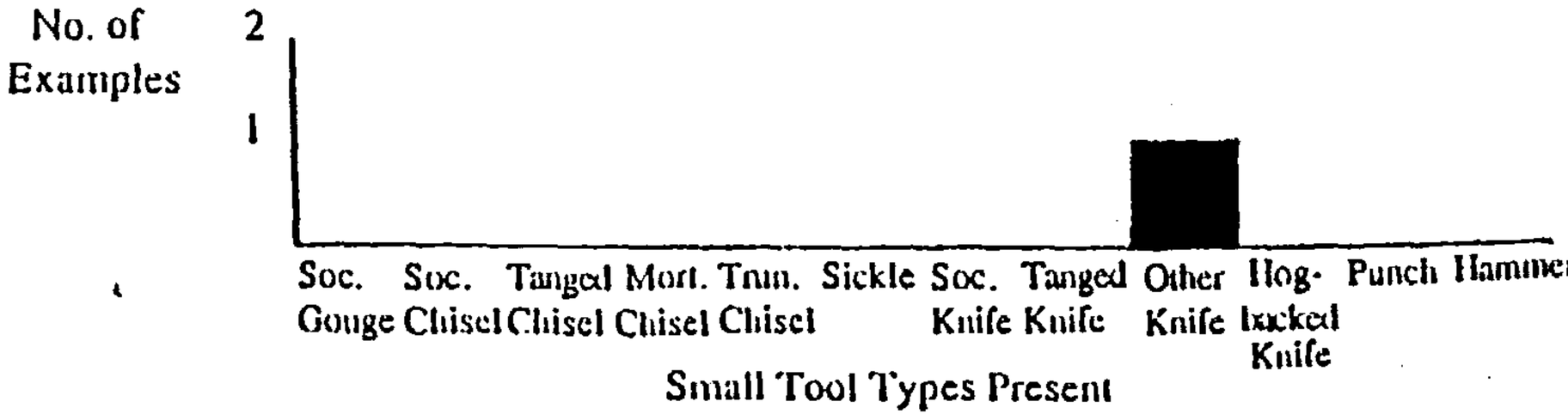
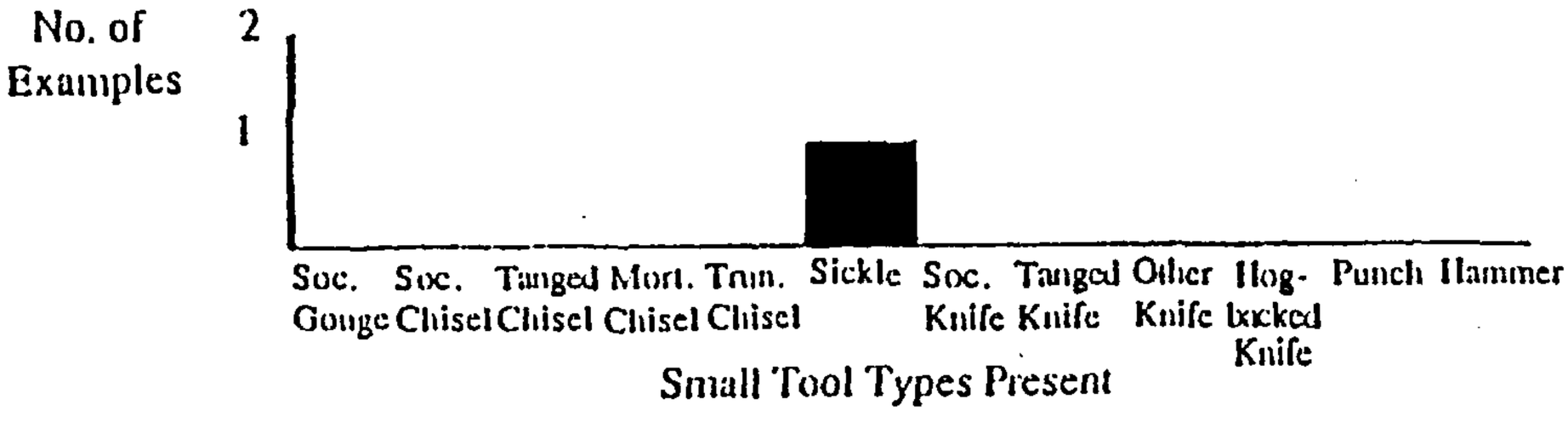
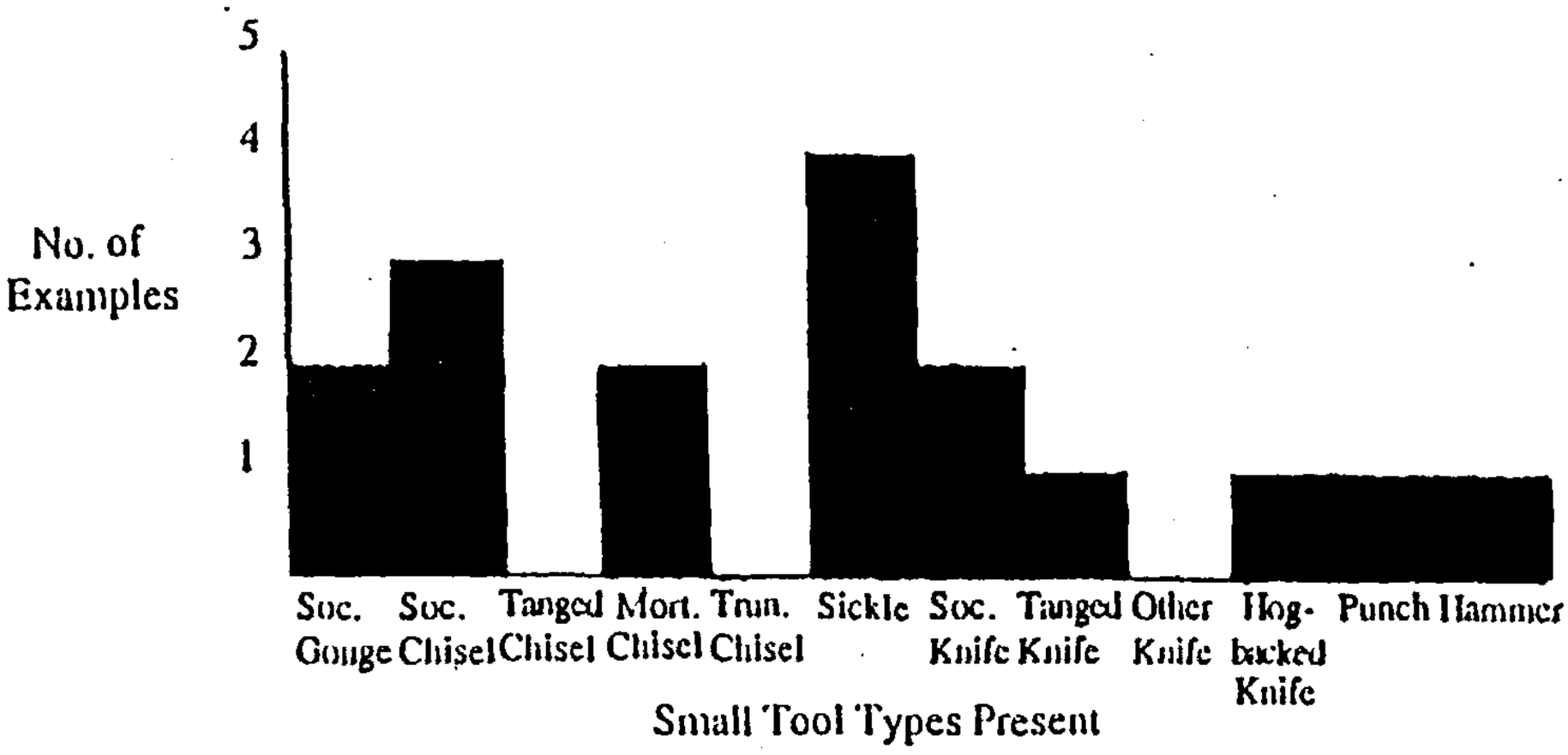


Fig. 8(c): The Range of Small Tool Types Present in the Group III Mixed Category Hoards of Kent (ii)

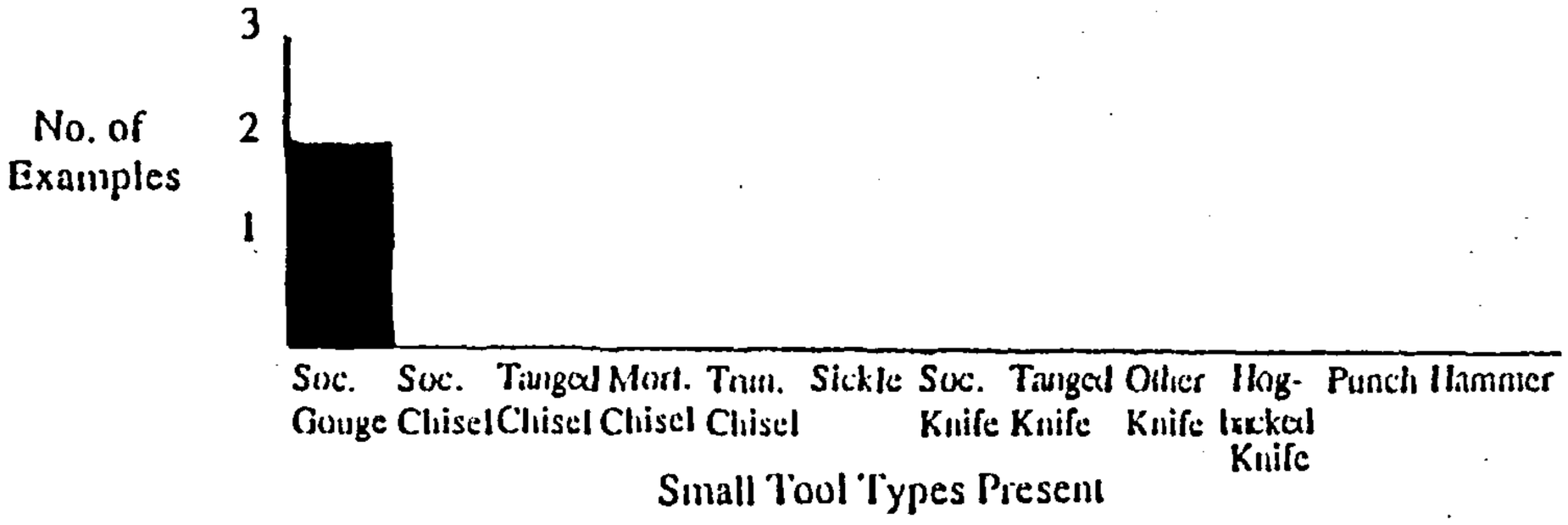
Ref. No. 18: Dartford



Ref. No. 19: Minnis Bay



Ref. No. 21: Stoke-at-Hoo



Ref. No. 23: Whitstable

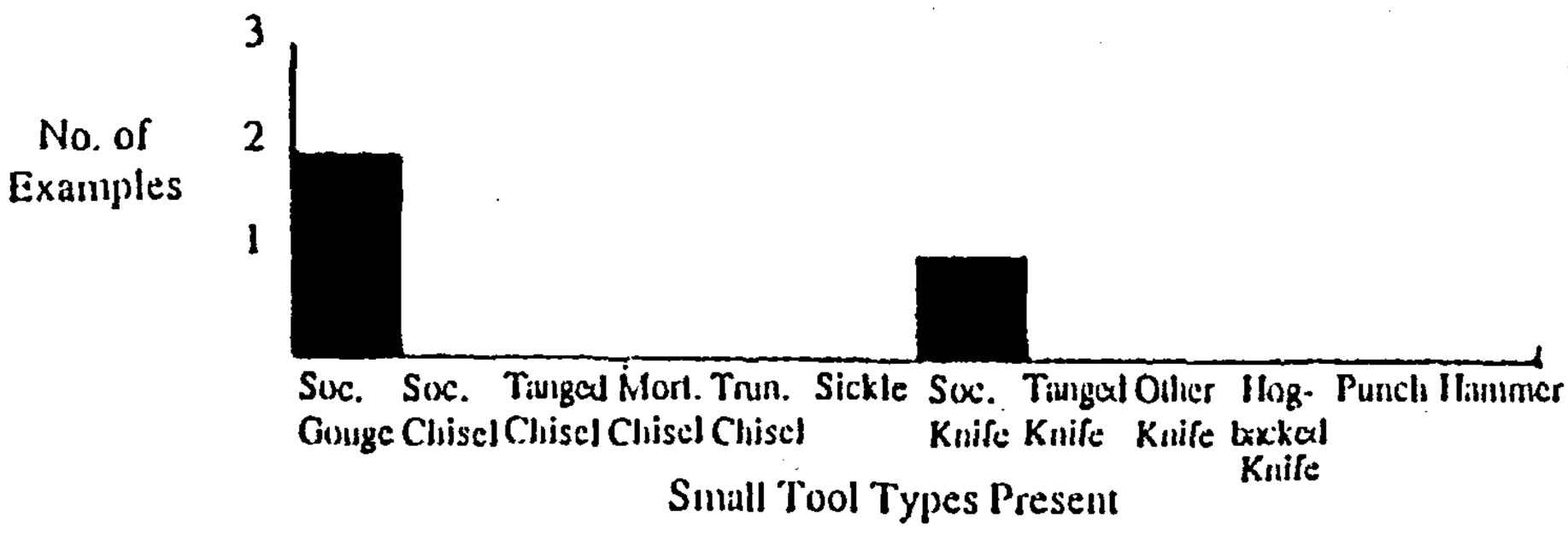
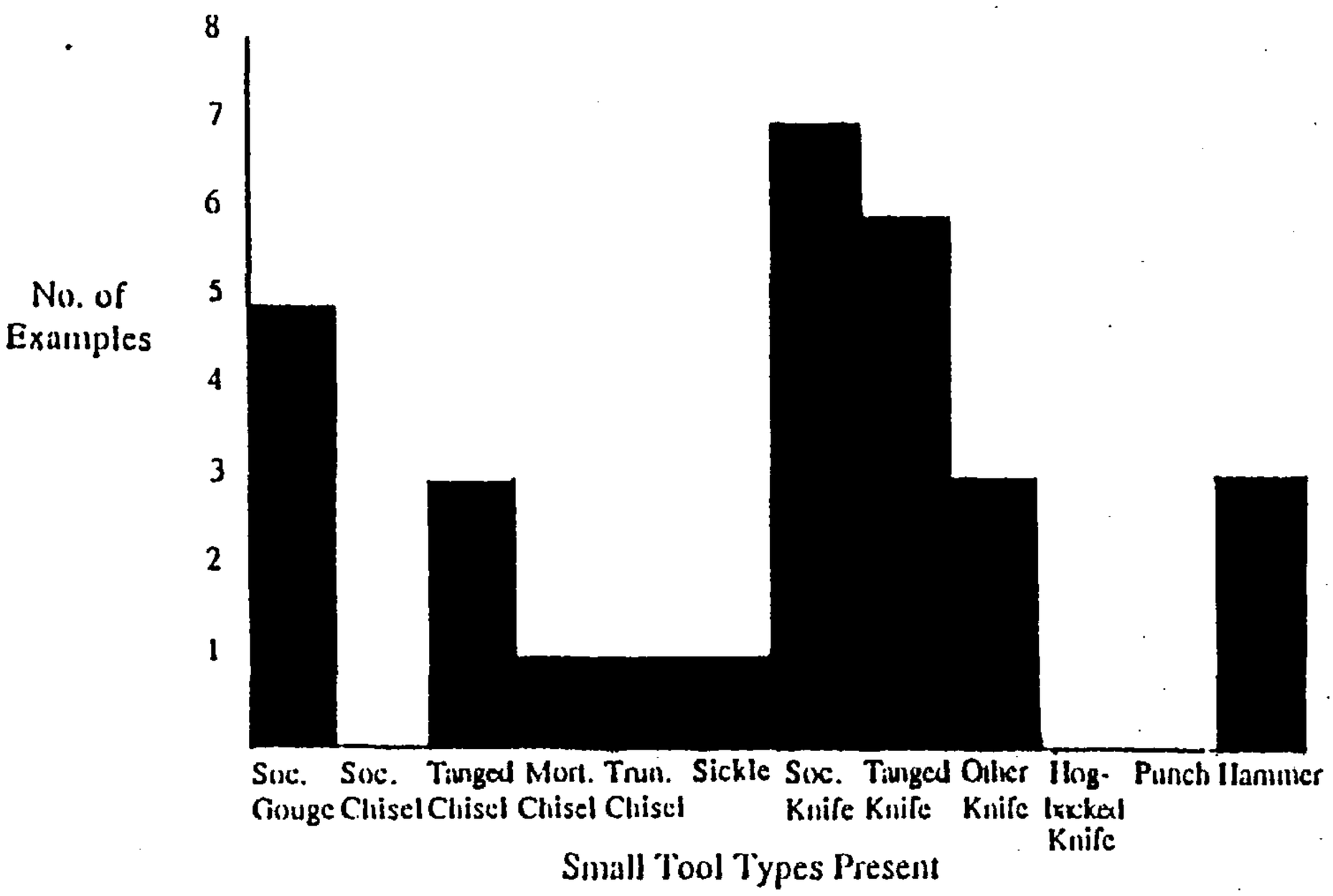


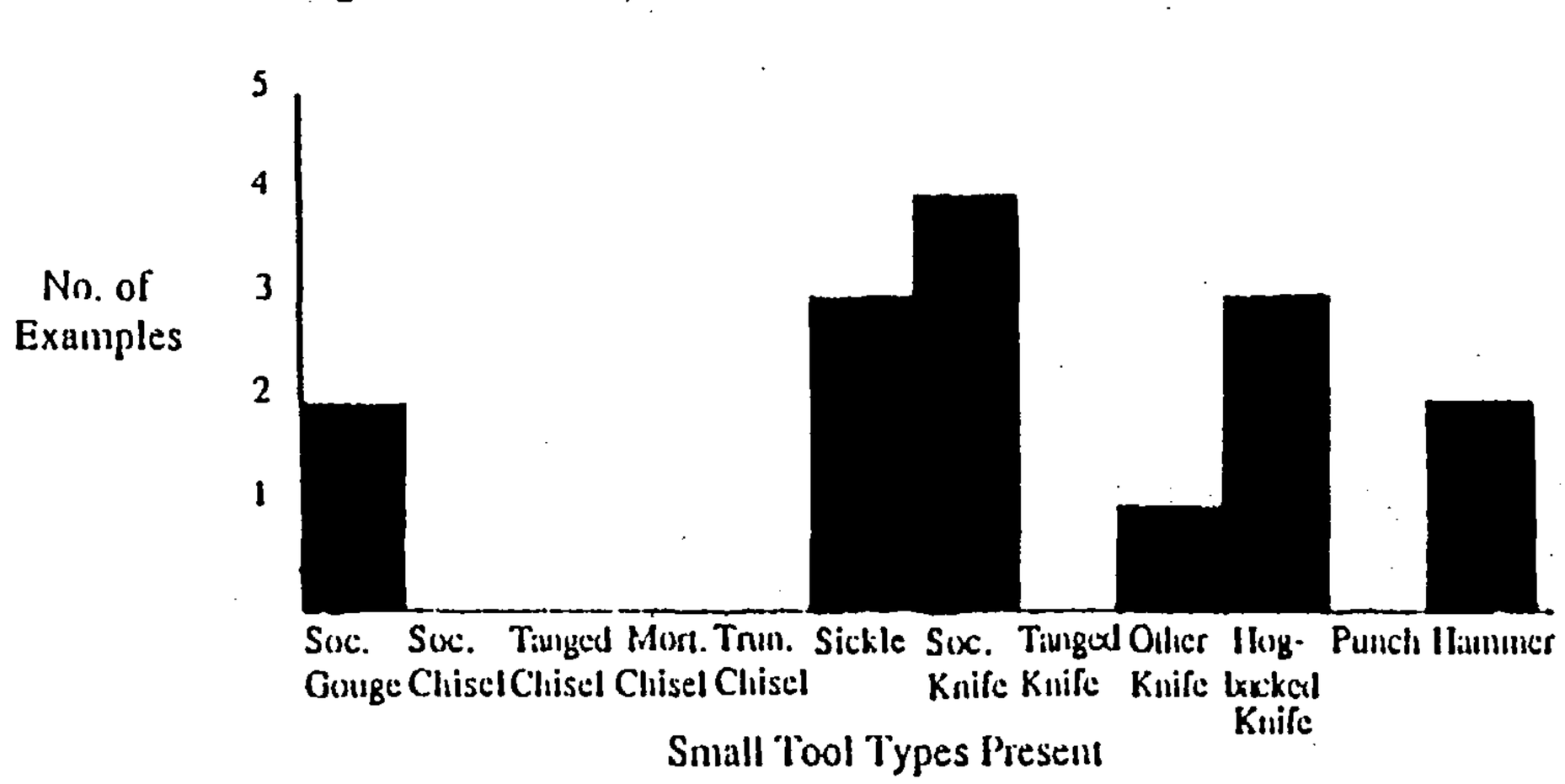
Fig. 9: The Range of Small Tool Types Present in the Group IV Mixed Category Hoards

1) Essex

Ref. No. 02: Grays Thurrock I



Ref. No. 05: Leigh II



2) Kent

Ref. No. 20: Minster

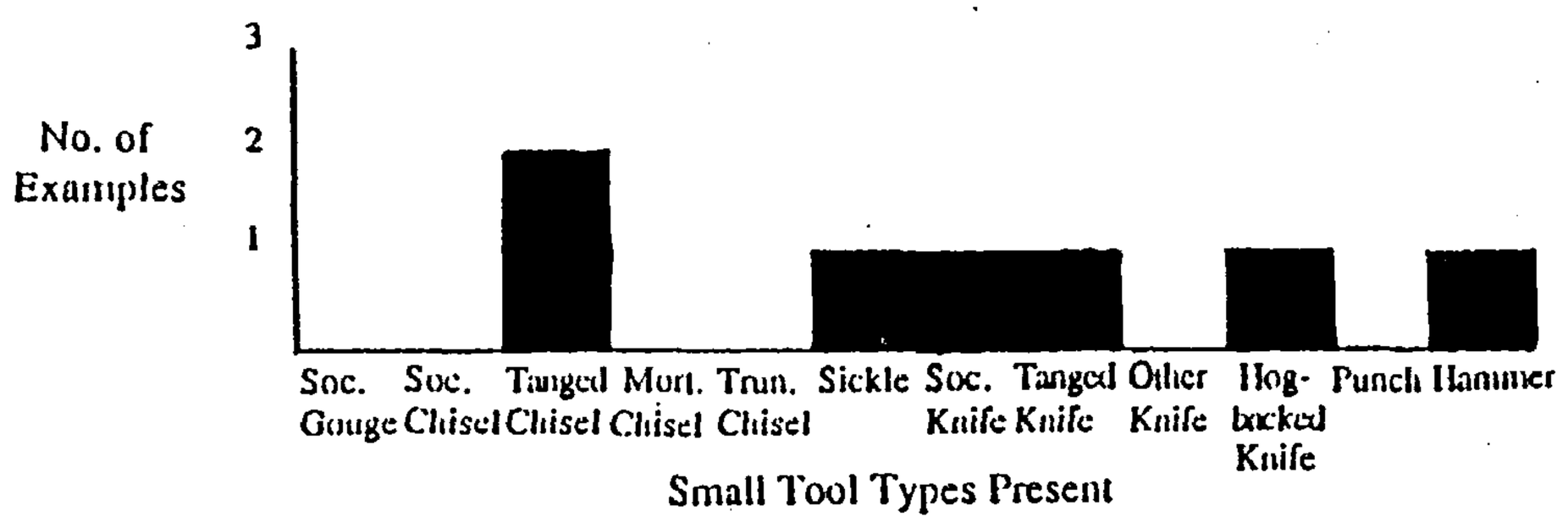
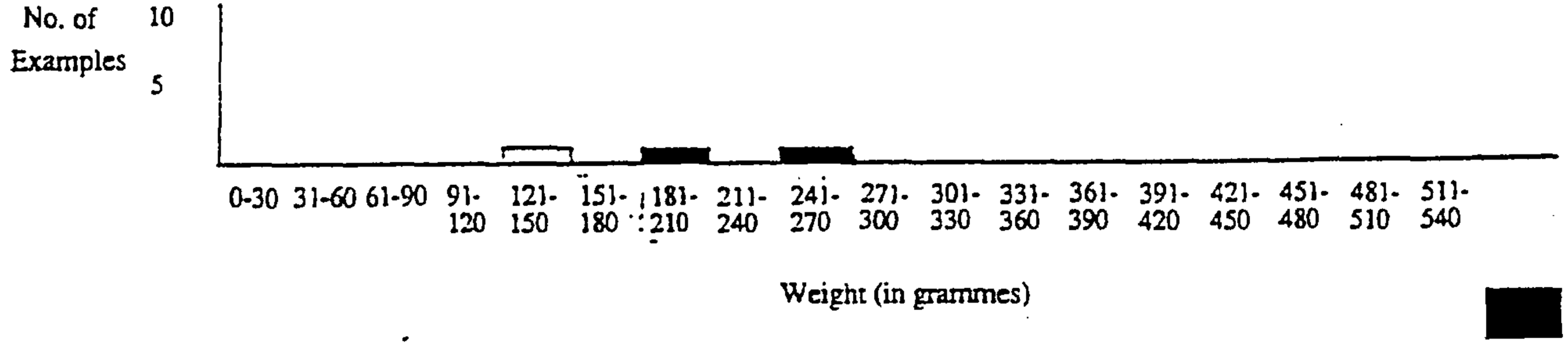


Fig. 10: The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group II Mixed Category Hoards

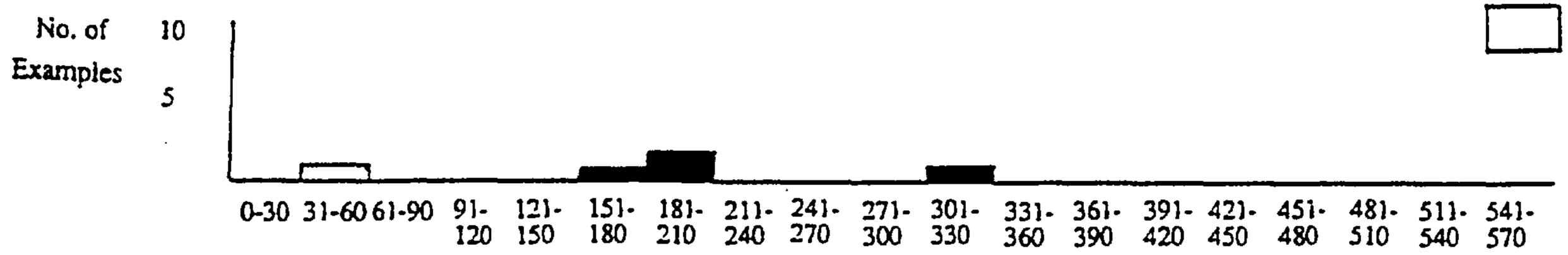
Ref. No. 03: Grays Thurrock II



Complete Socketed Axes

Fragmentary Socketed Axes

Ref. No. 04: Leigh I



2) Kent

Ref. No. 17: Cliffe-at-Hoo

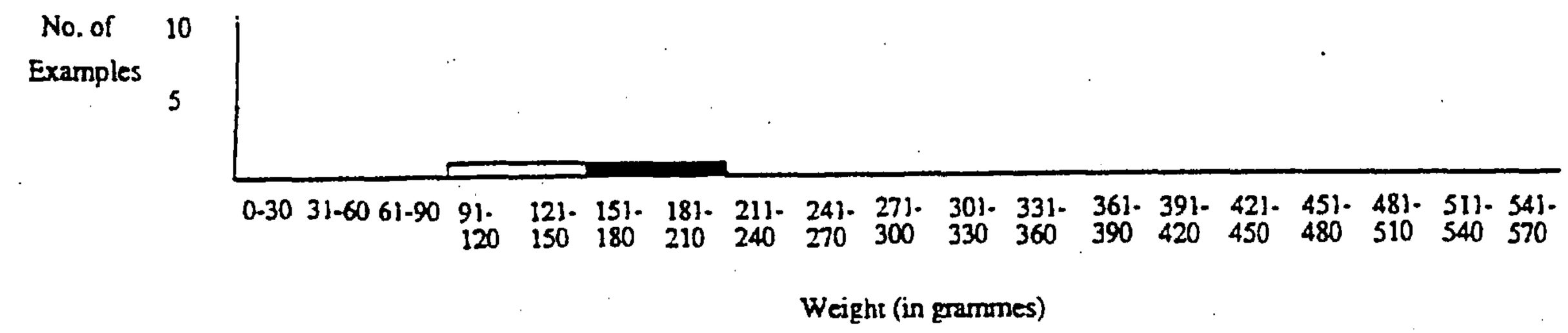
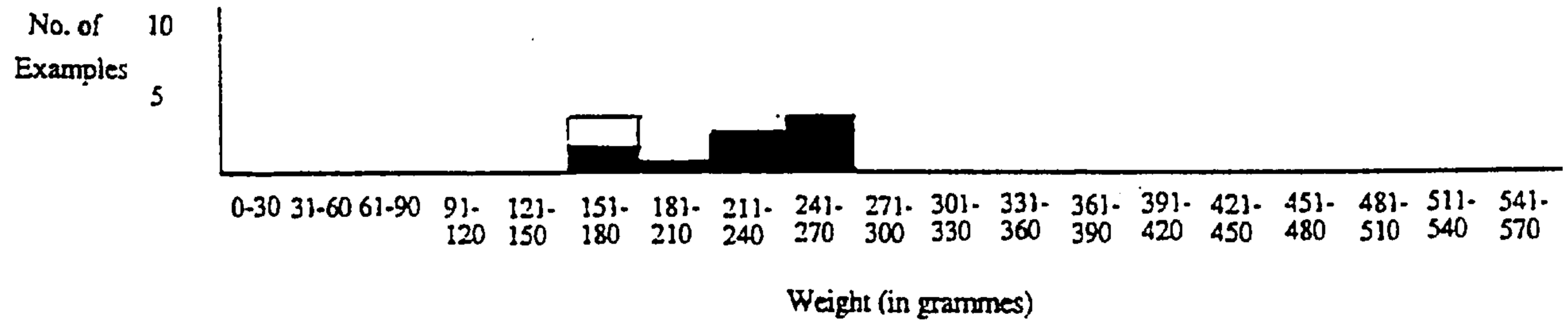
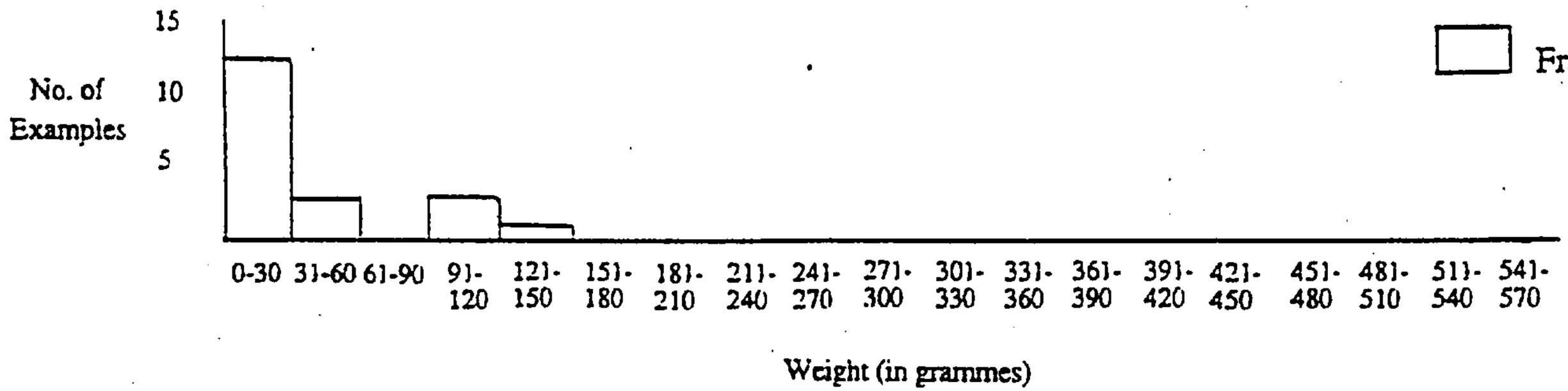


Fig. 11(a): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group III Mixed Category Hoards of Essex

Ref. No. 06: Shoebury I



Ref. No. 09: Southchurch I



Complete Socketed Axes

Fragmentary Socketed Axes

Ref. No. 11: Vange

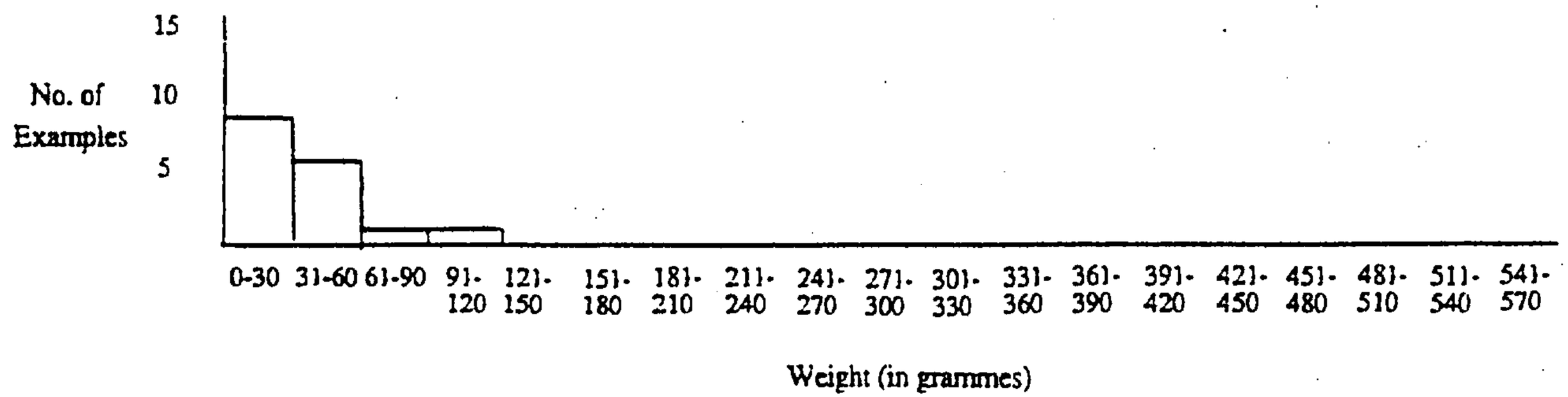
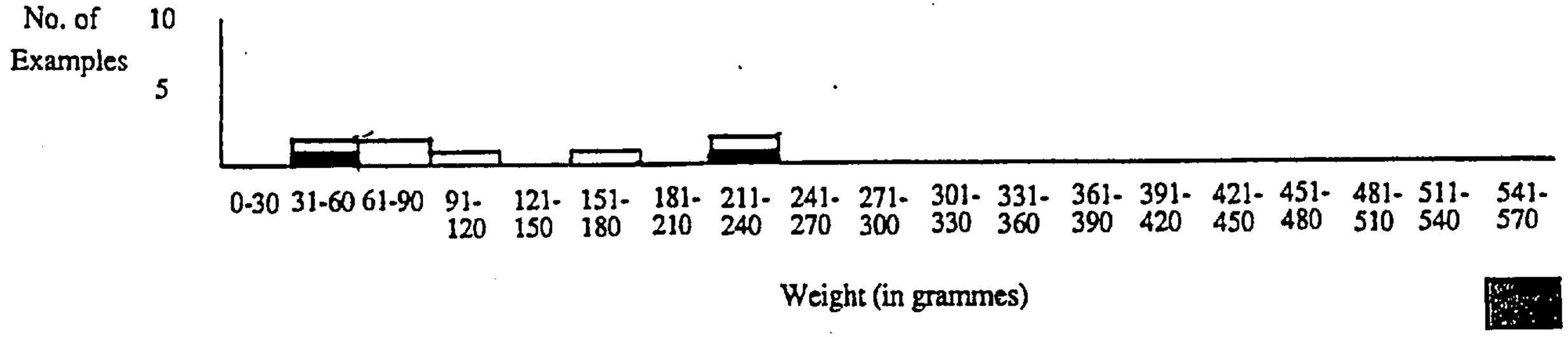


Fig. 11(b): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group III Mixed Category Hoards of Kent (i)

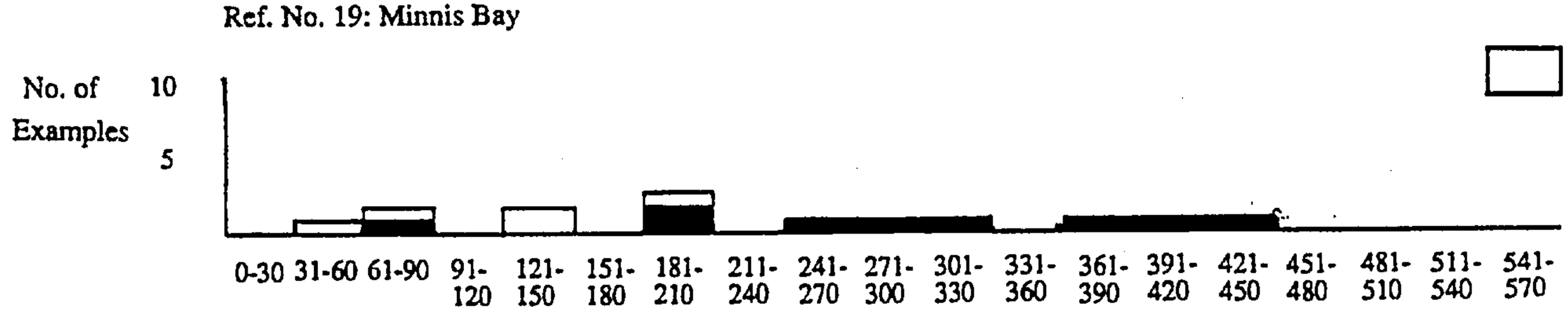
Fig. 11(c): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group III Mixed Category Hoards of Kent (ii)

Ref. No. 16: Borstal - No Weights Available

Ref. No. 18: Dartford



Ref. No. 19: Minnis Bay



Ref. No. 21: Stoke-at-Hoo

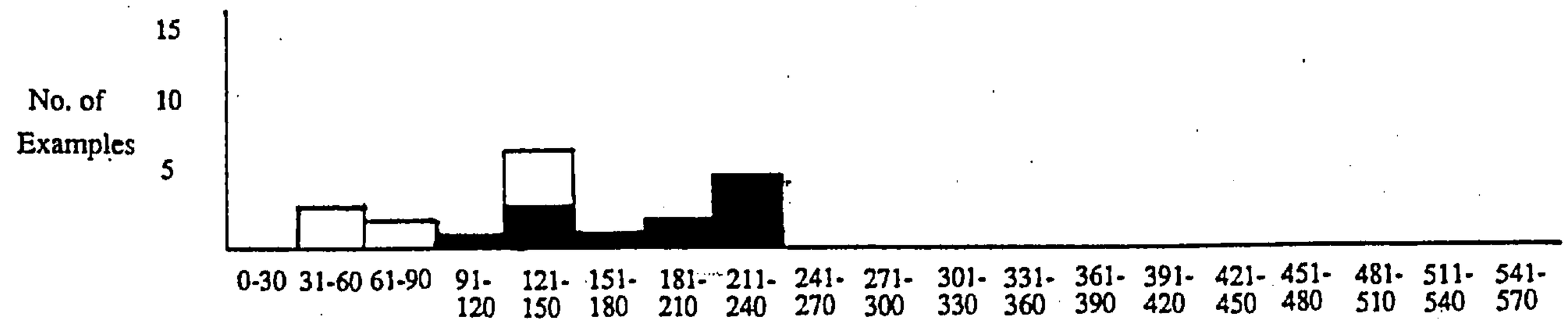


Fig. 11(d): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group III Mixed Category Hoards of Kent (iii)

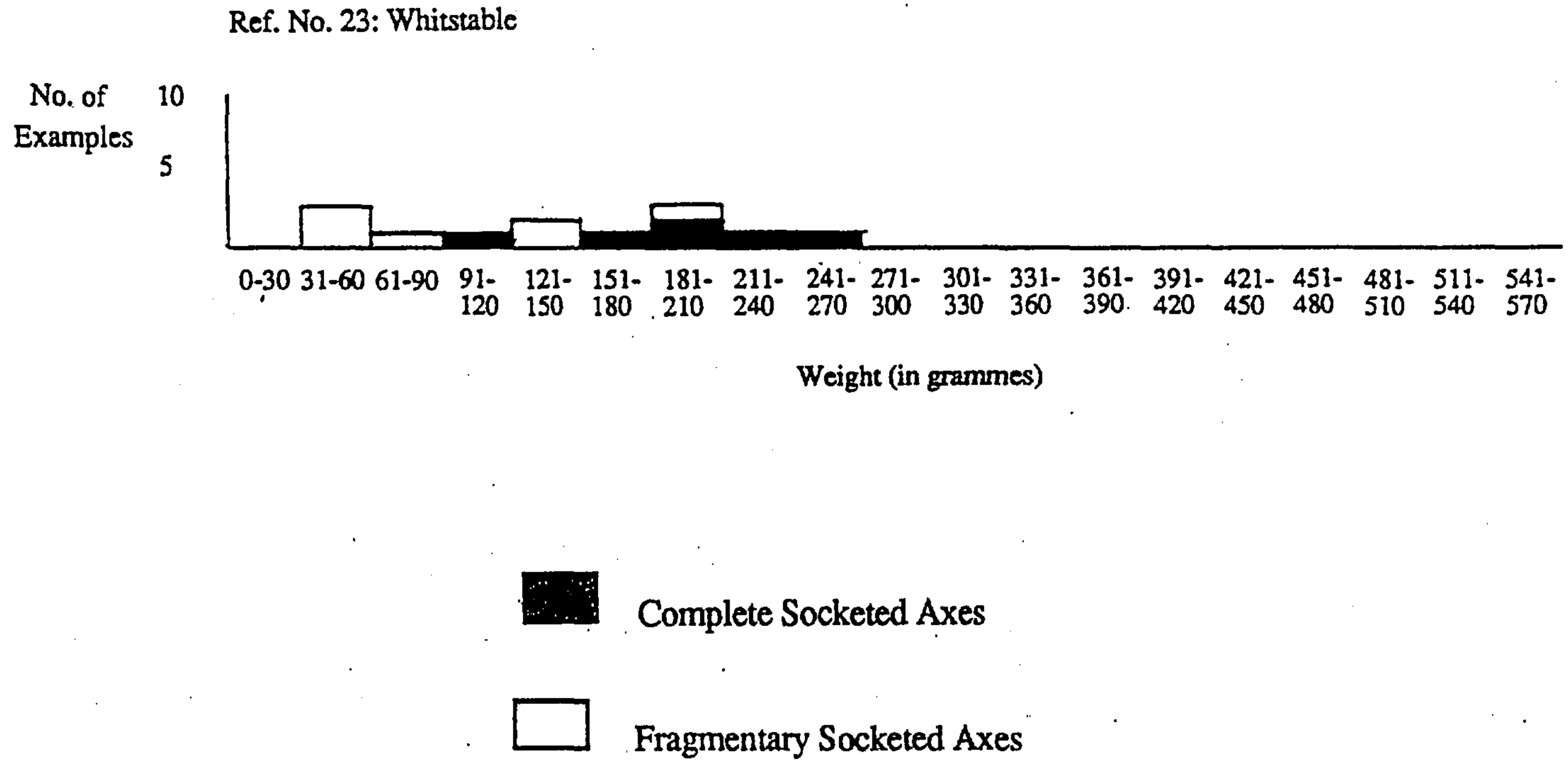
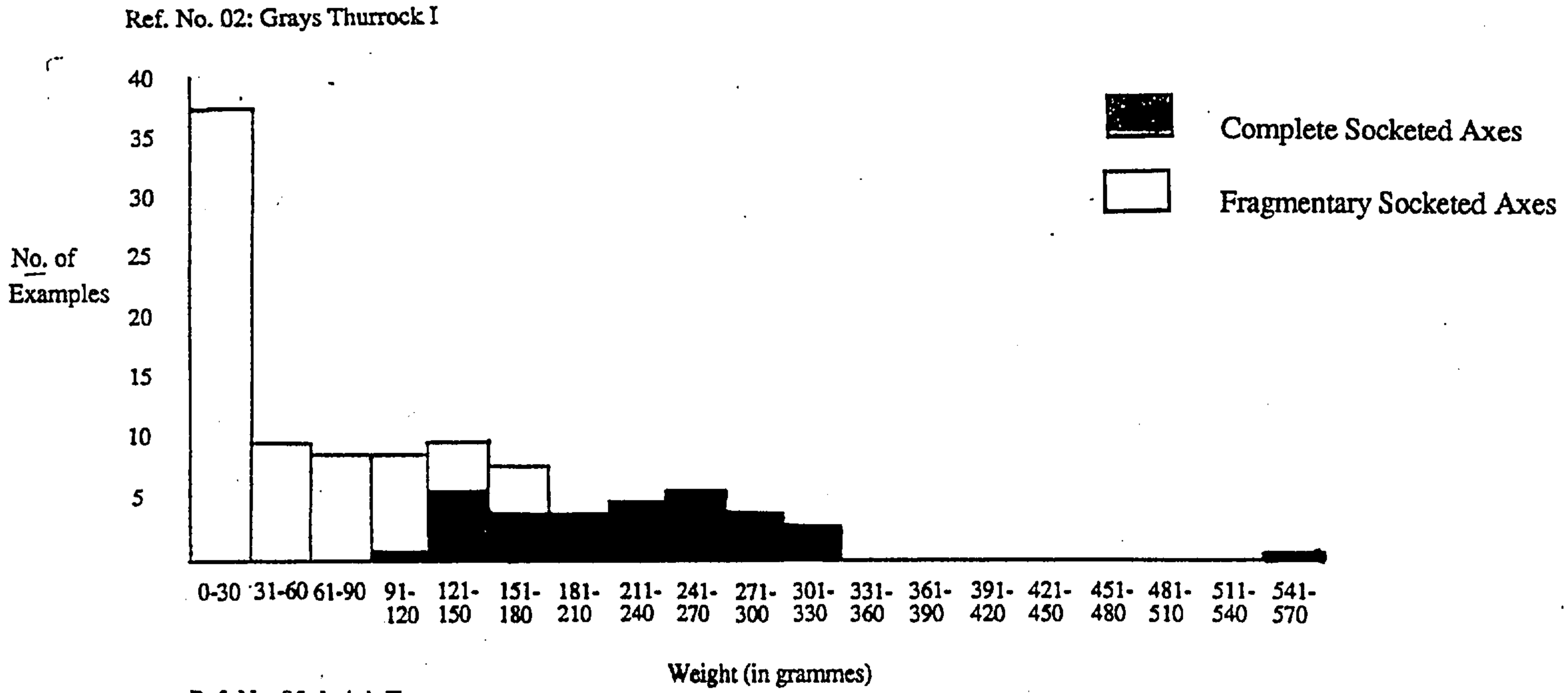


Fig. 12(a): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group IV Mixed Category Hoards of Essex



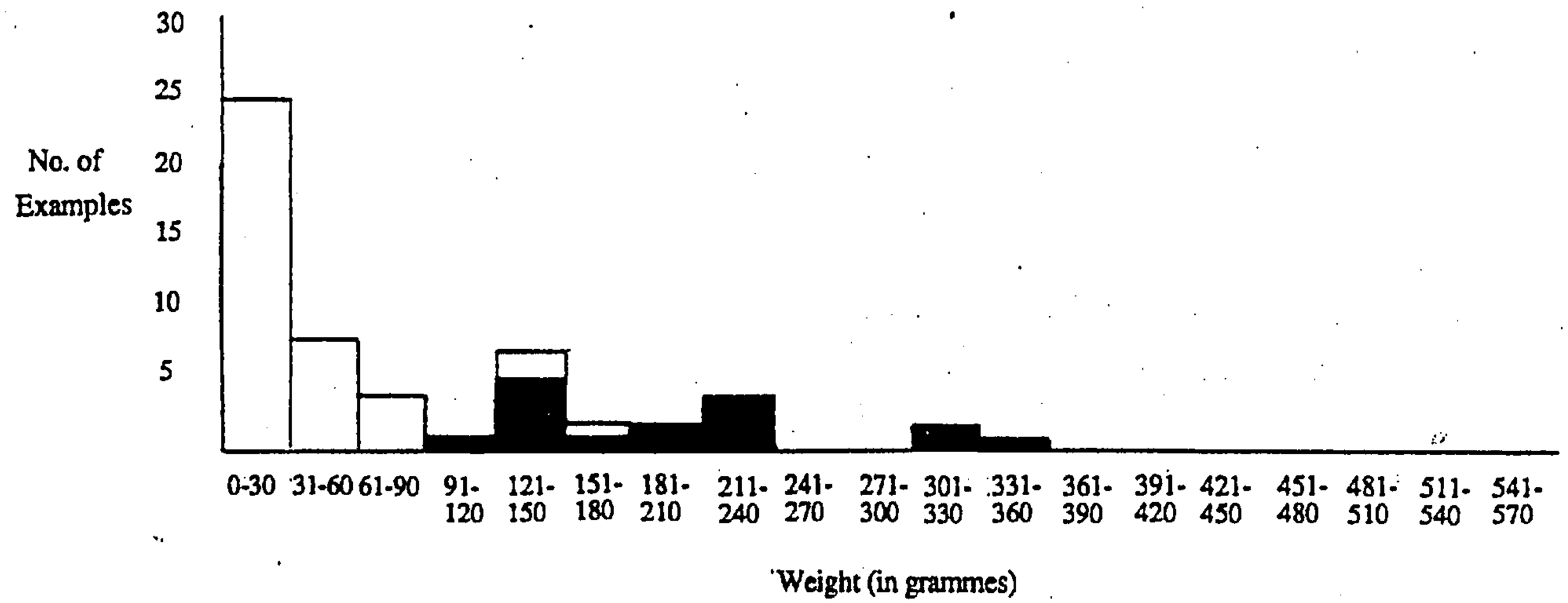


Fig. 12(b): The Weight Range Encompassed by Complete and Fragmentary Socketed Axes in the Group IV Mixed Category Hoards of Kent

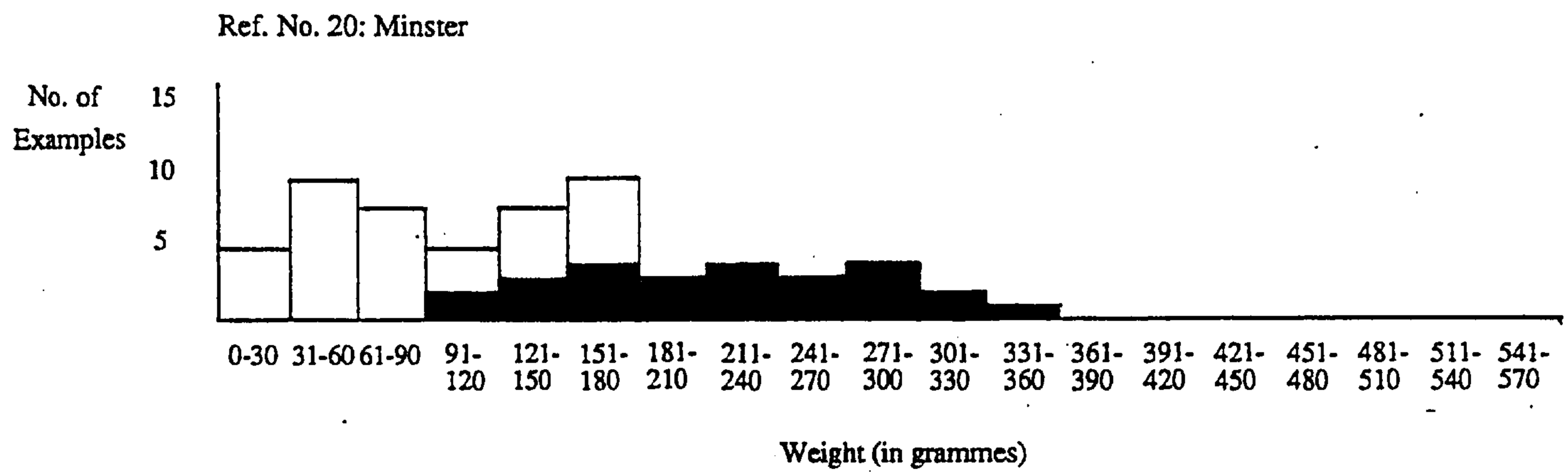


Fig. 13(a): The Weight Range Encompassed by Sword Fragments in the Group II Mixed Category Hoards of Essex and Kent and the Group III Mixed Category Hoards of Essex

1) Essex

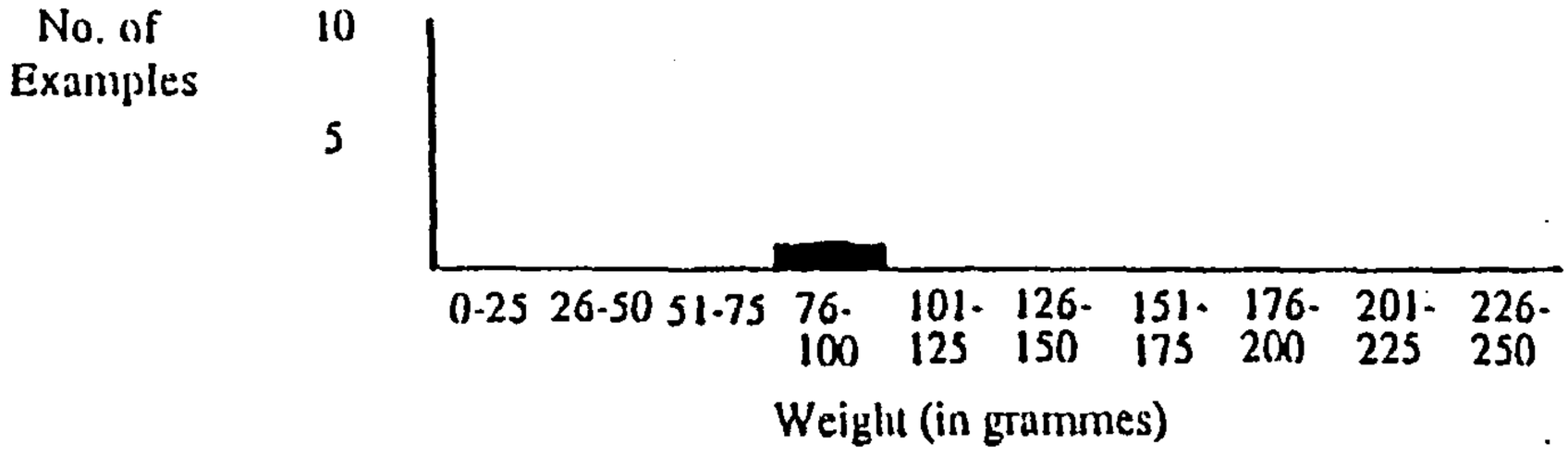
Ref. No. 03: Grays Thurrock II - No Swords Present

Ref. No. 04: Leigh I - No Swords Present

Ref. No. 07: Shoebury II - No Swords Present

2) Kent

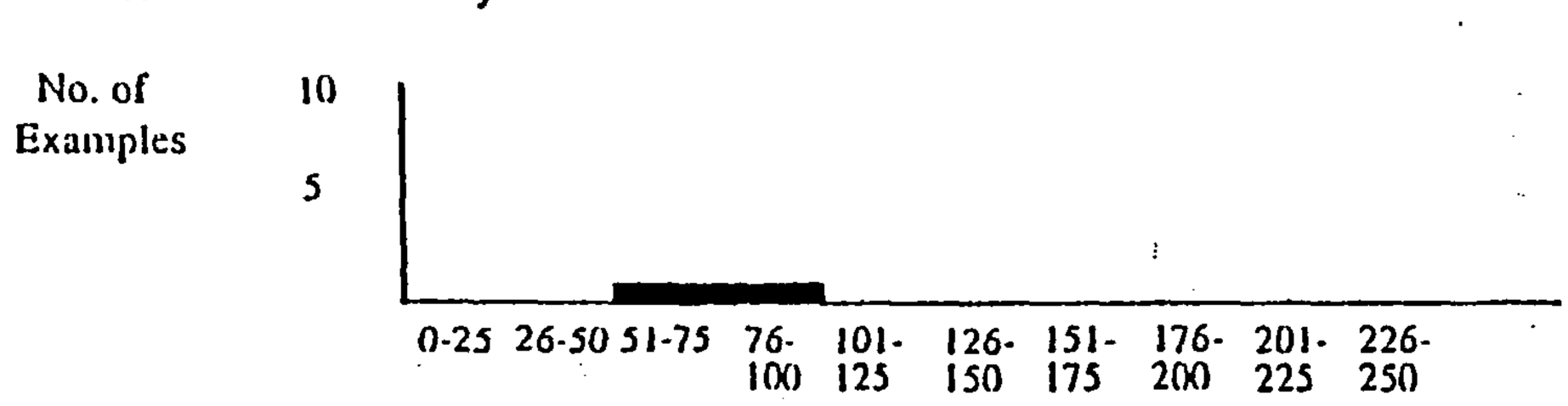
Ref. No. 17: Cliffe-at-Hoo



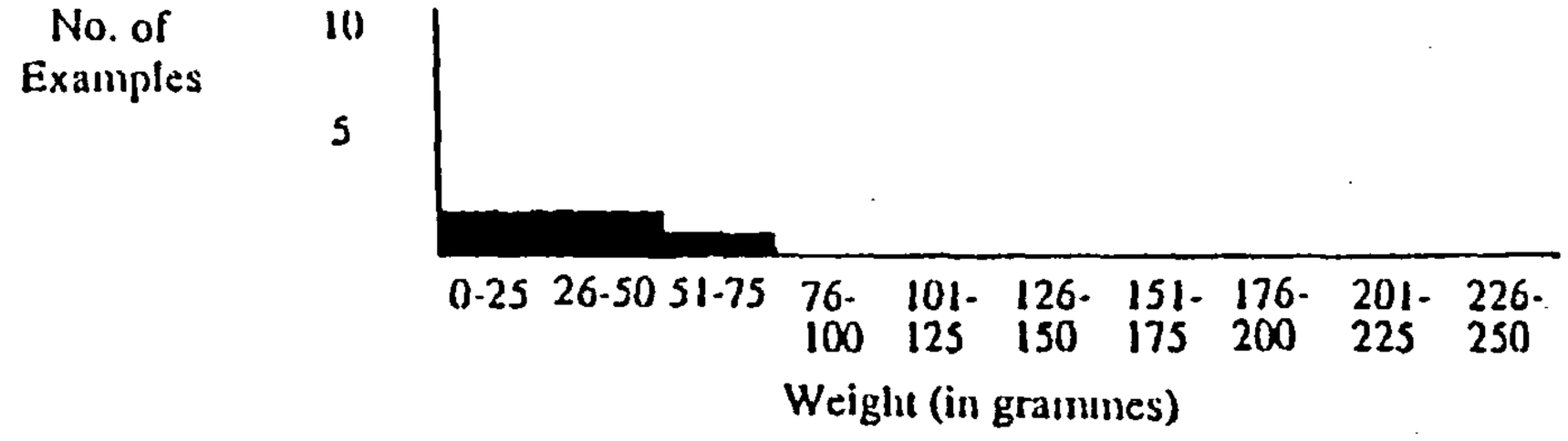
6(ii): The Group III Hoards

1) Essex

Ref. No. 06: Shoebury I



Ref. No. 09: Southchurch I



Ref. No. 11: Vange

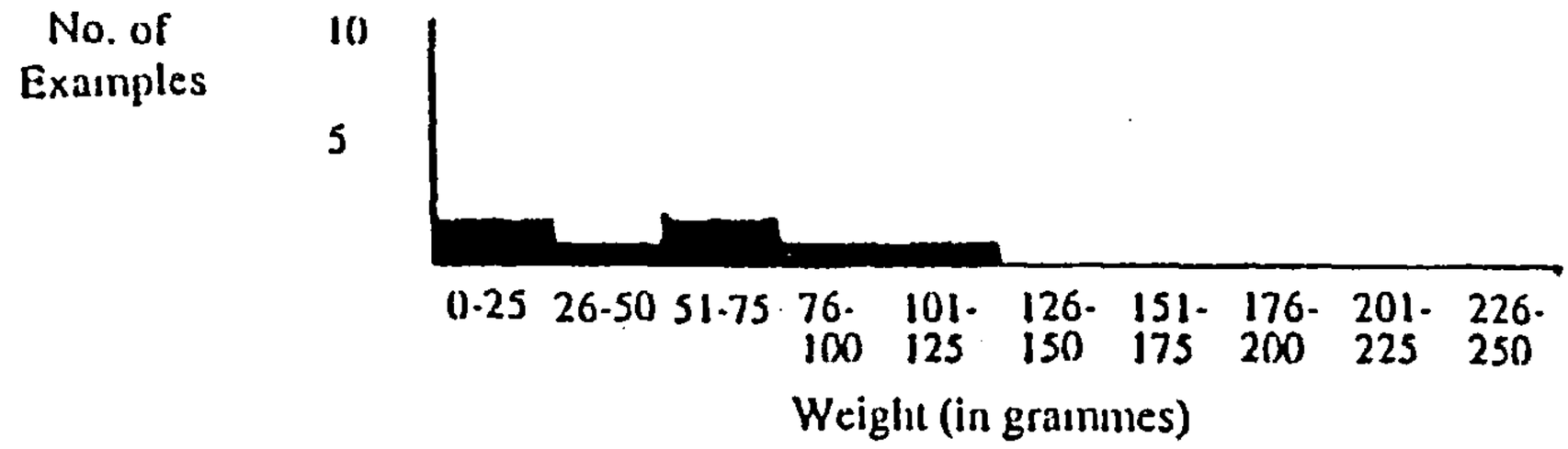
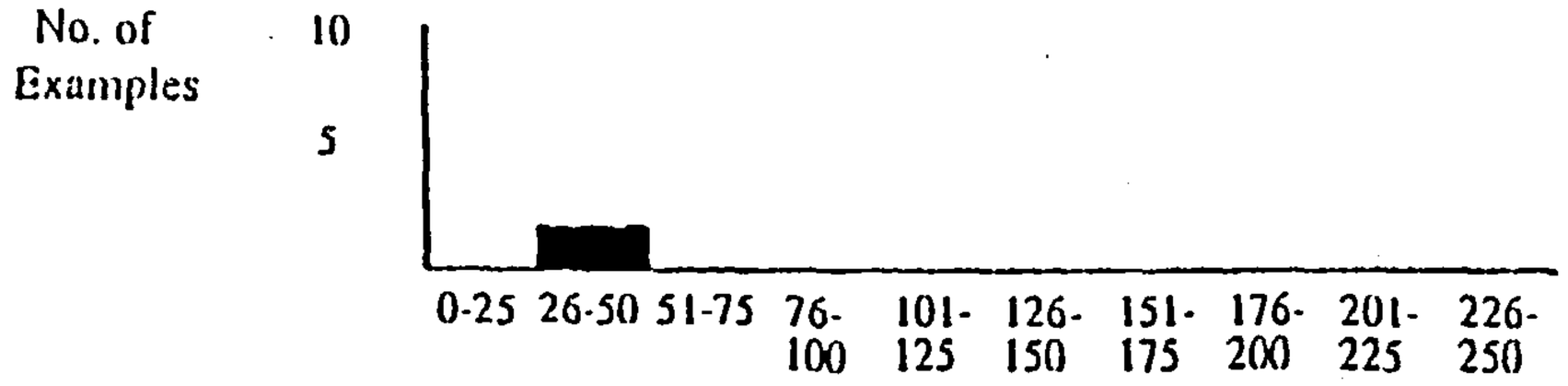
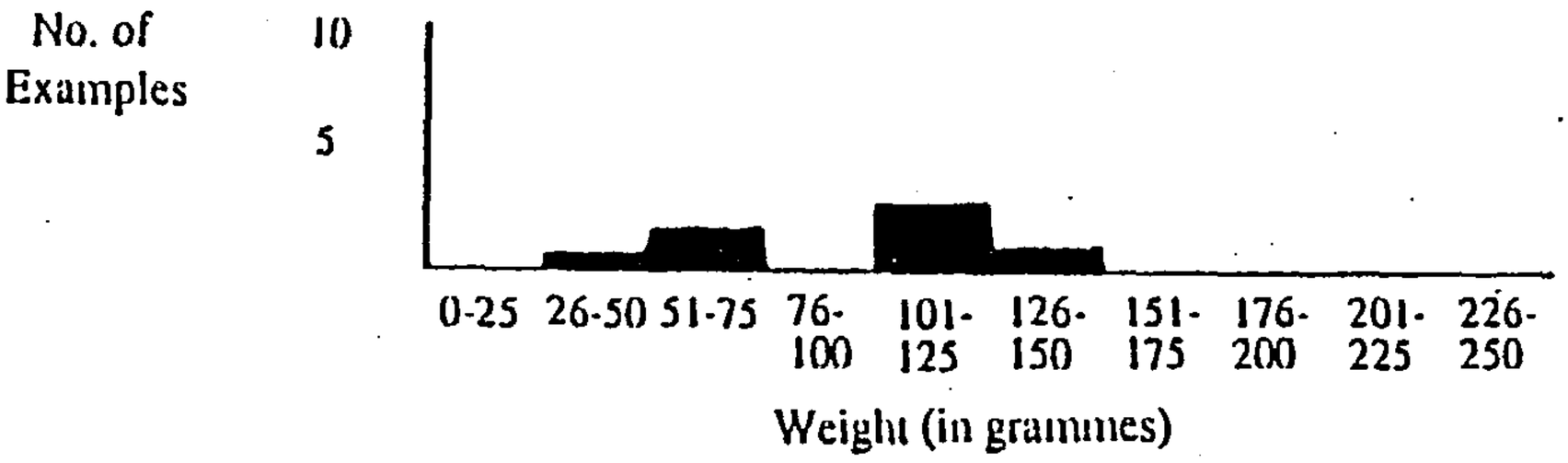


Fig. 13(b): The Weight Range Encompassed by Sword Fragments in the Group III Mixed Category Hoards of Kent (i)

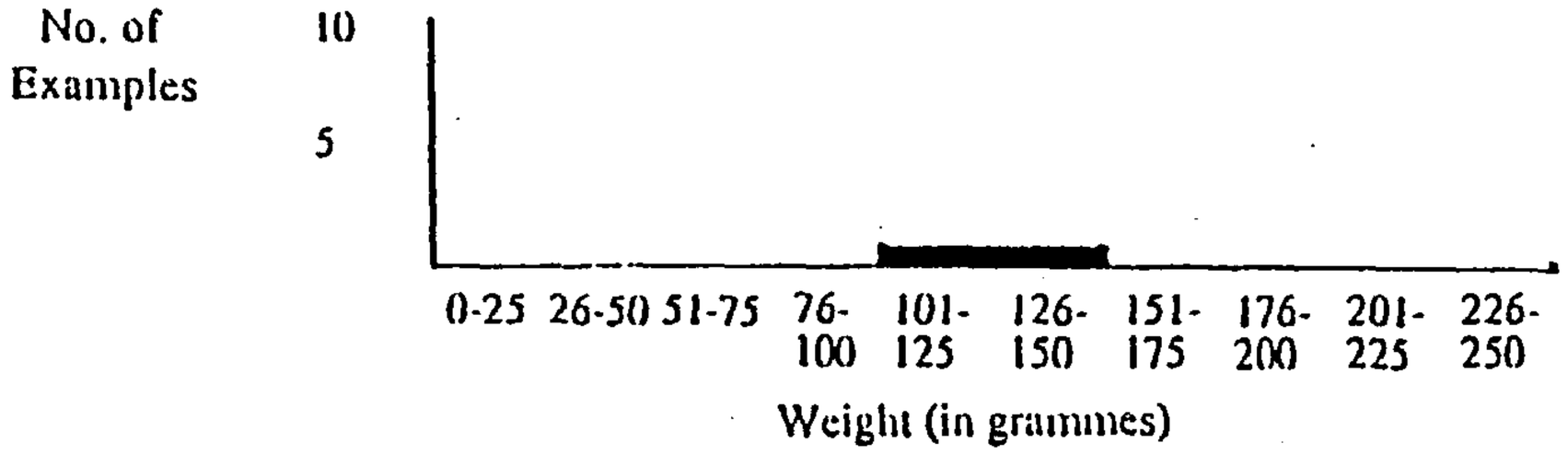
Ref. No. 12: All Hallows I



Ref. No. 13: All Hallows II



Ref. No. 15: Bexley Heath



Ref. No. 16: Borstal - No Weights Available

Ref. No. 18: Dartford

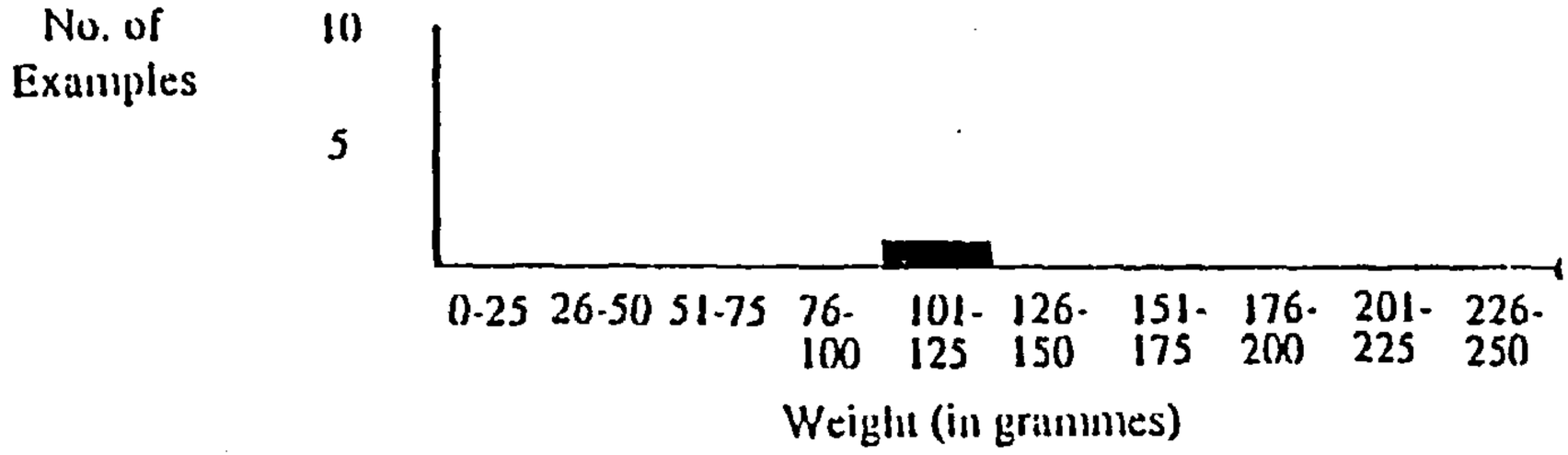
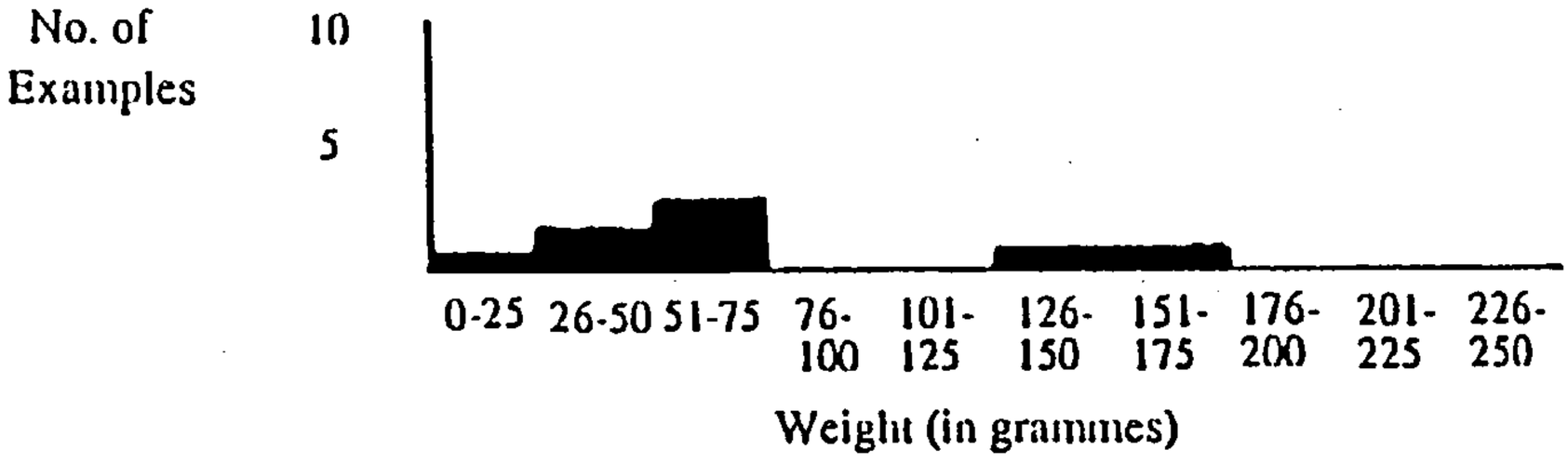
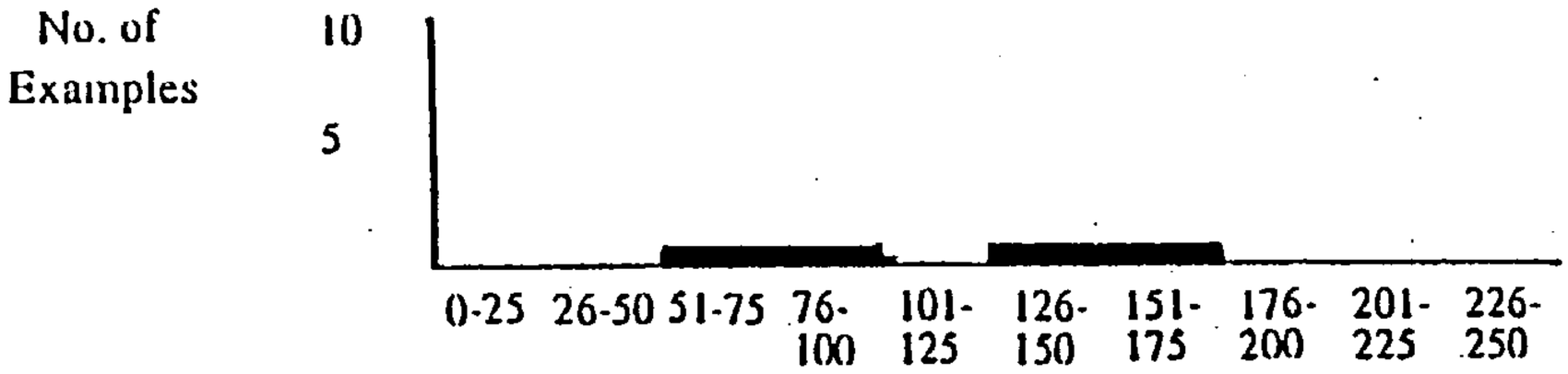


Fig. 13(c): The Weight Range Encompassed by Sword Fragments in the Group III Mixed Category Hoards of Kent (ii)

Ref. No. 19: Minnis Bay



Ref. No. 21: Stoke-at-Hoo



Ref. No. 23: Whitstable

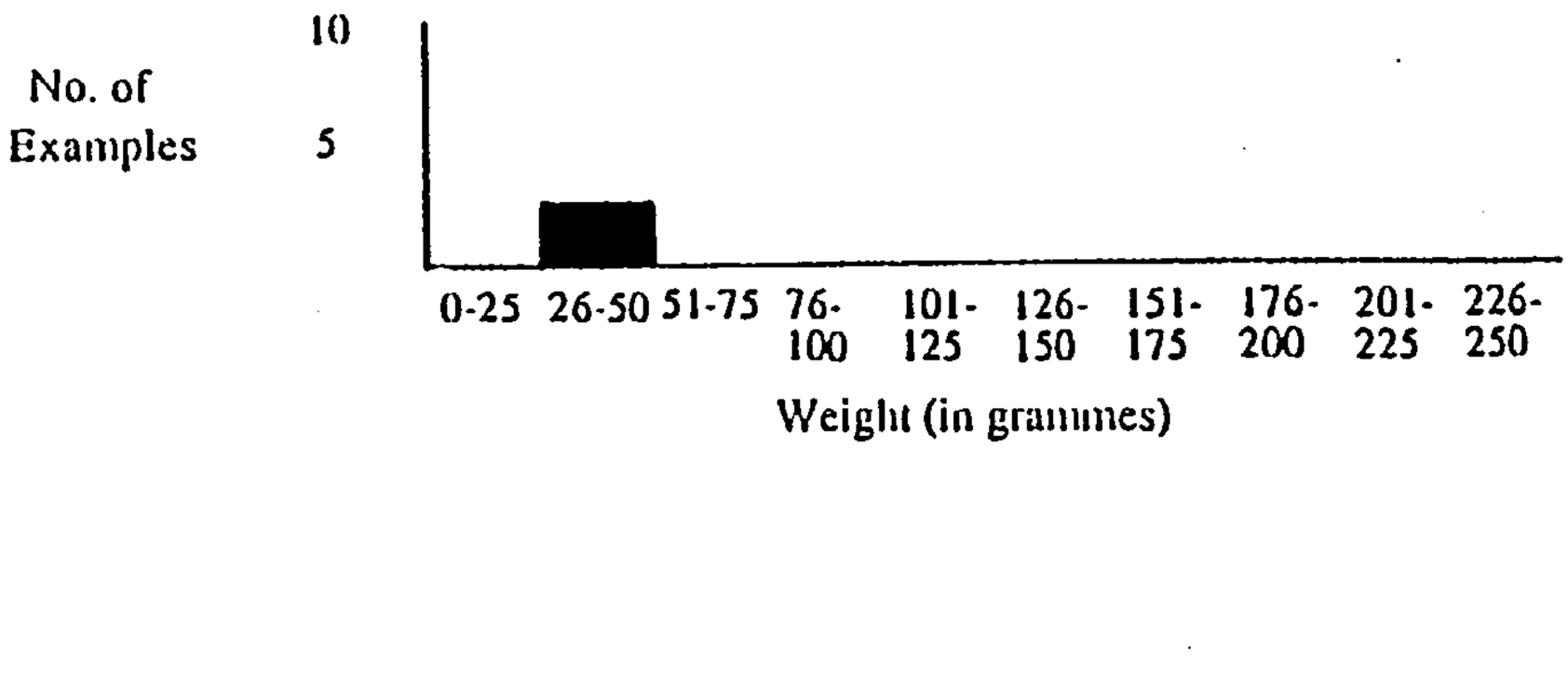
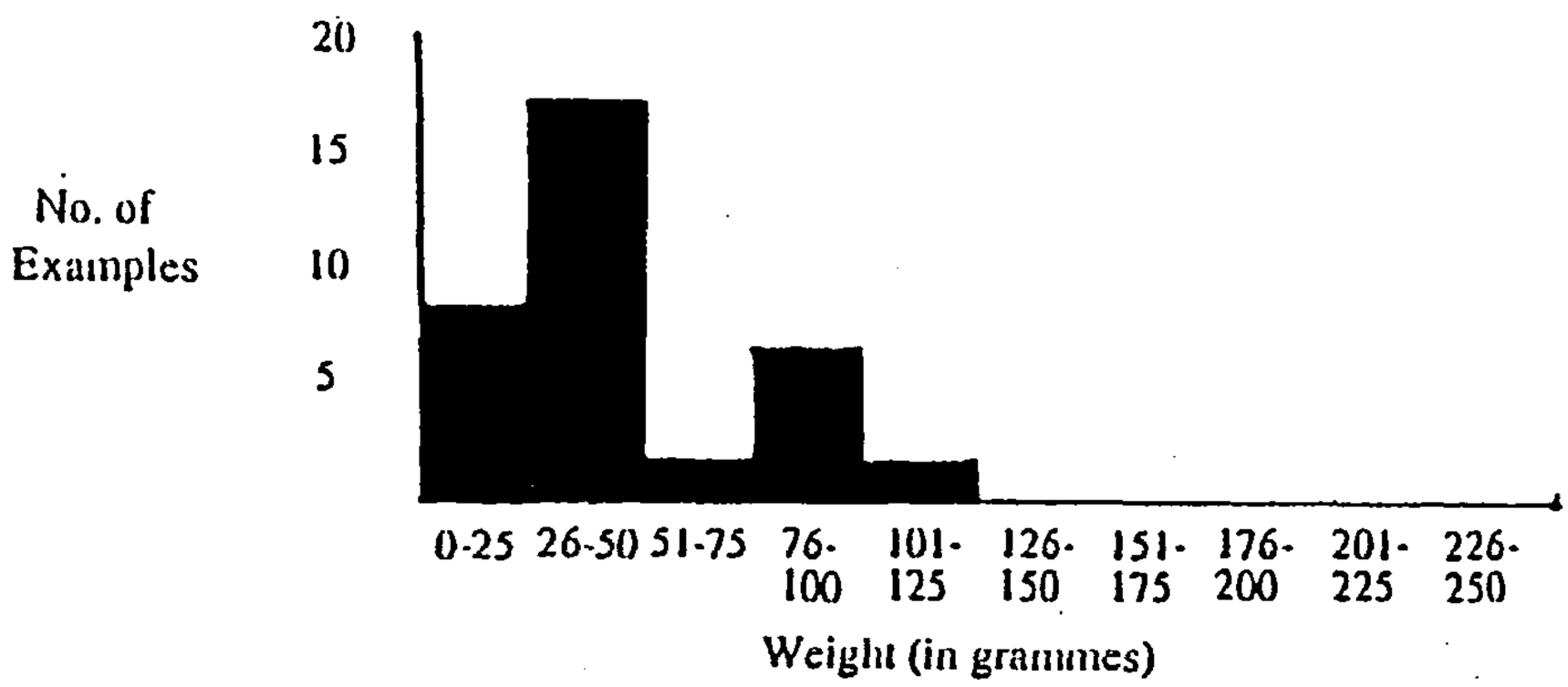


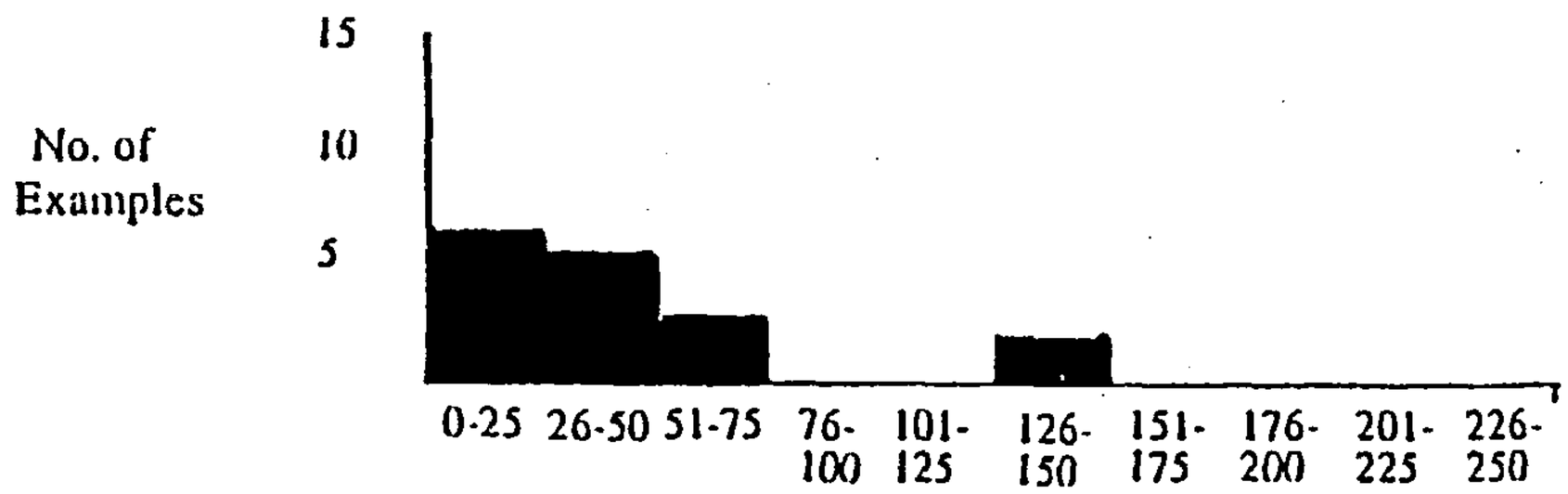
Fig. 14: The Weight Range Encompassed by Sword Fragments in the Group IV Mixed Category Hoards

1)Essex

Ref. No. 02: Grays Thurrock I



Ref. No. 05: Leigh II



2) Kent

Ref. No. 20: Minster

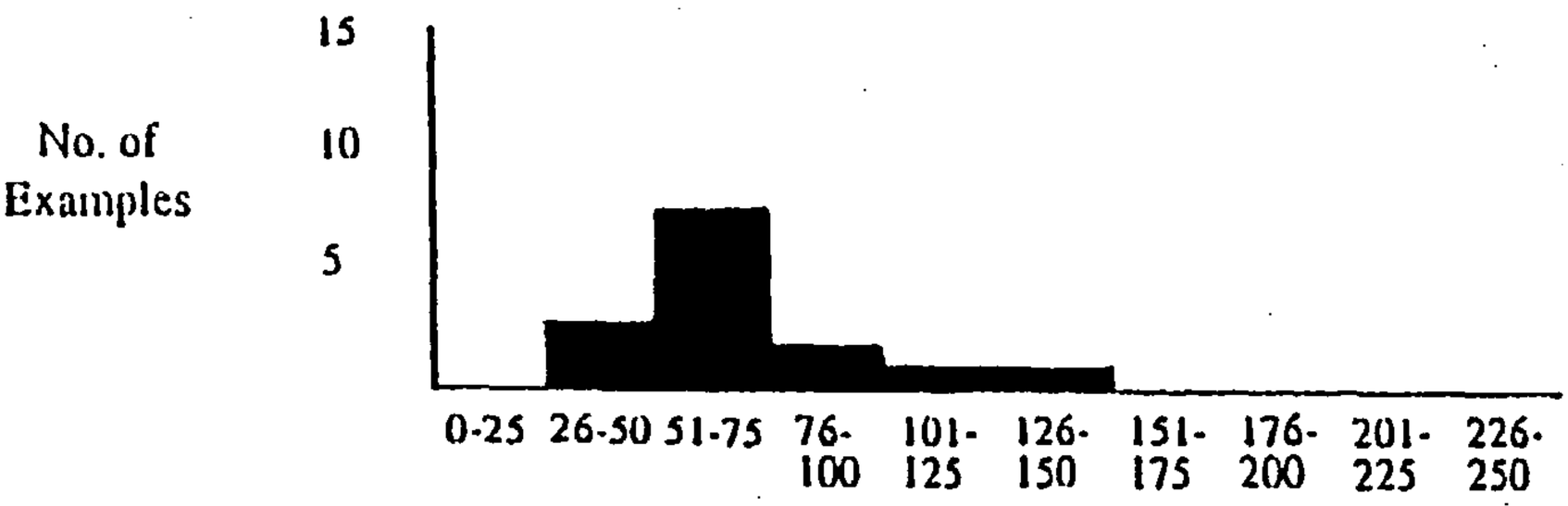
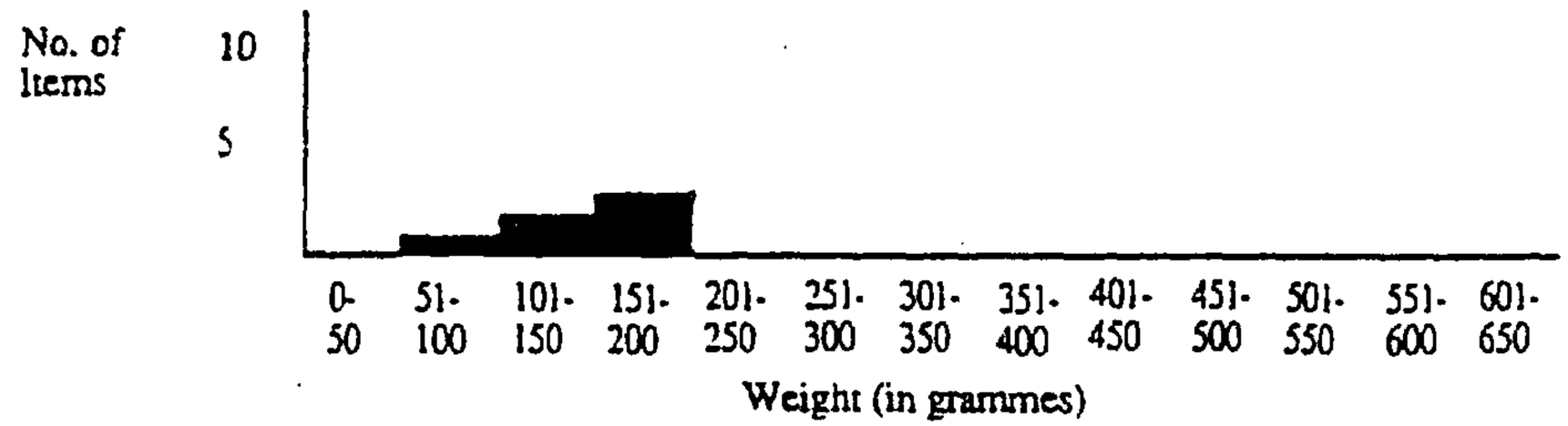


Fig. 15: The Weight Range Encompassed by Ingot Metal Fragments in the Group II Mixed Category Hoards and the Small Restricted Category Hoards of Essex and Kent

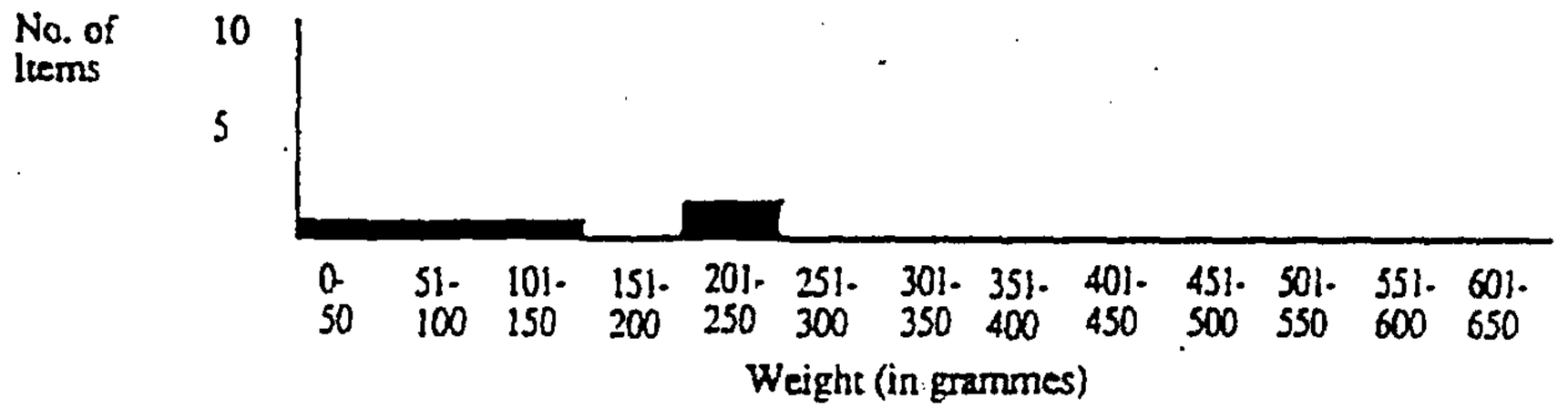
Ref. No. 03: Grays Thurrock II



Ref. No. 04: Leigh I - No Information Available

Ref. No. 07: Shoebury II - No Information Available

Ref. No. 10: Southchurch II



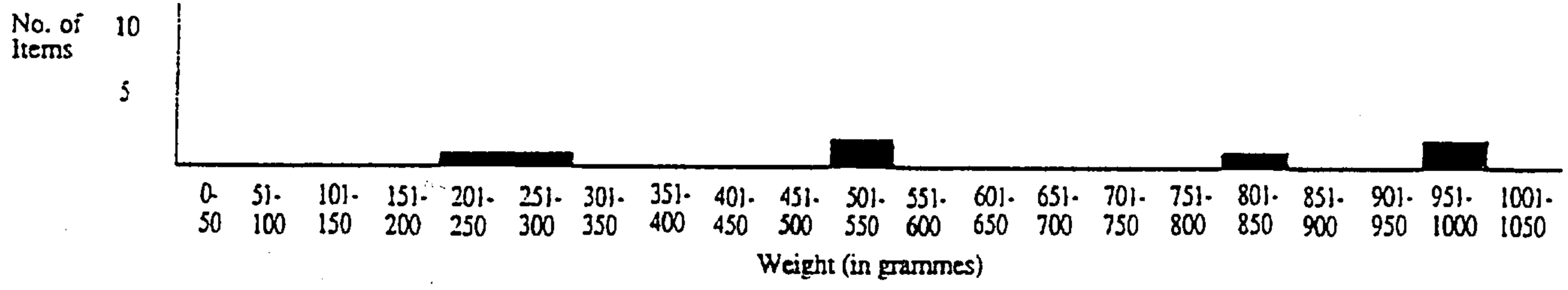
Ref. No. 14: Aylesford - No Ingot Metal Included

Ref. No. 17: Cliffe-at-Hoo - No Ingot Metal Included

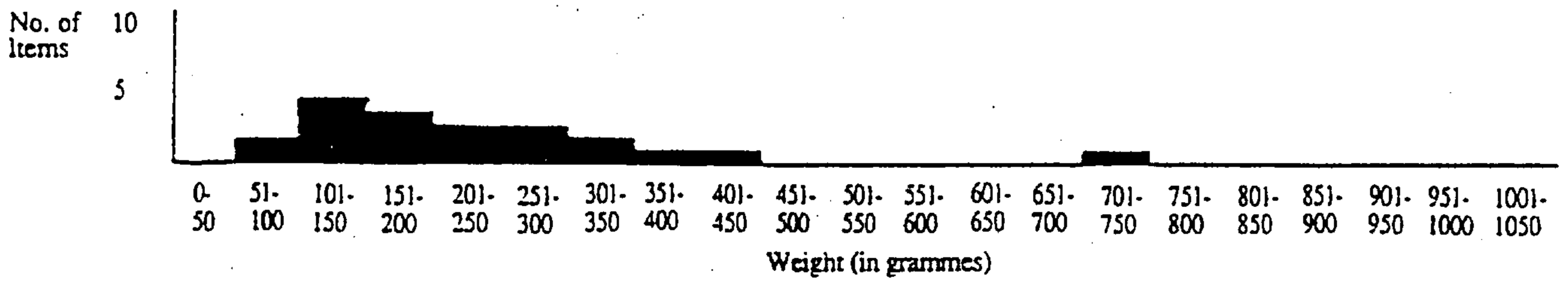
Fig. 16: The Weight Range Encompassed by Ingot Metal Fragments in the Group III Mixed Category Hoards and the Intermediate Restricted Category Hoards of Essex

Ref. No. 01: Aveley - No Ingot Metal Included

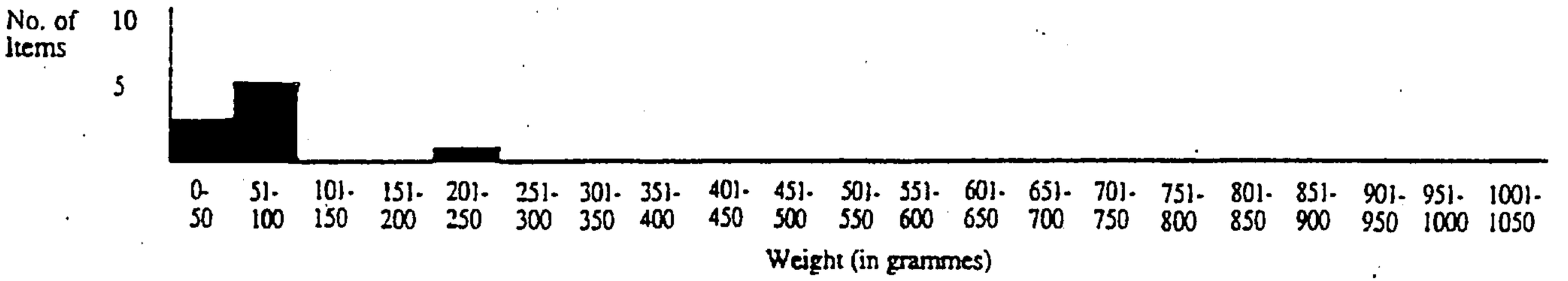
Ref. No. 06: Shoebury I



Ref. No. 08: Shoebury III



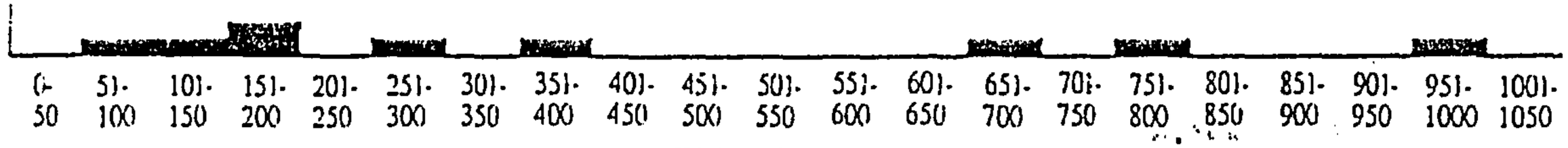
Ref. No. 09: Southchurch I



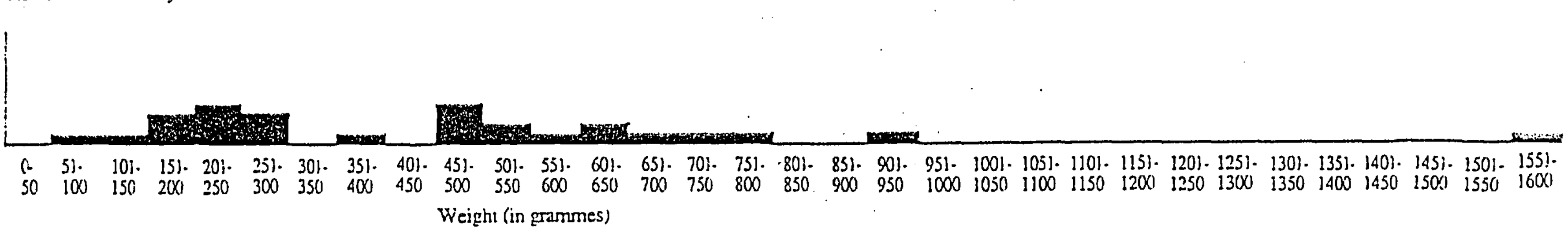
Ref. No. 11: Vange - No Information Available

Fig. 17(a): The Weight Range Encompassed by Ingot Metal Fragments in the Group III Mixed Category Hoards of Kent (i)

Ref. No. 12: All Hallows I



Ref. No. 15: Bexley Heath



Ref. No. 16: Borstal

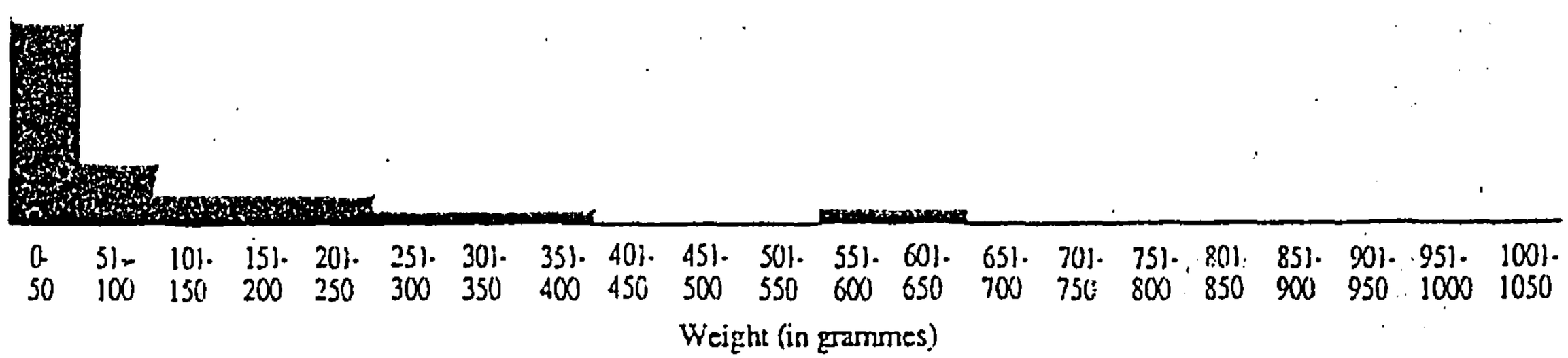


Fig. 17(b): The Weight Range Encompassed by Ingot Metal Fragments in the Group III Mixed Category Hoards of Kent (ii)

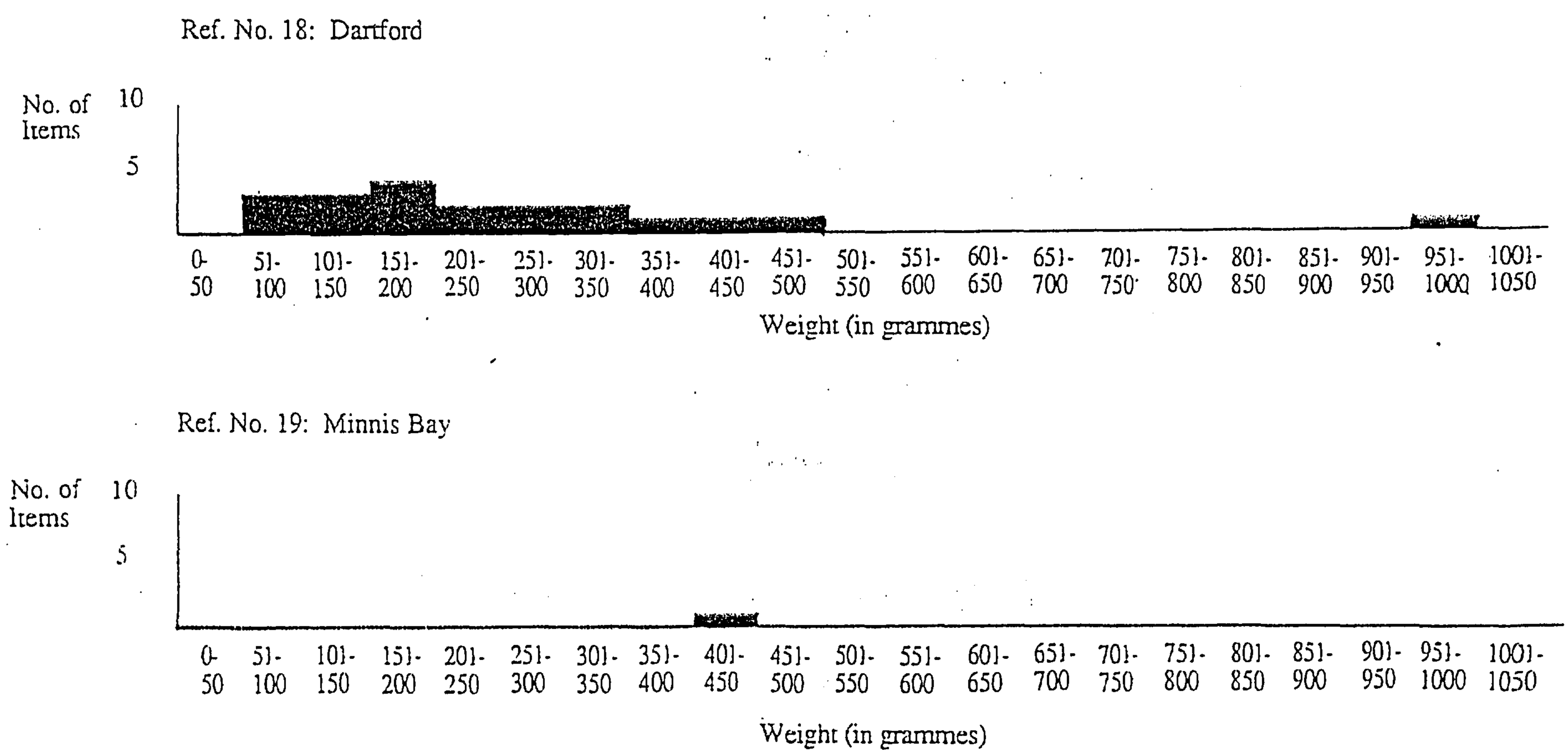
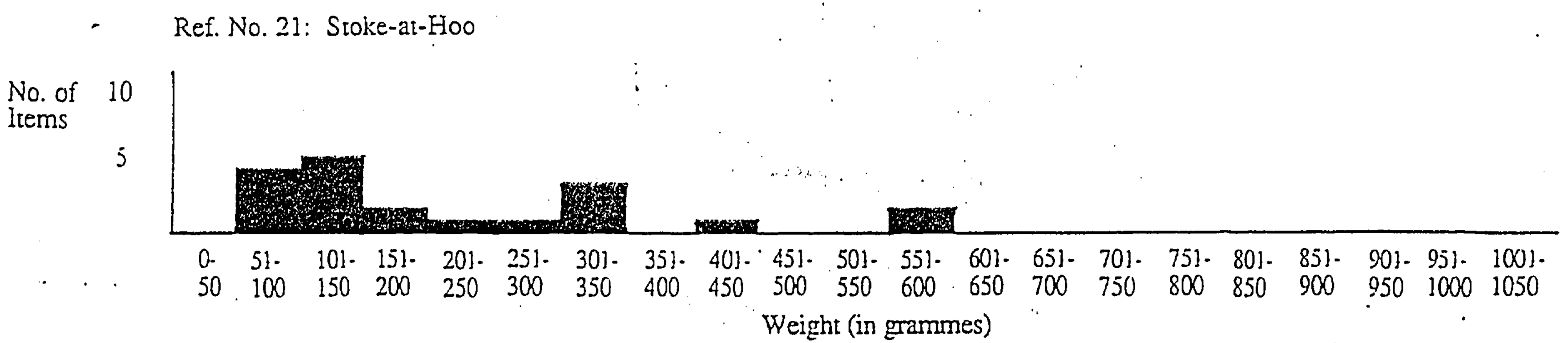


Fig. 17(c): The Weight Range Encompassed by Ingot Metal Fragments in the Group III Mixed Category Hoards of Kent (iii)



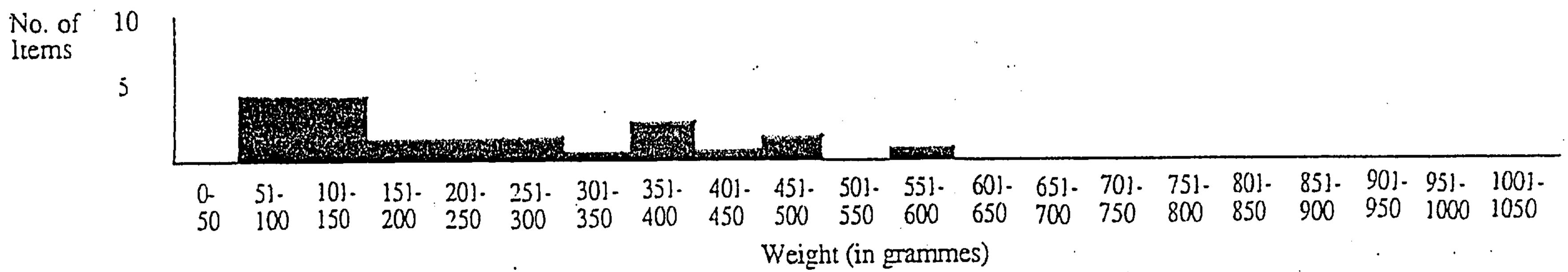
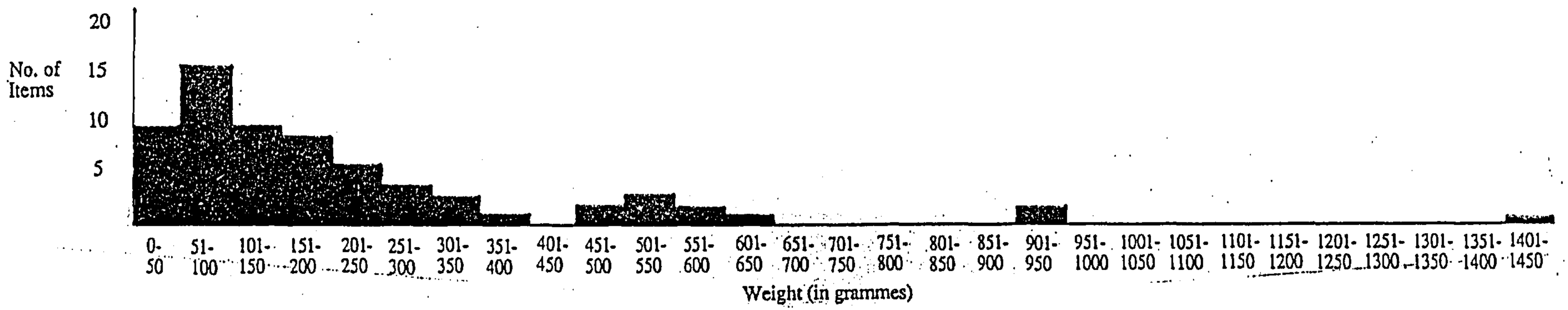


Fig. 18 (a): The Weight Range Encompassed by Ingot Metal Fragments in the Group IV Mixed Category Hoards of Essex

Ref. No. 02: Grays Thurrock I



Ref. No. 05: Leigh II

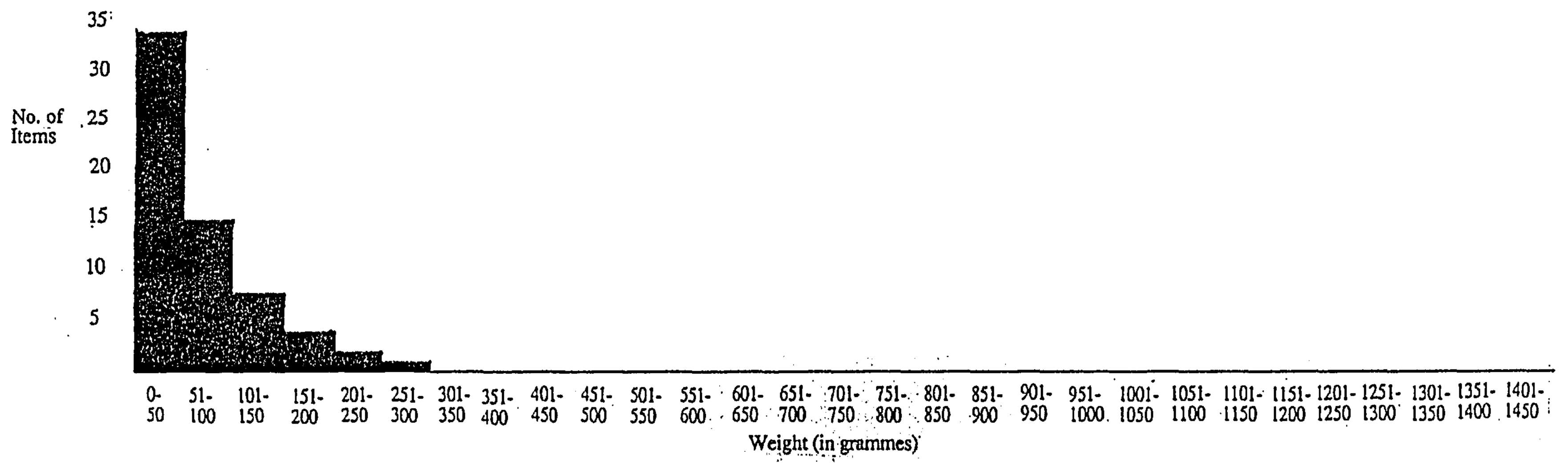


Fig. 18 (b): The Weight Range Encompassed by Ingot Metal Fragments in the Group IV Mixed Category Hoards of Kent

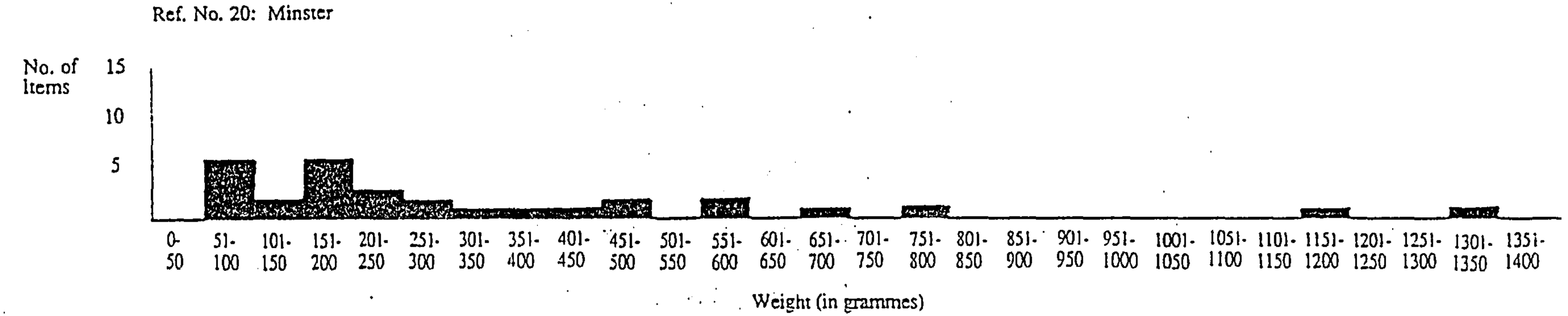


Figure 19: Flowchart Showing Metaphorical Comparisons Between the Use-Cycle of a Bronze Object and the Human Life-Cycle

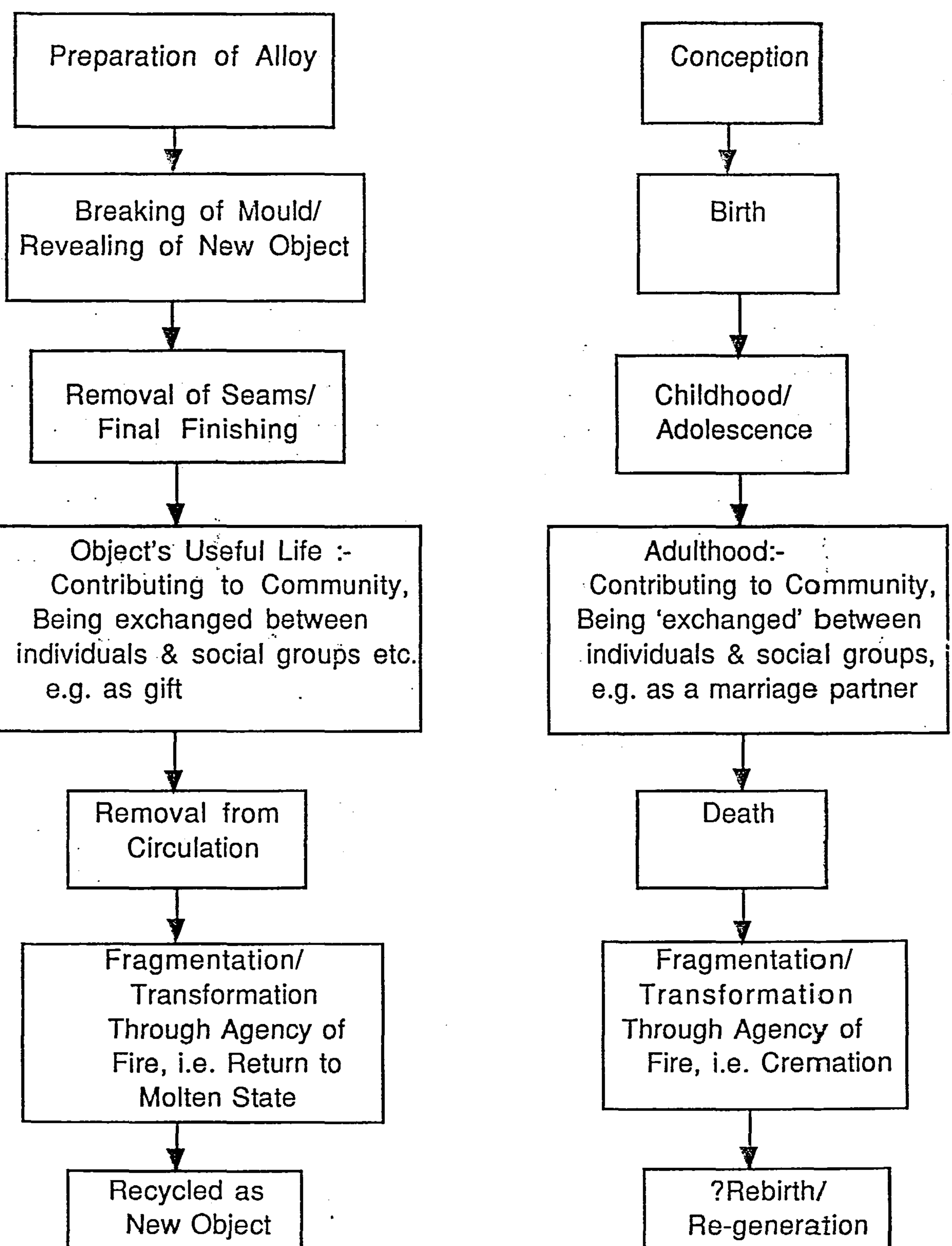


Table 1: Hawkes 1960 'Scheme for the British Bronze Age' - Summary & Chronological Chart

Mainland Britain (After Hawkes, 1960)	Central Europe*	Northern Europe*	Metalworking Phase (After Burgess, 1979)	Approximate Chronology (After Hawkes, 1960)	Absolute Chronology (After Burgess, 1979)
Copper Age	-	-	-	2000 - 1750 bc	-
Copper Age 2	-	-	-	1750 - 1600 bc	-
Early Bronze 1	Unetice	-	-	1650-1500 bc	-
Early Bronze 2	Unetice	-	-	1550-1400 bc	-
Middle Bronze 1	Tumulus B	Montelius IIa	Acton Park	1400-1200 bc	1500 - 1400 bc
Middle Bronze 2	Tumulus C - Bronze D	Montelius IIb-c	Taunton	1200-1000 bc	1400 -1300 bc
Middle Bronze 3	Bronze D - Hallstatt A2	Montelius III-!Va	Penard	1000-850 bc	1300 - 1100 bc
Late Bronze 1	Ha B1	Montelius IV	Wilburton	900-700 bc	1100 - 1000 bc
Late Bronze 2	Ha B2-3	Montelius V	Ewart Park	750-600 bc	1000 - 800 bc
Late Bronze 3	Ha C	Montelius VI	Llynfawr	650 - 500 bc	800 - 700 bc

* Information collated using information given in Burgess, 1979, Burgess, 1980, and Burgess and Coombs, 1979.

Table 2: The Occurrence of Diagnostic 'Carp's Tongue Complex' Artefacts in the Hoards Studied

Hoards Recovered in Essex

	Hoard Reference Number	Winged Axe	Thorndon' Type Knife	'Carp's Tongue' Sword	Purse Chape	Decorated Socketed Spearhead	Hog-backed Knife	Bugle-Shaped Object	Miscellaneous 'Bric-a-brac'
Aveley	01	-	-	-	-	-	-	-	-
Grays Thurrock I	02	X	X	X	X	X	-	-	X
Grays Thurrock II	03	-	-	-	-	-	-	-	-
Leigh I	04	-	-	-	-	-	-	-	-
Leigh II	05	X	X	X	-	X	X	-	X
Shoebury I	06	X	-	-	-	-	-	-	-
Shoebury II	07	X	-	-	-	-	-	-	-
Shoebury III	08	-	-	-	-	-	-	-	-
Southchurch I	09	-	X	X	X	X	-	-	-
Southchurch II	10	-	-	-	-	-	-	-	-
Vange	11	X	-	X	-	-	-	-	-

Key: 'X' denotes a type's presence
'-' denotes a type's absence

Hoards Recovered in Kent

	Hoard Reference Number	Winged Axe	Thorndon' Type Knife	'Carp's Tongue' Sword	Purse Chape	Decorated Socketed Spearhead	Hog-backed Knife	Bugle-Shaped Object	Miscellaneous 'Bric-a-brac'
All Hallows I	12	X	X	-	-	X	-	-	-
All Hallows II	13	-	-	X	-	-	X	-	X
Aylesford	14	-	-	-	-	-	-	-	-
Bexley Heath	15	-	-	-	-	-	X	-	-
Borstal	16	-	-	-	-	-	-	-	X
Cliffe-at-Hoo	17	-	-	-	-	-	-	-	-
Dartford	18	X	-	-	-	-	-	-	-
Minnis Bay	19	X	X	X	X	X	X	-	-
Minster	20	X	X	X	X	X	X	X	X
Stoke-at-Hoo	21	-	-	X	-	-	-	-	-
Sturry	22	X	-	-	-	-	-	-	-
Whitstable	23	X	X	X	X	X	-	-	-

Table 3: The Relative Numbers of Different Socketed Axe Types Occurring in the Hoards Studied

Hoards Recovered in Essex

	Total No. of Axes / Axe Fragments	Total No. of 'South-Eastern' Type	Total No. of 'Faceted' Type	Total No. of Misc. Ribbed Types	Total No. of Other Types	Total No. of Unknown Type
Aveley (01)	9 (*?)	9	0	0	0	0
Grays Thurrock I (02)	110	66	2	2	1	39
Grays Thurrock II (03)	3	3	0	0	0	0
Leigh I (04)	4	4	0	0	0	0
Leigh II (05)	73	30	2	1	1	39
Shoebury I (06)	15 (*18)	11 (*13)	0	2 (*3)	1	0
Shoebury II (07)	2	2	0	0	0	0
Shoebury III (08)	1	0	0	0	0	1
Southchurch I (09)	25	9	1	1	0	14
Southchurch II (10)	0	0	0	0	0	0
Vange (11)	23	3	1	0	0	19

Hoards Recovered in Kent

	Total No. of Axes / Axe Fragments	Total No. of 'South-Eastern' Type	Total No. of 'Faceted' Type	Total No. of Misc. Ribbed Types	Total No. of Other Types	Total No. of Unknown Type
All Hallows I (12)	16	6	4	0	0	6
All Hallows II (13)	12	11	1	0	0	0
Aylesford (14)	4	0	2	2	0	0
Bexley Heath (15)	45	31	0	2	0	12
Borstal (16)	20	11	1	0	0	8
Cliffe-at-Hoo (17)	5	1	2	0	0	2
Dartford (18)	6	4	0	1	1	0
Minnis Bay (19)	16	8	1	4	1	2
Minster (20)	69	43	1	2	2	21
Stoke-at-Hoo (21)	20	13	3	1	0	3
Sturry (22)	3	0	0	0	3	0
Whitstable (23)	14	10	0	0	1	3

Note: Information given in brackets applies to hoards in which the actual number of objects originally included in the hoard is unknown or uncertain.

Table 4: The Chronological Periods Represented by Metalwork Types Occurring in the Hoards Studied

Hoard Name/ Reference Number	Number of Artefacts Representing A Specific Chronological Period		
	Middle Bronze Age	Wilburton	Ewart Park/Carp's Tongue
Aveley (01)	-	-	9 (9+)
Grays Thurrock I (02)	?1	0	227
Grays Thurrock II (03)	0	0	4
Leigh I (04)	0	1	6
Leigh II (05)	2	0	138
Shoebury I (06)	2	0	21 (25)
Shoebury II (07)	0	0	5
Shoebury III (08)	0	0	1
Southchurch I (09)	1	0	50
Southchurch II (10)	-	-	-
Vange (11)	0	0	38
All Hallows I (12)	0	0	28
All Hallows II (13)	0	0	25
Aylesford (14)	0	0	4
Bexley Heath (15)	0	0	51
Borstal (16)	?1	0	37
Cliffe-at-Hoo (17)	0	0	8
Dartford (18)	0	1	11
Minnis Bay (19)	0	0	66
Minster (20)	1	0	135
Stoke-at-Hoo (21)	0	0	29
Sturry (22)	*0*	*I5*	*1*
Whitstable (23)	0	0	1

Note: i) An entry in italics denotes a LBA hoard which is believed to represent a chronological period other than the Ewart Park Phase.
ii) Any objects of uncertain identification or uncertain provenance are prefixed by a question mark.
iii) Blank columns may be encountered in two instances. Firstly, where a hoard is incomplete and where information pertaining to its contents is poor (e.g. Aveley), and secondly where no artefactual remains were recovered in the hoard (e.g. Southchurch II).
iv) Where the original size of a hoard is unknown or unclear (e.g. Aveley, Shoebury I), revised figures are included in brackets where possible.

Table 5: The Incidence of Casting Defects Amongst Socketed Axes (see also Appendix 2)

Hoard Name and Reference No.	Number of Socketed Axes Displaying Varying Degrees of Severity of Casting Defect			
	No Defects	*Minor*	*Significant*	*Severe*
Aveley (01)	3	4	2	-
Grays Thurrock I (02)	30	30	45	1
Grays Thurrock I (03)	-	1	2	-
Leigh I (04)	2	2	-	-
Leigh II (05)	44	10	18	-
Shoebury I (06)	10	4	1	-
Shoebury II (07)	1	1	-	-
Shoebury III (08)	1	-	-	-
Southchurch I (09)	18	1	6	-
Southchurch II (10)	-	-	-	-
Vange (11)	21	2	1	-
All Hallows I (12)	9	1	5	1
All Hallows II (13)	3	1	7	1
Aylesford (14)	3	-	1	-
Bexley Heath (15)	20	10	14	1
Borstal (16)	7	3	9	1
Cliffe-at-Hoo (17)	2	-	2	1
Dartford (18)	2	5	2	-
Minnis Bay (19)	10	4	2	-
Minster (20)	45	13	13	-
Stoke-at-Hoo (21)	6	6	7	1
Sturry (22)	2	-	1	-
Whitstable (23)	6	4	4	-

Table 6: The Incidence of Casting Defects Amongst Small Tools (see also Appendix 2)

Socketed Gouges

Hoard Name and Reference No.	Number of Objects Displaying Varying Degrees of Severity of Casting Defect			
	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	0	0	6	0
Grays Thurrock II (03)	0	0	1	0
Leigh I (04)	0	0	1	0
Leigh II (05)	3	0	0	0
Southchurch I (10)	1	0	0	0
Vange (11)	0	0	0	0
All Hallows I (12)	1	0	0	0
All Hallows II (13)	2	0	0	0
Bexley Heath (15)	1	0	0	0
Minnis Bay (19)	2	0	0	0
Stoke-at-Hoo (21)	3	0	0	0
Sturry (23)	0	1	0	0
Whitstable (23)	0	1	0	0

Chisels

a) Tanged Chisels

	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	3	0	0	1
Southchurch I (10)	1	0	0	0
Minster (20)	2	0	0	0

b) Socketed Chisels and Axe-like Chisels

	No Defects	*Minor*	*Significant*	*Severe*
All Hallows II (13)	1	0	0	0
Bexley Heath (15)	1	0	0	0
Minnis Bay (19)	1	1	1	0

c) Mortising Chisels and Punches

	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	0	0	1	0
Minnis Bay (19)	3	0	0	0

Table 6 (cont.): The Incidence of Casting Defects Amongst Small Tools (see also Appendix 2)

Knives

a) Thorndon Type Socketed Knives

Hoard Name and Reference No.	Number of Objects Displaying Varying Degrees of Severity of Casting Defect			
	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	5	0	2	0
Leigh II (05)	4	0	0	0
Southchurch I (09)	2	0	0	0
All Hallows I (12)	1	0	0	0
Minnis Bay (19)	1	0	1	0
Minster (20)	1	0	0	0
Whitstable (21)	1	0	0	0

b) Tanged Knives and Knives of Unknown Type

	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	8	0	0	1
Southchurch I (09)	1	0	0	0
Vange (11)	1	0	0	0
Borstal (16)	1	0	0	0
Minster (20)	1	0	0	0
Whitstable (23)	1	0	0	0

Table 7: The Incidence of Casting Defects Amongst Socketed Spearheads (see also Appendix 2)

Hoard Name and Reference No.	Number of Objects Displaying Varying Degrees of Severity of Casting Defect			
	No Defects	*Minor*	*Significant*	*Severe*
Grays Thurrock I (02)	4	0	10	1
Leigh I (04)	1	0	1	0
Leigh II (05)	7	0	1	0
Shoebury II (07)	1	0	0	0
Southchurch I (09)	6	0	0	0
All Hallows I (12)	1	1	1	0
Bexley Heath (15)	0	0	2	0
Borstal (16)	1	0	0	0
Cliffe-at-Hoo (17)	1	0	0	0
Minnis Bay (19)	1	1	0	0
Minster (20)	3	1	4	0
Sturry (22)	5	0	0	0
Whitstable (23)	1	0	2	0

Table 8: Evidence for Metalworking in the Hoards Studied

Hoard Name/ Reference No.	Primary Evidence				Secondary Evidence	
	Ingot Metal	*Casting Jets*	*Metal Spill*	*Mould Debris*	*Hammers*	*Whetstones*
Aveley (01)	-	-	-	-	-	-
Grays Thurrock I (02)	Yes	Yes	Yes	Yes	Yes	-
Grays Thurrock II (03)	Yes	-	-	-	-	-
Leigh I (04)	?Yes	-	-	-	-	-
Leigh II (05)	Yes	Yes	Yes	-	Yes	-
Shoebury I (06)	Yes	-	-	-	-	-
Shoebury II (07)	?Yes	-	-	-	-	-
Shoebury III (08)	Yes	-	-	-	-	-
Southchurch I (09)	Yes	Yes	-	-	-	-
Southchurch II (10)	Yes	-	-	-	-	-
Vange (11)	Yes	-	-	-	Yes	-
All Hallows I (12)	Yes	-	-	-	-	-
All Hallows II (13)	Yes	-	-	-	-	-
Aylesford (14)	-	-	-	-	-	-
Bexley Heath (15)	Yes	-	-	-	-	-
Borstal (16)	Yes	Yes	-	-	-	-
Cliffe-at-Hoo (17)	-	-	-	-	-	-
Dartford (18)	Yes	-	-	-	-	-
Minnis Bay (19)	Yes	Yes	-	-	Yes	-
Minster (20)	Yes	Yes	-	-	Yes	-
Stoke-at-Hoo (21)	Yes	Yes	-	Yes	-	-
Sturry (22)	Yes	-	-	-	-	-
Whitstable (23)	Yes	Yes	-	-	-	-

Note: Where the presence of ingot metal in a hoard is recorded in an entry prefixed by a question mark, documentary sources allow one to be reasonably sure that such finds were recovered, though they no longer survive in association with the appropriate hoard.

Table 9: Breakage Patterns Amongst Socketed Axes in the Hoards Studied

Hoard Name /Reference Number	Total Axe Population	Complete Axeheads				Fragmented Axeheads						
		I	Ia	Ib	II	III	IV	V	VI	VII	VIII	IX
Aveley	?	5	1	-	1	-	-	-	-	-	-	-
Grays Thurrock I	104	28	4	-	1	*(2)*	2 *(6)*	7 *(13)*	4 *(1)*	5	22	7
Grays Thurrock II	3	2	-	-	-	-	1	-	-	-	-	-
Leigh I	4	4	-	-	-	-	-	-	-	-	-	-
Leigh II	74	10	4	1	-	*(1)*	1 *(5)*	2 *(9)*	1 *(2)*	4	14	14
Shoebury I	14	10	2	-	-	*(1)*	1	-	-	-	-	-
Shoebury II	2	-	1	-	-	-	1	-	-	-	-	-
Shoebury III	1	-	-	-	-	*(1)*	-	-	-	-	-	-
Southchurch I	27	-	-	-	-	*(1)*	*(2)*	1 *(1)*	-	-	15	7
Southchurch II	0	-	-	-	-	-	-	-	-	-	-	-
Vange	?	-	-	-	-	*(5)*	-	1 *(8)*	-	-	-	-
All Hallows I	16	4	2	-	-	*(2)*	-	2 *(5)*	1	-	-	-
All Hallows II	12	2	3	2	-	-	-	3	1	-	1	-
Aylesford	4	4	-	-	-	-	-	-	-	-	-	-
Bexley Heath	45	28	-	-	1	*(3)*	*(3)*	1 *(8)*	1	-	-	-
Borstal	20	1	1	1	-	*(2)*	4 *(1)*	*(5)*	-	-	-	-
Cliffe-at-Hoo	5	2	-	-	-	*(2)*	1	-	-	-	-	-
Dartford	9	2	-	-	1	*(1)*	3 *(1)*	-	-	-	-	1
Minnis Bay	16	10	-	-	-	*(2)*	-	*(1)*	1	1	1	-
Minster	69	20	5	5	2	1	3 *(5)*	4 *(14)*	-	3	6	1
Stoke-at-Hoo	20	9	-	1	-	*(3)*	1	1 *(1)*	1	-	-	-
Whitstable	13	7	-	-	-	*(1)*	-	2 *(2)*	1	-	-	-

I - Complete and undamaged axehead.
II - Axehead subject to minor damage through use or through removal of haft.
III - Portion of axehead missing though object is basically complete.

IV - Fragmented axehead, with lower body seperated from mouth in a ratio of c. 2:1.
V - Fragmented axehead, with upper body seperated from cutting edge in a ratio of c. 2:1.

VI - Fragmented axehead subject to longditudinal division.
VII - 'Long' mouth fragment
VIII - 'Short' mouth fragment
IX - Fragment from body of socketed axe, missing mouth and cutting edge.

Note: Numbers in plain text refer to mouth fragments, numbers in bracketed and in italics refer to blade fragments.

Table 10: Breakage Patterns Amongst Swords in the Hoards Studied

Hoard Name /Reference Number	Total Sword Population	Complete Swords I	Hilt/Shoulders II	Blade Fragments III	IV	V	Tang VI	Frag. Tang VI
Grays Thurrock I (02)	40	-	1	8	16	6	2	3
Leigh II (05)	19	-	3	-	6	5	-	3
Shoebury I (06)	2	-	1	1	-	-	-	-
Southchurch I (09)	9	-	-	1	4	2	-	1
Vange	7	-	1	3	2	1	-	-
All Hallows I (12)	2	-	-	1	-	-	1	-
All Hallows II (13)	8	-	1	2	5	-	-	-
Bexley Heath (15)	2	-	1	1	-	-	-	-
Borstal (16)	8	-	1	1	5	1	-	-
Cliffe-at-Hoo (17)	1	-	-	1	-	-	-	-
Dartford (18)	1	-	1	-	-	-	-	-
Minnis Bay (19)	11	1	1	1	6	1	1	-
Minster (20)	36	-	7	6	1	1	1	-
Stoke-at-Hoo (21)	5	-	1	2	1	-	-	-
Whitstable (23)	3	-	-	1	2	-	-	-

Blade Fragments are Divided as Follows:-

Type III: Large fragments (over 75g in weight).
Type IV: Medium fragments (between 25 and 75g in weight)
Type V: Small fragments (less than 25g in weight)

Table 11: Breakage Patterns Amongst Socketed Spearheads in the Hoards Studied

Hoard Name Reference No.	Total Spearhead Population	Complete Spearheads Ia	Ib	Fragmentary Spearheads IIa	IIb	IIIa	IIIb	IVa	IVb	IVc	Va	Vc
Grays Thurrock I (02)	15	2	-	1	2	-	-	2	2	1	3	2
Leigh I (04)	1	-	-	-	-	-	-	-	1	-	-	-
Leigh II (05)	11	-	-	-	-	-	-	1	7	-	-	3
Shoebury II (07)	1	1	-	-	-	-	-	-	-	-	-	-
Southchurch I (09)	6	-	-	1	1	2	-	-	-	-	1	1
All Hallows I (12)	2	-	1	-	-	1	-	-	-	-	-	-
All Hallows II (13)	1	1	-	-	-	-	-	-	-	-	-	-
Bexley Heath (15)	2	-	-	-	-	1	1	-	-	-	-	-
Borstal (16)	4	-	1	-	-	-	-	-	-	-	1	2
Cliffe-at-Hoo (17)	1	1	-	-	-	-	-	-	-	-	-	-
Minnis Bay (19)	2	1	-	-	1	-	-	-	-	-	-	-
Minster (20)	8	3	1	-	-	1	1	2	-	-	-	-
Whitstable (23)	3	-	-	-	-	-	-	-	1	-	1	1

Key To Breakage Patterns:-

Type I - Spearhead complete and undamaged
Type Ia - Spearhead roughly broken though largely complete
Type II - Spearhead shows subdivision between blade (IIa) and socket (IIb)
Type III - Spearhead divided into two roughly equal parts: upper blade (IIIa) and lower blade/ socket (IIIb)
Type IV - Spearhead divided into three or more fragments: socket (c.f. IIb), lower blade, middle blade and blade tip
Type V - Any fragments subject to additional division on the longtitudinal plane. These may be blade fragments (Va) or socket fragments (Vb)

Table 12: Breakage Patterns Amongst Winged Axes and Palstaves in the Hoards Studied

i)Winged Axes

Hoard Name/ Reference No.	Total Winged Axe Population	Complete Winged Axes Ia	Ib	II	Fragmentary Winged Axes III	IV	V
Grays Thurrock I (02)	5	2	-	(2)	1	-	-
Leigh II (05)	3	-	-	-	-	2	1
Shoebury I (06)	2	1	-	1	-	-	-
Southchurch I (09)	?1	-	-	-	-	-	(1)
All Hallows I (12)	5	-	-	2 (1)	1(1)	-	-
Dartford (18)	1	-	-	(1)	-	-	-
Minnis Bay (19)	5	3	-	1 (1)	-	-	-
Minster (20)	2	2	1	2 (2)		1 (1)	-
Whitstable (23)	2	1	-	1	-	-	-

ii)Winged Adzes

Shoebury I (06)	1	-	(1)	-	-	-	-
Shoebury II (07)	1	1	-	-	-	-	-
Vange (11)	1	-	(1)	-	-	-	-

iii)Palstaves

Leigh II (05)	3	-	-	-	-	2	1
Shoebury I (06)	1	1	-	-	-	-	-
Dartford (18)	1	-	-	(1)	-	-	-
Minster (20)	1	-	-	(1)	-	-	-

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