The Distribution of Bronze Age Metalwork from Lancashire and Cheshire

By P. J. Davey

During the last 70 years prehistoric studies in the north-west have become increasingly systematic. Shone (1911) and Jackson (1934) both attempted to provide a detailed documentation for Cheshire and Lancashire respectively. Bronze Age metalwork was included in both their studies, but in neither case did the scope of the work allow detailed evidence to be presented or all the bronzes to be illustrated. This situation has recently been remedied by the publication of a detailed illustrated gazeteer for Lancashire and Cheshire (Davey and Foster 1975).

The aim of this paper is to examine some of the issues which arise from the known distribution of the finds rather than their typology or chronology.

Finds of Bronze Age metalwork from the area are not evenly distributed and there is considerable variation between finds of different periods (Fig. 1). Some of these differences can be analysed statistically, so that the influence of measurable geographical variables can be assessed. The distribution of bronzes of different periods, and areas of varying altitude and solid geology can be plotted on 5 kilometre grids, and the randomness of the scatter of finds in relation to each variable can be calculated using the Chi-squared test (Davey 1971). In each case the null hypothesis is of the form that there is no significant difference between the observed distribution of finds (o) and that expected of a random scatter (e). The results are set out in Tables 1 and 2. The probability that the null hypothesis is true is expressed as a percentage reading. A high result (e.g. more than 95%) would indicate a random scatter, while a low reading (e.g. less than 5%) would suggest that some factor, other than chance, governed the distributions. Results of between 5% and 95% are not statistically significant.

Table One

Period	Altitude	Area	% of total	o	e	$\frac{(o-e)^2}{e}$	χ^2
E.B.A.	<100m	189	62	15	15	0.00	
	100-200m	67	22	6	5	0.20	
	>200m	50	16	3	4	0.25	
		306	100	24	24	0.45	c. 50%
M.B.A.	<100m	189	62	28	19	5.67	
	100-200m	67	22	1	7	5.14	
	>200m	50	16	2	5	1.80	
		306	100	31	31	12.61	c. 0.3%
D.L.B.A.	<100m	189	62	29	23	1.56	
	100-200m	67	22	4	8	3.13	
	>200m	50	16	4	6	0.67	
		306	100	37	37	5.36	c. 7.5%
ALL	<100m	189	62	35	33	0.12	
	100-200m	67	22	10	12	0.17	
	>200m	50	16	8	8	0.00	
		306	100	53	53	0.29	c. 80%

(N.B. Degrees of Freedom, (N - 1), in this case (3 - 1), or 2)

The Relationship between Altitude and the Distribution of Find-Squares.
(cf. Fig. 5)

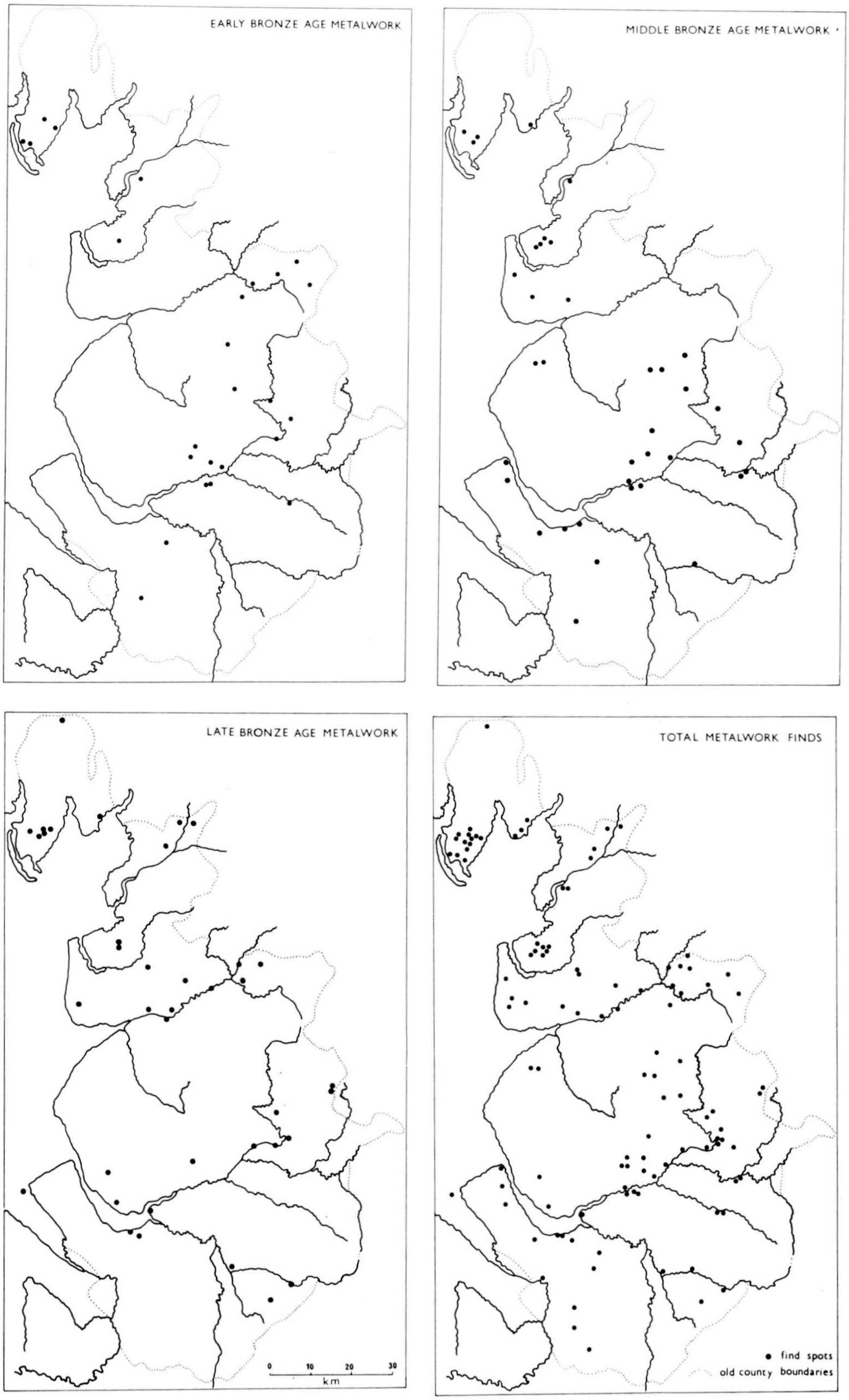
EARLY BRONZE AGE METALWORK
MIDDLE BRONZE AGE METALWORK
LATE BRONZE AGE METALWORK
0 10 20 30
km
TOTAL METALWORK FINDS
find spots
old county boundaries

Fig. 1

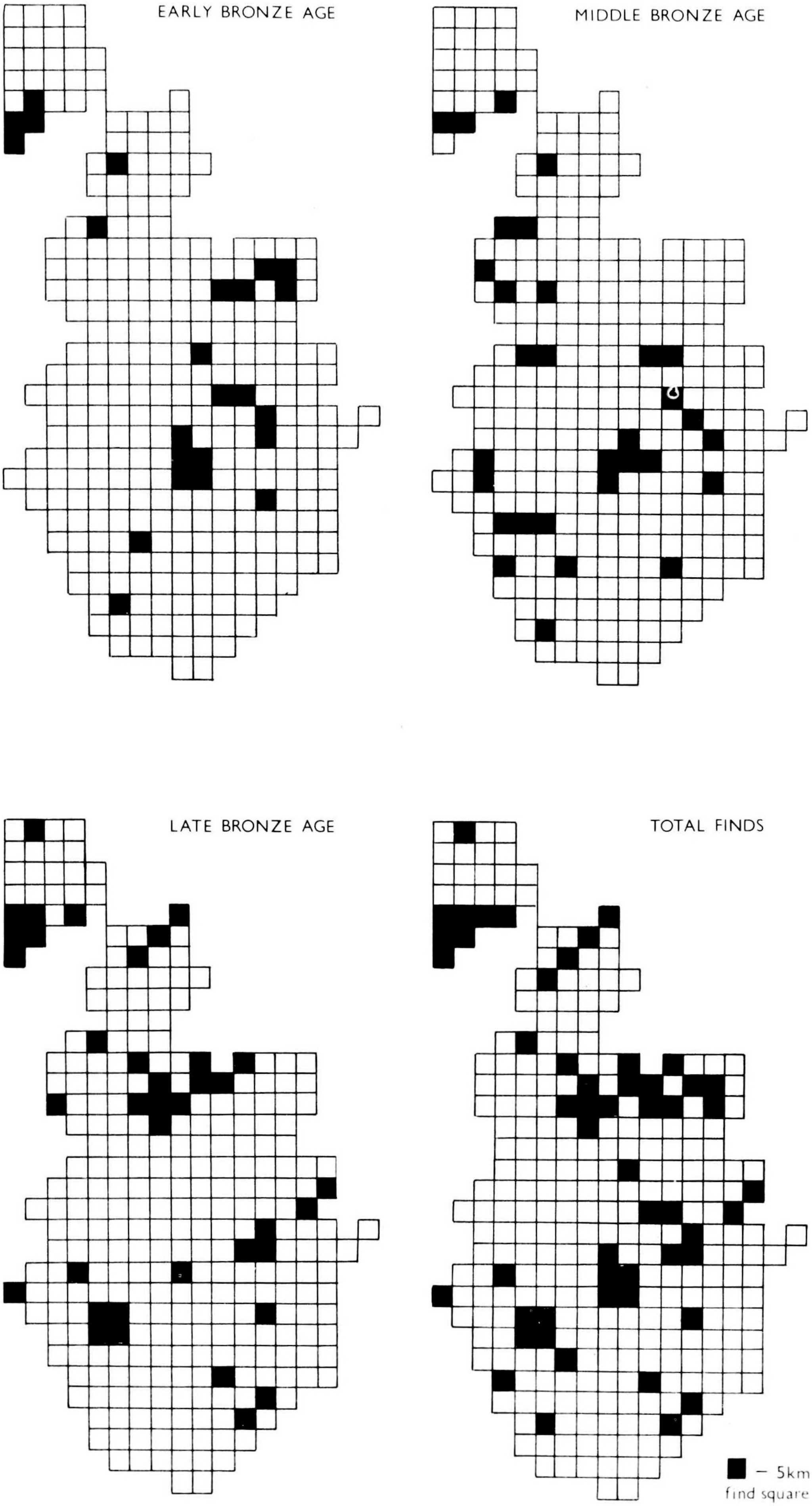

Fig. 2 *'The Distribution of Bronze Age Metalwork by 5Km squares'*

Table Two

Period	Rock type	No. of 5km squares	%	o	e	$\frac{(o-e)^2}{e}$	χ^2
ALL	A	18	6	1	3	01.33	
	B	18	6	9	3	12.00	
	C	39	13	7	7	00.00	
	D	52	17	8	9	00.11	
	E	90.	29	22	15½	02.73	
	F	89	29	6	15½	05.82	
		306	100	53	53	21.99	c.0.1%
E.B.A.	A	18	6	0	1½	1.50	
	B	18	6	2	1½	0.17	
	C	39	13	3	3	0.00	
	D	52	17	6	4	1.00	
	E	90	29	11	7	3.56	
	F	89	29	2	7	3.56	
		306	100	24	24	10.79	c.6%
M.B.A.	A	18	6	0	2	02.00	
	B	18	6	0	2	2.00	
	C	39	13	2	4	01.00	
	D	52	17	3	5	00.80	
	E	90	29	19	9	11.10	
	F	89	29	7	9	00.40	
		306	100	31	31	17.3	c.0.1%
D.L.B.A.	A	18	6	0	2	02.00	
	B	18	6	8	2	18.00	
	C	39	13	4	5	00.20	
	D	52	17	3	6	01.50	
	E	90	29	15	11	01.42	
	F	89	29	7	11	01.42	
		306	100	37	37	24.54	c.0.1%

(N.B. Degrees of Freedom, (N - 1), in this case, (6-1), or 5)

The relationship between Solid Geology and the Distribution of Find-Squares.
(For key to Rock-types cf. Fig. 6).

From the archaeologist's point of view, those variables which exhibit the greatest difference between (o) and (e) are of the most interest, as it is these which weight the results in favour of a low reading for Chi-squared, and which are consequently the most likely to be those directly affecting human settlements and activity.

ALTITUDE (Fig. 3)

Taking into consideration find-squares of all periods, the observed distribution is very close to what would be expected, given the relative areas of land below 100m, 100-200m and above 200m respectively. There is a slight bias towards lower land, and away from intermediate altitudes, but this is not statistically significant. Early Bronze Age find-squares, on the other hand, show a slight tendency in favour of land between 100m and 200m, and against higher levels, but again this bias is not significant. If bronzes from burials, which occur principally on land over 100m, are omitted, find-squares of this period exhibit a strong preference for lower land—a trend continued in the Middle and Late Bronze Ages. If find-spots or total numbers of finds had been considered,

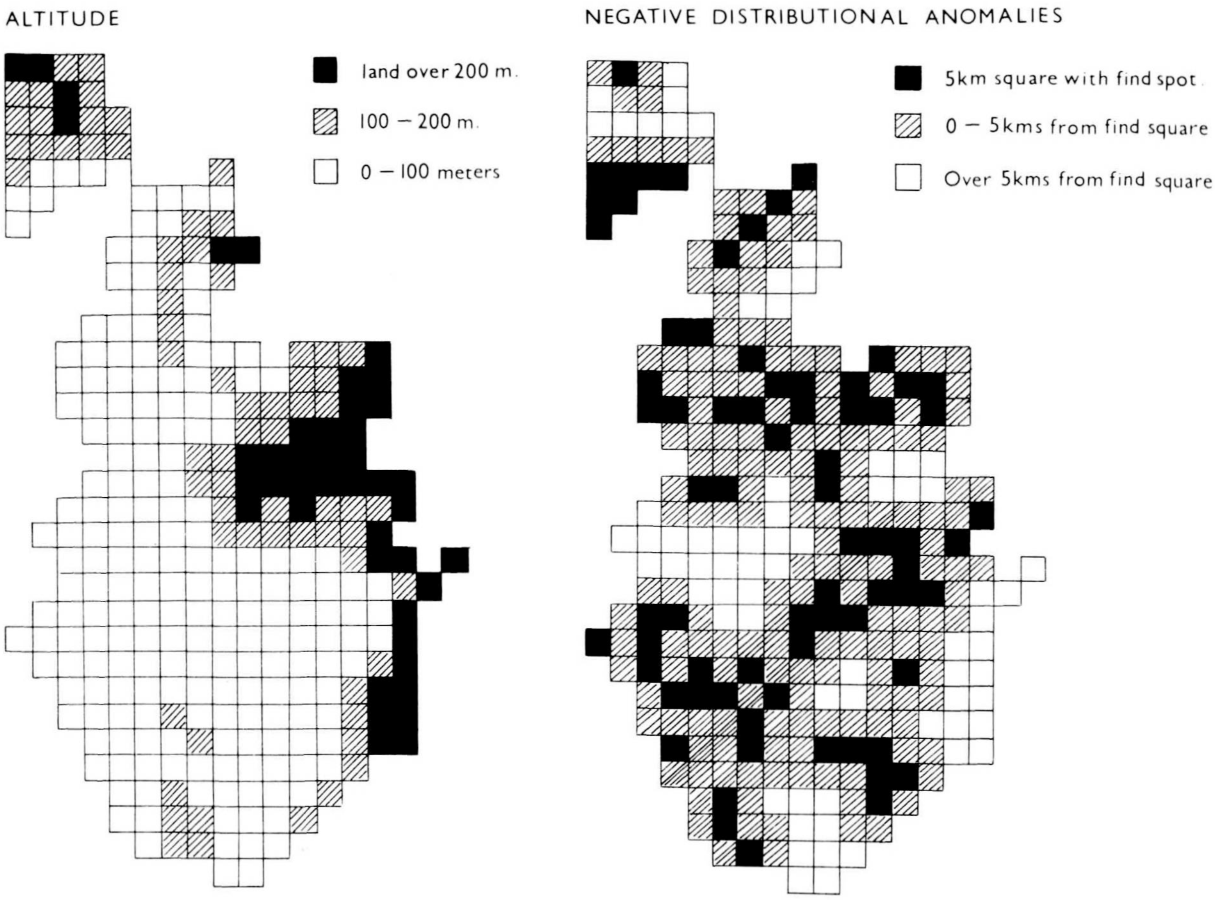

Fig. 3

instead of find-squares this would have been all the more marked. Late Bronze Age associations, for example, are almost entirely from lower altitudes. Although this marked preference for lower land is apparent in all periods, the figures themselves are inconclusive enough to suggest that factors, other than altitude alone, may be involved.

SOLID GEOLOGY

Throughout the Bronze Age geology seems to have been a highly significant factor in influencing metalwork distribution. The most consistent element demonstrated by the table is the strong positive bias of the Triassic Bunter series, matched by the similarly strong negative inclination of succeeding the Keuper. Although the Coal Measures exhibit a slightly positive tendency during the Early Bronze Age, and a correspondingly negative bias in the Developed Late Bronze Age, the overall distribution is normal. Surprisingly perhaps, the Carboniferous Limestone areas of the Upper Lune valley and parts of Ribblesdale do not appear to have been attractive to either the Early or Middle Bronze Age inhabitants of the region. Marked positive readings for the Developed Late Bronze Age would seem to indicate new activity in these areas.

The strong overall correlation between geology and bronze metalwork distributions is probably not as straight forward as it appears from Table 2. Within each geological series there is a wide variety of lithological types. Coal Measures include sandstones, shales and marls as well as coal seams; the Keuper series is formed of clays, sands, marls and conglomerates; even the Carboniferous Limestone, massive at its base, exposed in parts of the Lune valley, is lithologically complex over the rest of its Lancastrian outcrop. As it is impossible to measure the distribution of bronzes against such major variations in rock type which occur over very small areas, the solid geology map should only be regarded as a summary of quite a wide ranging set of variables. The matter is further complicated by the structural history of the region. Carboniferous rocks, as well as being essential components of the upland areas, have been downfaulted to form the basement of the Lancashire Plain and parts of coastal Lunesdale. It is noticeable that, apart from the Silurian rocks of High Furness, which occur only as an upland mass, younger rocks are not necessarily preferred. These complicating factors would lead to the conclusion that in measuring solid geology, other unstated variables are influencing the results. The soils developed over the region, although partly a function of solid geology, exhibit even more local variations then the lithological ones already described. In a small area around Preston, for example, 8 major and 47 minor soil types have been mapped (Crompton 1966). Soils are affected by factors such as aspect, slope and drainage, as well as underlying rock type. The complex geomorphological history of the region, varying types of glacial deposits, and traces of at least four denudational cycles will have played a major part in forming the environment encountered by prehistoric man.

Another unstated variable may be related to the actual drainage system which has developed over the area. The distribution of finds appears to have been influenced by the rivers. 100 out of 115 finds come from areas within 5km of a major river or the coast (Fig. 4); in other words only 13% of the finds of Bronze Age metalwork have been produced by 40% of the total area, in terms of Chi-squared a result of a very much less than 0.1%. The Upper Lune and Ribble rivers have eroded valleys through the Millstone Grit areas and now flow mainly over rocks of the Carboniferous Limestone series. Similarly the Mersey and its tributaries now flow over the older Bunter series, rather than the overlying Keuper. This may explain the importance of the geological horizons in Table 2.

One major problem with this approach is the scale at which it is applied. Human settlement and activity are obviously related to the microcosmic interplay of local environmental factors, as well as the more general features of the landscape, measurable over a wider area. Crucial to the pattern of occupance must be the distribution of springs, tillable soil, better drained land, stream crossing points and many other factors impossible to express in general terms. Any one of these may be the decisive element in the location of a prehistoric site. An alternative approach is to isolate the areas of greatest and least human activity by plotting distributional anomalies, and then to consider which positive factors appear to have been influential.

There are seven important areas of negative anomaly, (Fig. 3). Four of these—High Furness, Bowland, East Rossendale and Pennine Cheshire—correspond to areas of elevated moorland. These regions, with their steep slopes, poor drainage and acid soils, subject to wide extremes of temperature, high winds, frequent frosts and heavy rainfall, are in marked contrast to the 'ideal' prehistoric environments provided by the chalk 'uplands' of southern and eastern England. The other three areas— South Lancashire, Central North Cheshire and South Cheshire, correspond to large spreads of the more sterile soils developed on Triassic rocks, boulder clays and the Shirdley Hill Sands being particularly in evidence. The most significant elements, common to all the areas of negative anomaly, are their remoteness from the sea, or extensive network of larger rivers, and their lack of suitable agricultural land.

There are eight principal regions of positive anomaly, (Fig. 4). Four of these—Low Furness and Cartmel, the Coastal Peats, Ribblesdale, and the Upper Mersey/Irwell Basin—exhibit major concentrations of material from different periods. The remaining four—Lunesdale, West Rossendale, the Lower Mersey and the Upper Dane areas—seem to be less important.

LOW FURNESS (Fig. 4, A)

This is an isolated lowland area projecting from the upland mass of the Lake District, which has been an important centre of human activity from the Neolithic Period to the present day. The large numbers of Bronze Age finds of all types and periods indicate that this region, provided with easy coastal communications—it is bounded by sea on three sides—and light fertile soils on southerly facing slopes, was particularly attractive to Bronze Age settlement.

LUNESDALE (Fig. 4, B)

Lancashire Lunesdale forms a tongue of lowland passing north of the block of the Forest of Bowland. It is characterised by light, drift-free soils based on the basal members of the Carboniferous Limestone series. Finds are relatively few, but seem to indicate an increased activity upstream as the Bronze Age progressed.

THE COASTAL PEATS (Fig. 4, C)

The areas now occupied by Winmarleigh, Pilling, Martin, Marton, Salwick and Stalmine mosses would, during the Early and Middle Bronze Ages have provided well-drained 'warp' soils on raised beaches. Like Furness, coastal communications would have been relatively easy, and the

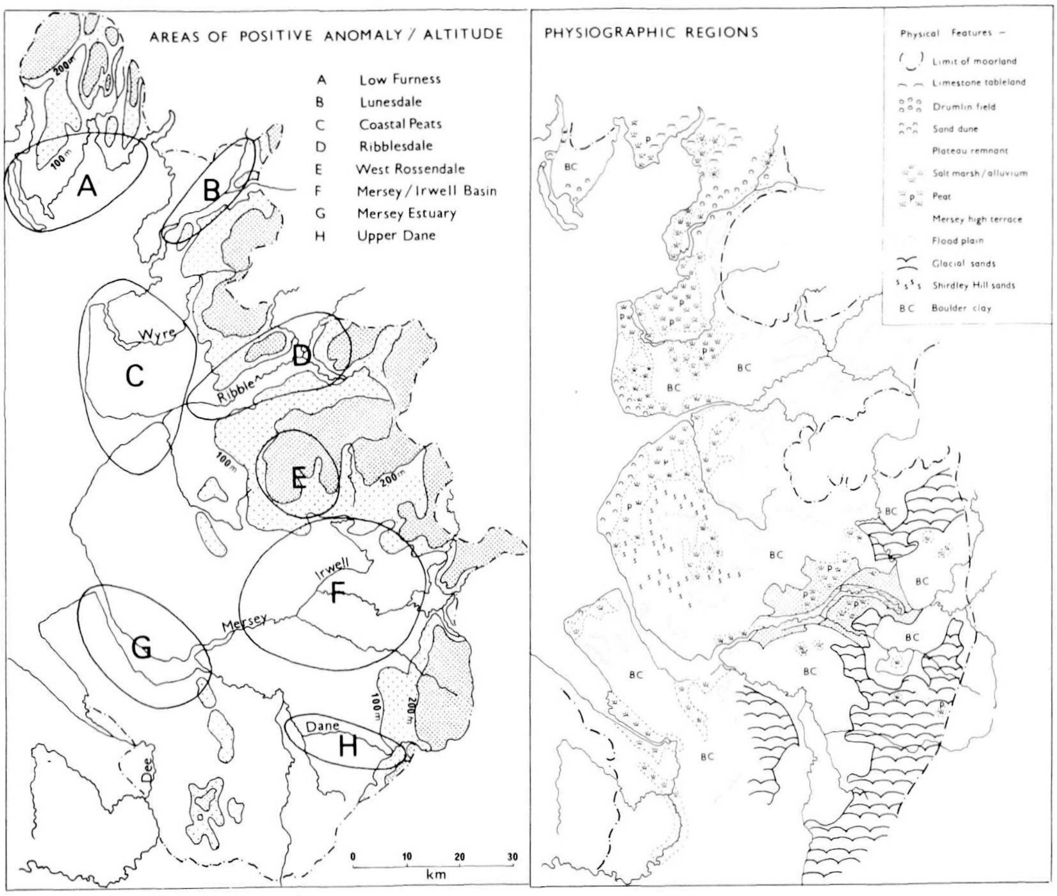

Fig. 4

extent of these would have been assisted by the wide estuaries of the Wyre and Lune. Finds of the earlier periods dominate in these areas, which almost certainly represented the most fertile land available throughout the whole region. The Late Bronze Age finds from the peats—the Winmarleigh Hoard, Pilling sword, etc.—which were almost certainly deposited into wet fen conditions, may possibly provide parallels for the concentrations noted in the Witham valley, which seem likely to have been ritual in origin. (Davey 1971).

RIBBLESDALE (Fig. 4, D)

This is an important low-lying zone between the two major upland blocks of Bowland and Rossendale. It corresponds to a confluence of water directed communications, and possible trans-Pennine routes. Judging by the finds, the main activity in the valley appears to have been during the Late Bronze Age. This may represent a retreat from increasingly wet conditions in the coastal siltlands, and improved clearance techniques able to tackle the more thickly forested inland valleys. The majority of finds are either from the river itself, or from well-drained river terraces. It is possible that strategic factors became important towards the end of the period.

WEST ROSSENDALE (Fig. 4, E)

Like the Forest of Bowland, the Rossendale Hills form a westward extension of the Pennine upland, but their summits are somewhat lower. In the south and west the Wheelton and Rivington Levels form broad shelves, well below the general level of the block. The upland itself is dissected by deep valleys (e.g. Edgeworth) and the synclinal trough cut by the Darwen and Calder rivers—now occupied by Blackburn and Accrington. The concentration of Middle Bronze Age finds from this area would suggest that its south-west facing shelves with access to upland pastures would have lent themselves to settlement and agriculture during this period.

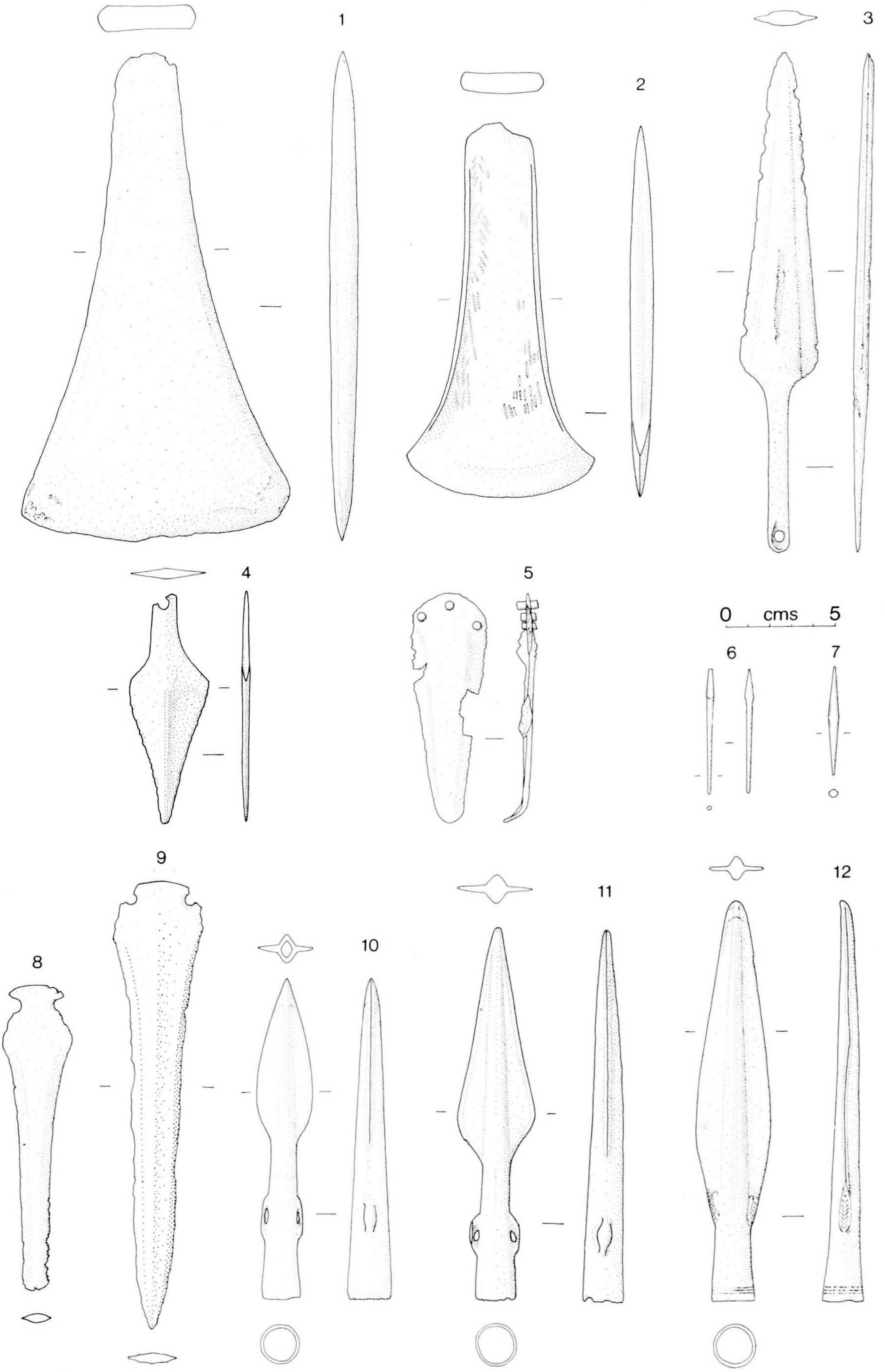

Fig. 5 1–7 Early and 8–12 Middle Bronze Age Metalwork

1. Grimsargh (2). 2. Rixton-with-Glazebrook (7). 3. Nelson (15).
4. Winwick (21). 5. Bolton (22). 6. Golborne (19).
7. Urswick/Aldingham (20). 8. Manchester (62). 9. Bebington (64).
10. Irlam (69). 11. Ellesmere Port (73). 12. Dalton-in-Furness (75).
(Numbers in brackets refer to the Davey Foster 1975 series).

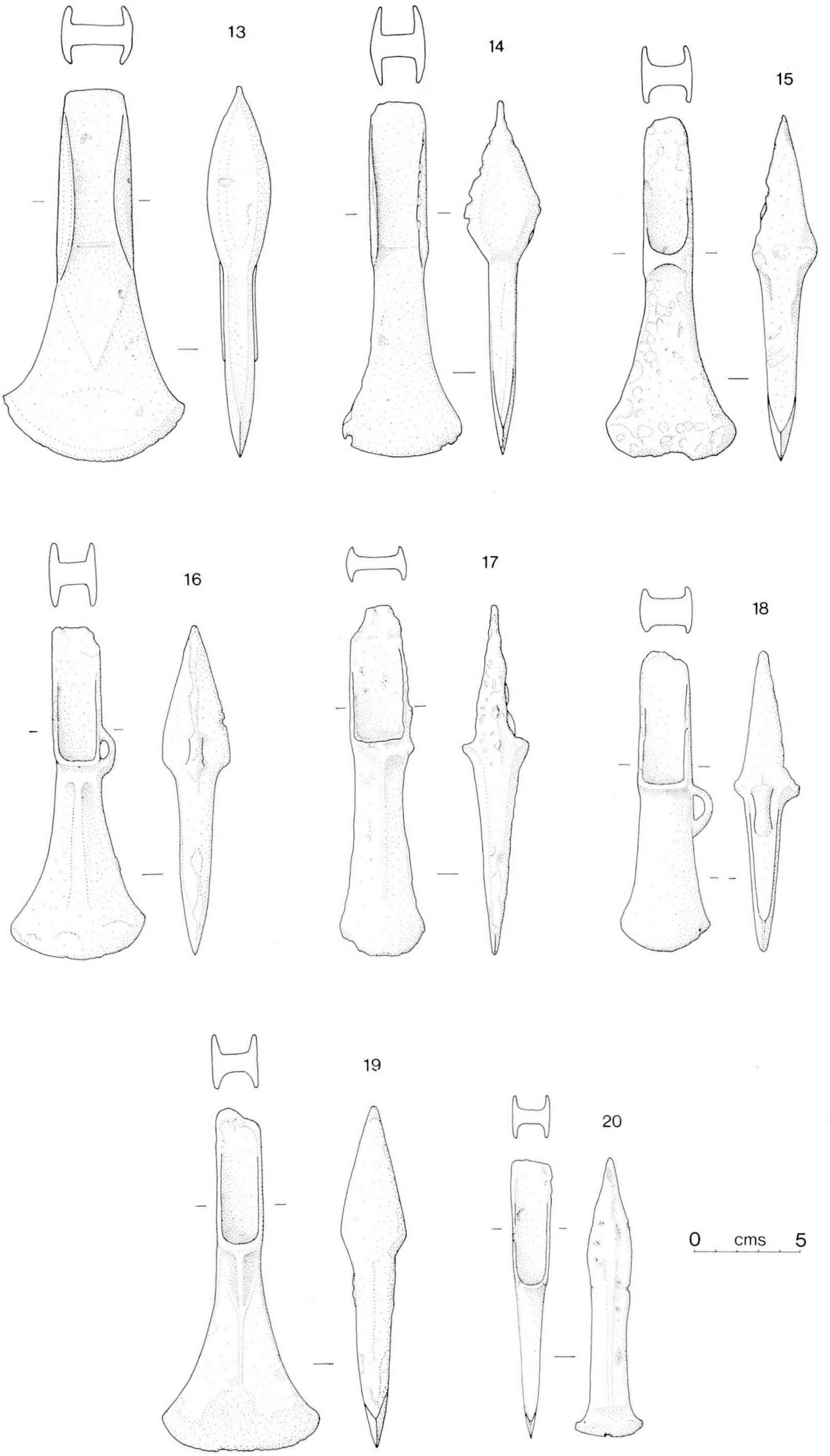

Fig. 6. Middle Bronze Age Metalwork

13. Golborne (28). 14. Pilling (29). 15. Birkenhead (40). 16. Ellesmere Port (50). 17. Wilmslow (55). 18. Runcorn (59). 19. Warrington (46). 20. Martin Mere (61).

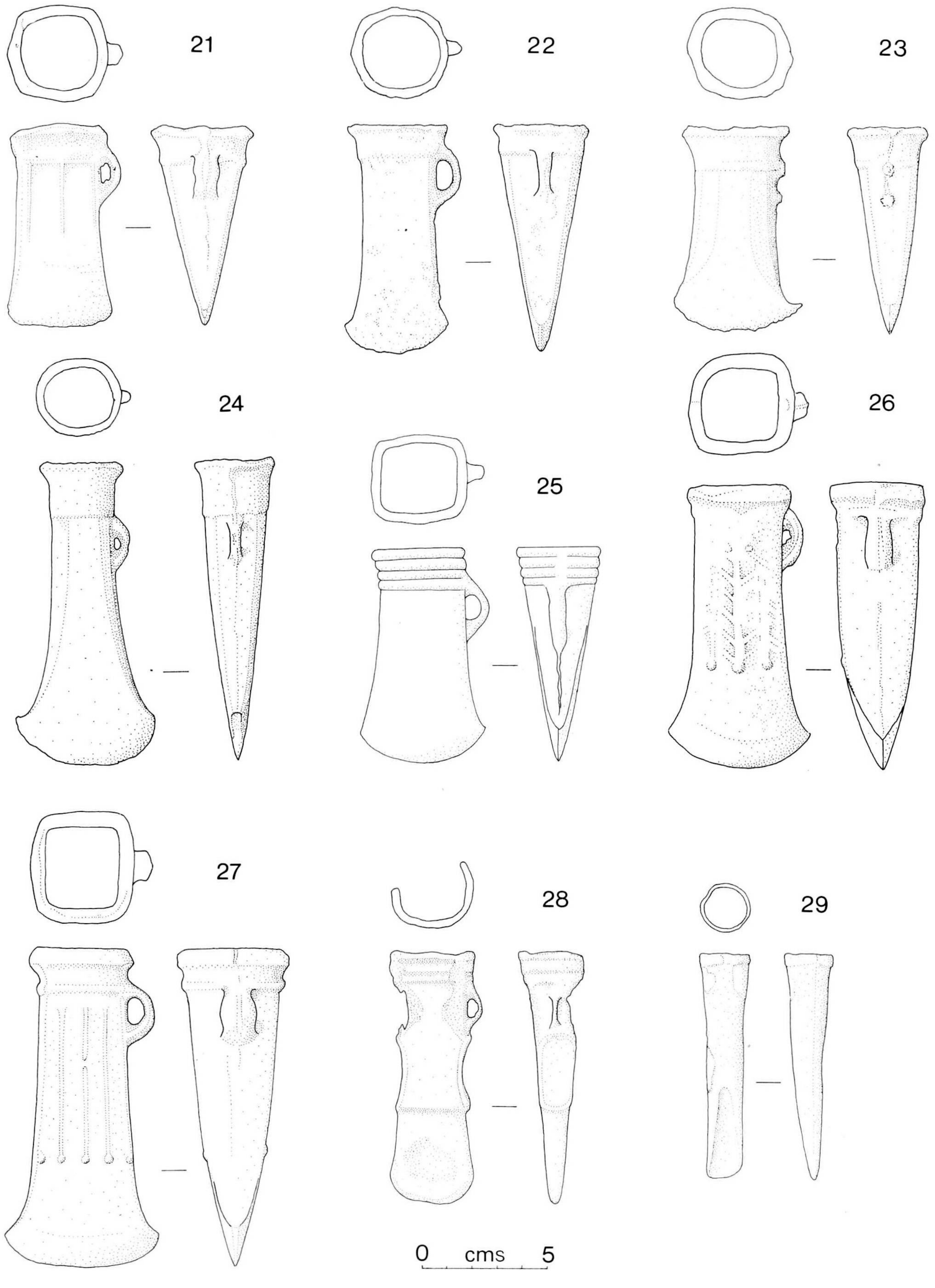

Fig. 7. *Late Bronze Age Metalwork*

21. Longridge (84). 22. Liverpool (90). 23. Whalley (147). 24. Liverpool (79). 25. Coniston (96). 26. Winwick (97). 27. Ellesmere Port (98). 28, 29. River Ribble (160, 162).

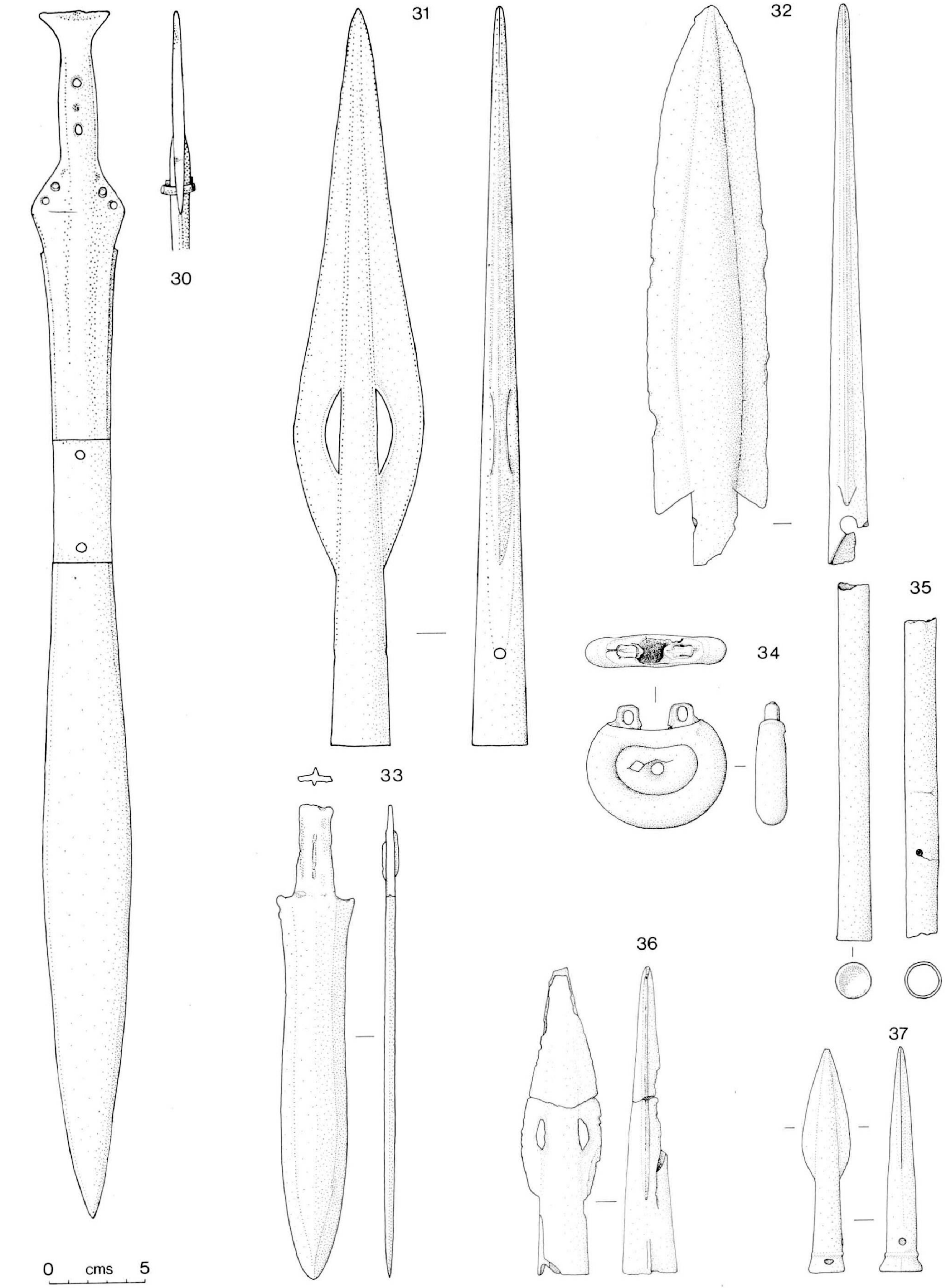

Fig. 8. Late Bronze Age Metalwork

30. Dalton-in-Furness (123). 31. Congleton (125). 32. Congleton (126). 33. Winmarleigh (137). 34. Walton-Le-Dale (150). 35. Congleton (128). 36. Milnrow (107). 37. Betchton (106).

THE MERSEY/IRWELL BASIN (Fig. 4, F)

The Mersey and Irwell valleys stand at the confluence of a network of rivers draining an area extending from the Rossendale Hills to the Derbyshire Pennines. Finds from this basin provide the largest single grouping in Lancastria. Two regions within the area seem of particular significance: the crossing point of the Irwell at Manchester and the Mersey at Warrington, the latter providing a focal point for overland movement round the Mersey Estuary. Between these two positions the Mersey High terrace, comprising broad stretches of gravel and alluvium, with a light well-drained soil, provided ideal sites for settlement and agriculture. The marked concentration of metal work finds, and much other settlement evidence, on the wide expanse of this terrace north of Warrington is of particular interest. Here suitable agricultural land, crossing point and focus of water and overland routes coincide; factors which were to prove significant during subsequent periods. During the Late Bronze Age, possibly in response to wetter conditions in the lower courses of the river, or the pressures of an expanding population, there is a noticeable extension of activity up the valleys—a phenomenon already noted in the Ribble valley.

THE MERSEY ESTUARY (Fig. 4, G)

There is a small scatter of Middle and Late Bronze Age finds from the lower reaches of the Mersey. The Wirral and South-west Lancashire appear to have been isolated from the main centres of activity. This may have been due to the difficulties of inland communication and the large tidal range and very swift currents of the river itself. The Middle Bronze Age finds are divided between forms of palstave from outcrops of the Keuper sandstone, and types of socket-looped spearhead, which like those from Irlam (73), Twemlow (73) and Warrington (80), are from the beds of the rivers themselves. This might reflect a combination of agricultural and fishing activities.

THE UPPER DANE (Fig. 4, H)

The valley of the Dane between Congleton and Middlewich has produced a number of finds, mainly of the Late Bronze Age. Here the river has eroded a wide flood plain, through a sand dominated drift, which would appear to have provided a suitable area for the up-valley extension of settlement which seems to characterise the period.

All the regions described furnish ample evidence for human activity during the Bronze Age—worked flints, perforated stone tools, burials and other field monuments. The bronzes must be considered as merely another element in this material culture. Such a wide ranging assemblage of artifacts, occuring within such well defined areas, must be treated primarily as evidence for settlement.

If this is so, the pattern of finds seems to indicate occupance of coastal sites and valley floors during the Early and Middle Bronze Ages, and an increasing colonisation of the upper courses of the rivers as the Late Bronze Age progressed; probably a dual response to increasingly wet conditions in the lower valleys and an improved ability to clear denser forest cover.

An exception to this pattern is that exhibited by bronzes from burials, at least half of which are from higher altitudes. This seems to have been due to the fact that cemeteries were generally placed above, and overlooking, settlements. When higher land was nearby, as for example the Urswick/Aldingham Common in Furness, or the Lancaster, Extwistle, Turton or Darwen Moors, sites on the edges of these were chosen, but the same principal seems to have applied to burials from lower altitudes, such as those from Winwick, Bolton or Wilmslow, which were set on sand or gravel ridges dominating known lowland settlement areas.

In the past there has been a tendency to interpret the distribution of bronzes almost solely in terms of 'trade routes'. Although finds do occur along the Ribble and Mersey valleys—obvious lines of trans-Pennine communication—similar concentrations are also typical of most of their tributary valleys, with access only to local upland. A valley like the Irwell has one of the most dense scatters of finds, yet its importance as a trade route is negligible.

Very few objects occur which are not typical of the bronze working traditions of northern England as a whole. Objects which can firmly be assigned to Irish or continental origins are exceptional. (Davey and Foster, 1975). The emphasis of any study should be to look first at the local significance of finds. When detailed distribution maps are available for the whole of the British Isles, then it may be possible to suggest the means by which metalwork technology, and perhaps bronze objects themselves, were dispersed from one area to another.

BIBLIOGRAPHY

Crompton 1966	Crompton, E., *'The Soils of the Preston District of Lancashire (Sheet 75)'* Harpenden 1966
Davey 1971	Davey P. J., 'Bronze Age Metalwork from Lincolnshire', *Archaeologia,* CIV, 1973, 51-127.
Davey & Foster 1975	Davey P. J. & Foster E., *Bronze Age Metalwork from Lancashire and Cheshire.* 1975, University of Liverpool Dept. of Prehistoric Archaeology Work Notes 1.
Jackson 1934	Jackson J. W., *'The Prehistoric Archaeology of Lancashire and Cheshire'.*
Shone 1911	Shone W., *Prehistoric Man in Cheshire,* London and Cheshire 1911.

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