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# BUCKETS AND CAULDRONS IN THE LATE BRONZE AGE OF NORTH-WEST EUROPE ; A REVIEW

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**Abstract**

An examination of LBA beaten bronze buckets in the British Isles suggests the likelihood of local manufacture, even for those formerly presumed to be imports. Their chronological relationship to continental Europe is not clear, probably Ha B2-C. The indigenous cauldron series preceded buckets, its earlier type A appearing in Ha B1. The detection of iron in both A and B cauldrons suggests a familiarity with its metallurgy at this time. Known distributions appear to be determined by accidents of preservation.

**Introduction**

In Britain recent studies of pottery (Barrett 1976 ; 1980), and of bronzes (Brugess, 1979) suggest that the traditional date of c. 750 B.C. for the introduction of the continental *Kurd-type* buckets should be about two centuries earlier. This new departure dislocates the attribution of insular cauldrons from any Mediterranean prototype and brings into sharp focus the relationship between bucket and cauldron and the connection between both and comparable examples along the Atlantic and within Europe.

A number of discoveries have been made since Hawkes and Smith's classic paper, almost 30 years ago. Among these were the discovery of a bucket and cauldron in the basement of the Yorkshire Museum at York in 1970, which prompted the writer to take up this study, one in which he has been encouraged by Christopher Hawkes and Colin Burgess.

The development of beaten bronze vessels is vital to an understanding of the European chronologies and the cultural relations of continental Europe with Britain and Ireland (Butler, 1963 ; Hawkes, 1952 ; O'Connor, 1980). It is equally fundamental to our knowledge of regional development within the British Isles. A full *corpus* of the bucket series is included (Appendix 2) ; space does not permit of the inclusion of a similar list of the cauldrons ; only those vessels completely unknown in 1957 are briefly described (Appendix 1). Using these, it is intended to consider the relationship of the insular buckets and cauldrons to their continental counterparts, discuss the implications of the iron recognised in two of the cauldrons, and examine the deposition and distribution of artifacts.

Other topics. such as technical, and metallurgical problems are not discussed.

**1 - Kurd-type buckets on the Continent**

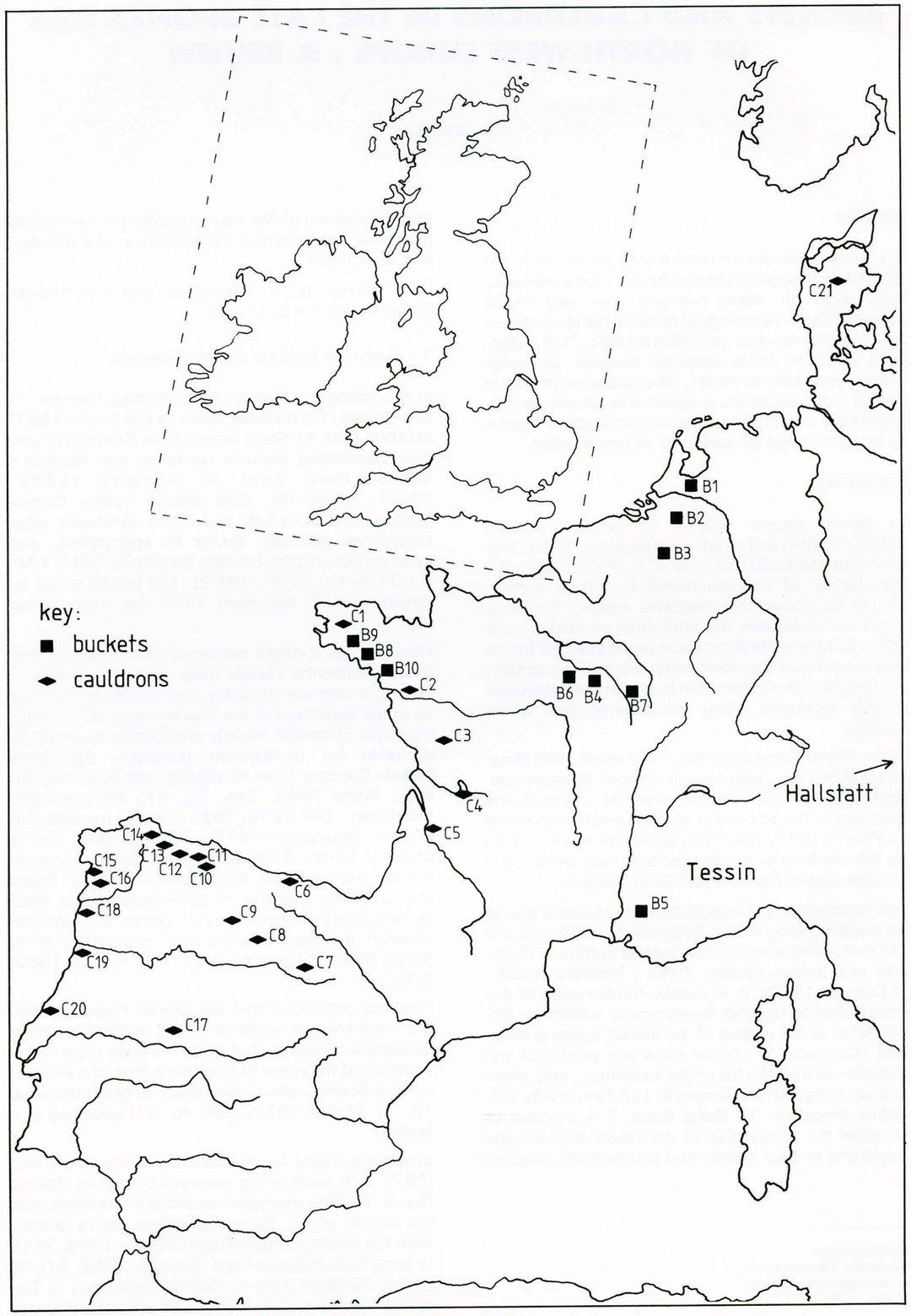
In describing the Nannau (now Arthog, here no. 1) and Dowris (10) buckets, Hawkes and Smith (1957) ascribed both to direct import from Central Europe, their possessing features similar to von Merhart's vessel from Kurd in Hungary (1952, 29-33 ; Taf.16-19). Best known within Central Europe, outliers in Italy and in the northwest were considered precisely similar in appearance, and synchronous in date (Hawkes and Smith 1957, 134-5 ; O'Connor, 1980, 191-2). The insular series is, however, well separated from the main group (fig. 1).

However, as it might reasonably be expected that those continental vessels lying closest to Britain, in sharing a common ancestry, could offer some clues as to the parentage of the insular series, a brief enumeration of certain French and Dutch examples is desirable for comparitive purposes. Analogues include Crossèc (Loire Atlantique) and Spézet (Finistère ; Briard 1965, 244, Fig. 87), Plougoumelen (Morbihan ; Giot 1976, 782), and also even Noslon (Yonne ; Bouloumié 1977). These vessels are of diverses forms. Their circumstances of discovery include one hoard (of Breten axes at Spézet ; Briard *loc. cit.*), the majority of all French bucket finds coming from cremation burial within the Urnfield-Hallstatt tradition, perhaps best exemplified at St André (Isère ; Chapotal, 1962 ; *cf* Freidin, 1982, 108).

I am not convinced that the bronze fragment from the Civry-la-Forêt hoard of 1896, exhibiting similar decorative design to that upon the base-plate of the unstratified fragment of base-plate from the excavations at South Cadbury, Somerset, England (here no. 19 ; *cf.* Mohen 1977, 156, no. 32) belonged to a bucket.

In seeking origins for the Gaulish vessels, Bouloumié (1977, 10) turns to the example from Ede, Holland (fig. 3, 5). This example has much in common with the Insular series, though is felt to derive directly from the Mediterranean (Giulani Pomes 1955, 161), or even from Hallstatt itself (Kimmig, 1962, 87). Its type is dated as early as mid-eighth century in Tarquinia, and as late as the fifth at Hallstatt, Pomes's

**Pwlldrainllwyn
Trefenter, Llangwyryfon,
nr Aberystwyth, Dyfed
Wales, G.B.**






chronology perhaps being too low and the sixth being more appropriate (Bouloumié, 1977, 11). The Dutch finds from Baarloo and Oss, the latter a tomb find, having possessed strap handles and ring carriers, the former a one-piece handle look to both Hallstatt and Italy, their cultural burial traditions linking them in a general way with Central and Eastern Europe.

These two, with St André, are considered typologically similar and are tentatively dated to the seventh century (Bouloumié, 1977, 18 ; *cf.* Chapotat, 1962, who suggest Ha B3-C for the latter site). The vessels from Overasselt (fig. 3, 7) and Nolson are considered impossible to place within the chronology (Bouloumié, 1977, 18) and Kimmig favours a La Tène milieu for the former (1962, 57).

The Plougoumelen tomb is seen as containing true Mediterranean imports, the bronze decorated bowl perhaps made at the command of its occupant (fig. 3, 6). But its associations, like those of Noslon and St Denis de Paulin, appear to be Hallstatt D (bouloumié, 1977, 22). Despite the problems of placing Crozon and Spézet within the bucket series, the Spézet hoard's associations set it early in the French series. Overall, for Bouloumié, the French-Dutch vessels have closer affinities to the Hallstatt, than to the Mediterranean world. For Kimmig a southern origin is preferable (1962 ; *cf.* Rolley in Délor and Pellet, 1980). Neither would claim a Ha A origin for any of the French or Dutch finds, which, in the main, seem unlikely to begin before Ha B2, and span Ha C and D.

Sadly, it is difficult to make comparisons of form and technology across the European répertoire, since no uniform *corpus* of illustrations and detailed descriptions exists ; this, it is hoped, will be remedied by Dr Gerloff's forthcoming survey. Another problem is of sample size, that of Holland and France being remarkably small, each vessel appearing peculiar in design. Only at Hallstatt itself is there a reasonable sample size, of about 70 vessels (Kromer, 1969). Of these, Bouloumié has undertaken a brief, though thorough and objective, analysis, one which deserves amplification. Isolating five different groups among these buckets, it is found that most span a period from the eighth to the sixth centuries B.C. (Bouloumié, 1977, 38, *fn*). There thus appears no particularly strong chronological division between single or double-handled vessels, on the one hand, and those with ribbon-straps or no carriers at all, on the other.

Freidin warns against attempting precise dating of either Gaulish or Rhenish vessels on the basis of associated gravegoods, suggesting a time lapse of indeterminate length between their importing and burial (1982, 111). It is, however, equally likely that vessels in several styles were fashionble over quite long periods ; certainly the paucity of evidence outside Hallstatt, Tessin and Vetullonia limits the potential of reasonable inference and speculation.

O'Connor has recently sketched out the background to the development of the earliest buckets, locating their origins within Ha A of Hungary-Transylvania, drawing attention to their small size, as compared to the insular series (1980, 191). Those examples closest to the Arthog and Dowris finds were in the Brincovenesti hoard and from Hösszupalyi (von Merhart, 1952, taf. 16, 5, 6 ; fig 2, 3), the former of Ha A tradition (O'Connor 1982, 192). No imports so early as this are known from France or Holland, and none from the British Isles ; only in Ha B can we cite the Welby hoard with its cruciform attachments for an imported bowl (Powell, 1950, fig. 3, 34-5), and the fragmentary sheet from Adabrock (Coles, 1959-60 ; O'Connor, 1980, 192-3). The object resembling an Urnfield-Hallstatt bucket handle from Rotsea, Yorkshire (Challis and Harding, 1975, 27, fig. 21.1 ; Manby, 1980, 341, fig. 4 ; fig. 4, 2). would not have served that purpose and is probably a little later than the preceding vessels.

Insular buckets (including those dubbed Kurd-type) begin to appear in Ha B 2-3 contexts in Ewart's Park hoards like Heathery Burn and Gilmonby, and at Dowris. However, it is noterworthy that neither at this period, nor later, did any classic Hallstatt or Tessin-style single-handled buckets filter through to Britain, nor are convincing imitations of them yet to be found among the Insular Series (see below). The Insular series is not normally found in interments with Urnfield style human burial (*cf.* Burgess, 1976).

*Fig. 1 : Buckets and Cauldrons in Europe.*

**Cauldrons** *prefixed C (Cauldrons after Coffyn et al 1981 ; buckets after Kimmig).*

1. *Crozon, Finistère*
2. *Depôt de la Prairie de Mauves, Nantes, Loire-Atlantique*
3. *Depôt de Nôtre-Dame-d'Or, Vienne (?)*
4. *Grotte du Quéroy, Chazelles, Charentes (?)*
5. *Camp de Cubzac-les-Ponts, Gironde (?)*
6. *Carbaçeno, Santander*
7. *Grotte Lobréga, Torrecilla de Cameros, Logrono*
8. *Depôt du Huerta de Arriba, Burgos (?)*
9. *Monte Bernorio, Villaren, Valencia (?)*
10. *Loís, Salamon, Leon (?)*
11. *Pico Castiello, Pola de Siero, Oviedo (?)*
12. *Tineo, Oviedo (?)*
13. *Castro Pendia, Boal, Oviedo (?)*
14. *Chao de Curras, Valle de Oro, Lugo (?)*
15. *Depôt de Limens, Hio, Pontevedra*
16. *Castro A Paneda, Arcade, Pontevedra*
17. *Castro de Castillejos, Sanchorreja, Avila (?)*
18. *Depôt de Caldelas, Braga, Minho, Portugal (?)*
19. *Minho ? Musée Ethnologique du Douro Littoral, Porto, Portugal (?)*
20. *Santa Olaya,? Olaia, Beira Littoral, Portugal (?)*
21. *Abildholt, Denmark*

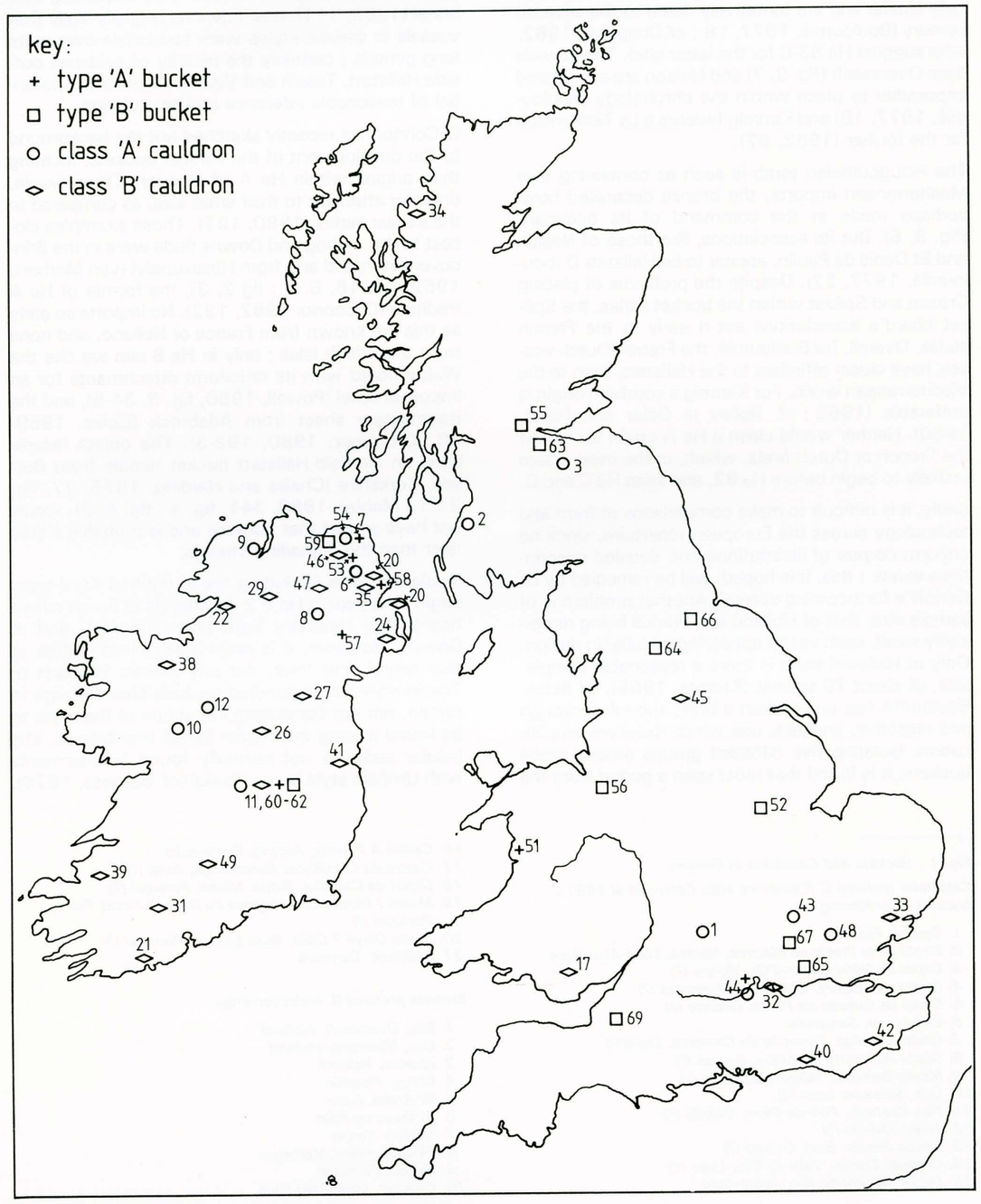
**Buckets** *prefixed B. (selection only)*

1. *Ede, Overasselt, Holland*
2. *Oss, Nijmegen, Holland*
3. *Baarloo, Holland*
4. *Gurgy, Picardie*
5. *St André, Isère*
6. *St Denis de Palin*
7. *Noslon, Yonne*
8. *Plougoumèlon, Morbihan*
9. *Spézet, Finistère*
10. *Crossec, Loire-Atlantique*

It is not until cordoned buckets appear in British La Tène contexts that either burial tradition or bucket technology become more closely connected.

**The bucket series in the British Isles**

In 1957 it was possible to describe 15 or 16 vessels or parts therefrom. There are now 20 or more, additions coming from the excavations at Egham (18) and South Cadbury (4), from the hoard at Gilmony (14), from an 18 th century discovery at Codington (5) and from the discovery on an antiquarian collection with an Irish bucket at York (3 ; Photo.1). ''Nannau'' is now re-provenanced to Arthog (1), and Leeds's n° 14, previously unprovenanced, is localised to Downhill, Co. Derry (9). Though described by Hawkes and Smith, the Bagmoor vessel, of Irish-British type, was neither mapped nor listed (1957, 145, 148 ; *cf.* 152). The vessels were divided sequentially into ''*kurd-type*'' with riveted-on handle holders (nos 1, 3, 10) ; those having secondary cast-on Irish-type handle holders (7 and 21), Irish-British types in which the original holders were cast on (5, 8, 15-17, and 20), with one variant (4), and 3 presumed Irish-British examples (9, 11 and 12). Discounting the fact that two have secondary cast-on staples over original rivets, and that the Cape Castle riveted bucket straps (Photo. 2) actually imitate the Irish-British cast-on type, 6 of the 20 known buckets exhibit general features thought diagnostic of the *Kurd-type.*




In seeking origins for the technique of these vessels, it seems useful to examine their bases as well as their ring carriers. The unprovenanced Irish vessel (20) was apparently unprotected, without even a footring ; ''Ballymoney'' similarly lacked protection, though was probably stronger on account of its corrugated base (Photo. 1). Dowris (10) had a footring protected by angle plates with embossed concentric decoration, and that from Derrymacash also carries angle plates (fig.5,2) ; in this case being decorated by circumferential concentric broken lines.

Hawkes argued that since the Hallstatt form was of high angular shoulders, (fig.3,1), ring handles appearing more ornamental than utilitarian, the vessels also showing low base sheets and a general absence of neck corrugation, that the Arthog bucket ((1) fig.3,9) corresponded more closely to the Urnfield type, which had rounded shoulders (fig.3,3). But the Hungarian examples at the head of the Urnfield series, Marosvecs and Hösszüpalyi (von Merhart, 1952, taf 16 5-6 ; here fig. 2, 3), also differ from Arthog in their possession of decorated ring staples, overall body decoration (Marosvecs only), and neither example has a base fashioned from a single sheet. Moreover, although angle plates are known from continental examples of buckets (*cf.* Hawkes and Smith, 1957, fig. 3), the most comon form of base is the false omphaloid type, with folded over and pressed edge jointing (Kimming 1962).

The bucket from Ede in Holland is in profile perhaps the closest to any British-Irish example (fig.3,5). These observations underline the dissimilarities between the insular series and its continental counterparts, emphasising the coherence of the Irish-British group as a separate entity. Its half-dozen examples now having, or formerly having possessed riveted-on ring staples, do however share something in common with the Urnfield-Hallstatt groups, but the survivors are not sufficiently numerous to allow of a close degree of comparison.

Examined in numerical and typological terms, the centre of production development of angle plates appears to have lain within the British Isles. Comparisons of base-plates on the Aichach, Choryn or Skočijan-St Kanzian vessels (Hawkes and Smith, 1957, fig. 3 ; Chapotat, 1962 ; Vinski-Gasparini, 1968) show only distant relationships, though a find from the latter site, the cruciform base plate, provides the unique parallel to that from the Petters hoard (18). Nevertheless, without the cross decoration, the Petters plate is comparable to both the Dowris (11) and Ireland (20) base strangtheners. Chapotat has also drawn attention to these differences (1962, 76).

To summarise of the problems which make it difficult to accept the ''Kurd-type'' buckets as true imports into the British Isles, they are larger than their continental ''progenitors'' ; they are numerically coherent as a distinct group, and, perhaps more curiously, there is no distributional ''fall-off'' from Middle Europe of precisely similar vessels, on the route believed to have been taken by the smiths who travelled back and forth to learn the skill of their production. It is therefore difficult to escape the fact that while enjoying a common family origin, the insular bucket series is largely developed indigenously. And as such, the vessels may be better divided into those

*Fig. 2 : The Distribution of Buckets and Cauldrons in the British Isles*

**Cauldrons** *(after Leeds and Hawkes, with addition).*

*1. River Cherwell*
*2. Dalduff*
*3. Hattenknowe*
*4. Scotland (N.M.A.S. DU4)*
*5. Ireland (N.M.I. W 14)*
*6. Portglenone*
*7. Cape Castle*
*8. Tulnacross*
*9. Ramelton*
*10. Cloonascurragh*
*11. Dowris (3 examples)*
*12. Derreen*
*13 - 15. Ireland*
*16. W. of Scotland*
*17. Llyn Fawr (2 examples)*
*18-19. Ireland (N.M.I. W 12 - W 13)*
*20. Dirnaveagh*
*21. Derry Bog*
*22. Ballyshannon*
*23. Donaghadee*
*24. Raffray*
*25. Minnis Bay*
*26. Millkernagh*
*27. Lisdromturk*
*28. N. Ireland*
*29. Castlederg.*
*30. Ballinvariscal*
*31. Kealanine*
*32. Battersea*
*33. Ipswich (2 examples)*
*34. Poolewe*
*35. Ballyscullion*
*36. Ireland (N.M.A.S. DU 5)*
*37. Ireland*
*38. Cloonta*
*39. Ballynorig West*
*40. Sompting*
*41. Dalkey Island.*
*42. Ditchling.*
*43. Chrishall*
*44. Petters*
*45. Vale of York.*
*46. Ballymoney*
*47. Calmore*
*48. Isleham*
*49. Monella*

*There is no 50 in the sequence. Examples 4, 5, 13-15, 18-19, 28 and 36-7 are not mapped*

**Buckets** *(for which the order remains as in the printed text)*

*51. Arthog*
*52. Bagmoor*
*53. Ballymoney*
*54. Cape Castle*
*55. Cardross*
*56. Codington*
*57. Derrymacash*
*58. Dervock*
*59. Downhill*
*60-62. Dowris*
*63. Duddingston Loch*
*64. Gilmonby*
*65. Hatfield Broad Oak*
*66. Heathery Burn*
*67. Meldreth*
*68. Petters*
*69. South Cadbury*
*70-71. Ireland (unmapped)*

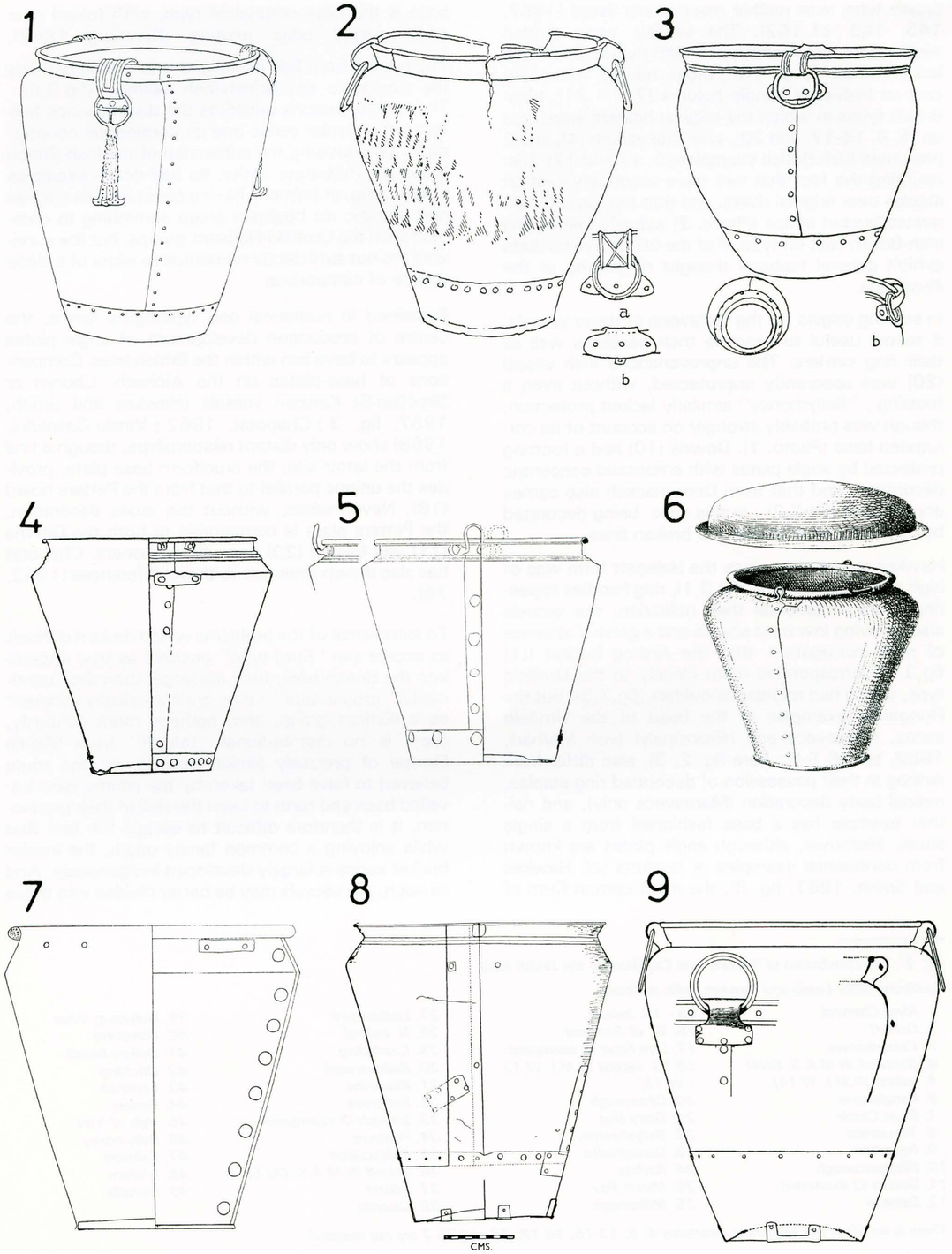



*Fig. 3 : European buckets*

*1. Hallstatt, Grave 504 (Merhart)*
*2. Marosvečs (Merhart)*
*3. Hösszüpalyi (Merhart)*
*4. Aichach (Merhart)*
*5. Ede, Veluwe (Kimming)*
*6. Le Rocher, Plougoumélen (Galles)*
*7. Ede, Overasselt, Gelderland (Kimmimg)*
*8. Dowris (Eogan 1964)*
*9. Arthog (Hawkes and Smith)*



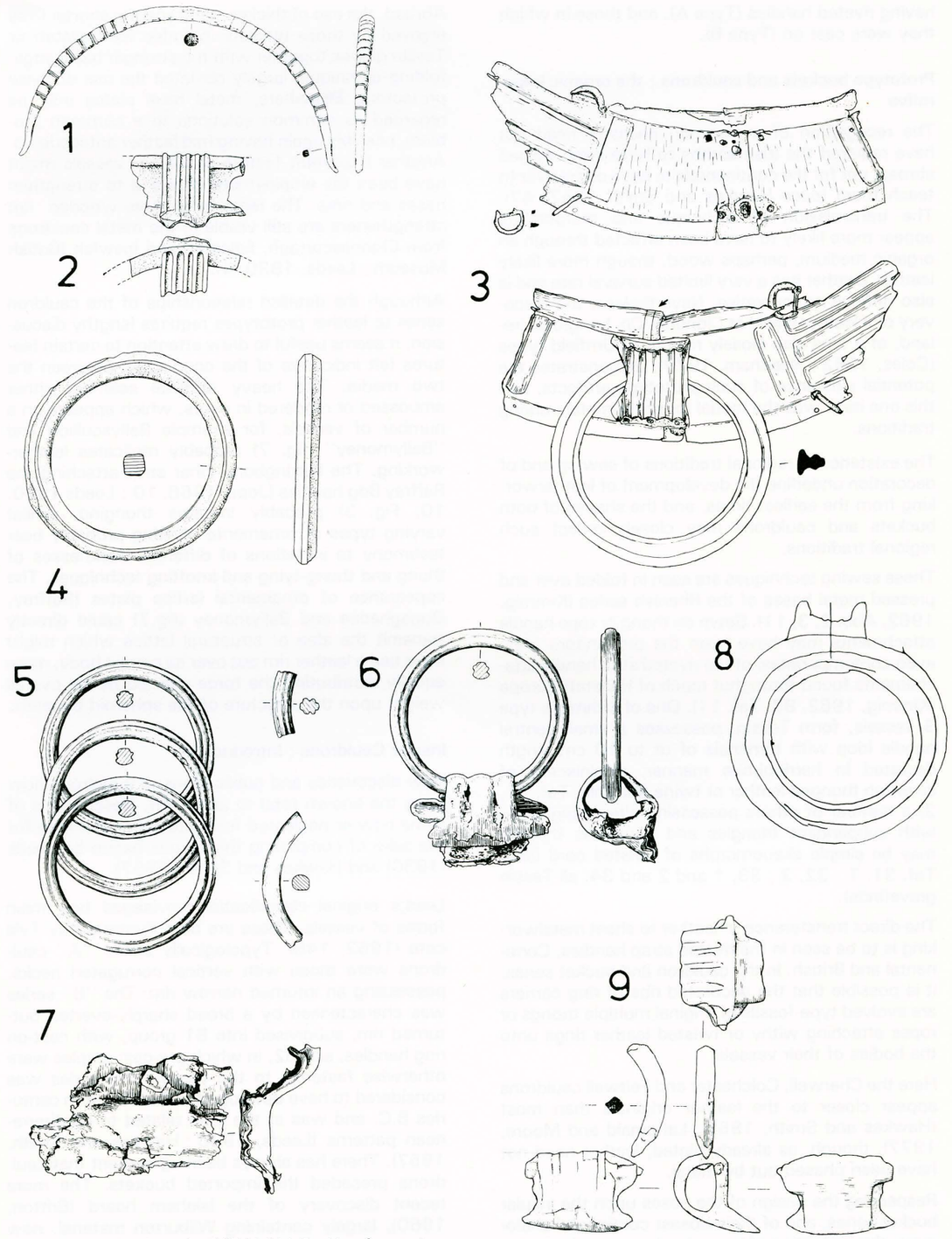



*Fig. 4 : Some Continental and British-Irish Cauldron fragments.*

*1. rotsea, Yorkshire, (after Manby)*
*2. Praire de Mauves (after Briard)*
*3. Ipswich (Ipswich Museum unpubl.)*
*4. Nantes (after Briard)*
*5-7. Isleham, Cambrigeshire (5) rigns Bury Mus. 29,1-3, small fragment 29,4, larger fragment 29.6 ; (6) ring and staple 27.1 ; (7), body/staple fragment, 28.1*
*8. Calmore, Co. Derry. (O.S.MS Royal Irish Academy)*
*9. Gilmonby Hoard, Co Durham (Drawn by Sandy Morris)*

having riveted handles (Type A), and those in which they were cast on (Type B).

**Prototype buckets and cauldrons ; the organic imperative**

The recognition of a common ancestry need not have required the Irish smiths to have been trained abroad, nor for the continentals to have come over to teach them (*pace* Hawkes and Smith 1957, 47). The transmission of technique and morphology appear more likely to have been effected through an organic medium, perhaps wood, though more likely leather. Leather has a very limited survival rate and is also difficult to recognise. Nevertheless, the discovery of a leather shield at Clonbrin, Co. Longford, Ireland, of a type also closely related to Urnfield types (Coles, 1962 ; Needham, 1979), demonstrates the potential existence of such prototype artifacts, and this one itself was the model for sheet-metalworking traditions.

The existence of regional traditions of sewing and of decoration underline the development of leatherworking from the earliest times, and the shapes of both buckets and cauldrons may closely reflect such regional traditions.

These sewing techniques are seen in folded over and pressed metal bases of the Rhenish series (Kimmig, 1962, Abb. 2, 3, 11). Sewn on thong or rope handle attachments may have been the progenitors (nay, even contemporaries) of the riveted strip handle attachements found throughut much of Hallstatt Europe (Kimmig, 1962, 83, Taf. 11). One of Kimmig's type 3 vessels, form Tessin, possesses a small central handle loop with terminals of ut to 10 cm length decrated in herringbone manner, reminiscent of sewn-on thonged leather or twine (Kimmig, Taf. 31, 2) a number of others possessing alternating voids with subpendant triangles and variations thereon may be simple skeuomorphs of twisted cord (*ibid.* Taf. 31, 1 ; 32, 2 ; 33, 1 and 2 and 34, all Tessin gravefinds).

The direct transference of leather to sheet metalworking is to be seen in the riveted strap handles, Continental and British. In the cauldron and bucket series, it is possible that the decorated ribs of ring carriers are evolved type-fossils of original multiple thongs or ropes attaching withy or twisted leather rings onto the bodies of their vessels.

Here the Cherwell, Colchester and Feltwell cauldrons appear closer to the leather originals than most (Hawkes and Smith, 1957 ; Langmaid and Moore, 1977), though, as already hinted, leather need not have been phased out by metal.

Respecting the design of the bases upon the insular bucket series, and of their closest continental analogues, the protection of bases beaten around wooden formers (*cf.* the wooden shields Coles, 1962, PL II-III) requiring the protection of angle plates and of decorative bosses could be seen as replicas of original leather examples in which wear was prevented by keeping the stiffened hide from the ground.

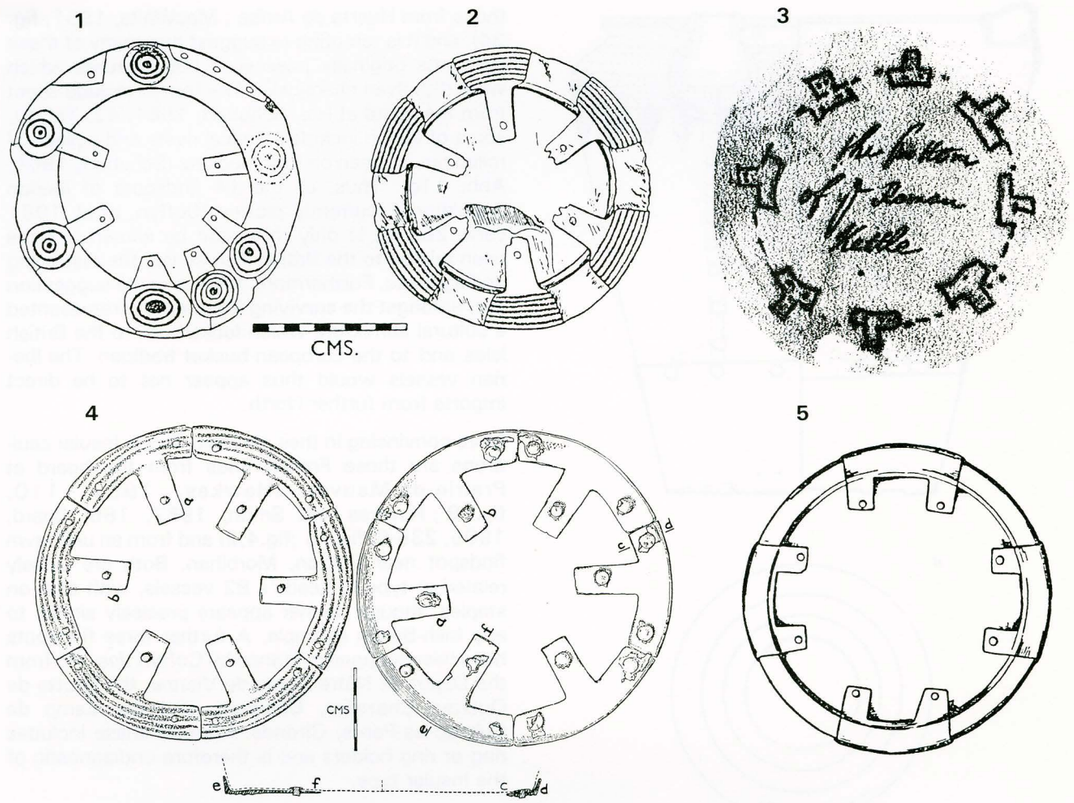
Abroad, the use of thicker metal and the shorter lives enjoyed by those buckets intended for Hallstatt or Tessin graves together with the stronger basal edge-folding technique, largely obviated the use of these protectors. Elsewhere, metal base plates may be regarded as common solutions to a common problem, possibly again having had leather antecedents. Another important feature of leather vessels might have been the employment of wood to strengthen bases and rims. The remains of three wooden rim strengtheners are still visible in the metal cauldrons from Cloonascurragh, Edleston and Ipswich (British Museum ; Leeds, 1930, 4).

Although the detailed relationships of the cauldron series to leather prototypes requires lengthy discussion, it seems useful to draw attention to certain features felt indicative of the connection between the two media. The heavy artificial seaming either embossed or rendered in rivets, which appears on a number of vessels, for example Ballyscullion and ''Ballymoney'' (fig. 7) probably replicates leather-working. The herringbone inner strut attaching the Raffray Bog handles (Jope, 1966, 10 ; Leeds 1930, 10, Fig. 3) probably imitates thonging, whilst varying types of ornamental riveting probably bear testimony to imitations of different thicknesses of thong and thong-tying and knotting techniques. The appearance of ornamental lattice plates (Raffray, Donaghadee and Ballymoney (fig.7) could directly transmit the idea of structural lattice which might have tied a leather rim out over its conoid body, more equally distributing the force exerted by its overall weight upon the structure of the spheroid beneath.

**Insular Cauldrons : Introduction**

New discoveries and publications of cauldrons now bring the known total to about 55. Descriptions of some new or neglected finds are appended here for the sake of completing the *corpus* begun by Leeds (1930) and Hawkes and Smith (1957).

Leed,s original classification envisaged two main forms of vessels. These are best illustrated by Tyle cote (1962, 148). Typologically earlier ''A'' cauldrons were those with vertical corrugated necks, possessing an inturned narrow rim. The ''B'' series was characterised by a broad sharply-everted outturned rim, subdivised into B1 group, with cast-on ring handles, and B2, in which pre-cast staples were otherwise fastened to the vessel. The series was considered to have developed in the 7th - 6 th centuries B.C. and was at the time related to Mediterranean patterns (Leeds, 1930 ; Hawkes and Smith, 1957). There has always been agreement that cauldrons preceded the imported buckets. The more recent discovery of the Isleham hoard (Britton, 1960), largely containing Wilburton material, now suggests a currency as early as the 10th century B.C. for cauldrons of A type. The presence of B cauldrons at Llyn Fawr, perhaps as late as the 7th century B.C., and the presence of both 'early' buckets (= type A, see above) and A cauldron at Dowris, in the eponymous hoard (Eogan 1983, 123) an assemblage also generally considered late (*cf.* Burgess 1979), suggests a currency for A and B cauldrons of from the 4th to 5th centuries, emphasising the tenuousness of our knowledge about the chronological relation ship between the A and B cauldrons.



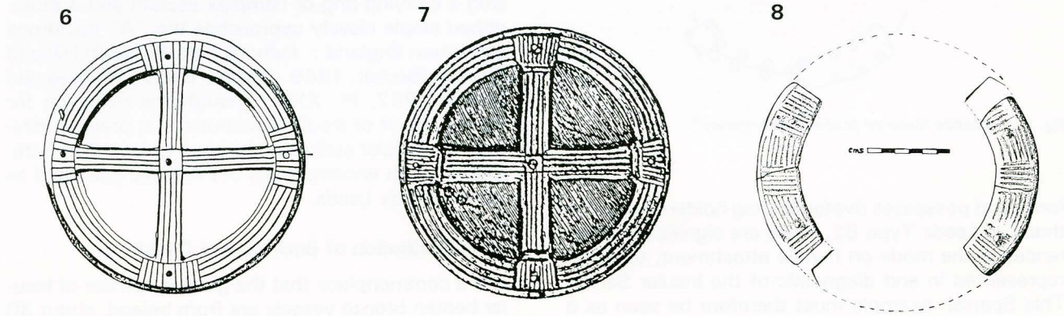




*Fig. 5 : British-Irish bucket base plates*

*1. Dowris (Eogan 1964)*
*2. Derrimacash (Eogan 1964)*
*3. Codington (Briggs 1977)*
*4. Bagmoor (Inv. Archaeol.)*
*5. Arthog (Hawkes and Smith)*
*6. Heathery Burn (Inv. Archaeol.)*
*7. Cardross (Anderson)*
*8. Hatfield (Davies)*

**Insular Cauldrons and the Atlantic connection**

Although the British-Irish cauldrons series comprise a discrete development in the LBA, similar vessels are known along the northwest European seaboard, principally from Iberia, Western France and Denmark.

The best-known of the Iberian examples, drawn by Hawkes, MacWhite and others, is that from Carbaçeno, Santander (Hawkes, 1952, fig. 8 and 9 ; Schubart, 1961, Abb. 4B, Taf 3-5). It has to be admitted that although this example is conical in

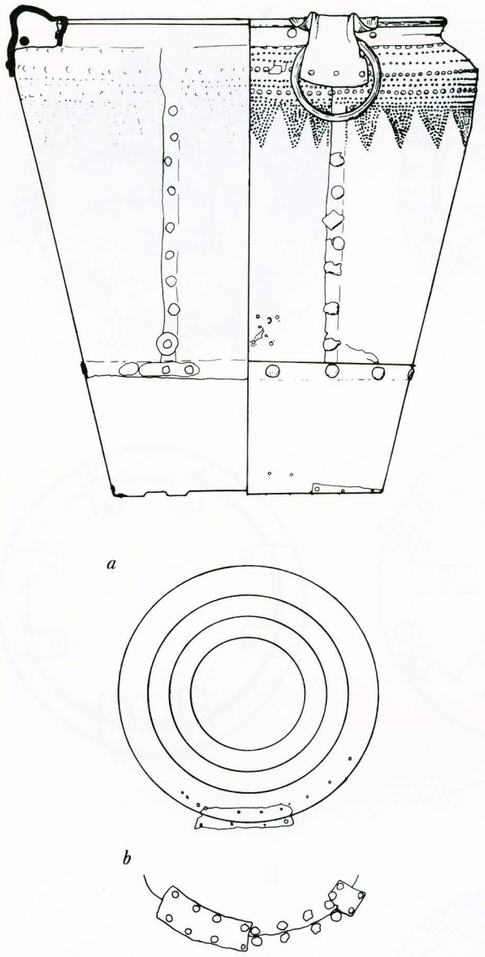



Fig. 6 : Yorkshire Museum bucket "Ballymoney"

form, and possesses riveted on ring holders similar to those of Leeds Type B2, there are significant differences in the mode on handle attachment, to those represented in and diagnostic of the Insular Series. This Spanish example must therefore be seen as a more distant relative (*cf.* Hawkes, 1952, 110-12 ; Hawkes and Smith, 1957, 185, *fn* 9). The cauldron from a cave deposit near Loís (Prov. Loís), which shares the same character traits (Schubart, 1961, Abb. 9), and a third, destroyed vessel from near Arcade (Prov. Pontevedra) was of a similar shape, with a slightly higher shoulder, but possessed bucket-like iron suspension loops and rivets with a single-piece rod handle in the style of those from the Etrusco-Hallstatt world (Schubart, 1961, 40, Abb.4A).

With the exception of a ring handle and sheet fragments from Lobréga (Prov. Lognonia), the rest of the evidence for Iberian cauldrons comprises either riveted sheet fragments quite undiagnostic of type, (like those from Huerta de Arriba ; MacWhite, 1951, fig. 34), and it is tempting to suggest that many of these remnants originally possessed Iron features which were dissolved chemically. The former include sheet from the hoard at Hio (Schubart, 1961, 42, Taf. 6), some of which included conical rivets and a piece of rolled rim, as seen on Kurd buckets (Schubart, 1961, Abb. 11c). Thus, of the 14 findspots of Iberian "cauldrons" currently plotted (Coffyn, *et al.* 1981 carte 25 ; fig.1) only three can be shown to have been related to the British-Irish series, the rest being undiagnostic. Furthermore, there is some suggestion that amongst the surviving fragments is represented a cultural admixture which looks both to the British Isles and to the European bucket tradition. The Iberian vessels would thus appear not to be direct imports from further North.

More convincing in their similarity to the Insular cauldrons are those French finds from the hoard at Prairie-de-Mauves (Hawkes, 1952, 110, fig. 8 ; Hawkes and Smith, 1957, 185 ; Briard, 1965, 235-6, fig.75 ;fig.4,2) and from an unknown findspot near Crozon, Morbihan. Both are closely related in type to Leeds's B2 vessels, with cast on staples, though neither appears precisely similar to any Irish-British example. A further three findspots have been mapped in France by Coffyn (*loc. cit*) from the Depôt de Nôtre Dame de Vienne, the Grotte de Quéroy, Chazelles, Charente, and the Camp de Cubzac-les-Ponts, Gironde. None of these includes ring or ring holders and is therefore undiagnostic of the Insular type.

A final, exported Insular handle fragment comes from Abidholt, Jutland, Denmark, which, in possessing a carrying ring of complex section and a three-ribbed staple closely approaches the "A" cauldrons of eastern England ; Feltwell Fen, Sheepen Hill and Shipton (Becker, 1949 ; Butler, 1963 ; Hawkes and Smith, 1957, Pl. XXII). Though the evidence for actual export of Insular cauldrons is at present minimal, the Insular series can be seen to belong to a tradition which encompasses the Atlantic seaboard as envisaged by Leeds.

**The Distribution of Buckets and Cauldrons**

It is a commonplace that the greater number of Insular beaten bronze vessels are from Ireland, about 30 cauldrons and 9 buckets, and there exists a belief that because the geater proportion of them was found in bogs or "watery places", that interment therein was deliberate, in preference to non-watery places (Torbrügge, 1972 ; *cf.* Eogan, 1983,8). This idea must be explored in terms of soil conditions, land-use and potential discovery rates.

Until about 1800, about one third of Ireland was covered in bog. Using MSS records, it is possible to show how 19th century agricultural improvement eroded this, and to demonstrate that the greatest rate of discovery was when this improvement was at its height (Briggs 1985). It is now accepted that peat bog was already well-established in many areas by the Late Bronze Age, and it may be surmised that



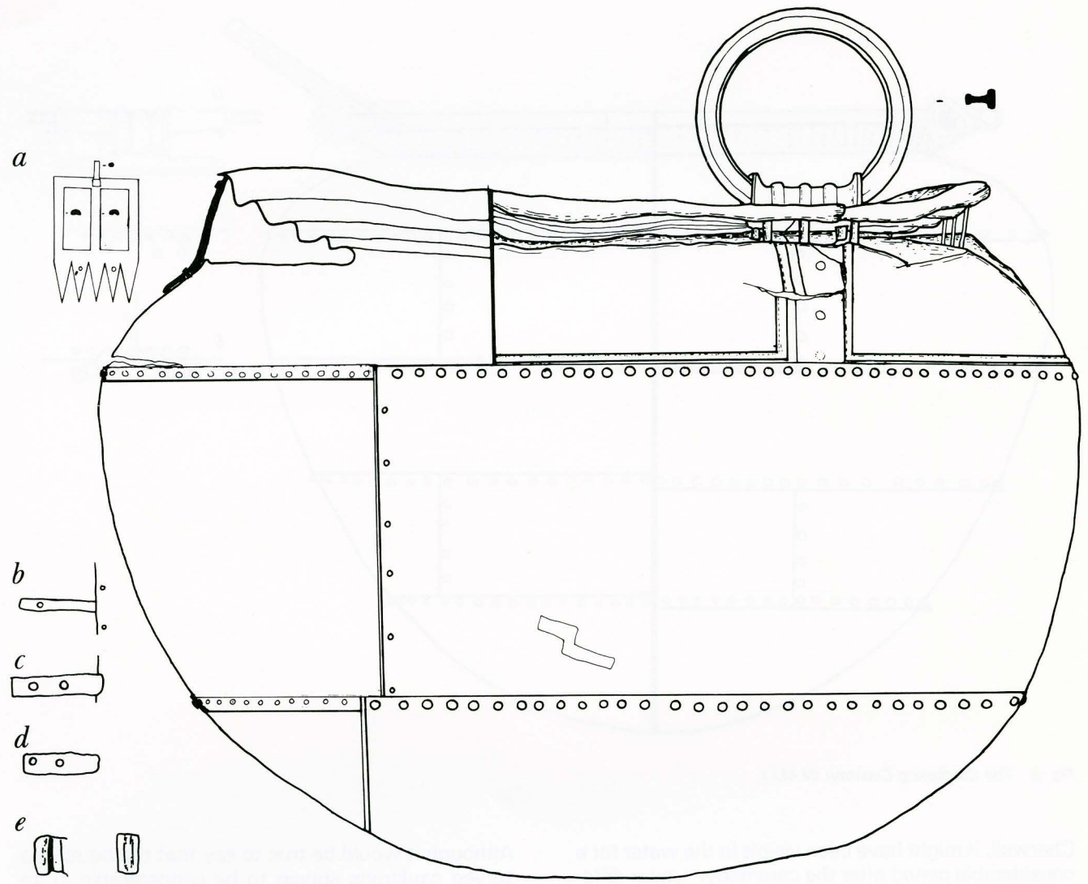



Fig. 7 : Yorkshire Museum cauldron "Ballymoney"

settlement and economic activity was not uncommonly situated upon peat or close to peat. The deliberate burial of hoards or of artifacts in such an environment would also naturally tend to be upon boggy land. Elsewhere in Britain, and upon the continent, this would also be true to a limited degree. Nevertheless once buried in peat, disturbance would only come through peat-cutting or mechanised agriculture ; anaerobic conditions guarantee almost universally good preservation for bronze artifacts.

In contrast, lowland well-drained soils under continuous ploughing would virtually guarantee loss without recognition of something so fragile as sheet metal. Thus, a coincidence of deposition in agriculturally neglected or relatively poorly drained soils and peat accentuates the chances of recognition and discovery. These may seem self-evident truths, but these facts explain how the South Cadbury baseplate (19) and the antiquarian loss from Codington (6) are the only finds currently known from Midland and Southwestern Britain. Absence of evidence should not therefore be taken as evidence of absence. Hence although nine vessels are known from England and Wales, the profiles of only two of them (Arthog and Heathery Burn) are known with certainty.

If the argument so far presented tends to secularise peat bogs as repositories for rich artifacts, might it have been possible that rivers were better candidates as receptacles for the assuaging of spirits ? Even for river deposition, there remain factors of geology which should not be overlooked. the wider rivers from which so many bronze artifacts have been recovered are, at times of flood, fast-flowing dynamic engines of destruction within which there is constant erosion of banks and re-working and admixture of sands, gravels and muds. Few major rivers now follow precisely the same courses as they did three millennia ago, and most minor ones have also altered course considerably. Vessels like that from Shipton-on-Cherwell (Leeds, 1930) and London (Hawkes and Smith, 1957, 191-8) seem more likely to have been deposited in settlement sites close to river banks, and adventitiously washed into the river beds more recently, than to have been deliberately cast into the stream, where, certainly in the case of the

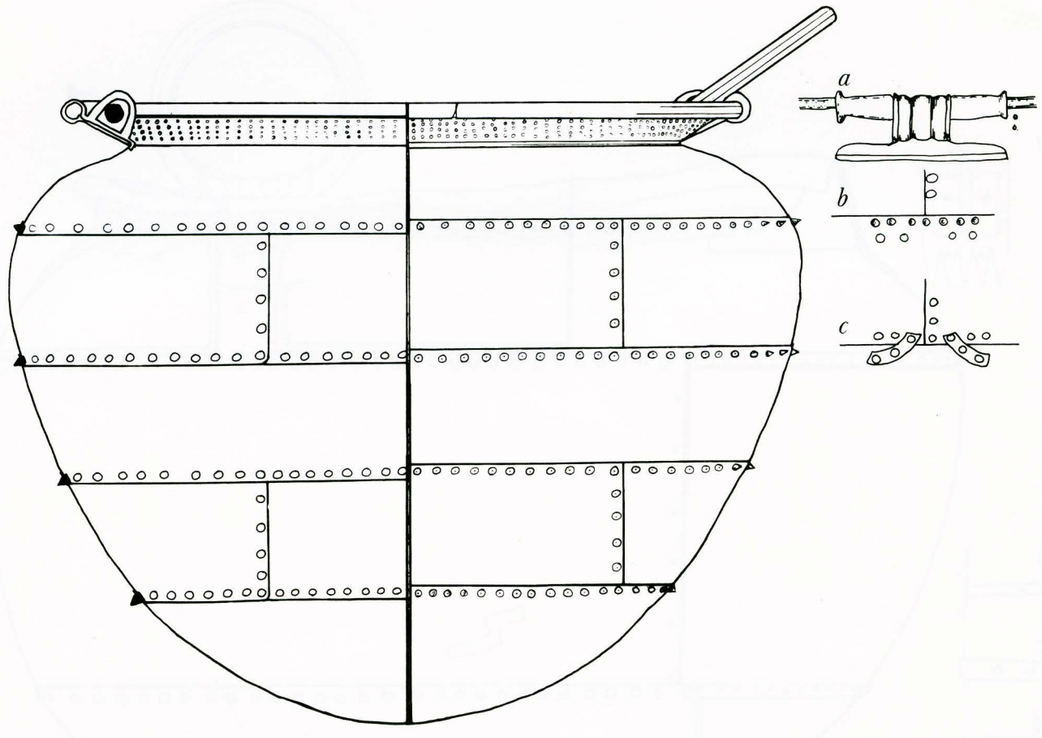



*Fig. 8 : The Castlederg Cauldron (N.M.I.)*

Cherwell, it might have been visible in the water for a considerable period after the ceremony. Under different circumstances of river flood or of estuarine erosion, fragments of the Petters Hoard (18), or of the find from the now inundated settlement site at Minnis Bay in Kent (Worsfold, 1946 ; Champion, 1980, 231) might have been broadcast into neighbouring fluvial deposits.

From this brief discussion, it must now be obvious that distribution patterns of British-Irish beaten bronze vessels differ radically from those of Middle, Eastern and Southern Europe, most particularly because the greater number of European vessels have been deliberately excavated from tombs in which they had been intentionally placed. The British-Irish finds were not intended for status burials, not so far as has been ascertained, and although the Sheepen Hill cauldron came from a pit, and was excavated scientifically, this appears to have been the only such recorded occurrence. No buckets appear to have been similarly deposited, and is of critical cultural significance that fifty percent of all known buckets fragments in the Insular series actually came from hoards, where they had been treated as scrap. This contrasts dramatically with the sanctity afforded buckets as gravegoods at Hallstatt (Angeli, 1970) reinforcing further the differences between Hallstatt and Insular Bronze - Iron Age cultures.

Although it would be true to say that the better preserved cauldrons appear to be concentrated in Ireland, finds from East Anglia are noteworthy. The belief that cauldrons were manufactured exclusively in Ireland is still one held by a number of prehistorians, but as both expertise and raw materials were not lacking outside Ireland, regional or more local production centres must be envisaged. Eogan (1974) has already hinted at the existence of recognisable regional developments within Ireland and the noteworty preservation of seven or eight beaten bronze vessels from the Bann-North Antrim area enables us to recognise certain common decorative and technological traits there.

Elsewhere, the evidence is still too meagre to speculate upon.

In recent years factors affecting recognition and discovery of sheet bronze have altered ; mechanised drainage often obviates the recovery of archaeological finds, and it seems safe, though lamentable, to predict that future knowledge is going to be controlled by the unprovenanced markets of the metal detectors on the one hand, and as funds for scientific research diminish, by adventitious discoveries upon rescue excavations, on the other.

**Lisdromturk and Tulnacross : the introduction of Iron**

Two cauldrons in the National Museum of Ireland have been found to incorporate iron, one as an original structural element, that from Tulnacross, Co. Tyrone, a Class A vessel, the other from Lisdromturk, Co. Monaghan, a Class B. The details of the Tulnacross vessel run as follows :



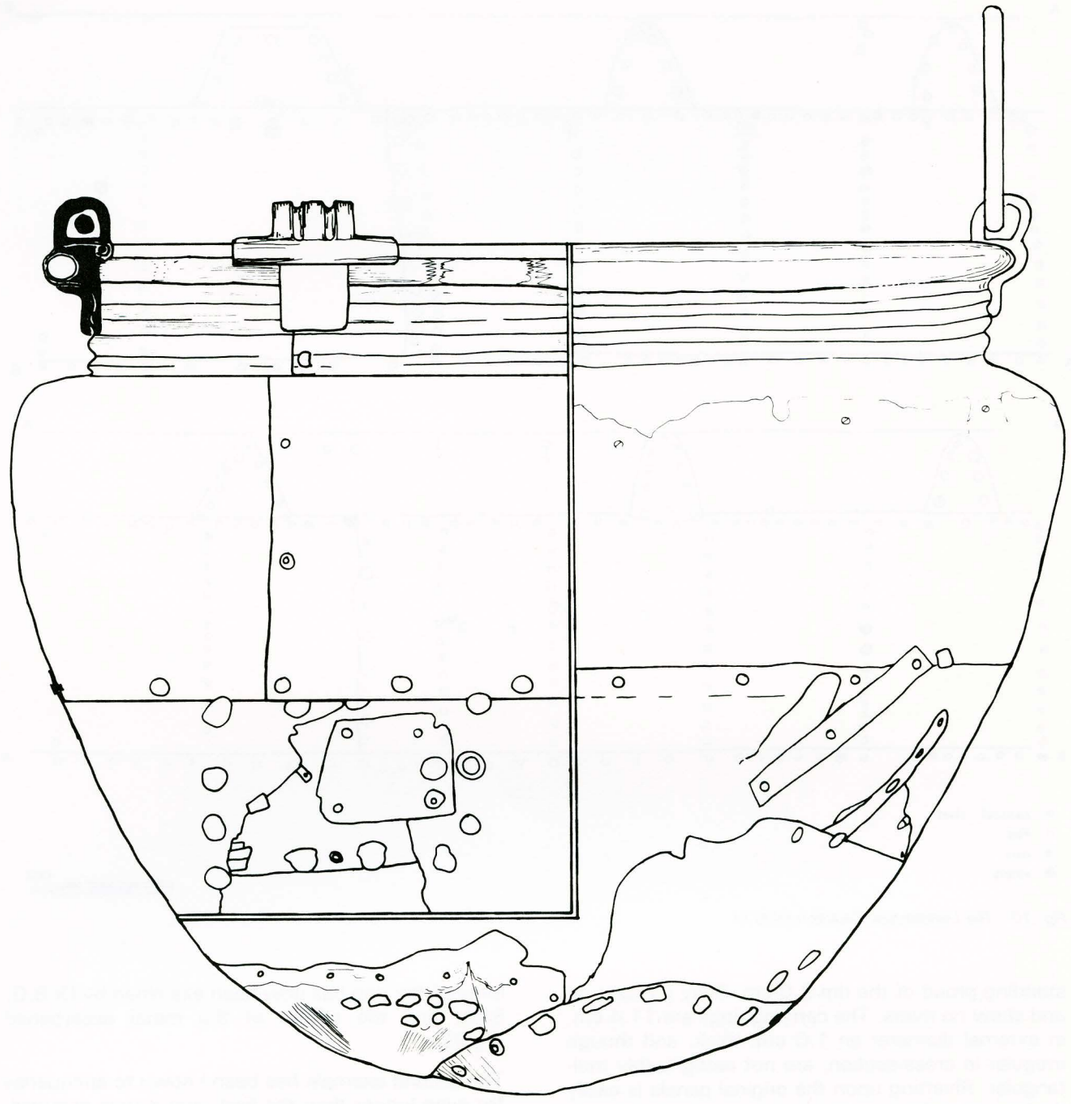


*Fig. 9 : the Tulnacross Cauldron (N.M.I.)*

Though now much repaired, the original cauldron was of the 5 piece pattern ; a 2 piece neck, the top of the body in two halves, and a single piece base. Its height is 47.0 cms. and diameter at the rim *c.* 49.0 cms., attaining a maximum of 52 to 55 cms. at the shoulder. From a high shoulder profile, the vertical neck is corrugated. The neck is now completely severed from the body and is supported on a stout wooden hoop in four parts.

The thickness of the original metal was probably 0.08 to 09 mm. It was beaten into shape using a sharp pointed instrument, the vertical punchmarks of which are still visible on the upper surface.

There is an unusually horizontal and rigid rim-line, in contrast to the marked sagging normally displayed by bronze cauldrons. One reason for this may lie in the strength of the rim, along the inside circumference of which runs a heavy deposit of rust, an iron ring over 1.0 cm. thick, and presumably originally intended as a strengthening hoop. The inturned inside rim is also strengthened in the conventional manner with a thick bronze wire, approximately 42.0 cm. in diameter, and no more than 1.4 cm. thick. The carrying staples are over 8.0 cm. long,

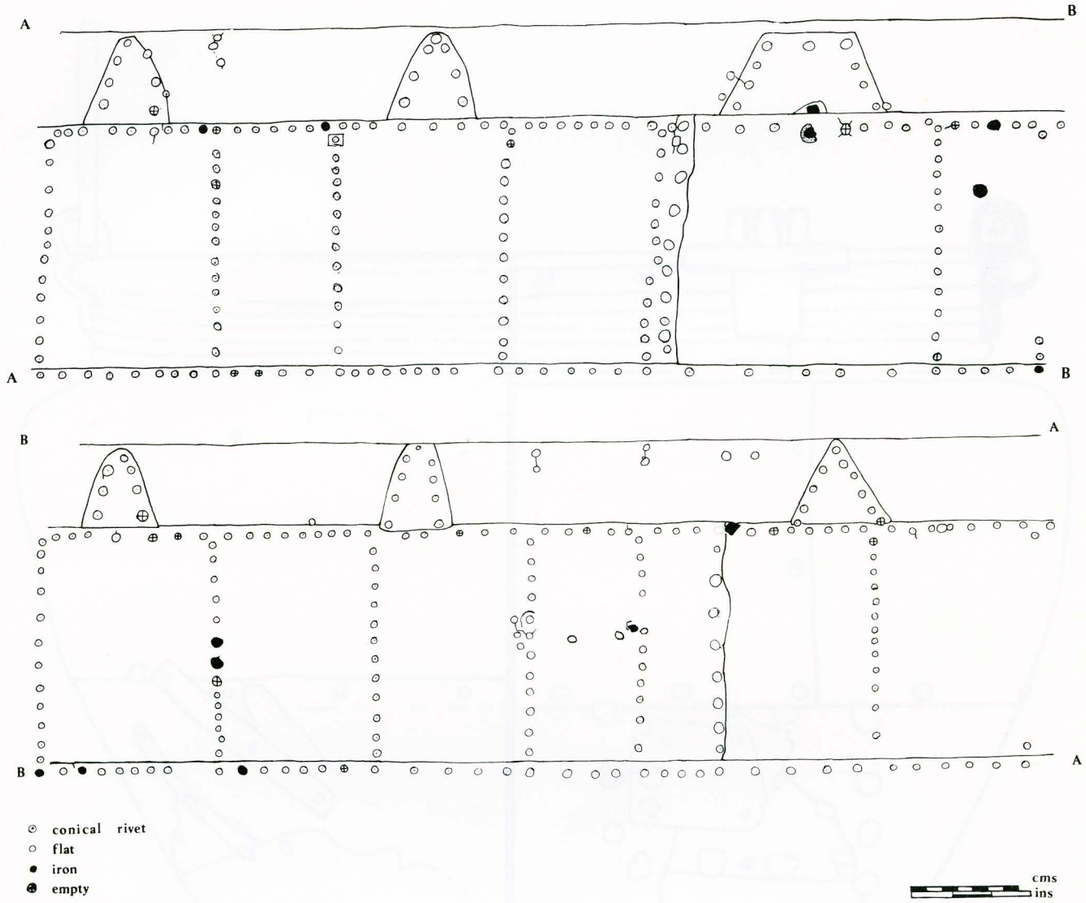



*Fig. 10 : The Lisdromturk Cauldron (N.M.I.)*

standing proud of the rim 2.0 cm. They are cast on and show no rivets. The carrying rings are 11.4 cm. in external diameter an 1.0 cm. thick, and though irregular in cross-section, are not recognizably multangular. Rivetting upon the original panels is easily distinguished from later mending ; individual heads are externally *c.* 1.0 in diameter, internally slightly less than half the size. At least one half of the side of the base appears to have been damaged and replaced in antiquity. This has been effected using three techniques, which may suggest separate phases of mending, or at least different artisans.

In the main, these have been fixed in a haphazard manner, using strips of varying thicknesses and lengths, and rivetting each by different methods. Only one ''paper-fastener'' mend appears. Peat still disguises some of the mend seams and their rivets. It was registered by the Museum in 1880 (n° 36), and little is known of its circumstances of discovery, other than that it came from a bog. It is well-known from the literature (Armstrong, 1924, 113 ; Leeds, 1930, 31, n° 8 ; Hawkes and Smith, 1957, 182 ; Eogan, 1964, Pl. XXIX upper), and the metallurgy of the ring has now been examined by Dr B.G. Scott and the nature of the metal ascertained (fig.9).

The second example has been known to antiquaries for even longer than the first, and it was acquired, along with much more material from the Barony of Farney, Co. Monaghan, by the National Museum in 1965 (Lucas, 1968, 118), and an illustration presented alongside its description, in which the salient features were noted. It seems worth adding, however, that its construction appears to include 12 or 13 iron rivets (fig.9). Again the writer is indebted to Dr Scott for having examined the vessel, though in this case there is not precise agreement upon the number of iron rivets represented. No doubt further metallurgical work will clarify the position. Of the 12 rivets noted, 3 are upon the inner joint, one appears at the junction between the central panels and the neck, the seam of which carries 4 more ; another appears upon one of the triangular neck panels, whilst 3, possibly 4, were not structural, and appear in the decorative rivet seams. Although there remains a shadow of possibility that some of these may be of iron by



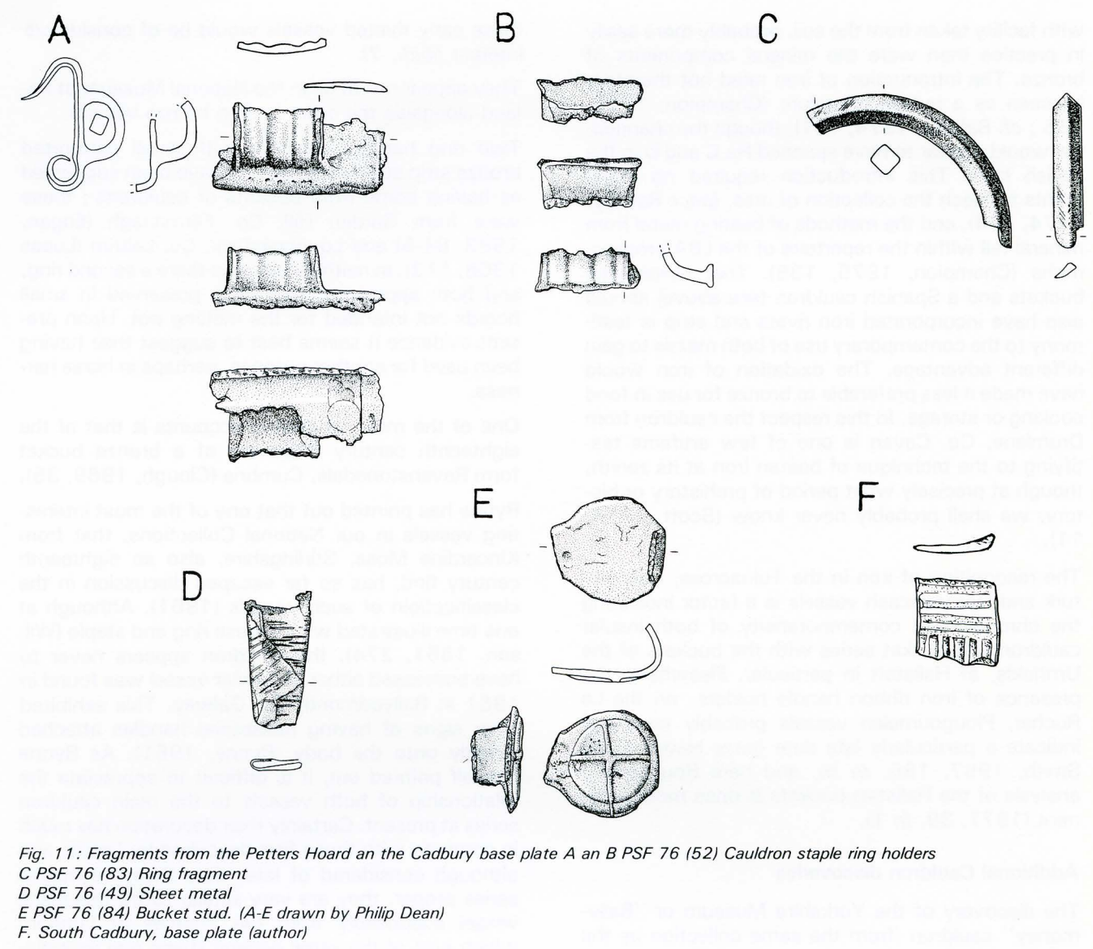



*Fig. 11 : Fragments from the Petters Hoard an the Cadbury base plate A an B PSF 76 (52) Cauldron staple ring holders*
*C PSF 76 (83) Ring fragment*
*D PSF 76 (49) Sheet metal*
*E PSF 76 (84) Bucket stud. (A-E drawn by Philip Dean)*
*F. South Cadbury, base plate (author)*

enriched bronze, through soil conditions, overall, this seems unlikely. The possibility that the rivets were of iron is further hinted by the fact that 17 or more of the remaining rivet holes are now quite empty. As iron commonly disappears through electrolytic action with copper, it seems reasonable to suggest that many of these holes may also originally have been filled with iron rivets (Spratling, 1971).

A further vessel, in this instance a bucket, may also include iron rivets. Dugan suggested that some of the patches''... on the Derrymacash bucket were ''fastened on by iron rivets'' (1897). This has not yet been confirmed by more recent examinations (fig. 5, 2). Nevertheless, such a manifestation need occasion no surprise since continental buckets commonly include iron features ; it is the more surprising that there are not other Insular vessels with iron. Within the cauldron series, the association of a small iron nail or stud with the type A vessel excavated at Sheepen Hill in 1933 is noteworthy (Hawkes and Smith, 1957, 161-3, Pl. XXI ; the nail appears not to have been illustrated). From the later context of Llyn Fawr come the well-known iron Hallstatt-type sword and sickles, accompanyng a Class B cauldron (Fox 1939).

The association of iron in the context of the Sompting hoard, which included fragments of a Leeds Class B cauldron (Curwen, 1948), should now be disregarded, as it is generally considered to have been an adventitious mineral intrusion. The incorporation of the complete iron strengthening ring in the Tulnacross cauldron does, however, lend credence to the belief that iron technology may have been known in Britain before the adoption of Irish-British buckets. Interestingly, the problem remains that although iron was already known early in the development of the cauldron series, which by analogy with the Isleham hoard means perhaps as early as the Wilburton phase, its more general use for the production of other artifacts in the British Isles was very restricted. Such restrictions were clearly not based upon the scarcity of the metal, since the British Isles is well endowed with a plethora of iron ore types (*pace* Scott, 1974, 19-20) many of which are

with facility taken from the soil, probably more easily in practice than were the mineral components of bronze. The introduction of iron need not therefore be seen as a radical departure (Champion, 1975, 138 ; *cf.* Raftery, 1974, 191), though the changeover would appear to have spanned Ha C and D in the British Isles. This introduction required no immigrants to teach the collection of ores, (*pace* Raftery, 1974, 194), and the methods of beating metal from mineral fell within the repertoire of the LBA bronzesmiths (Champion, 1975, 135). That continental buckets and a Spanish cauldron (see above) should also have incorporated iron rivets and strip is testimony to the contemporary use of both metals to gain different advantage. The oxidation of iron would have made it less preferable to bronze for use in food cooking or storage. In this respect the cauldron from Drumlane, Co. Cavan is one of few artifacts testifying to the technique of beaten iron at its zenith, though at precisely what period of prehistory or history, we shall probably never know (Scott, 1974, 11).

The recognition of iron in the Tulnacross, Lisdromturk and Derrymacash vessels is a factor indicating the chronological contemporaneity of both insular cauldron and bucket series with the buckets of the Urnfields, at Hallstatt in particular. Elsewhere, the presence of iron ribbon handle holders on the Le Rocher, Plougoumelen vessels probably need not indicate a particularly late date (*pace* Hawkes and Smith, 1957, 185, *fn* 6), and here Bouloumié's analysis of the Hallstatt buckets is once more pertinent (1977, 39, *fn* 1).

### Additional Cauldron discoveries

The discovery of the Yorkshire Museum or ''Ballymoney'' cauldron (from the same collection as the bucket, see above) (fig.7 Photo.3) ; a MS account of a ring carrier from Calmore, Co. Derry (fig.4,8), an unpublished rim-fragment and staple from Ipswich (fig.4,3) and a pair of handles from the Brackstone Collection, provenanced Monella, Co. Tipperary together with a similar pair from the Vale of York, bring the total of new findspots to seven, perhaps accounting for as many as a dozen vessels, taking into consideration those in the Isleham hoard (fig.4,5-7). It should be noted that the cauldron recently re-provenanced to Cape Castle, is not that from Portglenone unprovenanced in Belfast, n° 14 Leeds's as earlier velieved (pace Briggs 1979 ;(Leeds 1930, 32 ; Sabine Gerloff, *pers. comm.).*

A ring handle believed to have been from a cauldron was formerly in the F.G. Wynn Collection at Glynllifon, North Wales *(Glynllifon Sale Catalogue* n° 344 (1-3)) and the discovery of a Bronze Age gold hoard at Maesmynan, Flintshire in 1882 was said to have been in a cauldron (Ellis Davies, 1949, 17-18 ; 431-3). A findspot at Portumna, Co. Galway is provided for one of the unprovenanced vessels catalogued by Wilde (1857, 529-32) perhaps cauldrons W13, W14 or W15 (Anon, 1842,3). The present whereabouts of the ''five handles of brass pots similar to'' these early riveted vessels would be of considerble interest *(ibid., 7).*

They appear not to be in the National Museum of Ireland alongside the other beaten bronze vessels.

Two ring handles together with small perforated bronze strip strap attachments have been suggested as having come from buckets or cauldrons ; these were from Garden Hill, Co. Fermanagh (Eogan, 1983, 84-5) and Loughnaglack, Co. Leitrim (Lucas 1968, 113). In neither case was there a second ring, and both appear to have been preserved in small hoards not intended for the melting pot. Upon present evidence it seems best to suggest their having been used for another purpose, perhaps in horse harness.

One of the most tantalising accounts is that of the eighteenth century discovery of a bronze bucket form Ravenstonedale, Cumbria (Clough, 1969, 35).

Rynne has pointed out that one of the most interesting vessels in our National Collections, that from Kincardine Moss, Stirlingshire, also an eighteenth century find, has so far escaped discussion in the classificatioin of such vessels (1961). Although at one time illustrated with a loose ring and staple (Wilson, 1851, 274), the cauldron appears never to have possessed either. A similar vessel was found in 1961 at Ballyedmond, Co. Galway. This exhibited clear signs of having possessed handles attached directly onto the body (Rynne, 1961). As Rynne himself pointed out, it is difficult to appreciate the relationship of both vessels to the main cauldron series at present. Certainly their decoration has much in common with those first described by Leeds, and although considered of later date than the Insular series proper, they are very similar tottre one-piece vessel supposedly from the Thames at London, which was of the same general shape and was placed in Ha D (Hawkes and Smith, 1957, 191 *ff*). Therefore seems reasonable to see Ballyedmond and Kincardine as vessels lying at a slightly less advanced stage in cauldron development.

### Conclusions

Many of the LBA artifacts found around the North Sea basin, the English Channel and in Iberia are of uniform type (Butler, 1963 ; O'Connor, 1980 ; Savory, 1949), suggesting their contemporaneity of culture context and technological development. In type, beaten bronze buckets of Late Urnfield tradition display similarities to those in later, developed groups which reach across Europe. In detail, each regional group offers significant differences from the style of its neighbour. The examination of the Insular bucket series presented here illustrates a coherence of size, within a limited variation of technology and decoration, which isolates it from the neighbouring Gallic and Rhenish groups. There appears no direct connection between the British vessels and those of Middle Europe from which they are believed to derive. Those vessels previously believed to have been either imported or to have



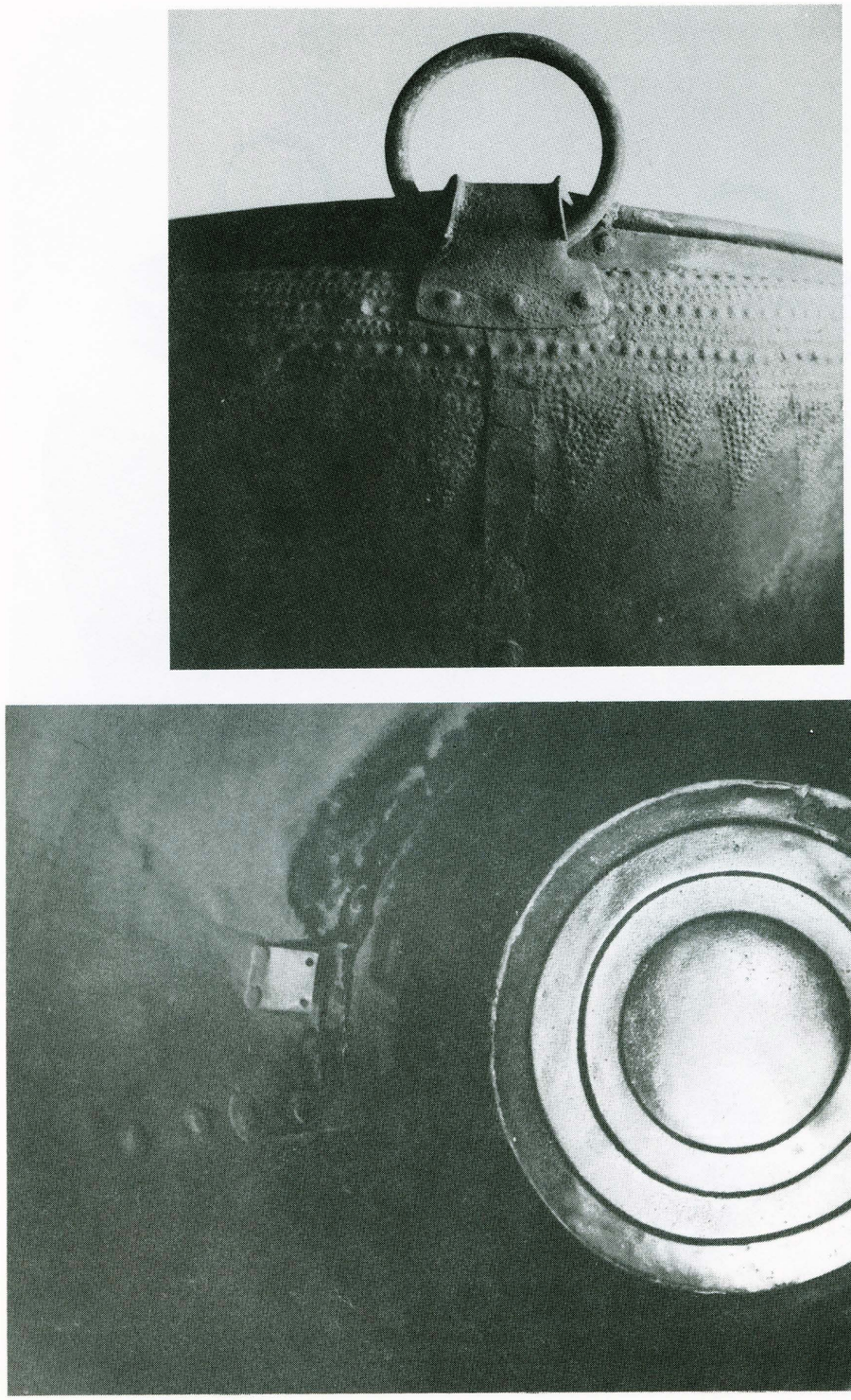


*Photo 1. ''Ballmoney bucket'' Yorkshire Museum, York. Photo Dr Barbara Pyrah.*
*upper showing ring holder and decoration*
*lower showing base*

*Photo 2. Cape Castle. Photo, Institute of Archaeology, Oxford.*



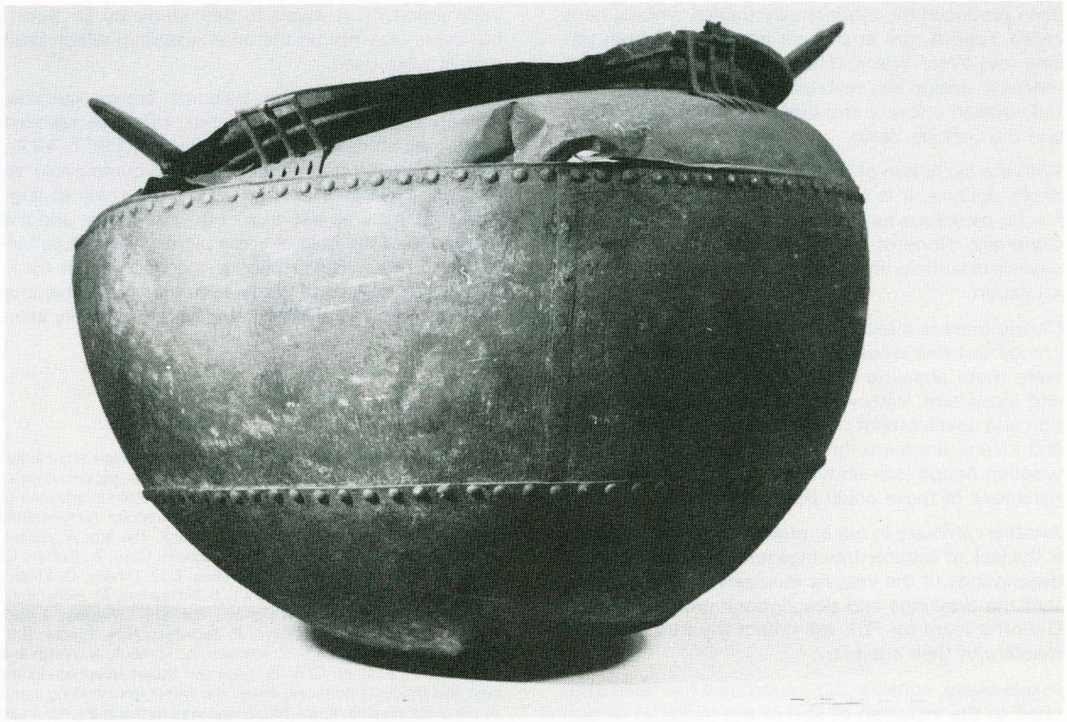


*Photo 3. Cauldron, "Ballymoney" Yorkshire Museum, York, photo Dr Barbara Pyrah.*

been produced by continentally trained smiths, here called Type A, are at present known only from Ireland and West Wales. There exist significant differences in design and technology between these riveted handled buckets and those from the Alpine area and the Danube Basin.

With the exception of the cauldron handle form Abildholt, Jutland, it is equally difficult to envisage the Insular cauldrons as having had direct links with the Continent. None of the published Iberian or French vessels is sufficiently similar to have been considered an export.

Clearly there is a relationship between these artifact groups but this would be better understood if there were more absolute dates, both in Central Europe and elsewhere, with which to appreciate the evolution and development of the several series. In Britain and Ireland there are three cauldrons still preserving wooden hoops (see above, p ). Carbon-14 determinations of these could be most helpful.

Another difficulty in our appreciation of the evidence is the lack of section drawings with concise technical descriptions of the vessels themselves. It is believed that the drawings and descriptions produced by Dr Gerloff's team for *PBF* will reflect the true technical mastery of their subject.

In this essay, considerable importance has been attached to the inclusion of iron in the make-up of two cauldrons, and attention has also been drawn to the possibility that a third vessel, the Derrymacash bucket (7), may also have carried a secondary repair in that metal. More precise technical and metallurgical information must await further study by Dr Scott, but these may not be the only vessels in which both metals were used.

When dealing with the Hallstatt bronze swords, Cowen suggested that Hallstatt influence recoiled almost imperceptibly back into Europe (1967, 422). Though cauldron numbers are not comparable to swords, the Iberian and Atlantic finds seem to suggest that this was also true of the cauldrons, and the testimony of the bucket angle plates tells a more far-reaching story. Nevertheless, the Irish-British tradition of beaten bronze vessels like that of the majority of its swords and shields, remains recognisably insular.

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## APPENDICES

The following abbreviations are used

*ABI Ancient Bronze Implements,* J. Evans, 1881
diam. diameter
dim. dimensions
ht. height
*H&S* Hawkes and Smith 1957
Publ. Publication
L. Leeds (1930)
I.A. *Inventaria Archaeologia*

### APPENDIX 1 New discoveries of Cauldrons

''BALLYMONEY'' Bann Valley/Co. Antrim. Yorkshire Mus. York. (fig.7, (Photo.3).
Of 5 main sheets arranged in 2 tiers, 2 sheets around the shoulder seams immediately below the staples ; 2 sheets forming the main body of the cauldron below. These are seamed at an angle diammetrically opposed to seams of the plates above. A large slightly bulged bowl-shaped sheet forms the base upon which these rest. Running horizontally and parallel around the body of the vessel are 2 rows of round-headed rivets which hold together the three tiers. There are 4 vertical seams along which rivets are barely visible. An overlap of about 1 cm is evident upon all the seams and the flattened rivets may be observed upon close inspection. The staples are 6,5 cm wide over the ribs and take up 5,56 cm of the rim diam. upon which they are cast. The staples cover 2 cast pillars beneath the rim. each of 0,5 cm diam. Both pillars and bars carry roughcast bronze and are poorly finished of 0,5 cm diam. The rim, 8 cm wide has 4 corrugations, its outer edge protected by a metallic rim of 0,08 th. The rivet heads are roughly 0,8-0,9 cm diam. and are domed. The top tier is held together by 9 rivets and incorporates an embossed beading around its edge. Where it runs vertically beneath the staples, these ribs are 8,7 apart, coming to within 2,5 cm of one another at the seams. Several mends have been effected upon the body, one a paper-fastener type (fig.7), made by the insertion of a piece of hammered bronze into the hole, leaving its 2 ends upon the outside, the looped interior beaten onto the side of the vessel. Two other small repairs are noted, all from the interior of the middle tier (fig. 7 a-d), while there is another to the left of one of the staples. Part of the rim is missing, together with much of the outer covering seam, exposing small rivets of 0,35 cm. diam. The body is patinated green ; one rivet head is missing from the basal seam.

CALMORE, Co. Derry, Ireland. Lost. Roy. Irish Acad. O.S. *MSS* box 42, I(3), fol. 4, Almost certainly a Leeds Class B vessel. ''Brass ring : the above draft (fig.4,8) represents the size and approaches the shape of a brass ring found in 1836, about 5 feet beneath the surface in the remains of an ancient Lough in the townland of Calmore. The part extending above the circle, only shows the size of an article suspended on the ring. Information from Thomas Fagan, 9th November 1836.'' The accompanying rough sketch is of a cauldron handle and ring, the ring of *c.* 13 cm, presumably of complex section, the ''part extending above the circle'' = remains of the staple, about 4,5 cm wide. The ring was about 2,5 cm th.

IPSWICH, Essex. Ipswich Mus. 962-191 (ex Fitch Coll., Norwich Cas. Mus.) Leeds Class B2. Rim fragment, staple and ring only. Rim diam, 12,75 cm ext., 9,85 int. ; of complex section. Unusual in permitting a clear view of method of riveting and casting, through access to underside of rim. Four ribbed staple with flanges, one broken. Ring decorated with lines of embossed concentric alternating concentric and transverse panels. Two cast annular rings joined by vertical bar pass through the rim edge. Their functions are not clear, but probably to stabilise folded over tubular rim, or even to protect with (now vanished) organic material. Most interesting feature is presence of guidelines along edge of sheet both below rim and on turned over outer edge. (fig.4,3)

ISLEHAM, Cambridgeshire. Bury St Edmund's Mus. *Publ.* Britton 1960, Coombes 1975. Hoard find comprising 6.500 pieces of bronze, weighing approx. 88 kg. Many weapon and tool types represented, including exotic, continental forms ; also much scrap metal. Preponderance of spearheads and swords, about 12 of Wilburton type. About 40 items related to beaten bronze vessels ; (nos 27-31). One staple with ring 10,45 cm diam. (ext) ; casting seams visiible, but abrasion suggests its having been used. Cross-section complex ; two grooves on each of outer faces. Staple made of 3 roughly semicircular bands joined together ; each convex in cross section on outside and flattish inside. Staple cast in several stages onto inside of rim and neck

Some pieces of sheet bronze, apparently from neck of Class A vessel with corrugations ; two ridges and two grooves survive. Another piece apparently from rolled over edge.

Fragments of ? six staples, probably similar type to complete example not otherwise diagnostic. One with part of terracotta mould *in situ.* Six fragments of ring handles varying from 10. 3-5 cm diam. Nine pieces of bronze with rivets attached and nineteen fragments of bronze sheet. (From comprehensive notes kindly supplied by Mr D. Britton) (fig. 4, 5-7)

MONELLA, bog of., Roscrea, Co. Tipperary. Nat. Mus. Ireland. (ex-Brackstone Coll, Salisbury Museum). *Archaeol. Jnl.* ix. 1851, 387-8. Type unknow. Two staples and ring handles found 10 feet (c 3,0 cm) deep in a bog ''soldered together''. Apparently discovered with a bronze ingot 3 in (7,6 cm) by 1 1/4 in (3,2 cm) by 3/4 in (1,9 cm). (Brackstone MS Catalogue).

PETTERS SPORTS FIELD. Fragments of A cauldron listed below, under buckets (18).

VALE OF YORK Yorkshire Mus. (1242:1948) York Ring handles and staples only. Probably a 19 th cent. find. Each handle comprises ring, roughly 9.0-9.1 cm external diam. circular in section and 0,8-0,9 cm th. Both staples are singlepiece castings of T-shape with top of the T forming the external ring strengthener, and having 6-ribbed moulding. The original bronze strengthening wire which attaches to the beaten bronze is also present.

### APPENDIX 2 Buckets in the British Isles.

Miss M. Holland and C.S. Briggs

1. ARTHOG (Nannau), Merioneth, Wales. Nat. Mus. Wales, 65-49. *Publ. H&S* 131-4, fig 1, 133 ; Hemp, 1960 ; Savory, 1960 ; Bowen and Gresham, 1967, 126-7, Pl VII. Unaccompanied find. *Dim.* Ht. 48 cm, (shoulder) *c* 40 cm ; base sheet 14 cm. ; diam. rim 37 cm. shoulder 42, base 20 cm. Handle carriers riveted on. Ring handles 9,5 cm diam. (outside). of diamond shape section. Base strengthened by four H-shaped riveted plates. (fig.5,5)

2. BAGMOOR, Burton-upon-Stather, Lincolnshire, England. Scunthorpe Mus. *Publ.* Dudley and Hawkes 1947, 8-11 ; Dudley, 1949, 95-101 ; *H & S,* 139 et *passim ;* Smith and Dudley *IA* GB, 23, 1959. Part of hoard including over 20 socketed axes or fragments : types Meldreth, Yorkshire and other, bag-shaped ; one socketed chisel, parts of 7 pegged spearheads, 2 decorated with traced concentric ornament. Base only. Six cast strengthening plates, roughly of equal size, total circ. *c.* 23 cm. Outside decorated concentrically with plain radial strap to carry securing rivet. Each plate carries 2 further rivets, one at each extremity, with sheet bronze adhering to them. (fig.5,4)

3. ''BALLYMONEY'' (Probably Bann Valley/Co. Antrim, N. Ireland). Collected pre-1856 by J. Wilson, Ballymoney, Yorkshire Museum. York. Unpub. *Dim.* ht. at rim 43-45 cm. shoulder, 38 cm, base sheet, 12 cm. Diam. at rim 35-39 cm, at shoulder 43,5 cm ; at base, 23 cm. Of three sheets, the base

secured by 22, the upper two by 9 opposed riveted jointings. Rivets equidistant, though exposed surface of metal on two body plates uneven. Neck *c.* 2 cm high, everted at angle of 70° from the shoulder. The rim 8 mm wide. Rim depressed in antiquity, obscuring original profile of shoulder, though this was probably rounded. Elaborate repoussée work around shoulder, using punches of *c* 0,4 cm and a little less than 0,2 cm diam. Pattern comprises 4 rows of 2 single lines of smaller punch alternating with one from the larger, the pattern repeated three times. Below this on either sheet, respectively 21 and 22 sub-pendant triangles of smaller punch. Staples slope own the shoulder towards outside of rim, carrying cast bronze rings of 8,0 cms diam., of circular section (0,85 cm). The staples are plain, riveted to the body above vertical seams, helping to strengthen joints at the top two plates of the rim. The base is corrugated into a double footring, the outer and inner breadths of which are 2,5 cm. The raised ring is 2,3 cm broad, the inner area 10,5 cm diam., carried about 1,0 cm above the base. The outer edge carries a complex repair, covering about a quarter its circumference, utilising 20 rivets, one external patch of 8, two other of respectively 8 and 4. Elsewhere upon the body, construction cracks have been plugged using a variety of washers and short metal strips. There are two small body repairs, each almost invisible from the exterior. One, achieved using a patch roughly 2,0 cm square, has now lost its two lower rivets, the upper corners being retained by 2 others. The condition of the vessel is stable.

4. CAPE CASTLE BOG, Co. Antrim, Ireland. Hunt Collection, Nat. Inst. Higher Education, Limerick. Formerly T.W.U. Robinson Coll., subsequently Pitt-Rivers, Farnham, Dorset. L6 *Publ. ABI,* 413, Armstrong 1924, 110 . *H & S,* 142, 147, 153 ; Doran, 1978, 5-6 and Pl. I. *Dim.* ht. at rim 45 cm ; at shoulder, 37 cm ; at base, 12 cm ; diam. at rim *c.* 34 cm ; at shoulder, *c.* 40 cm ; at base, 19 cm. Of three sheets, with a complex history, slightly damaged in antiquity. The rim is 6 mm broad, the strengthening wire 4 mm th. The neck is 2,4 cm long, rising almost vertical from the shoulder, which is of rounded profile, decorated by embossed lines. This comprises one double row of small punchmarks *c* 1 cm apart and 4 mm one above the other, alternating twice with a row of larger punchmarks over 1 cm apart. This is followed by a series of subpendant triangles executed with the smaller punch. The circumferential repoussée is not perfect, some lines merging, and a hiatus having been left to allow for the area taken up by the strap handles, one of which occupies less space than the outside onto the neck, the ring holders facing inside, continuing, to be riveted to the underside of the shoulder. Both ring holders are decorated by 2 ribs flanked by 2 shallow flanges, and the handle securing rivets can be seen on either side of them. The present handles are replacements, for on one side, just below the interior handle securing rivets, are two inert rivets with washers. Evidence from interior of the other staple shows 2 or 3 rivet holes between the three currently fixing it. It thus appears that the original handles were riveted outside the shoulder, as on the preceding (no 3). These were to be replaced by riveted straps resembling cast staples, with interior facing ring holders. One of the replacements is shorter than its original counterpart, the original rivets being left exposed, while the other strap re-utilises the original holes. The base, damaged in antiquity and more recently by corrosion, has apparently been reinforced by cast metal run on up to a height of 5 cm up the vessel wall. One indentation in this casting is the only evidence of an original footring. The marks of six (of a possible eight), base strengthening plates are visible /*H & S,* 153) A plain spoked wheel now protects the base, secured in position by 8 rivets on its outer circumference, a ninth in the centre. Two of the other base securing rivets are missing. The base sheet is now moulded to the shape of the basering. (Photo. 2)

5. CARDROSS, Flander's Moss, Stirlingshire, Scotland. Nat. Mus. Antiqs. Scotland. DU II, L4 *Publ.* Anderson, 1886 ; NMAS. Cat, 1892 ; Leeds, 22 and Fig. 8. *H & S,* 151. *Dim* Ht at rim, 47,5 cm ; shoulder 42 cm ; at shoulder 41,5 cm ; at base, 26 cm. Cast on staples, of 7 grooves, having quadrangular section rings 9,7 cm diam. (ext.) falling into the vessel. Neck 2,5 cm high on a sharply everted shoulder at angle of 70 °. The neck is intermittently decorated with tool marks of diamond pattern. Its base is protected by a 4-spoked wheel-shaped base ring cast in one piece, each spoke decorated by 4 parallel grooves, with its square central crossing secured to the base by a single rivet, itself surrounded by 8 punched holes. The basal ring decoration comprises 4 concentric grooves, the inner 3 interrupted by 4 sets of 10 short transverse ribs at the points where rivets are placed. The concentric circles appear so even, it is unlikely they could have been inscribed without a compass. The vertical flange of the base ring is hammered against the vessel wall to about 2,4 cm. This no longer fits tightly and is thus now insecure, since 2 of the other base ring rivets are missing. The base sheet is now moulded to the shape of the base ring. (fig.5,7)

6. CODINGTON, Cheshire, England. Lost. *Publ.* Briggs, 1978, H & S, 148, *fn.* 1. These are based upon MSS drawings ; Brit. Lib. (formerly B.M.) Add. MS 45663, fols 17 and 34 (here fig.5,3) and Soc. Antiqs Lond MSS 265,fol 30. These illustrations helped establish its findspot as Codington near Chester and that it was of the Irish-British series, having ring handles which hung inside the vessel and strengthened by 8-shaped base plates, some apparently attached to the body by as many as 5 rivets.In contradistinction to the Bagmoor plates, these clearly have their long horizontal arms on the inside of the base, the single vertical arm being attached to the exterior of the vessel. Subsequent investigation has brought to light a further crude representation of the vessel, showing the plate positions reversed and the central ground of the base covered in small decorative holes or rivet heads (*Minutes of the Acts and observations of the Spalding Gentleman's Society in Lincolnhire* (1710-1729) Vol. I, f. 108b : February 126/7. I am indebted to LDr S. Needham for drawing this to my notice). Upon general morphological argument alone, the latter drawing appears highly derivative, and event possibly contrived. Elsewhere (W. Stukeley, *Itinerarium Curiosum* (2 nd ed.) 1763, 32) we learn that the ''brass camp-kettle with two rings,'' had been ''21 Roman inches (?*c.* 53 cm) high''.

7. DERRYMACASH (Montiaghs), Co. Armagh, Ireland. Nat. Mus. Ireland 1898 ; 114. L8. *Publ.* Dugan, 1897 ; Armstrong, 1924, 111, Fig. 7 ; *H & S,* 144. *Dim.* Ht. at rim, 35 cm ; at shoulder, 28-20 cm, base sheet, 9 cm. Diam. at rim, 33 cm ; at shoulder, 36 cm ; at base, 18 cm. In good condition, built lopsided, hence the range in height at shoulder. Held together along vertical seams by 5 rivets visible inside and out ; the base plate secured by 19. Inconsistent groups of ''raindrop'' tooling appear particularly upon the neck, both internally and externally. The rim is 0,6 cm th. slightly oval, and in several places the sheet has been deliberately split to allow for the curvature of the bronze around the rim wire. The rim and neck are 3 cm in length and protrude at an angle of 105°. The shoulder is patched in places, probably through splitting during manufacture. Their contemporaneity is also suggested owing to the uniformity of rivet type. The staples are cast-on with three-ribbed decoration, asymmetrical and poorly cast. The ring carriers face into the vessel and carry rings of quadrangular section, 8 cm external diam. and 1,7 cm th., one of which is snapped. The present staples replaced earlier ones though the terminal of one partly covers the middle patch of a horizontal row of three rivets, while the terminal of the other staple partly covers the first of two patches. No rivet holes are apparent upon the neck itself to help support this theory. There has been casting together of the joints of the upper sheets of metal at the rim, neck and shoulder, which might suggest the rivets had been too weak or the smith was keen to practice his craft. The intact base is strengthened by six angle plates over an outer circumferential foot ring 2,3 cm broad, separated by a corrugation 0,4 cm wide from the central enclosed area of 12,3 cm diam. The base plates are straplike, 12,5 cm long in all, of which 4,0 cm covers the vessel wall terminal, 3,0 cm the terminal on the inner radius (each of which carries a single rivet), and the central trapezoidal section is 5,5 cm at longest by 2,5 cm at widest.The trapezoidal standings of these plates are each decorated with six incised concentric grooves.

8. DERVOCK, Co. Antrim, Ireland, Ulster. Mus. Belfast : 1911-141. *Publ.* Armstrong, 1924, 110 ; *H & S,* 148 *Dim.* ht : at rim, 47 cm ; at shoulder, 40 cm ; of base sheet, 12,2 Diam. : at rim, 37 cm, at shoulder, 40 cm ; at base, 25,5 cm. Above body, neck and rim in poor condition ; on the body are few tool marks of diamond pattern upon the neck, occasionally interrupted by ''raindrop'' marks. The body rivets are evenly-spaced, of irregular shape, hammered flat on both faces, with average outside diameters of 1,2 cm. The sheet bronze is 0,4 mm thick. The rim is 6 mm th., of which 4 mm is diam. of wire. The rim and neck project at an angle of 80-90° about 2,0 cm high. The staples were cast on over the riveted joint, each measuring 6,2 cm long along the bar which clips onto the rim. The ring carriers are decorated by 5 grooves. The rings are externally 8,2 and 8,4 cm in diam, of hexagonal section. The base is protected by a cast 4-spoked ring, held by 6 rivets and a flange 1,5 cm high hammered against the wall of the vessel. This flange has split and parted from the sheet metal. Each spoke carries two parallel ridges and the outer ring, one concentric ridge as decoration. The spokes average 2 cm wide, the base ring, 1,5 cm and is of poor quality workmanship in comparison to those of the Heathery Burn and Cardross buckets.

9. DOWNHILL, Co. Derry, Ireland. Hunterian Museum, Glasgow. *Publ.* Armstrong, 1924, 110 ; Corcoran, 1965 ; Rynne, 1967 ; L14. *Dim.*Ht : at rim, 39 cm ; shoulder, 34 ; of base sheet, 10 cm ; diam ; at rim, 32,3 ;at shoulder, 37 cm ; at base, 16,5 cm. The vessel is fully described by Corcoran. It is in good condition, of three pieces with an omphaloid base, with a footring 1,9 cm wide.

10 DOWRIS, Whigsborough, Co. Offaly. Ireland British Mus. 54, 7-14 313. *L3. Publ. ABI,* 412 ; Cooke, 1848 ; Armstrong, 1922, 134 ; *H&S,* 134, Fig.2 ; Eogan, 1964, 299 ; 1983, 129-30, Fig.72. *Dim.* Ht. at rim, 41,8 cm ; at shoulder, 35,5 cm ; of base sheet, 9,5 cm ; Diam. at rim, 37 cm ; at shoulder, 39 cm ; at base, 18,5 cm. The vessel was heavily used in antiquity, resulting in considerable patching on one side, between the shoulder and base sheet. In one area, roughly 14 cm², are four repairs, 2 overlapping. Only one patch is observed on the opposite sheet, though the bronze exhibits cracks, probably due to its burial. Three external and one internal patch appear on the base, the smallest 5 by 6 cm. The metal is 0,7-0,8 mm th., with patches of thinner material. the rivets are generally flat, though protrude on the interior. Rivets are uneven in shape and size and unevenly spaced. Forty were originally used, 10 each on verti cals, and 20 on the horizontal joint, of which 2 are now missing. Some patch rivets are loose. The rim varies in th. from 5-6 mm. Rim and neck together measure 3 cm and are everted from the shoulder at an angle of 110°. Two corrugations appear at the base of the neck, each 4 mm wide. Vestigial rivets or rivet-holes appear on either side of both vertical joints. In profile, the vessel is rounded to angular. There are no handles, but evidence suggests them to have been riveted, their having existed 2 sets of 4 rivets, securing ring holders on the inside of the neck. Evidence exists in the form of a bead of cast metal, 3 mm diam., that one handle may have been reinforced or mended with cast metal. The base was originally reinforced by 6 evenly-spaced angle plates, each with 2 terminals, 2 cm long and having an oval centre section decorated with 3 concentric grooves, these, 3 cms long. Four plates remain, a fifth has base terminal only. The positiion of the sixth is now

taken by 2 ; one a crude copy of the original, of which its neighbour may be a survivor. The latter is less oval than the other plates, its central grooves more shallow, and the terminals 8 mm shorter. Both these plates hold a patch in position, which has a further 2 repairs and is dented.

11. As above. B.M. 54.7-14, 314. *LIO* Half bucket only. *Dim.* ht. of base sheet, 14-12 cm. Diam. of base, 26 cm. The base sheet, with evidence of 26 rivets, 13 still in place 3 retaining fragments of sheet bronze from the upper body. The exterior appears unmarked, the interior covered in fine cross-hatched tool marks to within 3 cm of base, below which ''raindrop'' hammer marks visible. These continue onto the base and radiate from the centre. The incised tool marks are concentric on the outside of the base, to a point where they meet on the inner edge of the footring, where they merge with radial marks to produce a cross-hatched pattern. They disappear on the outside edge of the footring. The sheet metal, 0,4 mm th. appears unpatinated and gold-brown, the base is marked by dark patches suggestive of peat or ferrous deposits. The base was originally protected by 8 angle plates, each with 2 teminals, averaging 4 cm in length, the central section rectangular and decorated with 6 deep parallel grooves. Five adjacent angle plates are still in place, the other 3 represented only by their securing rivets. Impressions of the 2 plates on the sheet metal confirm their original positions. Patching appears in several places, principally on the outside edge of the footring. The footring was so badly dented that one angle plate is lifted *c* 2,0 cm clear from it. Another plate is snapped, and the sheet metal is generally split, particularly within the footring. There is no evidence to suggest that there were originally 10 footrings (*pace* Eogan, 1983, 130).

12 As B.M. 54.7-14, 315. Two angle plates.
a. Angle plate of plain rectangular section, 5 cm by 2,3 cm. The terminals both retain securing rivets.
b. As above but lacking rivets and terminal holes, their having been broken off. The curve of the base terminal is less accentuated than the previous example ; its dimensions are otherwise similar.

13. DUDDINGSTON LOCH, Edinburgh, Scotland. Nat. Mus. Antiqs. Scotland DQ 1. *L5. Publ. ABI,* 409 ; Callander, 1922, 361. Ring and staple only. D. of ring 7 cm 2,1 th. Lozenge cross-section. The rim hollow is still visible, though the rim is gone traces of sheet metal remain trapped between the internal and external staple terminals. The staple is 5 cm broad.

14. GILMONBY, nr Bowes, Co. Durham, England. Bowes Museum, Barnard Castle. Hoard Find. Handle staple and ring fragment only. *Publ.* Coggins and Burgess, 1981. Notes kindly supplied by D. Coggins :
''It is not clear whether or not his is a single piece of metal bent ito a ''D'' shape, or alternatively it is in 2 pieces ''burned'' together. The toe of the ''D'' is of double thickness and presumanly enclosed the neck angle of the bucket. The staple has 4 ribs and a reinforcing wire runs along the top edge. Part of a free-riding lozenge-sectioned bronze ring handle remains in the loop. *Dim.* of staple, 4,5 cm ; weight ; 220 gm. Original diam. of ring, *c* 80 cm ; wt. of fragment 25 gm. Very heavily corroded. fig.

15. HATFIELD BROAD OAK, Essex, England. Colchester Mus. *L3. Publ. Victoria County History of Essex,* I, 268, 1903 ; Davies, 1979.
Staples and base-plates only.
a. Cast staple having 5 grooves cast over rim of bucket, sheet metal adhering. The rim is strengthened with a twisted bronze wire around which the sheet bronze is wrapped. The ring handle is of lozenge section.
b. As above having only 4 transverse grooves and plain rim-strengthening wire. The grooves are extremely irregular, giving the appearance of a faulty casting. The ring handle is badly worn and shows signs of hammer-welded repair.
c. Two flanged base-plates, each broken into 2, but make up 2 contiguous quadrants. Two rivets appear on each, retaining on underside fragments of sheet bronze, originally part of bucket bottom. The base plates are decorated with a series of horizontal and vertical incised grooves. The base plate arcs suggest a bucket bottom of 203 mm external diam. (fig. )

16. HEATHERY BURN, Stanhope, Weardale, Co. Durham, England. British Mus., WG 1271. *L2. Publ. ABI,* 412 ; Greenwell, 1894, *H & S,* 1957 ; *IA* GB 55, (10) (4) ; Britton, (1971,) *Dim.* ht. at rim, 42,8, at shoulder, 39, of lower base sheet, 11,8. Diam. at rim, *c.* 37 cm ; at shoulder, c 41,5 cm ; at base, 23 cm. The vessel has cast-on staples with 6 and 5 grooved decoration and rings 9,5 cm diam. externally, of quadrangular section. One staple probably a replacement, and this was cast onto metal sheet, then riveted to the vessel. The base is protected by a wheel-shaped footring bearing concentric decoration and transverse bars. (fig.5,6)

17 MELDRETH, Royston, Cambridgeshire, England. Brit. Mus. 80, 11-24, 37. *L1. Publ. ABI,* 441 ; *H & S,* 144 ; Hawkes and Smith, 1955, *IA,* GB 13,3 (I-3).
Staple with ring only, the outer diam. of which is 7 cm, and quadrangular in section, 0,6 cm th. The ring holder is 4 cm wide and the staple remains attached to a fragment of the sheet bronze rim and neck, 9 cm in length. The ring holder is decorated by 4 shallow grooves and 2 terminals, one cast externally onto the neck and shoulder, the other on the underside on the shoulder. The joint between the 2 casts at the rim is marked with drops of solidified bronze, the jointing cast poured untidily. The strengthening wire is visible at both ends. The Meldreth Hoard contains a further piece reminiscent of a cast staple handle, no. 12 on the same illustration. (*IA* GB 13. 3, 1)

18. PETTERS SPORTS FIELD, Egham, Surey, England. Brit. Mus. *Publ.* O'Connell and Needham, 1977.
There are 4 items ;
a. A section of ring handle, of external diam 9,6 and internal, 7,5 cm. and quadrangular section. (fig. 11C).



b. Fragmentary angle plate of bucket. The circular, cruciform decorated piece is 3,9 cm diam. having only 5 mm terminal left. (fig. 11E)
c. Fragment of staple ring holder, having two ribs. (fig. 11B)
d. Fragment of staple ring holder, having three ribs (fig.11A) (from A - type cauldron).

19. SOUTH CADBURY, Somerset. From unstratified ditch. *Publ.* Alcock, 1970. Base-plate of bucket only, of cast bronze, a fragment from an arc broken at both sides and just above the angle of the external flange. The bottom of the plate bears grooves laterally and longitudinally. The fragment measures about 3 cm from brok en side to side and about 2 cm across its bottom (fig. 11F)

20. IRELAND, no locality. Nat, Mus, Ireland, W 15 ; *L12.Publ.* Armstrong, 1924, 110. *H 25,* 146, 148. *Dim.* Ht. at rim, 47 cm ; at shoulder ; 43,5 cm ; of base sheet, 10 cm. Diam. at rim, *c* 38 cm ; at shoulder, 44 cm ; at base, 23 cm. The shoulder is so badly damaged that a wooden brace has been inserted for conservation. The bodywork is covered in patches ; one over a cutaway area 16 cm by 11 cm. The upper sheet about 0,5 mm th, the lower appears much thicker. For most of the circumferential body riveting the sheet is continuously patched, the largest 26,5 by 4,5 cm. Most rivets in the upper body average 1 cm diam, though one is 1,8 cm, whilst another has fallen out. The surface is tooled with ''raindrop'' type beating, some as deep scores ; they are absent from base and interior. The rim is at one point heavily dented with wire 5 mm th. Its neck rises almost vertically from the shoulder at an angle of 90°, standing 1,9 cm high above the rim which is no longer symmetrical. The staples appear to be original and are cast on. Both ring holders are 4,5 cm broad and face the interior. One carries 4, the other 5 grooves. The exterior terminals are 5,5 cm broad, the 5 groove staple reinforced with 2 rivets, the shoulder, one of which appears modern. The rings of quadrangular section are 8 cm external diam, 6,7 internally. The presence of apparently superfluous rivets raises the question of their having possibly been originally riveted onto the vessel. The base was originally protected by 6 angle plates, 5 of which survive, with one only surviving as a base terminal. The plates consist of a cup-like central section and 2 terminals, the outer one of which is 2,5 cm, the inner, base terminal, 3 cm in length. The centres are 2,3 cm diam, but these are also deep, raising the 1,4 cm wide footring some 1,4 cm clear of the ground. The footring also carries at least 4 linear patches extending to the base within the footring. The angle plates vary from 6,5 to 8 cm apart.

21 IRELAND, no locality. Nat. Mus. Ireland. 1901 : 57. *L13. Publ.* Armstrong, 1923, 110. H 25, 146. *Dim.* ht. at rim, *c* 30 cm ; at shoulder ; 32 cm ; at base 18 cm.
Very worn, having sheet of 0,6-0,7 mm th. Base sheet largely replaced by multiple patching. Patches carry rivets with flat heads of 7-8 mm, protruding sharp-edged in the bucket. these contrast with original rivets of 1,5 cm diam, with short bodies. Present base sheet 3-5 cm high. Faint toolmarks of incised ''raindrop'' type on upper body, absent from bronze patches. The rim is 7 mm th., the reinforcing wire exposed owing to a fracture. The neck is 1,5 cm long and is everted from the shoulder at angle of 100°. The shoulder is distinctly rounded in profile, with cast on staples. Which replace original riveted-on handles, as shown by remains of 4 rivets on either side of the vessel, 2 on the neck flanking the present staple, 2 on the shoulder. The present staples are small, the ring holders double-grooved, 2 cm broad, expanding to 3 cm where cast to underside of shoulder. The internal terminals are of inverted T form on one side, and of roughly L-shape on the other.

The vessel walls are repaired with 8 or 9 patches, with more reinforcing the outer edge of the base. The base appears neither to have had a footring, nor to have been reinforced. The lower bucket wall carries a number of roughly square and rectangular patches, but none of these continue to the base as angle plates. One protective patch has been cast upon the outside edge of the base.