The End of the Irish Bronze Age

TIMOTHY CHAMPION

For some time now it has been generally accepted that the Late Bronze Age in Ireland lasted until the third century B.C., to be followed immediately by the La Tène Iron Age. Despite the recent lengthening of the once fashionable short chronology in Britain, which has resulted in a significantly earlier date for the end of the Bronze Age there, no similar reconsideration has been made of the Irish evidence; indeed, attempts have been made to find new support for the old theory. In the most recent general survey of the Later Bronze Age, Eogan has postulated three subdivisions of his last phase, Dowris A, B and C. The object of this article is to examine the validity of Dowris C; it is not part of the present purpose to consider the content, development, periodisation or external relationships of the Irish Bronze or Iron Ages. The arguments to follow will be purely chronological, and will attempt to answer the question 'When did the Bronze Age end in Ireland?'

Before an answer to such a question can be contemplated, it is of course necessary to define what is meant by the Bronze Age. In much of the archaeological literature of the earlier part of this century, a rigid system of classification formed the conceptual basis, whereby each subdivision within the Three Age System was characterised by its peculiar types, which extended into neither the earlier nor the later phase. The Late Bronze Age and Early Iron Age could therefore be defined in terms of distinctive pottery, metal and settlement types. It has, however, recently become increasingly clear that such a system is too simple and too rigid, and that the various categories of archaeological remains, both artifacts and sites, do not follow such a regular development; the changes in one type do not coincide with the changes in another — indeed, there is no reason why they should. The surprised question 'Can there be Bronze Age hillforts in England?' ceases to be a problem if hillforts are no longer thought of as a part of the definition of the Iron Age. It must be realised that there is no necessary connection between the start of a settlement type and a change in metal technology.

This may be illustrated in terms of a chart in which the horizontal rows represent successive chronological phases, the vertical columns different artifact and settlement types. In the old, excessively rigid formulation of archaeological periods, such a chart would resemble a chest-of-drawers: all the lines, both vertical and horizontal, would be straight, and many of the problems of archaeology could be solved by assigning material to the correct drawer. If such a chart were drawn in accordance with more modern concepts, then the horizontal, chronological lines would not be continuous across the entire width, but would find their own level in each of the vertical divisions. Such a scheme is, of course, familiar in charts showing the relationship between archaeological sequences for different areas, in which the boundaries between periods are rarely exactly contemporary.

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A concept closely linked to what has been called the chest-of-drawers notion is that of the invasion. For many archaeologists before the most recent years, the most common, if not the only, explanation for cultural change was invasion or immigration, envisaged more or less militaristically. As long as this was accepted as the mechanism for the appearance of new types, then it was reasonable to suppose that several innovations could and should occur simultaneously, for dramatic incursions should be matched by dramatic changes in material. It would be difficult to assess the extent to which the invasion hypothesis was either the cause or the effect of the 'chest-of-drawers' concept, but certainly they were strongly allied; and with the realisation that there are other, perhaps more likely, processes to explain changes in material culture, there is now less temptation to see as contemporary developments which may have had no necessary connection with each other, and have taken place independently over a period of time.

One major consequence of the outgrowing of such a grossly oversimplified notion is to destroy the neat system of periods defined by their own specific range of types. The vertical axis of such a chart can no longer be drawn in terms of Early, Middle and Late Bronze Age, but must be based on the metalwork alone, organised into a scheme of regional industrial groupings. That must form the framework to which the rest of the material can be fitted. This means that terms such as Late Bronze Age should, in a strict sense, be used solely with reference to a stage in the development of the bronze industry.

Before attempting to answer the question when the Irish Bronze Age, as thus defined, came to an end, we must consider in purely theoretical terms what information is to be regarded as relevant to the problem. Three groups of evidence can be used. Hoard associations are the traditional basis for a relative chronology of bronze types, though Coles' recent reassessment of the Dowris finds will necessitate the careful scrutiny of the circumstances of deposition of alleged hoards. The association in Irish hoards of native bronzes with other objects, whether bronze implements or not, which are themselves datable by an archaeological system determined independently of insular bronze typology, will provide a terminus post quem for the native material, for its deposition cannot be earlier than the earliest date for the exotic objects. If, therefore, an Irish hoard should contain material which is datable in terms of the continental schemes of Reinecke or Montelius for Central Europe and the Nordic zone respectively, its earliest possible date can be calculated. Conversely, similar conclusions could be drawn if metalwork of Irish origin were to be found in foreign hoards. In the second place, individual bronzes of native manufacture may display a feature that can be shown to be of foreign derivation. Here again, the earliest appearance of the foreign type from which that feature is drawn will be the earliest possible date for the production of the native piece.

A concept often found in the archaeological literature of the past must now be briefly examined, that of the time-lag. By this principle, material of continental origin was not allowed a date parallel to that which it had in its native context, but had to be retarded by as much as a century or more, so that, for instance, Hallstatt C material could scarcely be conceived of in Britain or Ireland before the late sixth century B.C. This notion, the reasons for which have never been explicitly propound-

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ed, seems to have affected only the Late Bronze Age and Early Iron Age, and to be curiously at odds with the more usual archaeological practice of establishing exact correlations between regional sequences by means of the material common to both. Hawkes and Smith⁴ led the way in abandoning it, and there is now a much greater readiness to allow objects either actually imported from the Continent or closely derived from continental prototypes to have their true continental date.

The third source of evidence is provided by those bronzes found in contexts datable by non-archaeological means, for example by pollen analysis or radiocarbon dating, though the limitations of these methods cannot be over-emphasised. It may well be doubted whether the degree of precision which can be achieved with pollen analysis and radiocarbon makes either of them of anything but the most general value in the first millennium B.C. An archaeological deposit can only be dated by its pollen content when the analysis can be compared with others which are themselves dated either by archaeological means or by radiocarbon determinations, and the perils of using this method to provide a date have been pointed out by Mitchell⁵. Radiocarbon dates for the Late Bronze Age-Early Iron Age period are complicated not only by the usual problems of standard deviation and interpretation of the sample and the context from which it was derived⁶, but also by a serious fluctuation in the calibration curve, as most recently published⁷, for the relevant centuries. For the purposes of the present problem, C¹⁴ dates can only be used with the utmost caution if at all.

If scientifically derived dates are to be treated with care, the archaeological evidence must also be viewed critically. Its most serious limitation is that it can only provide a terminus post quem. The calculation of a terminus ante quem for any particular hoard is extremely difficult, but in theory a possible argument to provide such a terminus for the cessation of the general practice of hoard deposition could be built on the negative evidence of the absence of certain types from the latest hoards. If, for example, it could be shown that the latest bronze swords, that is Hallstatt C types or native weapons with Hallstatt C features, were totally absent from hoards despite a previous tradition of the inclusion of swords in hoards, then it might be argued that the bronze hoards cease before the general currency of these latest swords; the alternative is to postulate a change in the practice of including swords. But this line of argument fails, for despite the frequent occurrence of such late swords, and their absence from hoards, there is not the evidence for the deposition of earlier sword-types in the hoards; Eogan's catalogue of Irish swords shows that scarcely more than 20 out of over 600 have even a possible hoard provenance.⁸

Even if this argument were to succeed, either with swords or with any other type, it would strictly be relevant (as with all evidence from hoards) not to the end of the Irish bronze industry, but to the cessation of hoard deposition; it would, indeed, presuppose the continued manufacture of native bronzes of the type not found in hoards. This raises the question whether all the bronze types that were replaced in iron were so replaced simultaneously, for on the Continent, even in Hallstatt C, bronze swords predominated; the present state of the evidence, however, scarcely

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allows an answer to this question. It may well be, therefore, that, on the basis of evidence derived from the typology or associations of the bronzes themselves, it is a theoretical impossibility to give a terminus ante quem for the end of their manufacture.

Such a limit could in theory be suggested if there were sufficient evidence available to allow conclusions to be drawn from the absence of bronzes from datable layers where they might otherwise be expected, or to enable the actual change from a bronze to an iron technology to be seen. Both these arguments would depend on the excavation of a large number of sites with well-sealed and well-dated layers providing an abundance of occupation material, and, in the latter case, on a succession of several such layers. For the time being, at least, this must remain a theoretical, not a practical, possibility.

There are also some facts that cannot be accepted as evidence for the date of the end of the Bronze Age. The continued use of bronze, for purposes for which iron was either impossible or inappropriate, will not be relevant. Thus, although bronze was still used for a variety of ornaments and other objects, there is no reason to argue that the Late Bronze Age sensu stricto continued, nor is there any necessity to suppose that Late Bronze Age ornament-types did not continue after the change to iron for weapons and implements. Similarly, where the use of iron was a technical impossibility, most notably for sheet-metal working, bronze is only to be expected. Its continued use for buckets, cauldrons and musical instruments is perfectly natural, and here again it cannot be assumed that the change from the 'Late Bronze Age form' to the 'Iron Age form' of these types necessarily coincided with the change from bronze to iron.

In the second place, the survival of non-bronze types current during the Late Bronze Age cannot be adduced as evidence for the dating of the bronze industry. There is no a priori reason why settlement types, pottery or other artifacts of bone, gold or amber should go out of use at the same time as the change in metal technology.

Lastly, the appearance of iron need not betoken the end of the bronze industry. Neither the first occurrence of iron nor the earliest proof of native manufacture is sufficient; what must be demonstrated is the general supersession of bronze by iron, though that will depend on the gathering of far more evidence than is currently available.

If these theoretical considerations are applied to the particular facts that can be or have been used for the Irish Late Bronze Age, the evidence is seen to be almost depressingly slight. The latest exotic objects in hoards are the bronze bracelet in the Kilnurry, Co. Kerry hoard9, which finds its best parallel in Alsace during Hallstatt C, and the cup-headed pins from the Maryborough, Co. Laois, hoard10, and from the somewhat dubious hoard from Derryhale, Co. Armagh;11, which are to be compared with examples dated to Montelius VI in the Nordic zone12. The latest foreign influence on native types is to be found in the swords. As well as a variant of the Hallstatt C Gündingen type shown by Cowen12 to be most probably of local manufacture, there are also swords of local ancestry incorporating Hallstatt C features; these are Eogan's classes 5 and 4c respectively14, though he may have underestimated the

10 Ibid., p. 341.
11 Ibid., p. 333.
12 Ibid., pp. 307 and 320.
number of swords showing features derived from Hallstatt C swords. In none of these cases need the date of the foreign influence be put later than the seventh century B.C. The Hallstatt C origin of the swords and the bracelet may date well back towards the beginning of that century, while the correlation with Montelius VI indicated by the pins does not have to be later than the middle of the century, to take the earliest possible dating. Eogan's comment that the lack of any later influence is due to the lack of any later bronze industries to exert it entirely begs the question. The only valid conclusion to be drawn from this is that hoards were still being deposited in the seventh century, and this date must count as the latest terminus post quem for the end of the native industry. A possible line of approach to the calculation of a terminus ante quem for its end has been outlined above; it has been shown how the swords fail to provide the necessary evidence, and it does not seem at the present that any other type could be invoked to any better advantage in that argument.

A number of other pieces of evidence have been used to give a later date for the continuation of the Bronze Age, and they must be reviewed in turn to assess both their relevance to the problem and the reliability of their dating. A small hoard consisting of a dress-fastener and three bracelets found in a bog at Kilmoyley North, Co. Kerry, has been given a date of 500 B.C. on the basis of the pollen analysis of its context, but this must be discarded in view of what has already been said above about the difficulties of dating by such a method, and because it sheds no light on the bronze implement-producing industry. The same objections must be made to the gold penannular bracelet found at Gahlstorf, for even if the date as given by the associated Harstedt pot is accepted as being c. 550 B.C., the object is a gold ornament, not a bronze implement. The evidence of amber beads has also been adduced: those from Drumcooley Hill, Co. Offaly, were found with La Tène II glass beads, while the necklace from Derrybrien, Co. Galway, has been dated by the radiocarbon method, with a determination of A.D. 70–90. As Harbison admits, these beads may not be very sensitive chronological pointers, and possibly continued to be made well into the Iron Age; certainly they cannot be used to date the bronzework.

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22 P. Harbison, op. cit., p. 198.
Another possible piece of evidence has recently been published by Harbison\textsuperscript{23}, who claimed that a Late Bronze Age leaf-shaped bronze sword had been in a scabbard now corroded, but originally of La Tène II form and hence to be dated c. 300-100 B.C. The present writer has not examined the actual sword, but to judge from the published illustrations, the uneven degree of survival and the impossibility of withdrawing the broadest part of the blade through the narrow strengthening cross-band of the scabbard may still allow room for scepticism. If the raised surface on the edge of the blade represents the binding of the scabbard, then the supposed cross-band cannot originally have been wider, as claimed, and it is difficult to see how such a sword and such a scabbard could have been used together. Even if the original existence of the alleged scabbard were to be confirmed, perhaps by radiographic examination, the interpretation of this association would be hard to assess. The sword is apparently unprovenanced, and in the circumstances it would seem rash to argue for either its manufacture or its use after 300 B.C.

The last site to be examined in this review of possible evidence is perhaps the most important. The lowest occupation layers of Crannog 61, Lough Gara, Co, Sligo\textsuperscript{24}, have yielded material in which the hesitent beginning of an iron industry might be seen. The lowest layer contained flints, “typical bronzes”, a gold penannular ring and pottery of the flat-rimmed ware type. After a period of abandonment when the crannog was inundated, the next layer provided the first iron objects, including a swan’s-neck pin and a clumsily forged axehead, as well as a bifid razor, a phalera of bronze and more pottery of the same type as in the earlier layer. These same layers have also produced radiocarbon dates ranging from $300 \pm 130$ B.C. to $120 \pm 130$ B.C.\textsuperscript{25}, though purely on the grounds of comparison with similar archaeological material elsewhere, these successive occupations would be assigned to a chronological bracket perhaps as much as five centuries earlier than these determinations. In view of what has been said above about the definition of the Bronze Age, and the difficulties of using such dates, judgement must be suspended until publication of the excavation allows an assessment to be made of the bronze industry represented there, and of the context of the samples used for the radiocarbon determinations. Even so, their calibration in terms of years B.C. may not be simple, and their value, for the time being, can only be left as an open question. It should be pointed out in passing that the small hoard of bronze objects found nearby, Eogan’s Rathinnaum hoard\textsuperscript{26}, is for the present purposes irrelevant; unless it can be shown to have been in a definite stratigraphical relationship to the crannog, the hoard cannot date the occupation, nor the occupation the hoard.

The notion that ideas and techniques have a tendency to linger on in Ireland after their abandonment elsewhere can only be applied with the greatest caution to this period. The most obvious example of this alleged tendency is the long survival of a way of life rooted ultimately in the Celtic Iron Age, if not earlier, but the reasons for that survival are to be found not so much in any innate cultural conservatism, as in political and social changes that affected the British Isles, leaving Ireland untouched: that is, the Roman conquest and the Saxon settlement. In the prehistoric period

\textsuperscript{23} Ibid., pp. 185-199.
\textsuperscript{25} R. McAulay and W. A. Watts, Radiocarbon, 3 (1961), 34-35.
there is no evidence that Ireland lagged seriously behind its neighbouring island. In the Early Bronze Age, indeed, it was well to the forefront, and in the later stages of the Bronze Age, if not abreast of the latest developments taking place in Southern England, it certainly did not lag to any significant extent behind Scotland, Wales and the more northerly and westerly parts of England. It would, therefore, be dangerous to invoke without good reason a natural backwardness in Ireland to explain the alleged retention there of a bronze industry for perhaps four centuries after the adoption of iron in Britain.

It must be concluded that, in the present state of the evidence, the latest date that can be demonstrated for the Irish Bronze Age need not be later than the seventh century B.C., though it is possible that it lasted for an appreciable period thereafter. It has been argued that it may well be methodologically impossible to provide a lower limit for its survival from the bronzework alone, and if that is so, such a limit could only be provided by the evidence of ironworking. But what would have to be shown is not merely a datable context in which iron has superseded bronze, but a series of such contexts in which the actual process of that supersession could be demonstrated and dated.

In the meantime, until that demonstration can be made, care must be taken to avoid the pitfalls to which our archaeological terminology renders us prone. The restriction of terms such as 'Late Bronze Age' to a purely technological phase has been advocated above, and in this sense it is only natural that some elements current during that phase should persist into the next. If it in fact makes sense to talk of a Late Bronze Age way of life, and an Iron Age way of life, it should not be assumed that the two are necessarily different in all respects.

Nor should a system of general chronological phases be used with a precision it cannot support. Such a scheme, in which the Late Bronze Age is followed by La Tène, followed in turn by Early Christian, involves names assigned on a variety of criteria to those archaeological complexes that are best known and best represented in the archaeological remains. It is well suited to some uses, for instance the display of museum objects, but for the purpose of precise chronological argument it is liable to be misleading. Since the Late Bronze Age is an industrial phase, it can only be followed by another industrial phase, and unless the La Tène period is defined in such terms, the two names cannot be used in a single chronological scheme. To say that the Late Bronze Age is followed by La Tène is to say no more than that there is no readily identifiable material or group of sites to be assigned to the time between those two complexes, and to extend the name Late Bronze Age to the entire period down to the emergence of a recognisable La Tène Iron Age is unjustifiable.

Just as the name should not be extended beyond its correct application, neither should the material conventionally assigned to the Late Bronze Age be spread out over the centuries before the La Tène phase. Gold objects of types found with Late Bronze Age bronzes may be argued to extend through the sixth century B.C., and the fashion for amber beads may have lasted for several centuries thereafter; but not the bronzes. The cause of archaeology will be better served by admitting the deficiencies of the evidence than by spreading the available material to cover apparent gaps. Certainly, new excavation and the publication of sites already excavated will

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shed more light on this period, as will the reassessment of sites already published. Barry Raftery,\textsuperscript{28} has already shown reason to doubt the ninth century A.D. date for Cahernemnaun, Co. Clare, pointing to material best paralleled in the British pre-Roman Iron Age, and the Lough Gur excavations yielded metalwork of both Late Bronze Age and Iron Age types.\textsuperscript{29} Doubtless there are other sites awaiting reconsideration.

In the arguments presented above, no new material has been brought forward, nor has any object been radically redated. What is new is the definition of some of the terms and the methodological treatment of the evidence. The tentative conclusions advanced may well prove to be wrong, but if this article stimulates a restatement of the case for a survival of the Irish Bronze Age till towards the end of the first millennium B.C., it will have served a useful purpose.

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