

THE DATING OF IVINGHOE BEACON

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Three radio carbon dates have been obtained on bone contemporary with the Late Bronze Age occupation of Ivinghoe Beacon. These dates have means of 720 bc, 520 bc and 350 bc. Consideration is given to the interpretation of these dates and some additional comment is made on the question of whether timber defences did really exist at the site or whether some other interpretation of the post holes is possible.

Introduction

A bequest from Mrs. Muriel Bennell to the Buckinghamshire Archaeological Society, together with a grant from the Liberty Trust, has made it possible to obtain three radiocarbon determinations on samples yielded by the excavation of Ivinghoe Beacon hillfort, funded by the Society (Cotton and Frere, 1965).

The only suitable material preserved comprised bone from an occupation deposit described by the excavators as stratified behind the northern rampart and interpreted as sealed by collapse from that rampart (Cotton and Frere, 1968, 191, fig. 2 and plate IIIb). The excavators considered the deposit as coeval with the occupation of the site, which they believed to have lasted 'little more than a generation'.

The Radiocarbon Dates

The three dates were all obtained from unweathered animal bone clearly labelled as from the deposit sealed by chalk rubble behind the rampart on Site A. The bones themselves were marked with the designation A VIII 2 (i.e. Site A, cutting VIII, layer 2). The identification of this with the bone spread was verified by reference to the excavators' site note-books preserved in the County Museum at Aylesbury.

The determinations were made on bone-collagen extracted with dilute hydrochloric acid and are as follows. The use of lower case 'b.c.' indicates an age expressed in radiocarbon years. The ages expressed in calendar years 'B.C.' are after Ralph *et al.* (1973). The

one case where a range has been expressed arises from squiggles in the radiocarbon/tree ring correction curve.

720 ± 100 b.c. (Birm.-804) . . . 800 B.C.
520 ± 100 b.c. (Birm.-895) . . . 500-640 B.C.
350 ± 100 b.c. (Birm.-803) . . . 410 B.C.

Frere and Cotton believed that the deposit formed within the thirty years or so in which the fort was occupied. They dated this occupation on the evidence of the scatter of Ewart Park bronzes on the hilltop (Britton in Cotton and Frere, 1968, 204-213), which are now conventionally dated to the ninth and eighth centuries B.C.. It was hoped therefore, that the mean radiocarbon dates would lie within this chronological range, but this is the case with only one of the three determinations.

Consideration must first be given to whether the dates, which are statistical expressions of probable age, are significantly different in a statistical sense. Two dates may be said to be significantly different if

$$\Delta A > 2 \sqrt{(\sigma_1^2 + \sigma_2^2)}$$

where ΔA stands for the difference in the two mean ^{14}C dates and where σ_1 and σ_2 are the respective standard deviations. Application of the test shows that the two outermost dates (Birm.-803 and Birm.-804) are significantly different and that the dates are unlikely, on statistical grounds, to refer to a single event.

However, given a sufficient number of ^{14}C determinations of the same event, one in twenty results will lie outside the range of 2σ and this result may be no more than just such a statistical aberration.

Equally, the material on which the determinations were made may be responsible for the results. There are various difficulties associated with the use of bone (Polach and Golson, 1966; Hassan *et al.*, 1977) and such factors as whether the bones in the ^{14}C sample had, or had not, been cooked might result in the production of disparate ^{14}C ages. Moreover when dates are younger than expected, this circumstance is sometimes attributed to the use of bone for dating (Tamers and Pearson, 1965).

The Stratigraphical Context

Cotton and Frere (1968, 191) regarded the chalk rubble overlying the occupation deposit as being collapsed bank material. In their interpretation of the sequence in the north-western area of Site A (Frere and Cotton, 1968, 190–191; fig. 3, opp. p.191) they suggested that the defences narrowed in order to avoid a pre-existing stake structure and that occupation subsequently took place in the shelter of the northern rampart; the traces of this occupation (i.e. the deposit here dated) were then sealed by the collapse of the bank.

At this juncture, consideration must be given to the 'timber defences', which have been regarded as a distinctive form of timber-strengthened rampart, named the 'Ivinghoe type' (Cunliffe, 1974, 229). The writer is frankly disinclined to accept the excavators' interpretation of the postholes excavated as timber defences. Cotton and Frere themselves recognised that the construction of the 'defences' smacked of incompetence and suggested that perhaps the builders were unfamiliar with the use of chalk in structures of this nature (Cotton and Frere, 1968, 191–2). This implication that the hillfort builders were strangers to the area, or 'immigrants' to use the excavators' term, led to an inference that

there could not have been pre-hillfort settlement on the site, and this in turn led to the unhappy interpretation of the apparently pre-rampart house (Structure III), as a D-shaped building abutting on to the rear of the rampart, notwithstanding the fact that the semicircle of posts were demonstrated to have been accurately laid out on the periphery of a true circle (Cotton and Frere, 1968, 195 and fig. 3, opp. p.190). Most of the area of the house site, where it underlay the rampart, was not excavated and sections of the postholes were not published. As possible explanations of the absence of postholes, one might suggest either that they are present only on the uphill side of the house where the hill slope necessitated the setting of the posts deeper into the ground or that postholes 12 and 18 of the 'defences' (Cotton and Frere, 1968, fig. 3, opp. p.190) may in fact be entrance posts. In the same way postholes number 24, 30, 22 and 15 of the defences (Cotton and Frere, 1968, fig. 3, opp. p.190) carry conviction more as part of a 4-post structure than as a part of the defences, and postholes 10, 12, 17 and 18 could, indeed, be seen in the same light. When excavation on a larger scale has taken place, these points may be finally resolved but, for the moment, the evidence for timber-strengthened defences at Ivinghoe lacks conviction.

Conclusion

The ^{14}C determinations here published lend some support to the good archaeological evidence for Late Bronze Age settlement on the site but their wide spread necessarily throws us back to the archaeological evidence for dating the occupation. I am indebted here to David Knight who (*in litt.*, 1980) has suggested that 'pottery directly comparable to material from Ivinghoe commonly occurs in Continental Late Urnfield assemblages [and so] increases the likelihood that the earliest occupation on the site may date from the later ninth century B.C.'. However, this date, as noted above, refers only to the pre-hillfort settlement. The construction of the defences, possibly comprising just a ditch with dump rampart, seems to have been followed by abandonment of the

site. There is no direct evidence for the date of the defences, although the relatively fresh condition of the bone in the midden deposit dated here may imply that they were constructed not very long after deposition of the midden. To this one must add the *caveat* that it is more than likely that our bone samples come from the base of a midden and were probably, therefore, in a protected environment for much of the time before becoming sealed by the bank material.

The possibility of dating hillfort construction to the Bronze Age has perhaps been greeted with more enthusiasm than the evidence has often warranted. This is not the place for a full review of the evidence but we may note, in this context, the doubts recently raised, following re-excavation, about a possibly early origin for the defences at Dinorben (Guilbert, 1980). In future, more critical appraisal will be required before sites can be accepted as hillforts of genuinely Bronze Age construction and use. What is certainly seen in the later Bronze Age, however, is the

open settlements, so-called *Hohensiedlungen*, in defensible hill-top situations.

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Note on Possible Contamination

Roger Williams has contributed the following note on the possibility of contamination of the samples during their storage in cardboard boxes in the County Museum at Aylesbury:

'Concerning the possibility of recent contamination due to the inclusion of cardboard from the storage boxes, this is highly unlikely. We extract the collagen from the bone samples and they all undergo a very careful inspection which includes thoroughly scraping and removing the outer layer'.

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