

well have had earthwork defences contemporary with group (ii), but on a different line. This is certainly so at Caistor by Norwich and may possibly be the case in London, where a peculiarity of the street-plan, as recently mapped, suggests it.

The prior existence of the earthworks—themselves the product of emergency—may be thought the probable cause of the provision of

town walls in Britain before they were provided on any scale in Gaul. To that extent the walls of Britain may be considered as the second part of a programme, but the two parts are separated by half a century or more. This is not the context for a fuller discussion of the historical points involved, which are being treated by the writer in a forthcoming book.

NOTES

[1] Fosse Earthwork: R. E. M. and T. V. Wheeler, *Verulamium, A Belgic and Two Roman Cities* (Oxford, 1936), pl. xviii. 'Silchester, Outer Earthwork', *Archaeologia*, xcii, pl. xxxviii; inner bank, pl. xxx.

[2] *Archaeological Journal*, cxii, 21.

[3] *Ibid.*, cxix, 114-49.

[4] *Digest*, L., x., 6.

Dr Jarrett writes:

Professor Frere's reply to my note on the dating of town defences widens the scope of the discussion without clarifying the issue. He appears to have misunderstood the whole intention of my note. It was no part of my purpose to suggest that there are *no* towns with earthwork defences significantly earlier than their stone walls. I sought rather to ensure that, where this was being claimed (and important

historical conclusions drawn from it), the evidence for two distinct defences was adequate, and had been considered in the light of various possible interpretations. I did not then believe that the evidence could support what was claimed; nor have the interesting but irrelevant arguments by Professor Frere done anything to convince me that, in most cases, the evidence is sufficient to make a decision in favour of either one or two periods.

A Source of Charcoal in Antiquity

In his review of Professor Forbes's *Studies in Ancient Technology*, vol. VIII (ANTIQUITY, 1964, 230), H. H. Coghlan comments on Forbes's virtual rejection of peat as a metallurgical fuel. Coghlan argues on grounds of availability in certain areas and heat potential, that it is premature, despite lack of evidence, to dismiss completely peat from the reckoning. Peat has serious disadvantages, such as a high sulphur content, and, while a number of authorities on early technology have considered the matter briefly (Coghlan himself [1], Tylecote [2], Hodges [3], Cecilia A. Western [4], and of course Forbes), lack of evidence and the inherent disadvantages of peat have caused them to reject its possibilities for early metallurgy.

The purpose of this note is to indicate a way out of these difficulties. A very important fuel has been almost totally absent from archaeological considerations, namely peat charcoal.

This writer has published [5] conclusive evidence of the value of peat charcoal metallurgically with details of its manufacture. This paper, which embodies a transcript of a detailed description by an elderly Hebridean smith who made and used peat charcoal, does I think demonstrate not only the use of this fuel some 60 years ago in what was not very far removed from an Iron Age economy but also demonstrates, incidentally, the great value that well-authenticated oral tradition can have from an archaeological and technological viewpoint. I would suggest, subject to further technical research, on the basis of this transcript and bearing in mind the calorific potential of 'unrefined' peat, that the 'charred' form might well qualify for an efficiency rating close to that of coke and superior to wood-charcoal. This is a case where an important aspect of ancient technology has barely survived in documentary

records, charcoal, in general, being of course superseded by coal (coke) in the 18th century, and this in turn of course has been an additional reason for the neglect of the subject. The only recent technological reference I am aware of is Tylecote's (p. 292), who, having dismissed peat earlier in his work, paraphrases a 19th-century paper [6] thus: 'wood and peat-charcoal was used for smelting'; but the implications of this seem to have been missed as indeed has a fairly detailed account of peat-charcoal making in the same paper. There are other 19th-century references [7] but the record is very scanty. Consideration of the possibility of excavational evidence raises the major problem of how to distinguish partially combusted peat from peat-charcoal—they are of course identical materials. The present writer in excavating Iron

Age and medieval sites in the Hebrides where iron slag deposits indicate considerable metal working, is particularly conscious of this problem (Tylecote's comment, p. 264—'one cannot neglect the possibilities that bog iron-ore and peat were used'—is very relevant for this area). Any appreciable heap of charcoal unassociated with a hearth may presumably be regarded as the deliberately refined form of peat. As is generally realized the population of the north-west of Scotland, especially of the Hebrides, has been forced by isolation and a subsistence economy to conserve a technology of medieval (if not Iron Age) aspect; details of this economy, *pace* Curwen, are perhaps not so well known as they might profitably be from a comparative viewpoint.

I. A. CRAWFORD

NOTES

[1] H. H. Coghlan, *Notes on Prehistoric and Early Iron* (Oxford, Pitt Rivers Museum Occasional Papers on Technology, 8).

[2] R. F. Tylecote, *Metallurgy in Archaeology* (1962).

[3] H. Hodges, *Artifacts* (1964).

[4] Cecilia A. Western, 'Wood and Charcoal in Archaeology' (ed. E. S. Higgs and D. Brothwell, *Science in Archaeology* (1963)).

[5] I. A. Crawford, 'Gual Gaidhealach: Peat Charcoal', *Scottish Studies*, 8, pt. 1, 108.

[6] W. I. Macadam, 'Notes on The Ancient Industry of Scotland', *Proc. Soc. Ant. Scot.*, XXI, 1886-7, 89.

[7] A. Ross, 'Old Highland Industries', *Trans. Gaelic Soc. Inverness*, XII, 1885-6, 389.

Taking the Baulks Home

PLATES XXX-I

The following note is sent to us by Dr H. J. Franken, Lector in Palestinian Archaeology, Faculty of Theology, Leiden University, Holland. This note will briefly touch on the reasons for taking 'squeezes' of sections, some ways of taking them on a Near Eastern site, and their usefulness.

Tell Deir 'Alla is a site in the Jordan valley which has been excavated for the past 4 years by a Dutch team whose aim was to get a very finely stratified type series which would form a basic chronology for trans-Jordanian pottery. The dig was also intended as a training ground for Dutch students who might one day be interested in working in the Near East. With these two factors in mind it became increasingly desirable to take home a more actual record of key sections than just section drawings and colour

slides. The team is in the field 3 months of the year and the vital work on interpreting the stratigraphy must perforce take place, at least partially, thousands of miles from the site. Furthermore it is a new Dutch venture to excavate anything so large or so out of the way as a Near Eastern tell. Few colleagues could afford the time off to come and see for themselves what was going on in Deir 'Alla, so the answer seemed to be to take home some sections as they are, and argue out points of interpretation from the soil itself rather than from drawings, which demand some amount of interpretation before they can be drawn.

Taking a squeeze is not the correct terminology, and perhaps taking a 'pull-off' would be a more accurate phrase. What has been done is not the taking of an impression but the lifting