

## A copper flat axehead from Wester Cartmore Farm, Lochgelly, Fife: a cautionary tale

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### ABSTRACT

*In 1995 a Late Neolithic/Early Bronze Age copper flat axehead was discovered by a metal detectorist in a field near Lochgelly, Fife. Further investigation revealed that the find-spot was located in a glacially deepened depression containing organic sediments. Although the precise stratigraphic location of the axehead could not be ascertained, the find circumstances appeared superficially to be in keeping with deposition of metalwork in a 'wetland' setting. In the event, pollen analysis showed this to be untenable. The results provide a salutary reminder of the need for caution when interpreting the possible significance of discoveries of metalwork from peat deposits, in the absence of a secure context and independent dating evidence.*

### CIRCUMSTANCES OF DISCOVERY

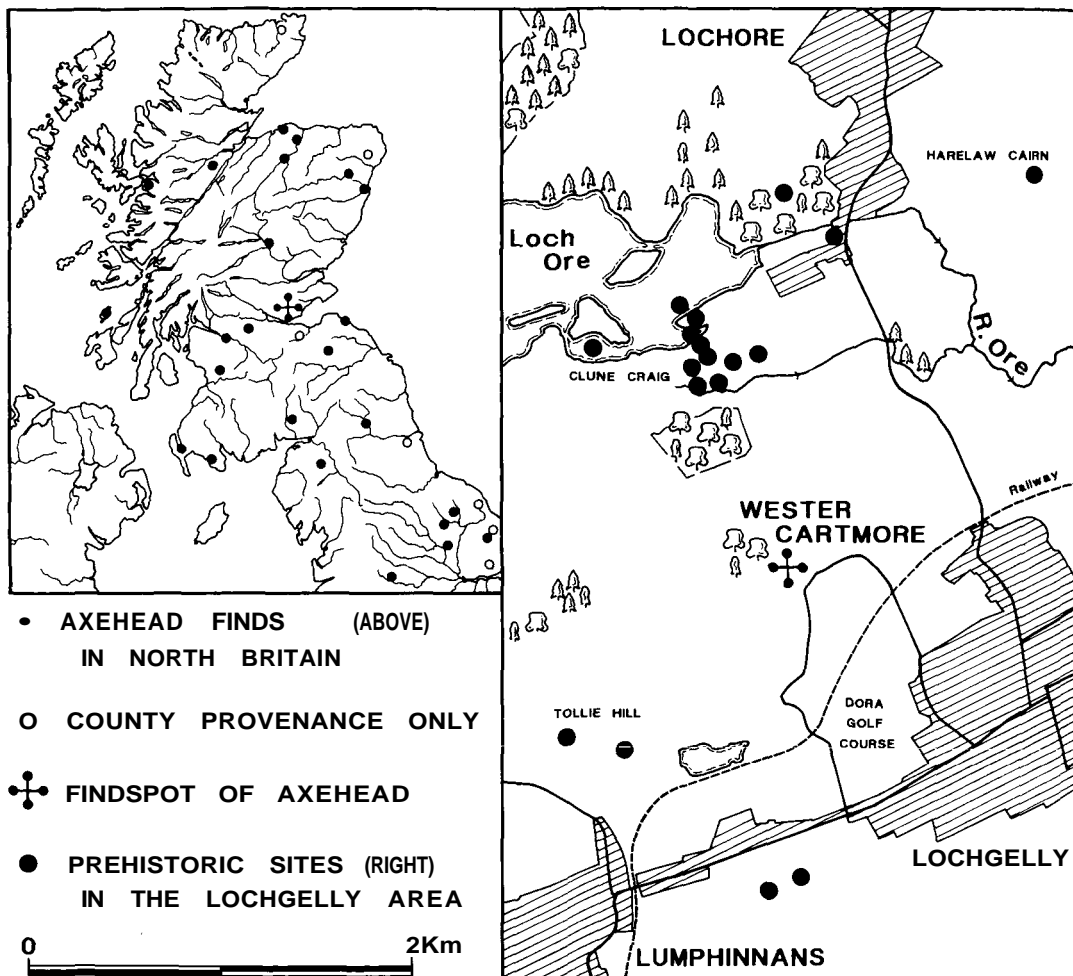
During the late summer of 1995 Derek Adie of Lochgelly, Fife, found a Late Neolithic/Early Bronze Age copper axehead while metal detecting at Wester Cartmore Farm on the western outskirts of the town (illus 1) (NGR: NT 1745 9412; Fife Sites & Monuments Record NT19SE 071). Mr Adie initially took the axehead to Kirkcaldy Museum and shortly afterwards the discovery was reported to the National Museums of Scotland. Having been claimed as Treasure Trove, the axehead was subsequently allocated to Dunfermline Museum, within whose collecting area the find-spot actually lay.

At the earliest opportunity, two of the writers (PY & TC) accompanied Mr Adie to assess the find circumstances. The find-spot lay in poorly drained rough pasture to the west of the farm steading. A trench, approximately 1 m square, was excavated at the location indicated by the finder (although it was no longer possible to discern the small backfilled hole originally dug to retrieve the axehead). No archaeological features were found, but the trench did reveal that at the depth of approximately 0.3 m, at which the axehead was said to have been found, there was a marked change to apparently undisturbed organic sediments. A ranging rod was used to probe them and they were found to be at least 1 m in depth. Further metal-detecting was also carried out in the immediate area but with no positive result.

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ILLUS 1 Location map showing the find-spot of the axehead and the local archaeological sites referred to in the text. The inset indicates the distribution of copper axeheads from northern Britain after Schmidt & Burgess (1981), with additions

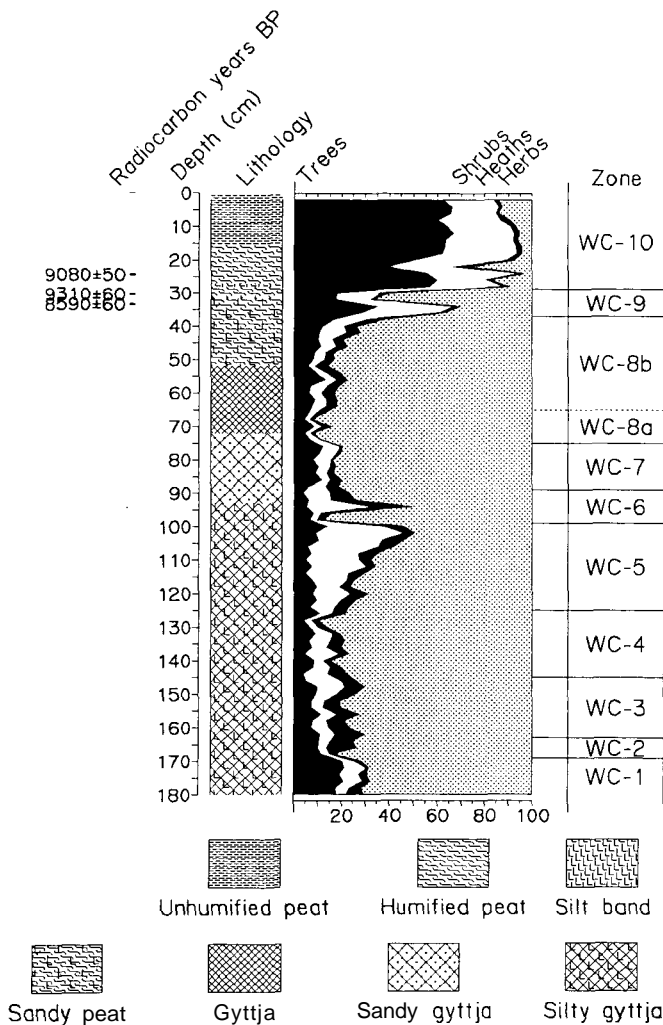
### PREHISTORIC SITES IN THE VICINITY

The find-spot of the axehead is located within a fairly rich landscape of prehistoric sites, many of which have survived despite the intensive industrialization of the Lochgelly area in the 19th and 20th centuries.

The mutilated remains of the Harelaw Cairn (NT19NE 002) are located 2.5 km north-east of the find-spot; the cairn was investigated in the 1890s, when three cists were found, two of which each contained a Food Vessel. Another cairn and a stone circle nearby were recorded earlier this century, but both have subsequently been destroyed (NT19NE 037 & 033). In this same area, on the south side of Loch Ore and 1 km to the north of the find-spot, extensive traces of prehistoric settlement are known. Earlier this century, the loch was seriously affected by drainage works related to the coal industry and they led to a number of finds being made, including a 'Roman' spear (NT19NE 039), a possible crannog (NT19NE 035) and a dugout canoe (NT19NE 036).

The latter, now destroyed, was found immediately adjacent to an enclosed, defended promontory at Clune Craig (NT19NE 023), which stood above another enclosure in a low-lying position just to the north (NT19NE 025). A large group of hut circles has been found traversing an east/west ridge, 200 m south of Clune Craig (NT19NE 021, 022 & 024).

There are also significant sites to the south of the find-spot. A possible tumulus site, 1.4 km south-west of Wester Cartmore, was excavated on Tollie Hill (NT19SE 001) in 1927-8. A Bronze Age cemetery was also identified there. A major cropmark site of a possible henge (NT19SE 009) has been recorded 1.5 km south of the find-spot and has recently been conserved. Other cropmarks in its vicinity have proved to be the remains of ironstone and coal workings and the henge appears to be the only survivor of this ritual landscape.



ILLUS 2 Wester Cartmore cumulative pollen diagram; ages are in uncalibrated radiocarbon years BP (see Table 1 for conversions)

## ENVIRONMENTAL CONDITIONS AT THE SITE

The find-spot lies in a field located in a glacially deepened depression, of c 200 m diameter and often containing standing water, in an area of glacial till derived from Carboniferous deposits. To the north and west of the depression slopes up to 10 degrees occur, while to the south and east the land falls away gently. Coring over the area of the field revealed a consistent substrate. The depression possesses no stream inlet or outlet and contains c 2.3 m of infill, of which the lowest 0.5 m is non-polleniferous (illus 2). The basal 0.5 m consists of sands, silts and clays and are succeeded by gyttja (an organic lake mud) which between 0.9 m and 0.7 m depth becomes much more mineral. A return to more organic gyttja then occurs with the organic content rising to its maximum (95% loss-on-ignition) at 0.3 m. From that point the organic content declines to 70% loss-on-ignition up to the present land surface. This whole sequence is consistent with the accumulation of sediments which typically characterize the period since the removal of the last ice from Fife (Edwards & Whittington 1997). The steep rise in the organic content of the deposits at 0.7 m appears to mark the onset of the major temperature recovery at Wester Cartmore after the last ice (Loch Lomond Readvance) left Scotland.

The pollen analyses undertaken lend support to these views. The lower sediments (pollen zones wc-1 to wc-7 in illus 2), not considered here, have a pollen flora which changes with the fluctuations in climate that occurred towards the close of the Devensian ice age. At 0.3 m the apparent arrival of the thermophilous species of trees, such as *Quercus* (oak), *Ulmus* (elm) and *Alnus glutinosa* (alder) occurs and those taxa better adapted to cooler conditions, such as *Juniperus communis* (juniper) and *Salix* (willow) either disappear or go into a marked decline. From 0.3 m to the present-day land surface the pollen spectra are dominated by *Betula* (birch), *Alnus* and *Corylus-avellana*-type (hazel and/or *Myricagale* — Sweet Gale). The dominance of *Betula* would be consistent with the name of the parish — Beath, derived from the Gaelic for birch.

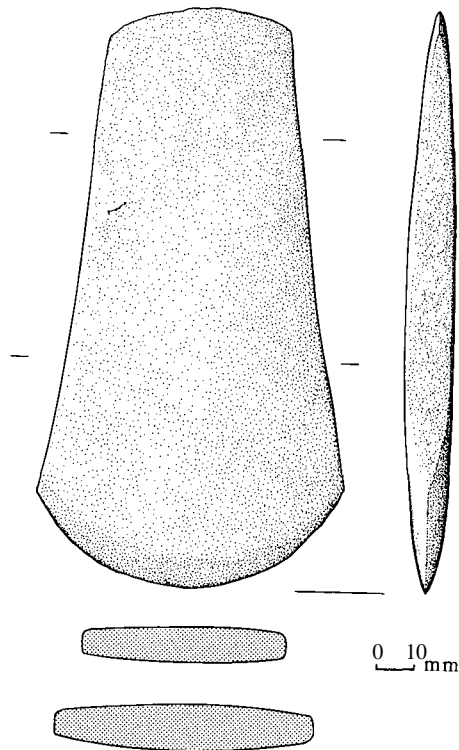
## DESCRIPTION OF THE AXEHEAD

Flat axe (illus 3); lenticular long profile; broad arched butt; the sides diverge in a gentle curve to meet the strongly curved cutting edge which is backed by a bevel, 7-9 mm wide; generally a smooth matt brown colour, with gold-coloured highlights where rubbed/worn and some areas where minor corrosion has resulted in the surface being green and rougher in texture. Dimensions: L 153 mm; W (cutting edge) 81 mm; W (butt) 48.5 mm; Th 12 mm; Weight: 691.5 g.

X-ray fluorescence analysis of the axehead by Katherine Eremin (1995) showed that it was composed of copper, with traces of antimony, arsenic and tin.

## DISCUSSION

The very earliest evidence of metalworking in these islands is in Ireland, where versions of copper axes found in continental Europe suggest that native production may have been under way soon after 2500 cal BC. The typological features of this copper axehead, particularly the thin-butted form and curving sides, indicate that it belongs to a group classified as Ballybeg/Roseisle axes (Schmidt & Burgess 1981, 27-9) or Needham's generic Class 2 axes (Needham *et al* 1985, iii). In broad terms, the axehead from Wester Cartmore can be dated confidently to the second half of the third millennium cal BC, during that period of transition from the Late Neolithic to the Early Bronze Age when metal was in production and use among what were essentially Neolithic societies. Typologically, axeheads of this form are precursors of the first thin-butted bronze flat



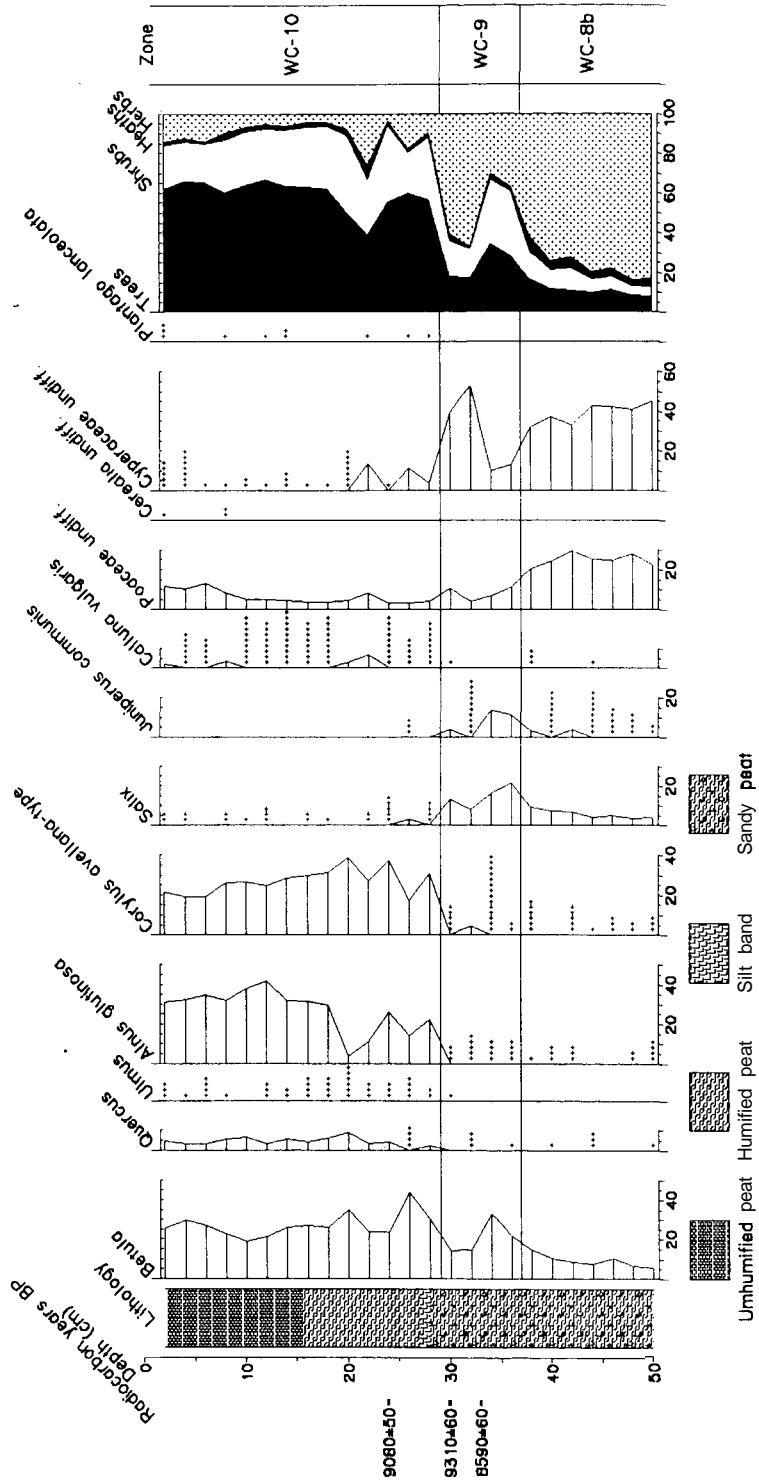
ILLUS 3 The copper axehead

axes, which would have appeared following the adoption of full tin-bronze metallurgy during the last quarter of the millennium.

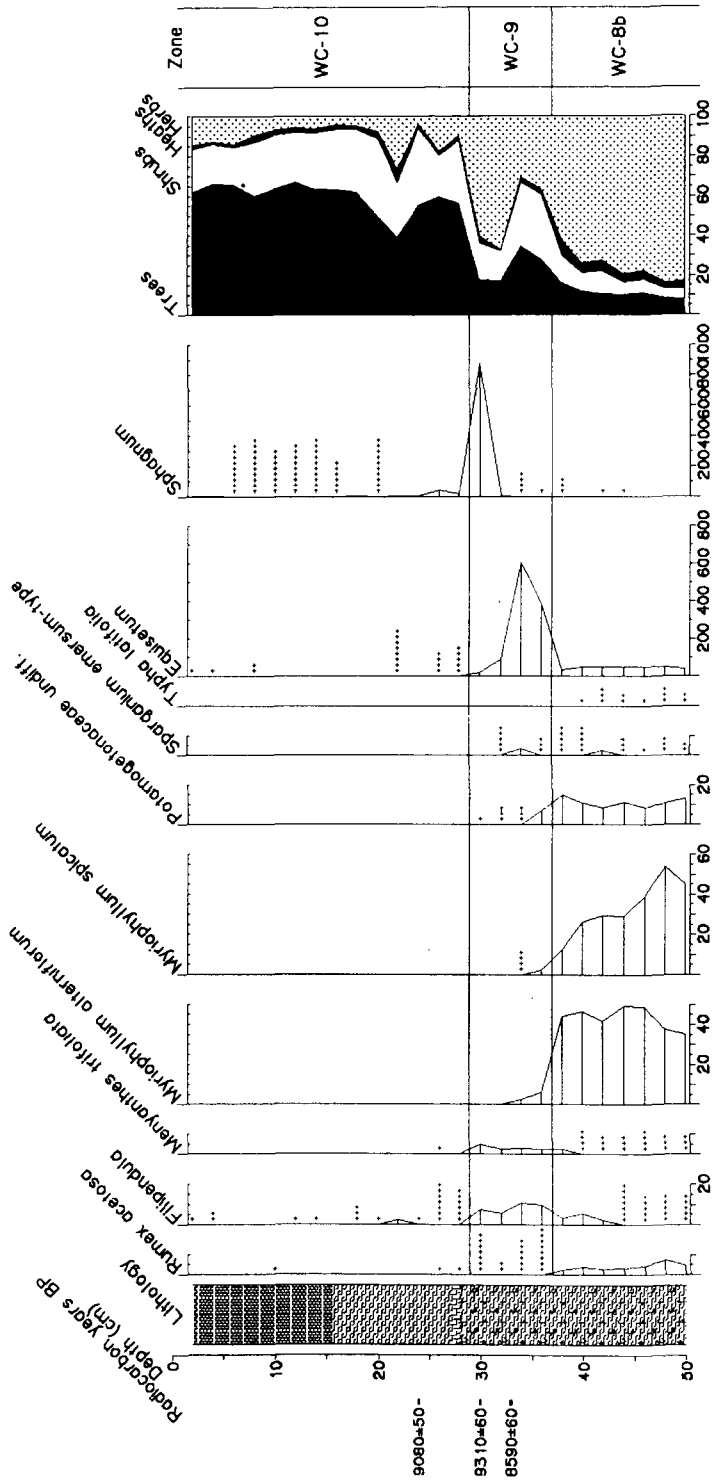
Relatively few copper axes are known from northern Britain (see illus 1) by comparison with Ireland, where very large numbers have been recovered (Harbison 1969). The Wester Cartmore specimen is one of about only a dozen examples of Ballybeg/Roseisle type from northern Britain, found widely distributed from Yorkshire to the Highlands (Schmidt & Burgess 1981, 114; another recent discovery from Galston, Ayrshire, should also now be added to their corpus). It should be stressed, however, that the present general scarcity of copper axeheads in this zone may be misleading: while the numbers in circulation may have been less than in Ireland, differences in the circumstances of deposition may have led to differential survival and recovery. An unknown proportion of the original total in circulation may have ended up being recycled; this would leave only those which were taken out of circulation in other ways (eg deliberate deposits or casual losses) potentially recoverable as archaeological finds.

The question arises as to how, why and in what environmental circumstances the Wester Cartmore axehead came to be where it was found. Thus close-sample pollen analyses were undertaken and radiocarbon dates were obtained. From the latter, the sediments in which the axehead was presumed to have lain are dated to 9310  $\pm$  60 BP (8450-8140 calBC, Beta-104917). This date clearly suggests that the artefact is not in a correct stratigraphical context.

Today the Wester Cartmore field has the appearance, especially in winter, of being an ill-drained area of rough pasture with an irregular surface, rather than a bog, as it supports very few of the species characteristic of such a feature. Perhaps the most striking feature of the deposits in this field, and their pollen, is that the lower 2 m represent some 4000 radiocarbon years while only



ILLUS 4 (above and facing) Wester Cartmore percentage pollen diagram for selected taxa for the upper 0.5 m of the sediments; ages are in uncalibrated radiocarbon years BP (see Table 1 for conversions)



the upper 0.7 m belong to the Holocene period, which has now been in existence for some 10,000 radiocarbon years. This discrepancy in relative depths of sediments belonging to the two periods could be explained by an extremely slowed deposition rate in the Holocene section of the core. Not only would this be most unusual in a lowland situation, where agricultural activities would be expected to have enhanced erosion rates on the steep slopes surrounding the depression, but the pollen diagram does not show a complete Holocene vegetation history (Whittington *et al* 1991a; 1991b). It is suggested that there has been a massive removal of material from the depression which could once have held a raised bog.

The recovery of much metalwork from 'wet' contexts, such as bogs, rivers and lochs, where recovery would have been difficult or impossible, has led to the interpretation of many such deposits as votive offerings. It could be speculated that if the axehead is evidence of a votive or ritual offering, its location in a stratum which has a very early Holocene date could be explained by the weight of the object carrying it well below the contemporary surface of poorly consolidated sediments of the bog. For this suggestion to be supported, it would have been necessary, at the time when the axehead was in circulation, for a bog containing intermittent pools of water to have been in existence. There are, however, palynological objections to this suggestion. The pollen diagram (illus 4) has virtually no indication of aquatic or wet land plants being in existence above 0.3 m; even the presence of Cyperaceae (sedges) falls off dramatically at that level.

Illustration 4 is a selected taxa pollen diagram from the findsite. The presumed level of the axehead correlates with the top of pollen assemblage zone wc-9 and it is noticeable that below that level there had been a major change in the recorded vegetation history, revealed by some striking changes in pollen and spore representation towards the top of zone wc-8b and at the base of zone wc-9. The aquatic taxa of *Myriophyllum alterniflorum* (Alternate-flowered Water Milfoil), *Myriophyllum spicatum* (Spiked Water Milfoil), and Potamogetonaceae (Pondweeds) collapse, and the presence of *Equisetum* (Horsetails) increases nearly eightfold and then collapses as swiftly as it had risen, to be replaced by a shortlived and thousandfold increase in *Sphagnum* spores. The water plants gave way first to those such as *Equisetum*, *Filipendula* (Meadowsweet/Dropwort) and *Menyanthes trifoliata* (Bogbean) which thrive in muddy water or very wet land. They in turn were replaced by mosses, over which the layer of silt occurs. Thus by 9310 BP the Wester Cartmore bog had ceased to exist as there are no aquatic and virtually no wet-land plants represented above this level. As a result, the possibility of a deliberate Bronze Age deposition of the axehead into a watery area has to be abandoned. A further important feature of the site is the existence of 10 mm of coarse silt just above the level at which the axehead was recovered and which appears to represent an inwash of sediment.

An explanation of the way in which the axehead achieved its resting place is difficult. It had been hoped that close radiocarbon dating of the sediments above and below the presumed level of the axehead would be illuminating. As can be seen from illus 4 the dates are reversed; the youngest date, 8590 ± 60 BP (7695-7505 cal BC, Beta-104918), is lowest in the stratigraphic column and is succeeded by the oldest date, 9310 BP, above which occurs a date of 9080 ± 50 BP (8130-8020 cal BC, Beta-104916). The pollen record suggests that the youngest date is too young. By 8590 BP, other pollen records in Fife (Whittington *et al* 1991a; 1991b) show that *Quercus* and *Ulmus* were well established; that is seemingly not the case at Wester Cartmore. While, as will be shown below, the central date does appear to be correct, the upper date also seems to be anomalous.

The marked changes in the nature of many pollen and spore records just before and during zone wc-9 are probably due to a slowing down in sediment deposition into the basin following upon the development of woodland on the surrounding slopes. That would also have had the



TABLE 1

## Radiocarbon dates

Lab code	Material dated	Years BP	Calibrated dates (two sigma)
Beta-104916	Humified peat	9080 + 50	8130-8020 cal BC
Beta-104917	Sandy peat	9310 + 60	8450-8140 cal BC
Beta-104918	Sandy peat	8590 + 60	7695-7505 cal BC

Calibrations are based on Stuiver & Reimer (1993)

effect of decreasing run-off into the basin, leading to its drying out and the demise of wetland taxa which could have been replaced by colonizing *Betula*. This may also have been a response to a marked rise in temperature which occurred at the close of the Devensian ice age and which allowed the colonization of thermophilous arboreal species, as represented in zone WC-10 at Wester Cartmore.

The axehead was situated below a point in the stratigraphy where peat gives way to the band of inwashed silt. It is this which suggests not only an explanation for the position of the axehead in non-contemporaneous deposits but also why it occurs in this location. Clearance of trees would have led to erosion of the soils on the steep slopes north and west of the basin, providing the silt band which lies above the axehead and it is during this episode that the axehead would most probably have reached its final resting place in the ground, whatever the precise circumstances.

Subsequent to this, peat would have grown again due to an increase in run-off from the slopes allowing the growth of *Betula* and perhaps of *Myrica gale*, if it is that taxon which is represented by the *Corylus avellana*-type pollen. If this chain of events did occur, the apparent anomalous nature of the radiocarbon dates can also be rationalized. The date of 9310 BP is seen as a real date as it accords with the presence of *Salix*, *Juniperus* and Cyperaceae, as representatives of the previous colder conditions, but also with the time when arboreal taxa were beginning to colonize. Some of this growth would have been on the former bog surface and subsequent root penetration may have introduced younger carbon into the sediments, thus providing the date of 8590 BP. The date of 9080 BP from the deposits above the silt band can be regarded only as anomalous. It has been obtained by the AMS method from a very small sample of sediment and there is the possibility that contamination has taken place. While this could have occurred, perhaps due to hard water draining into the depression, the magnitude of error involved in the date, to allow the axehead to lie in Bronze Age sediments, is not realistic (Kerrow *et al* 1984).

The possibility that the axehead was deliberately buried might also be raised because this would have led to a mixing of sediments of differing ages. While the possibility of deliberate burial must remain, that cannot be used to explain the anomalous dates as the monolith used for the pollen analysis and for the radiocarbon analyses was not taken from the immediate find site.

## CONCLUSIONS

The most probable explanation for the location of the axehead seems to be that woodland clearance around the Wester Cartmore basin, an unsurprising activity given the wealth of prehistoric activity in the area, occurred during the period of currency of such axes. Subsequent to that date woodland once again became established in the area. The basin then accumulated unhumified peat which further buried the axehead. At a much later and undeterminable date, probably once woodland had been removed from the entire area, the need for fuel led to the cutting of peat from this site. This has left only remnant deposits in the basin, as can be seen from

the truncated vegetation history revealed by the pollen analysis. Although the fine condition of the axehead still tends to invite explanation in terms of deliberate deposition rather than casual loss or discard, the pollen analysis from Wester Cartmore shows the very real need for caution when interpreting the possible significance of archaeological finds from peatland, especially inorganic artefacts, and particular circumspection with regard to antiquarian accounts of finds from bogs and mosses. It is in such circumstances that palynology becomes a vital adjunct to excavation.

#### ACKNOWLEDGEMENTS

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