

Bronze Age banks at the Black Crofts, North Connel, Argyll, a synthesis and re-assessment

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ABSTRACT

The excavation and publication of the Bronze Age banks discovered at the Black Crofts, North Connel, in the years around 1970 remains an important landmark in prehistoric archaeology in Scotland and, in particular, the study of archaeology under blanket peat. Investigations at the site continued up to 1978 but the results of this later work were never fully published. Recent archaeological investigations, triggered by housing developments in the Black Crofts, have led to renewed interest in the site and the earlier archaeological studies. This paper provides, for the first time, a summary of all of the work undertaken at this key site and undertakes a re-assessment of the published interpretations of the bank system in the light of more recent research.

INTRODUCTION

EARLY INVESTIGATIONS

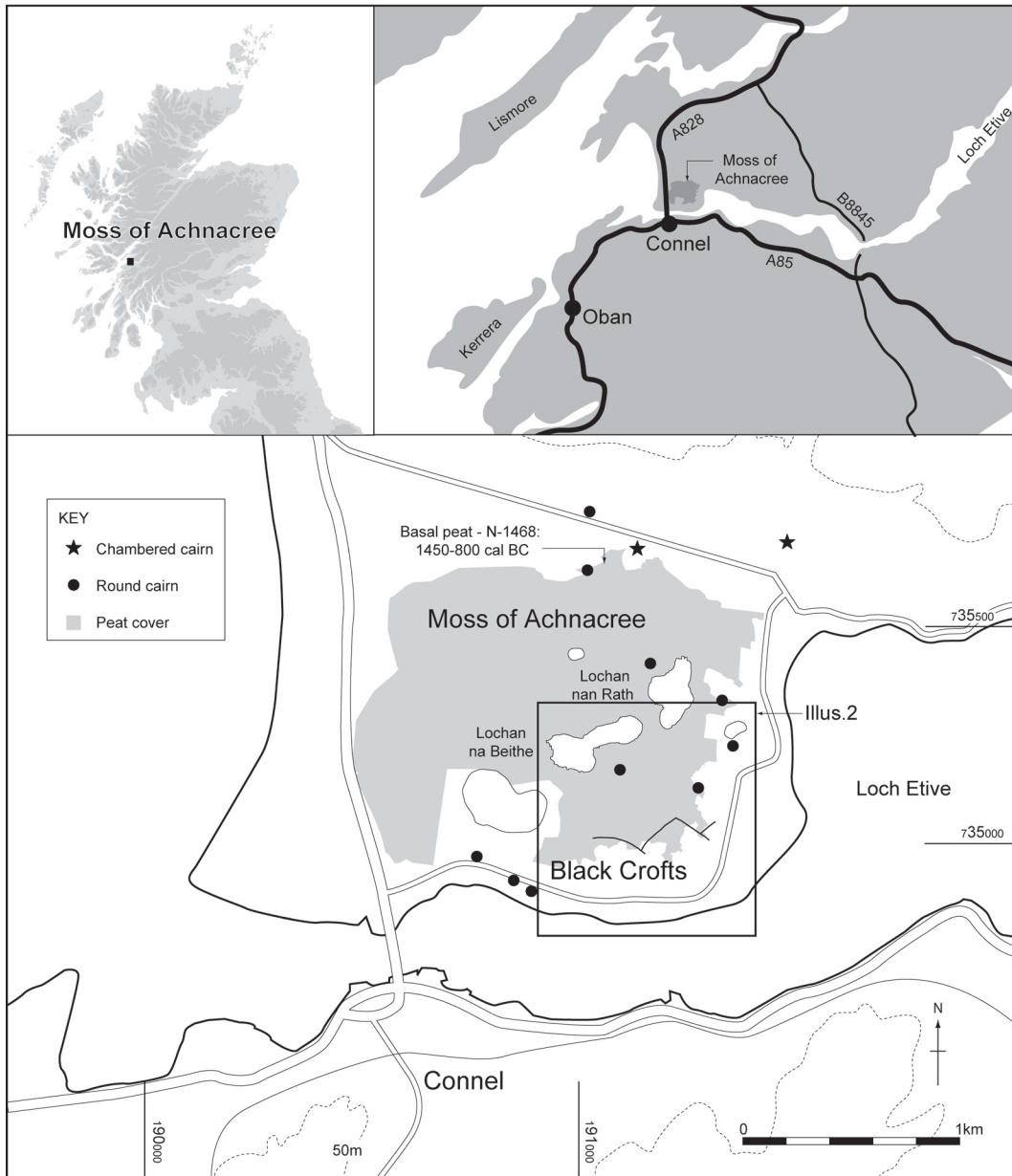
It is now over 35 years since Bronze Age banks were first recorded at a site in Argyll variously known in the archaeological literature as the Black Crofts, North Connel, or the Moss of Achnacree. The Moss of Achnacree is located in Benderloch, on a gravel terrace at the mouth of Loch Etive, 7km to the north-east of Oban (Gray 1992; see *illus 1*). Archaeological interest in the Moss pre-dates the discovery of the Bronze Age banks and a number of other archaeological sites have been recorded within and in the immediate vicinity of the Moss. Most prominent are the two chambered cairns at the north end of the Moss and there are a further nine large round cairns, up to 24m in diameter and 2m high (*illus 1*). The cairns within the Moss all appear to pre-date the accumulation of the peat and are partially obscured by it.

The Black Crofts are a row of crofts on the south-eastern edge of the Moss of Achnacree, probably created shortly before 1800. Successive

occupiers of the crofts cut peat for fuel, gradually shifting the edge of the Moss northwards and enlarging the area of cultivable land. This process can be traced on maps from the earliest detailed Ordnance Survey mapping in 1871 to the present day, the edge of the peat retreating by at least 100m in most crofts in the century between the 1870s and 1970s (*illus 2*). It was at this later date (1968, to be precise) that banks were first recognized emerging from the edge of the Moss in Croft 1 and Croft 3 where the peat had been cut back. The discovery was made by Dr A Fraser who reported it to staff from RCAHMS, then undertaking field survey during the preparation of the Lorn volume of the Argyll Inventory (RCAHMS 1975).

Three small-scale excavations by Anna and Graham Ritchie on what is now referred to as Bank B followed in 1969, 1971 and 1973, leading to the publication of a paper in the *Glasgow Archaeological Journal* (Ritchie et al 1974). This paper included radiocarbon dates demonstrating a Bronze Age date for the banks as well as the results of pollen and

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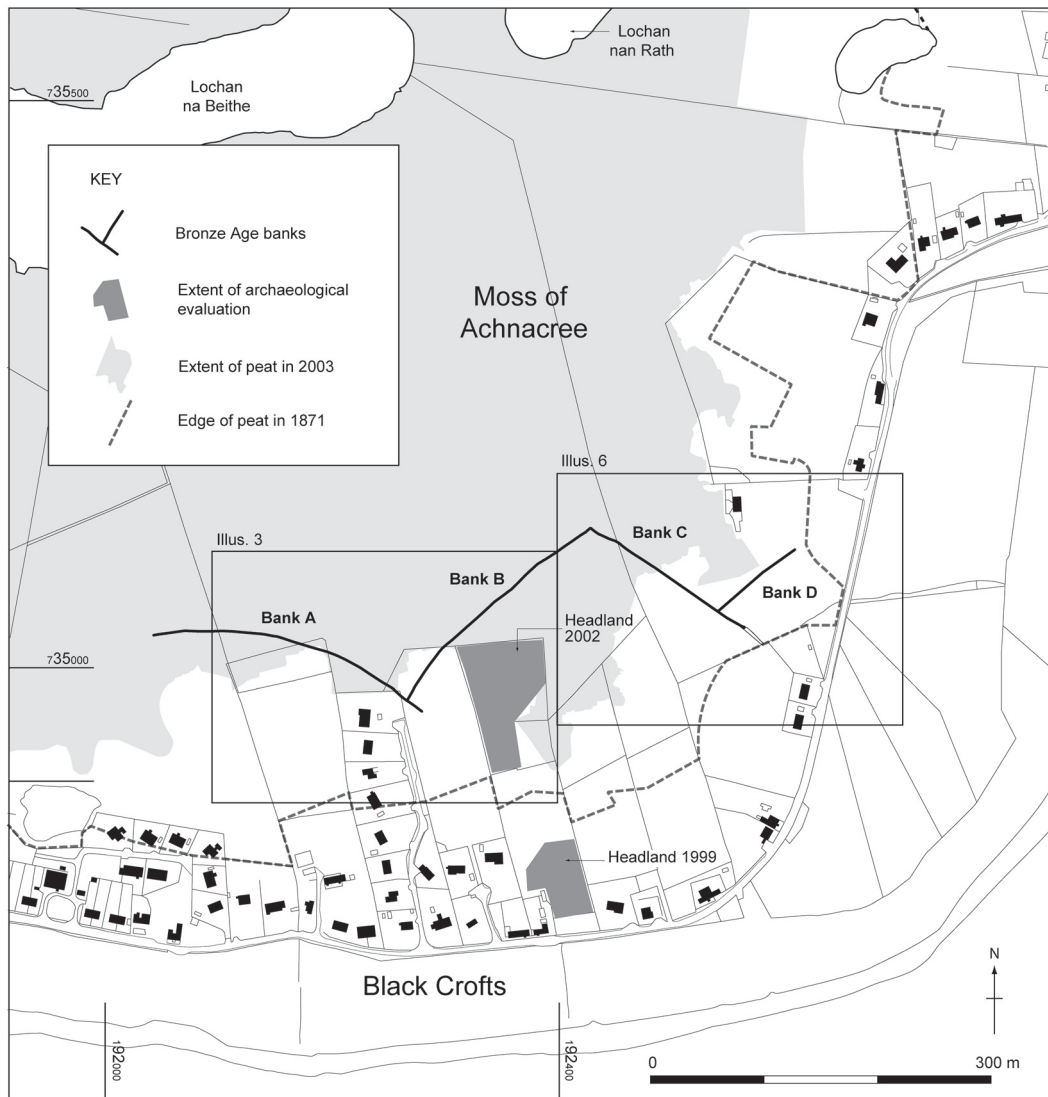
ILLUS 1 Location maps for the Moss of Achnacree (Based on the Ordnance Survey map © Crown Copyright)

soil analyses by Graeme Whittington and John Soulsby from the University of St Andrews which provided valuable evidence for the nature of the environment in which the banks had been built. The site subsequently featured in Volume

2 of the Argyll Inventory (RCAHMS 1975, site no 203, 95–6); Soulsby (1976) also published a paper in the *Transactions of the Institute of British Geographers* describing the buried soil in greater detail.

The discovery at the Black Crofts generated considerable interest amongst archaeologists; interest enhanced by the prompt publication of the excavations and the innovative and effective use of soil and pollen analyses. There was also the enticing prospect of more discoveries to be made where the banks disappeared beneath the edge of the Moss. This interest crystallized in the formation of the Achnacree Research

Group under the leadership of Peter Hill. This group conducted three seasons of fieldwork between 1975 and 1977, tracing the banks under the peat by probing and excavating further sections. The perceived importance of what was now recognized as an extensive bank system was reflected in the scheduling of part of it in 1975. An interim statement on the work of the Research Group was published in 1976



ILLUS 2 The Black Crofts. Location and extent of the bank system (Based on the Ordnance Survey map © Crown Copyright)

(Barrett et al 1976) but, unfortunately, a final report never appeared. Graeme Whittington was again involved in the research programme and he subsequently published a paper on the soil pollen from beneath Bank A in the *Journal of Archaeological Science* (Whittington 1983). In 1978 (but not as part of the Achnacree Research Group), Stratford Halliday conducted a small-scale 'rescue' excavation on behalf of the Inspectorate of Ancient Monuments (now Historic Scotland) but this also remained unpublished and no further investigations took place in the Black Crofts for over 20 years.

RECENT INVESTIGATIONS

Interest in the site was re-kindled in the late 1990s when proposals for house building in the Black Crofts prompted Argyll & Bute Council (advised by the West of Scotland Archaeology Service (WoSAS)) to require archaeological evaluation of two development sites. The results of this work, carried out by Headland Archaeology (Dalland 1999; 2002), were negative but preparatory research for these evaluations revealed that there was no complete plan of the banks discovered in the 1970s. None of the existing plans were tied into the National Grid as the work was carried out prior to the publication of detailed National Grid maps of the area. The work from the early 1970s was therefore located by reference to croft boundaries, and the peat-probe survey and excavation trenches from 1975 to 1976 in relation to the peat edge at the time. One unfortunate outcome of this situation was that it was not realized that the 1975 Scheduled Area was incorrectly located and therefore did not coincide with the length of Bank B in Croft 3 that it had been designed to protect. As a result, this part of Croft 3 received planning permission for house building so it was not possible to preserve the bank. Headland Archaeology was therefore commissioned by Historic Scotland to record and excavate the threatened section of bank in 2001 (Dalland 2001).

In the aftermath of the 2001 excavation in Croft 3, it was agreed that it would be helpful for the future preservation, management and study of the bank system to bring together the results of all of the archaeological investigations in the Black Crofts (published and unpublished). Historic Scotland generously agreed to finance the project, and the support and cooperation of the earlier researchers was readily obtained. The project had three component parts:

Archive: All primary records relating to the unpublished work by the Achnacree Research Group and Halliday's 1978 excavation were collected and catalogued, forming an archive that has been deposited along with the original RCAHMS and the post-1999 Headland Archaeology records in the NMRS.

Survey: The Black Crofts were re-surveyed to locate all surviving remains of the banks and to tie in sections of bank previously recorded, creating a definitive plan of the whole system.

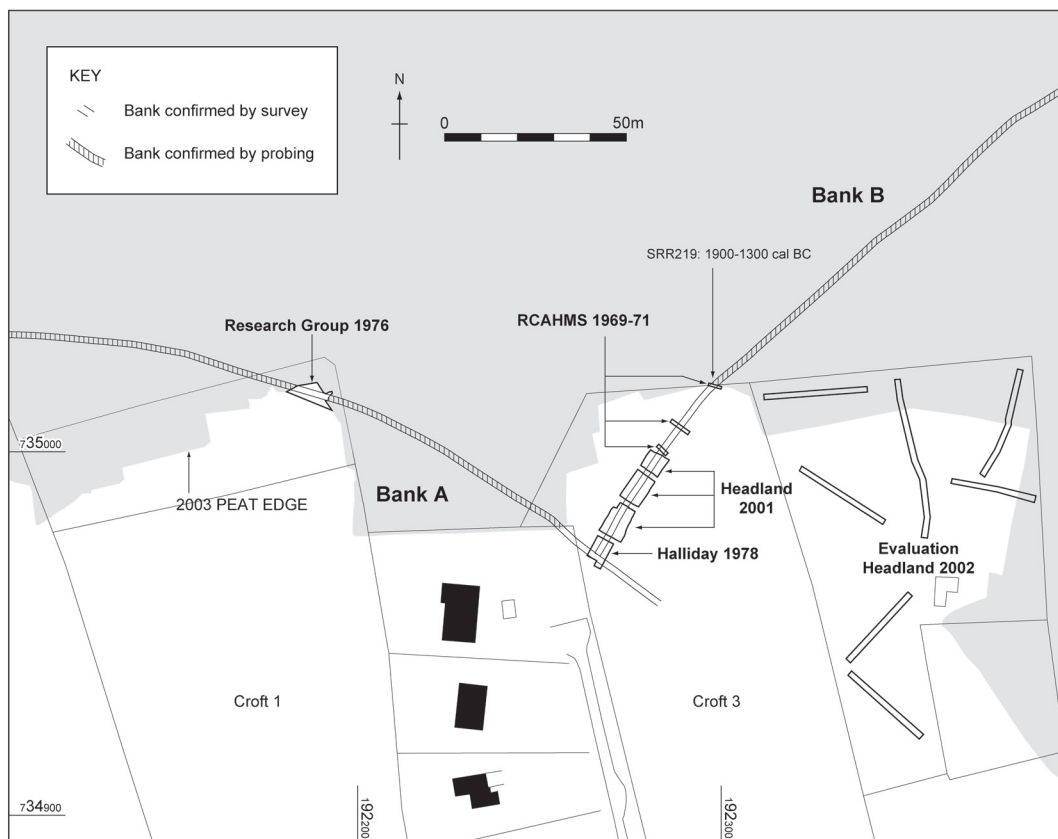
Publication: The results of the various investigations were collated, re-assessed and presented in this paper.

The bank system at the Black Crofts remains a key site in the study of Scottish prehistoric land-use and soil development, witnessed by continued references to it in general texts (see for example Cowie & Shepherd 1997 and Davidson & Carter 1997); yet much of the primary data remain unpublished. There is therefore a very real difficulty that influential interpretations of the site are based on only part of the available evidence. Regardless of the potential problems raised by partial publication, the site deserves re-assessment because there has been considerable progress made in both archaeological and palaeo-environmental interpretations of sub-peat archaeological sites. The aims of this paper are therefore twofold: firstly, to publish a synthesis of all archaeological and palaeo-environmental investigations on the banks in the Black Crofts;

and secondly, to re-assess the interpretations and hypotheses proposed in the 1970s regarding the purpose of the banks, prehistoric land-use and soil development in the light of more recent research work.

The original investigations at the Black Crofts took place at a time when the investigation of archaeological sites preserved under blanket peat was in its infancy. The authors of the first report were unable to find many Scottish parallels for the site although they could quote several references to work in Ireland (Ritchie et al 1974, 70). With hindsight, the publication of the work by RCAHMS at the Black Crofts heralded the start of a period of discovery followed by investigation of archaeology under

peat in the west and north of Scotland. These included further examples of isolated banks (Whittington, 1980, in Shetland; Newall, 1988, in Lewis) and studies of discrete sites such as Cùl a'Bhaile in Jura (Stevenson 1984) and Bharpa Carinish, North Uist (Crone 1993). Whole landscapes have also been investigated, including studies by Barber & Brown (1984) at An Sithean in Islay, the extensive investigations by John Barber in Arran (Ray & Chamberlain 1985; Barber 1997) and the more recent work by Rod McCullagh south of Lairg, Sutherland (McCullagh & Tipping 1998). Many of these studies have made effective use of palaeo-environmental analytical techniques and there have been important methodological advances



ILLUS 3 The bank system, showing locations of archaeological investigations (western half) (Based on the Ordnance Survey map © Crown Copyright)



ILLUS 4 Bank A at the rear of Croft 1 during the 1976 excavation by the Achnacree Research Group showing the less-steep inner face towards the camera. Viewed from the south-east (scale: 1m) (*Achnacree Research Group*)

in the actual techniques such as soil pollen (Tipping et al 1994; 1997; Davidson et al 1999; Bunting 2003). This re-assessment of the Black Crofts therefore takes place in a context radically different to that experienced by the original researchers, 35 years ago, and readers should bear this in mind as they read this paper.

SYNTHESIS & RE-ASSESSMENT

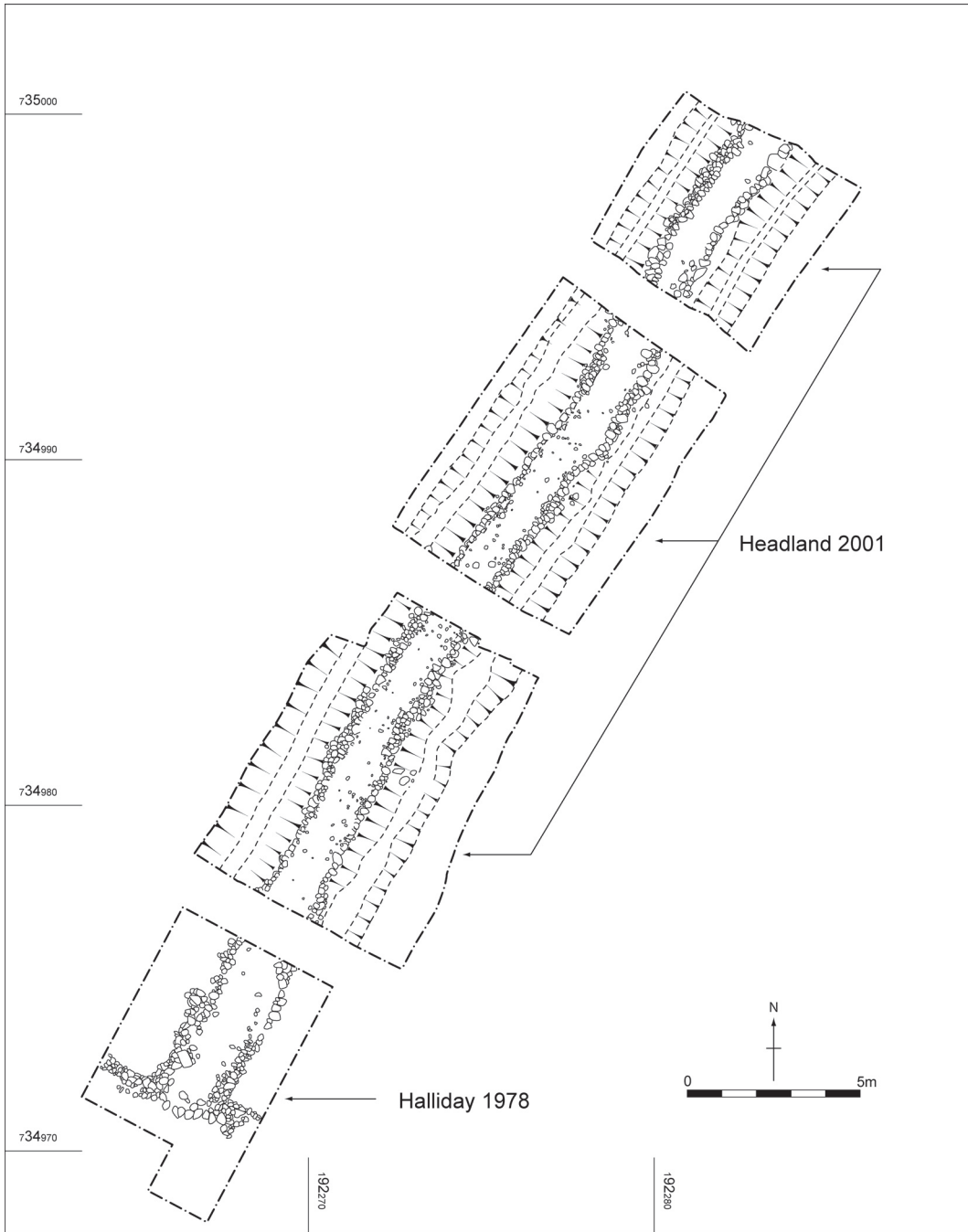
In preparing the synthesis, it has been necessary to draw on information from a variety of published and unpublished sources. For readers interested in the primary records that lie behind the synthesis presented here, an Appendix has been added to this report that contains a chronological account of all archaeological investigations to date in the Black Crofts. Previously published information is presented

in summary form with references to original publications; hitherto unpublished information is presented in greater detail. What follows is based on these sources and specific references are not given in the text unless it is considered necessary.

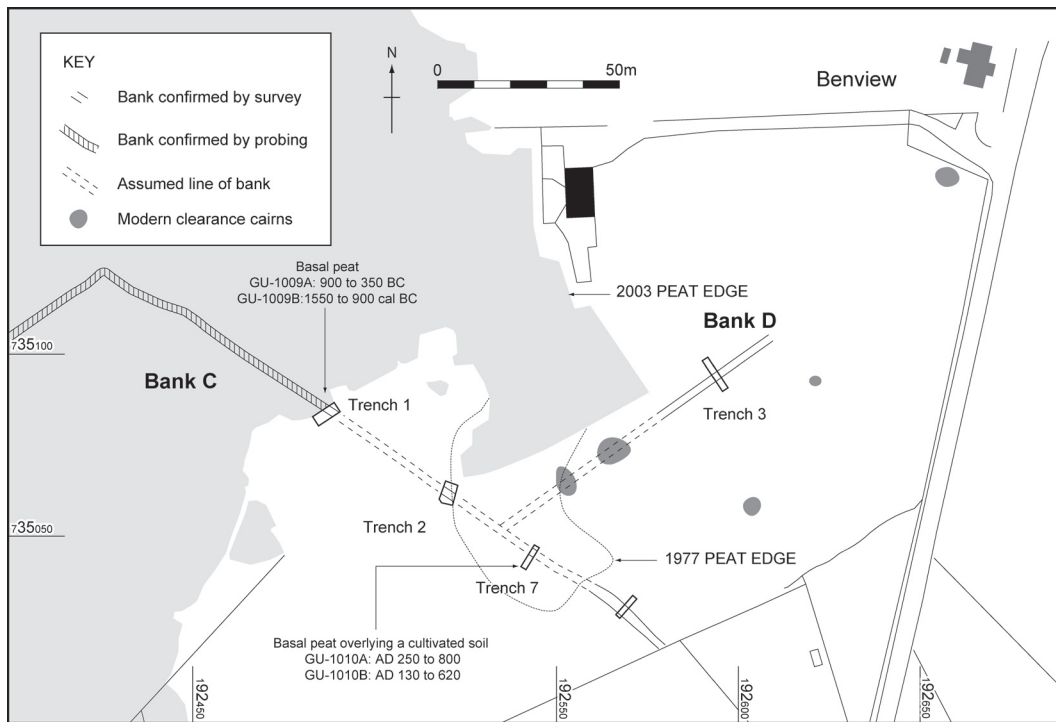
THE BANK SYSTEM

The bank system, as it is currently recognized, comprises four linked sections of bank (labelled Banks A–D in illus 2). Banks A, B and C were named by the Achnacree Research Group; Bank D has been added by the present authors for one of the banks identified by the Research Group in 1977. A fifth bank was also identified in 1977 as another offshoot to Bank C but it has since proved impossible to re-locate.

Some 750m of banks have now been traced along the south-eastern edge of the Moss. The



ILLUS 5 Plan of Bank B at its junction with Bank A (based on plans drawn during excavations by Halliday in 1978 and Headland Archaeology in 2001)



ILLUS 6 The bank system, showing locations of archaeological investigations (eastern half) (Based on the Ordnance Survey map © Crown Copyright)

majority of this length still lies buried under deep peat and was traced by probing in 1975. The banks have been exposed by peat-cutting in two areas. At the west end of the system (illus 3), Bank A was exposed for a short distance at the rear of Croft 1 (illus 4) and the junction of Banks A and B was revealed at the rear of Croft 3 (see illus 3 and detail shown in illus 5). Both of these exposures have been the subject of destructive archaeological excavations so there is little now to see in the field except for roughly 20m of Bank B where it emerges from under the peat in Croft 3. At the east end (illus 6), Banks C and D were both traced intermittently in 1977 through an area of rough pasture and shallow peat – Bank C for 110m and Bank D for 90m. This area has been subject to agricultural improvement since the banks were first recorded in 1977 and no visible remains survive except for a very reduced segment of Bank C roughly 20m

long. Bank D now appears to be represented by modern clearance cairns where the remains of the bank were pushed together into piles of stones. Overall, there is very little at present to reward an archaeologist paying a casual visit to the Black Crofts.

All four banks have been constructed using the same basic technique, although poor condition of Banks C and D where they have been recorded (illus 7 & 8) precludes detailed comparison with the better preserved and more substantially excavated Banks A and B (illus 4 & 9). Soil and gravel subsoil has been dug from lateral ditches to provide material for the core of the bank and this has been faced with larger stones. The stones used for facing could have been collected from the ground surface on either side of the banks. However, although the subsoil gravels include some large stones, there are few of the size used as facing stones.



ILLUS 7 Bank C in Trench 2 of the 1977 excavations by the Achnacree Research Group; the poorly preserved bank runs across the photo. Viewed from the south-west (scale: 2m) (*Achnacree Research Group*)

It is possible that additional facing stones were gathered from the nearby shore of Loch Etive. The resulting bank is generally between 1.5 and 1.8m wide at the base and survives no more than 0.6m high. The use of turves was noted along the base of Bank A during Halliday's excavation in 1978 but has not been recorded elsewhere. It is unclear whether this type of variation should be regarded as significant or simply a measure of the variability of materials used within one bank. The quantity of larger stones is also variable along and between banks but this could reflect a history of decay and robbing as much as an original constructional feature.

The one clear difference between banks that can be identified is the number of ditches present. In excavated sections where any ditch has been recorded, Banks A and D only have one ditch (illus 8) and Banks B and C have two, one on each side (illus 9). The similarity between Banks

B and C is to be expected as they are essentially two sides of the same enclosure. For Banks A and D, in both cases the ditch is on the northern side, that is the outside of the enclosures, closer to the Moss. Bank A has a distinct asymmetric profile with a steeper outer face containing larger facing stones adjacent to the ditch (illus 4). Bank D, although less-well preserved, appears to display the same asymmetric profile.

What potential is there for discovery of additional elements of the bank system? The current west end of Bank A appears to offer the greatest potential for future discoveries. Probing at this point indicated that the final 20m of bank had been almost entirely demolished and it proved impossible to trace further by that method (illus 10). It is possible that further fieldwork could determine what the original route and destination of Bank A was beyond this point and whether the bank system continues



ILLUS 8 Bank D in Trench 3 of the 1977 excavations by the Achnacree Research Group showing the stone-filled ditch on the north side of the bank. Viewed from the north (scale: 1m) (*Achnacree Research Group*)

right along the southern edge of the Moss. All other open ends to banks in the system have been identified in areas free from peat where the banks fade out in agricultural land and it is clear that no additional upstanding remains survive. It is possible that the former courses of these banks could be traced by following their ditch (or ditches) if these survive as cuts into the gravel subsoil.

It is clear that only a small fraction of the area enclosed by the banks remains buried under peat (illus 2). The major part of the enclosed area is now occupied by improved farmland and, increasingly, by houses. The reverse situation was probably true in 1800 when the Black Crofts were new, and even in 1871 much of the area enclosed by the banks was still covered by peat. The banks were progressively exposed and then destroyed as the peat was cut back over a period of almost two centuries.

The exposed fragments of bank recorded in the 1960s and 1970s were simply the latest to appear and, as recent history has shown, they have been equally susceptible to damage. The decline of the use of peat as a fuel has stopped the progressive exposure of the banks and, with the exception of one area of shallow peat in the vicinity of Banks C and D (illus 6), there has been no significant change in the position of the peat edge in the last 30 years. It therefore seems likely that the fragments of enclosures still buried by peat will remain undisturbed for the foreseeable future.

CHRONOLOGY OF THE BANK SYSTEM

An assessment of the chronology of the bank system requires consideration of the inception, evolution, use and disuse of the system. Some evidence is available for all of these aspects



ILLUS 9 Bank B at the rear of Croft 3 during the 2001 excavation by Headland Archaeology showing the irregular line of the bank and the shallow peat-filled ditches on either side. Viewed from the south-west (scales: 2m and 1m)

of chronology but the picture is by no means complete.

Halliday's 1978 excavation of the junction of Banks A and B confirmed that Bank A pre-dated Bank B. It is reasonable to assume that Banks B and C were built at the same time as two sides of the same enclosure. The junction of Banks C and D has not been excavated but it appears that D must have butted up against C and therefore must be the youngest element of the system. Therefore the bank system apparently has its origin at the west end and expanded eastwards.

There is no radiocarbon date relating directly to the earliest bank (Bank A) so we are dependent on the date of 1900–1300 BC (SRR-219) obtained

from organic matter on the surface of the buried soil under Bank B. Interpretation of radiocarbon dates from soil organic matter is dependent on an assessment of the mean radiometric residence time of the carbon, that is the average age of the carbon at the time of burial. The surface organic horizon of a podzol could contain 'old' carbon so this date range should be treated as the oldest possible date range for the construction of Bank B (and, by association, Bank C). Banks B and C may be younger than this date range suggests, but not older. Bank A is older than Bank B/C but it was still a functional barrier when Bank B/C was built so it is assumed that the two banks are relatively close in age. This could still

allow a difference in age of decades or even a few centuries but probably not millennia. The similarity of the *Calluna*-dominated heathland vegetation recorded under both banks by Whittington (1983) is also not inconsistent with a short time-interval between Banks A and B/C.

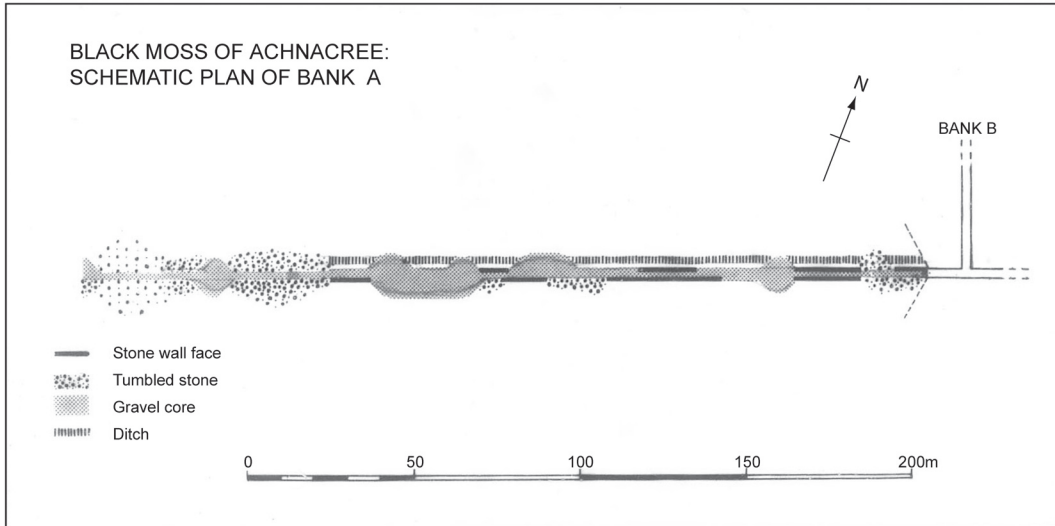
There is no direct evidence for the date of construction of Bank D so it can only be assumed to be relatively close to the other banks. This assumption relies heavily on the apparent coherence of the banks, allowing their interpretation as a unitary system of enclosures. This coherence may be deceptive if the long and complex chronology of the system of banks recorded at An Sithean in Islay is any guide (Barber & Brown 1984). We are therefore left with the rather weak conclusion that the system of banks in the Black Crofts probably originated in the mid-second millennium BC and may have developed over a relatively short timescale.

Evidence for the chronology of use and disuse of the bank system comes from the condition of the banks and from basal peat dates. There are three radiocarbon dates from basal peat samples that may provide upper age limits for use of the system but their interpretation is problematic. Firstly, it must be pointed out that the original basal peat date obtained from the Moss of Achnacree and published by Ritchie et al (1974, N-1468) does not derive from peat associated with the banks. In fact it does not come from the Black Crofts at all, the published grid reference placing it over 1km to the north on the opposite side of the Moss (illus 1). This basal peat sample was dated for its association with one of Dr Durno's unpublished pollen diagrams from the Moss, not for any direct archaeological associations. However, the date is not without value for the present discussion as it shows that peat started to accumulate on what is now the northern margin of the Moss during the period 1450–800 BC.

There are two other radiocarbon dates from basal peat samples taken during the 1977 excavations by the Achnacree Research Group. The samples were collected from Trenches

1 and 7 across Bank C (illus 6); the precise location of the sample from Trench 1 is not known, the sample from Trench 7 came from peat to the south-west, that is inside Bank C. Two radiocarbon determinations were made on each sample with differing pretreatments. In both cases, the stronger pretreatment yielded an older radiocarbon date, suggesting that the weaker pretreatment had failed to remove all of the younger mobile carbon from the sample (see the Appendix for details of this issue). The results obtained with the stronger pretreatment are therefore quoted here. In Trench 1, a date range of 1550–900 BC was obtained (GU-1009B); in Trench 7, only 70m to the south-east, the result was AD 130–620 (GU-1010B). Taken at face value, these results suggest that peat accumulation started at least 1000 years earlier in Trench 1 than in Trench 7. This is possible for a variety of reasons. Trench 1 lies closer to the centre of the Moss and lateral growth of peat could have been slow in this area; alternatively, the sample in Trench 1 may have come from outside Bank C and therefore the age difference reflects the long-term maintenance of peat-free ground within the enclosures. A more complex history is also possible with the late date in Trench 7 reflecting re-growth of peat after removal of the original cover by human or natural causes.

It is impossible to provide a definitive interpretation of these radiocarbon dates as there are too many alternative models. Obtaining three basal peat dates simply hints at the complexity of the pattern, causes and timing of peat accumulation in the Moss of Achnacree. More important is the recognition that basal peat dates cannot be used as a simple proxy for the disuse of the bank system. This use of dates depends on the assumption that, whatever the 'use' of the enclosures, either it was ended by the initiation of peat growth or peat growth was triggered by it stopping. The former suggestion is plausible if it is assumed that the enclosures were used to regulate grazing land – peat growth could cause deterioration in pasture quality, leading



ILLUS 10 Drawing prepared by the Achnacree Research Group to illustrate the results of the peat-probing survey along Bank A

to abandonment of the enclosures. The latter suggestion is plausible as vegetation change caused by land-use change could trigger peat accumulation, but it is impossible to prove with the limited data available. Indeed, the thousand-year minimum age difference between the two dates from Bank C could be read as evidence for a very variable time delay between disuse and initiation of peat growth. So, the available radiocarbon dates are of limited value in determining when the bank system, or component parts of it, finally fell into disuse. There is no evidence that the two events, peat initiation and disuse of the bank system, are related either by cause or effect.

Physical evidence from the banks themselves for the chronology of use and disuse is essentially negative. Other than the repair to Bank A noted by Halliday (1978) and already referred to above, there is no evidence for repair, modification or reuse of any part of the bank system. In part this reflects the limited size of the excavations undertaken, but the 2001 excavation of Bank B by Headland Archaeology was certainly sufficiently large to detect any

modifications if they had been present (illus 5). The evidence for the condition of the banks under the peat is slightly more informative. Peat-probing results from Bank A (illus 10) and the excavations on Bank C show that both banks were in a very variable condition by the time that they were buried by accumulating peat. Some segments remained in good condition (illus 4), adjacent segments were reduced to low spreads of stone (illus 7). The recorded section across Bank D (1977, Trench 3, illus 8) shows that at this point the bank had collapsed or been demolished, filling the external ditch before peat accumulation began. In contrast, the two ditches of Bank B were filled predominantly with peat but sediment continued to erode off the bank as the peat built up beside it (illus 9). It is not possible to discern any pattern from these observations that might indicate the systematic sequential abandonment or later reuse of parts of the system.

The overall impression gained from this discussion of the limited evidence for chronology is of a simple history of eastward expansion of a series of enclosures in the

mid-second millennium BC followed by their abandonment before any major repair or modification occurred. The banks had fallen into disrepair before peat accumulation started in the later second millennium BC and they were progressively buried by peat over the succeeding millennium.

PURPOSE OF THE BANKS

Much of the preceding discussion of chronology and, in particular, the interpretation of basal peat dates, begs the question what was the purpose of the banks? It is accepted that the banks define, divide and enclose areas of land but why was this division undertaken? Ritchie et al (1974) assumed that the banks must have an agricultural function but, given the low agricultural productivity of the podzolized soils and pollen evidence for vegetation dominated by heather, it was doubted that arable farming was practiced. They also argued that Bank B was not likely to have been stock-proof, and this suggested that its principal purpose was to mark the division between areas of grazing land. Two years later, the Achnacree Research Group had identified a much more extensive system of banks and had investigated part of Bank A (illus 4). Their preliminary interpretation of Bank A (Barrett et al 1976) was that it was an effective stock-proof barrier, designed to exclude grazing livestock from the area that the bank enclosed. The bank system was considered to be either a series of pastoral enclosures or the principal banks of a field system. The Research Group favoured the latter interpretation and drew a parallel between the asymmetric head-dyke of a pre-improvement township (designed to exclude livestock) and the function of the banks. Subsequently, Whittington (1983) reverted to the earlier interpretation of the banks as property boundaries rather than functional agricultural enclosures, basing his conclusions primarily on additional pollen data from beneath Bank A.

The comparison with a head-dyke remains an attractive suggestion. The implication is that the

bank system represents a series of land holdings, each roughly 10ha in extent. Each could contain a settlement focus ('farmstead'), probably on the coastal edge of each enclosure with arable plots adjacent and an area of pasture behind. It must be stressed that there is no evidence for the details of this type of settlement pattern in the Black Crofts, nor are there obvious parallels elsewhere in the Bronze Age of Scotland, but it could be offered as a model. It may be noted that the two recent archaeological evaluations in Croft 4 (illus 2) failed to detect any evidence for either settlement or cultivation of any date but most of the land enclosed by the banks remains uninvestigated. Development pressure in the future could well provide opportunities to test other areas of the Black Crofts but, at present, we have no positive evidence for prehistoric activity within the areas enclosed by the banks. If the asymmetric constructional details of Bank A are to be used to promote a head-dyke model, it is important to consider the potential significance of the symmetric double-ditched Bank B/C. Bank B/C could function as a head-dyke but it could equally be interpreted as an enclosure, keeping livestock in. In this case, it could be suggested that Bank B/C represents a stock enclosure attached to the outside of the head-dyke Bank A. We are then faced with the single-ditched Bank D, apparently added to the east of Bank C. Further speculation on this point would be unhelpful.

Pollen evidence has been used to support all of the previously published interpretations of the banks and, given recent advances in the analysis of soil pollen, it is worth re-assessing the arguments that have been made, based on pollen analysis. Pollen has been analysed from the soils buried beneath Banks A and B and, in both cases, the surface organic horizon of the buried soil was found to be dominated by pollen from *Calluna* (heather). The interpretation of this result was that both banks were constructed in a landscape dominated by heather, that is a heather moor, and therefore a landscape of low agricultural potential. This was the basis for

the conclusion that the banks defined areas of low-intensity grazing or were simply property boundaries running through an area with no particular agricultural purpose.

Whilst the potential to obtain meaningful data from soil pollen has been strongly challenged in recent years (Tipping et al 1994; 1997; Davidson et al 1999), it remains reasonable to conclude that both Banks A and B were constructed in an area dominated by heather. However, the analysis of pollen from a soil buried by a bank has one unavoidable drawback: it provides information about the vegetation at the time of construction but does not say anything about the vegetation after construction. If we are interested in the function of the bank system we ideally need to know what was happening after construction. It is here that the relative age of Banks A and B is potentially significant. Bank A pre-dates Bank B so surface pollen buried during the construction of Bank B relates to the period after Bank A was built and has the potential to register the impact of human activities related to Bank A. We can therefore propose that Bank A was built through heather and, by the time Bank B was built, the area was still covered in heather. Does this demonstrate that the construction and use of Bank A had no impact on the local vegetation? Bank B was constructed outside the area enclosed by Bank A and therefore on land that would not be directly affected by changing land-use within Bank A. Would we expect that a pollen assemblage deposited 60m outside Bank A (the distance of the Bank B sampling point from the junction with Bank A, see *illus 3*) would reflect changes within Bank A? Recent research (Bunting 2003) strongly suggests that the answer to this question is no; pollen deposited in this situation would have been predominantly derived from plants within 10m of the sampling site. It is therefore less likely that we can detect land-use changes within Bank A using the pollen assemblage from under Bank B than was presumed by Whittington (1983). We can at least conclude that Bank A was built through

heather and heather was still present outside it when Bank B was built.

The key conclusion from Bunting's research is that soil pollen assemblages in moorland (and other areas with non-arboreal vegetation) are extremely local in origin. So, we cannot use pollen to inform us about vegetation on a landscape scale unless numerous sampling points are available. In the case of the Black Crofts we do not have any pollen data that definitely relate to land-use within the enclosures. Returning to the head-dyke model, we can now conclude that the pollen evidence for heather moorland outside the enclosures does not preclude the existence other vegetation types within the enclosures; this could be pasture or even arable fields.

RELATIONSHIP BETWEEN LAND-USE HISTORY AND SOIL DEVELOPMENT

Published interpretations of land-use history at the Black Crofts, based on the soil pollen evidence discussed above, have been supported by the analysis and interpretation of the soil itself. The interpretation favoured by all writers to date, starting with Soulsby's assessment (Ritchie et al 1974; Soulsby 1976), has been that the podzols at the Black Crofts are soils of low fertility and therefore unsuitable for productive agricultural use. This view has underpinned the interpretation of the banks as divisions in an area of low-intensity grazing.

Interpretation of the podzols at the Black Crofts by Soulsby (1976) and subsequently by Whittington (1983) went beyond the simple assessment of their suitability for agriculture and introduced other wider issues: the interaction between human land-use and soil development, and the causes of blanket peat initiation. The influential researcher in this field was Geoffrey Dimbleby who developed a model of progressive soil degradation and consequent environmental change triggered by prehistoric agricultural methods (Dimbleby 1952; 1962; 1965; 1976). In this model, podzols were the product of damaging prehistoric

agricultural practices causing permanent soil degradation. This degradation included loss of fertility which led to land abandonment and the development of heathlands. It also involved the formation of iron pans in the podzolized soils, which impeded drainage and promoted surface waterlogging; a condition that would promote peat accumulation.

It is clear why this model would have been attractive to researchers at the Black Crofts. The existence of a podzolized soil profile beneath the banks suggested earlier agriculture leading to soil degradation and land abandonment. In the context of the Black Crofts this could be read as Neolithic agriculture (attested by the large funerary cairns nearby) causing soil degradation and leading to abandonment until re-occupation demonstrated by the Bronze Age banks built in heathland. Continued podzolization and iron pan development then provided an explanation for the subsequent accumulation of peat over the banks.

More recent research and the steady accumulation of more site-specific information from Scotland has led to a move away from Dimbleby's model which was based primarily on his experience in Eastern and Southern England. Pedologists now view the formation of podzols in upland Britain as part of the natural sequence of development in freely draining acidic soils (Askew et al 1985); it is a ubiquitous process rather than one that has to be triggered by particular human action in specific locations. It is also becoming clear that podzols began to appear in Northern and Western Scotland much earlier than Dimbleby and others suspected (Davidson & Carter 1997; McCullagh & Tipping 1998), again emphasizing the essentially natural process that leads to podzol formation. The realization that podzols could form early has led to the conclusion that, rather than being the end-product of agriculture-induced soil degradation and a cause of land abandonment, podzols must have been successfully cultivated for long periods. This conclusion is supported by the increasing body of evidence for the use

of manure and other fertilizers by prehistoric farmers to maintain and even improve naturally infertile soils (Davidson & Carter 1997).

CONCLUSION

What impact do these new ideas have on our interpretation of the evidence from the Black Crofts? It appears that we should move away from a simple linear model of early agriculture triggering a process of soil degradation leading inevitably to peat accumulation and land abandonment. The Bronze Age people who constructed the banks in a heathland were probably capable of improving and maintaining the land in an agriculturally productive condition as long as they wished to. The determining factors behind their decisions about land management were probably economic and social, not primarily environmental. Similarly, the subsequent abandonment of the bank system is not likely to have been the simple result of environmental pressures such as declining pasture quality and peat accumulation.

We simply do not have enough information to begin to explore the social and economic motivations of the Bronze Age inhabitants of this area but the recent history of the Black Crofts can be used to illustrate the possibilities. The social, political and economic upheavals in the Highlands of Scotland in the years between AD 1750 and 1800 led to the settling of people in the Black Crofts. This was just one small example of the creation of small single-tenant holdings and the forced movement of people at this time. The Black Crofts were laid out in an unoccupied area of heathland backing onto a peat moss but a combination of economic necessity and hard work by the farming tenants created a series of agricultural small holdings that lasted for over 150 years and had a major impact on the local landscape. Peat was cut off and burnt as fuel; infertile podzolized soils were improved and cultivated. In the past 50 years, changing economic opportunities and social

expectations have led to the abandonment of the crofts as agricultural holdings and they are rapidly developing into a suburb of Connel and ultimately of Oban. So, whilst environmental factors over the past two centuries have clearly provided a constraining framework to human activity, they have not played the determining role. We believe that this applies equally to the Bronze Age.

ACKNOWLEDGEMENTS

It would have been impossible to prepare this paper without the full co-operation of the archaeologists who have previously worked at the Black Crofts. We are particularly grateful to Peter Hill and Strat Halliday for giving us their site records and agreeing for them to be deposited in the NMRS at the end of this project. Historic Scotland funded the synthesis and re-assessment of the site as well as commissioning the fieldwork carried out by Headland Archaeology in 2000, 2001 and 2003. We wish to thank Andrea Smith, who at the time was Inspector of Ancient Monuments and is now Director of the Society of Antiquaries of Scotland, for her support and interest in the project. The illustrations for this paper (unless credited to others in the captions) were prepared for publication by Andrew Dutton and Tom Small. An earlier draft of the paper benefited from a critical review by Richard Tipping but, as ever, the views expressed remain the responsibility of the authors.

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APPENDIX

CATALOGUE OF ARCHAEOLOGICAL INVESTIGATIONS IN THE BLACK CROFTS, NORTH CONNEL

The purpose of this appendix is to provide a comprehensive catalogue of archaeological investigations in the Black Crofts, regardless of whether they have previously been published or not. The catalogue is divided into four sections, reflecting the four distinct episodes of investigation. Each section is headed by a list of relevant publications; the text that follows summarizes published information or provides a longer account of hitherto unpublished information.

RCAHMS (1968–73)

Publications

Soulsby 1976 (soil study)
 RCAHMS 1975 (Argyll Inventory)
 Ritchie et al 1974 (main publication)

Investigations by RCAHMS were triggered by the chance discovery of a bank emerging from under peat at a time when staff were undertaking fieldwork in the area. The first bank to be discovered (subsequently labelled Bank B) was located in Croft 3 in 1968 by Dr A Fraser and its existence was brought to the attention of RCAHMS staff working on the Lorn volume of the Inventory of Argyll.

Anna and Graham Ritchie carried out small-scale excavations in 1969 and 1971 when three trenches were cut across the bank. A second bank (Bank A) was discovered 88m to the north-west in Croft 1, but not investigated further at this time. A further small excavation was carried out in Bank B in 1973 to retrieve material for radiocarbon dating, and samples were also taken from the buried soil profile for soil and pollen investigations by Graeme Whittington and John Soulsby of the University of St Andrews. It

should be noted that there is a reference in the 1974 publication to pollen analysis of the overlying peat deposits by Dr S E Durno of the Macaulay Institute, Aberdeen. Two pollen diagrams are referred to (named 'Black Crofts' and 'Achnacree') but neither have been published.

The RCAHMS investigations comprised the cleaning up and recording of the section face where Bank B emerged from the peat (Trench 1), and two slot trenches 14m (Trench 2) and 22m (Trench 3) to the south-west of the peat face (illus 3). They found the bank to be, in general, 1.5m wide and 0.3m high; it was faced on either side by mainly granite boulders and had a central core of earth and smaller stones. The bank was flanked by shallow ditches on both sides, thought to be formed through the quarrying of material for the core. The construction of the bank with a stone face on both sides and a gravel core indicated that it was a deliberately constructed boundary and not a linear field clearance heap. The small volume of tumble found on either side suggested that the original height was not much greater than that of the surviving remains.

A radiocarbon sample was retrieved from the old ground surface below the bank (SRR-219). This sample was dated to 1900–1300 cal BC. A second sample was retrieved from basal peat at a location some 1300m to the north of the bank on the north side of the Moss (N-1468, illus 1); this was dated to 1450–800 cal BC.

ACHNACREE RESEARCH GROUP (1975–7)

Publications

Barrett et al 1976 (interim account of 1975/6 results)
Hill 1975 (DES entry)
Hill 1977 (DES entry)
Whittington 1983 (soil pollen study)

In 1975, the Achnacree Research Group was formed under the leadership of Peter Hill to investigate further the extent and function of the banks recorded by RCAHMS. The group carried out a three-year programme of survey and excavations between 1975 and 1977. In view of the partial publication of this work to date, an extended account of the investigations is provided below, based on the published account and supplemented by original field records.

In 1975, an extensive peat-probe survey was carried out to trace the course of the banks under the peat; this identified three linked banks (labelled

A–C in all subsequent accounts). As a result of the peat-probe survey, Bank B was scheduled in 1975 (SAM 3777 Achnacree Moss, field bank behind Black Crofts). However, a mistake was made when the Scheduled Area was outlined on the map. As a result, the Scheduled Area, which was intended to be centred on the bank, was located 70–90m to the south-east of the bank. When the mistake was discovered in 2001, the area was de-scheduled.

The 1976 fieldwork was focused on the excavation of the exposed section of Bank A to the north of Croft 1 (illus 3). A trench was also cut at the point where Bank C emerged from the peat. A soil monolith was taken from Bank A for pollen analyses by Graeme Whittington.

In 1977, seven trenches were excavated in the area to the south-east of the point where Bank C emerged from the peat to confirm the location and nature of banks in this area (illus 6). Four trenches were excavated across the line of Bank C, the other three across two offshoots from this bank. Two basal peat samples were submitted for radiocarbon dating.

1975 peat-probe survey The peat-probing was carried out as a series of traverses at c 10-m intervals along the projected line of the banks. Each traverse was a levelled line 4m long, which was probed every 0.2m. In addition to the variation in height of the sub-peat surface, the nature of the surface was also noted as it was possible to distinguish between sand and rocks. The data were recorded in a table and the location of each traverse and the line of the bank were surveyed in using a plane table. The peat-edge and modern fences were also surveyed. Through this method it was possible to trace the buried banks over a distance of some 550m. In addition to the two banks noted in 1968/9 (Banks A and B), the line of a third bank (Bank C) was discovered (illus 2). It was also noted that there was a T-junction between Banks A and B in the peat-free area in Croft 3.

Bank A could be traced over a distance of some 250m. At the south-east end, the bank continued beyond the junction with Bank B some 20m to the south-east before fading out. Based on the peat-probe data, a schematic plan of the dyke was compiled (illus 10). This shows that the west end of the bank appeared to have been demolished and the stone scattered over a wide area before peat started to accumulate. There were indications of a ditch 0.4–0.8m wide running along the north side of the bank. This ditch was best defined in the south-eastern section of the bank and faded out towards the west.

Bank B was 215m long. It ran towards the north-east from a T-junction with Bank A to the corner with Bank C. At the north-east end there was an approximate right angle junction with Bank C. There was no evidence that Bank B continued beyond this junction. The probing indicated that this bank was better preserved than Bank A. The lateral ditches recorded during the RCAHMS investigations seemed to fade out towards the north-eastern end of the bank.

Bank C ran towards the south-east from its junction with Bank B. It could be traced for 75m from the junction to where it emerged from the peat edge. It was slightly curved and appeared to be roughly parallel with the projected line of Bank A some 220m to the south-west. The structure of the bank was similar to that of Banks A and B, but it was less well-preserved than Bank B.

1976 excavations Bank A emerged from the peat at two places: at the south-east end where it was abutted by Bank B and 80m to the north-west where a section was exposed at the north-west corner of Croft 1. The main excavation in 1976 was focused on this section of Bank A. An 11m long segment of the bank was excavated in May 1976 (illus 4). It showed that the bank had a gravel and earth core that had been quarried from a ditch to the north. The core had been faced with stones on both sides. It was c 1.5m wide and up to 0.4m high. The stone revetting on the north side comprised larger stones set in a steeper face than the smaller stones on the south side.

Bank C was sectioned at the point where it emerged from the peat. The trench exposed a spread of stone with low remains of a bank. To the south-west of the projected line of the bank was an area of cobbling.

1977 excavations The 1977 fieldwork was carried out in the area to the south and east of the point where Bank C emerged from the peat (illus 6). The aim was to investigate remains of field banks noted in this area of rough ground that had been partly cleared of peat. Seven trenches were excavated, four of these were cut across Bank C and the other three across two offshoots to Bank C. No contemporary plan showing the location of these banks and trenches has survived and it has proved possible to locate only five of the seven trenches. These were cut through Bank C and one of the offshoots (labelled Bank D here for the first time). The location of the second offshoot to Bank C and the two other trenches cannot be determined from the surviving records.

Trench 1 was located at the point where Bank C emerged from the peat. This was an extension of the trench investigated the previous year. As noted earlier, the bank was very eroded at this point and appeared as a low gravelly ridge c 0.4m high and c 1.8m wide, covered by a spread of stones. There was no evidence of any lateral ditches at this point. The east side of the bank was defined in plan by a layer of stones one to two courses deep. Up against the west side of the bank was an area of cobbling, or possibly dispersed bank material, as noted the previous year. A radiocarbon sample was taken from the basal peat in the section face where the bank emerged (GU-1009). The sample was dated twice using weaker (Sample A) and stronger (Sample B) pretreatment. The two sub-samples were dated to 900–350 cal BC (GU-1009A) and 1550–900 cal BC (GU-1009B). The difference in the date ranges obtained reflects a fundamental difficulty in the interpretation of radiocarbon dates from peat. It is recognized that a fraction of the organic matter in peat (the humic acid) may become soluble and therefore mobile, migrating down through the peat deposit. Therefore, unless humic acid is excluded from the organic matter to be dated, there is an unknown and variable component of intrusive 'young' carbon that can result in the dates obtained being too young. The stronger pretreatment of the peat is designed to remove the mobile humic acid and therefore produce a more reliable radiocarbon date. Comparison of Samples A and B indicates that 'young' humic acids were present in this peat sample.

Trench 2 was located 37m to the south-east of Trench 1 at a point where Bank C re-entered an area of peat cover. The bank had been largely removed at the north-west end, and was best preserved up against the peat edge to the south-east. Here the bank was 1.8m wide and 0.5m high and flanked by shallow ditches on either side. The core of the bank comprised grey and brown gravels. The bank and the ditches were covered in stones, probably collapsed facing stones.

Trench 7 measured 1.2m by 7m. It was aligned north-east to south-west across Bank C some 25m to the southeast of Trench 2 in an area covered by uneven shallow peat. The bank was 2.5m wide and 0.6m high. It had a gravel core, faced by stones on both sides, and there was no evidence of any lateral ditches at this point. A radiocarbon sample was taken from basal peat on the south-west side of the bank (GU-1010). The sample was also dated twice using weaker (Sample A) and stronger (Sample B) pretreatment. The two sub-samples were dated to cal

AD 250–800 (GU-1010A) and cal AD 130–620 (GU-1010B). Again, the impact of humic acids in Sample A can be recognized, although less of an effect that was found in GU-1009 (above).

The last trench across Bank C (trench number unknown) was located in an area cleared of peat some 25m to the south-east of Trench 7. The trench measured 1.5m by 7m. The line of the bank was visible before excavation as a low stony ridge. The bank was less well preserved than in the two trenches to the north-west and appeared as a linear concentration of dispersed facing stones.

Trench 3 cut across a fourth bank (labelled Bank D by the present authors) aligned north-east to south-west and roughly parallel with Bank B. The trench measured 1.75m by 10m and was on a north-east/south-west alignment, some 67m north-east of Trench 7. The bank was 2.4m wide and 0.5m high (illus 8). It had a gravel core that was faced on both sides and covered on top by stones; the north side of the bank appeared steeper than the south side. A spread of collapsed stones was recorded mainly on the north side of the bank where it filled a shallow ditch running parallel to the bank. The ditch was up to 3.3m wide and 0.4m deep; there was no evidence of a ditch along the south side of the bank.

HALLIDAY (1978)

Publications

Halliday 1978 (DES entry)

Further excavation was carried out in 1978, prompted by proposals for house building in Croft 3 that might threaten the banks in that area. The Inspectorate of Ancient Monuments (now Historic Scotland) commissioned Stratford Halliday to undertake excavations at the junction of Banks A and B. The excavation comprised an L-shaped trench, 4m by 7m, across the junction of the banks some 30m to the south-west of the 1971 RCAHMS trenches. The layout of the banks, as recorded during the 1975 survey, clearly suggested that Bank B was built up against Bank A; this was confirmed during the excavation.

A 3.8m long segment of Bank B was exposed within the trench (illus 5). It was 1.6–1.8m wide and 0.3m high, slightly wider than noted during previous excavations, but was generally found to be as recorded previously, ie a stone-faced gravel core with lateral ditches on either side. The bank had been

built on top of the old ground surface, visible as a dark stripe beneath the bank material.

Bank A was less well-preserved than Bank B at this point, with the west side being ill-defined. Bank A was 1.8m wide up to 0.3m high with a ditch 0.8m wide and 0.2m deep running along the east side of the bank (previously recorded by the Achnacree Research Group). The bank had a stone facing, well-preserved along the east side. The core comprised gravel, but at the base along the east side there was evidence of turves being used in the construction. It is possible that the turves had been used in the laying out of the bank, or perhaps they represented an earlier less substantial version of the bank. It was also noted that the face on the east side of the bank had been repaired next to its junction with Bank B.

HEADLAND ARCHAEOLOGY (1999–2003)

Publications

Dalland 1999 (DES Entry)

Dalland 2001 (DES Entry)

Dalland 2002 (DES Entry)

Interest in the bank system was re-kindled in the late 1990s when proposals for house building on the Black Crofts prompted Argyll and Bute Council (advised by the West of Scotland Archaeology Service (WoSAS)) to require archaeological evaluation of two development sites. The results of this work led Historic Scotland to commission further investigations and ultimately the present publication.

1999 evaluation In June 1999, Headland Archaeology carried out an archaeological evaluation of three proposed building plots at 4 Black Crofts, some 200m to the south-east of the junction of Banks A and B (illus 2). Five machine-excavated trial trenches were investigated but no archaeological features were uncovered. During the fieldwork, a discrepancy between the location of the Scheduled Area and the physical location of Bank B was discovered and brought to the attention of Historic Scotland. Headland Archaeology subsequently undertook a re-survey of Bank B at the back of 3 Black Crofts in September 2000 on behalf of Historic Scotland to confirm its precise location.

2001 excavation Confusion surrounding the position of Bank B and the related Scheduled Area had already led to planning permission being granted for the

construction of houses at the back of 3 Black Crofts. The development affected the west end of Bank B and its junction with Bank A between Halliday's 1978 investigation and the Ritchies' Trench 3. In June 2001, Headland Archaeology recorded and fully excavated the threatened 26.5m long segment of Bank B on behalf of Historic Scotland (illus 3, 5 & 9). As expected, the construction and appearance of the bank did not differ significantly from that seen during the previous excavations. The bank comprised a gravel core with faces on both sides built from rounded stones 0.15–0.4m across (illus 5 & 9); the faces survived between one and four courses high. The bank was slightly sinuous, with ditches on either side. It was 1.5–1.9m wide at the base and from 0.2m to 0.6m high. The ditches were 1–2m wide and up to 0.3m deep. As suggested previously, they are most likely to have been created through quarrying gravel for the bank. The base of the ditches sloped slightly towards the south-west at a gradient of 1:100. The subsoil did not contain many larger stones and the stones used in the faces were possibly collected from the ground surface along the bank or possibly from the nearby beach. The ditches were partly filled with stones and gravel, collapsed bank material, which in places was interleaved with peat, indicating that some erosion of the bank had occurred during the growth of the peat cover.

The original ground surface was clearly visible under most of the bank with the exception of the south end of the middle segment. It appeared as a black humic layer 0.03–0.05m thick. Beneath the old ground surface was a light grey depletion layer.

2002 evaluation Further planned housing development at 4 Black Crofts prompted a second evaluation in June 2002, again working to a WoSAS brief. This time the evaluation covered the north end of the Croft to within 10m of the probed line of Bank B (illus 2). Seven machine-excavated trenches were investigated but no archaeological features were uncovered.

2003 re-survey In 2003, Headland Archaeology carried out a re-survey of the peat-edge in the Black Crofts and the area where excavations took place in 1977. The published results of the 1975 peat-probe survey showed the line of the sub-peat banks in relation to the peat edge, which had been surveyed in great detail (Barratt et al 1976). However, the plan lacked any mapped reference points that would locate the banks precisely on the National Grid. A re-survey was therefore carried out in 2003 to map accurately the section of peat-edge relating to the 1975 peat-probe survey. The peat-edge had largely remained unchanged since the 1975 survey and it was therefore possible to place the peat-probe survey within the National Grid.

During this survey, the area of the 1977 investigations was examined. No bank or trench location plan can be traced from the 1977 season and the area was subsequently cleared during agricultural improvements. A large area of peat was cut away and the banks were bulldozed. As a result, very little survives of the banks investigated in 1977, although faint traces of Bank C were recorded in 2003 roughly 90m to the south-east from the point where it emerged from the peat (illus 6). It was less than 0.15m high, with an ill-defined east side, and spread to 4m wide. It was visible over a distance of 23m and faded out at both ends. The bank was in line with the probed section of Bank C and is likely to be part of the same bank (illus 6). Of the two offshoots to Bank C mentioned in accounts of the 1977 work (Hill 1977), only one has been re-located and is now only represented by modern clearance cairns close to its original line. This has been labelled Bank D by the present authors. The locations of the seven trenches excavated across banks in 1977 have been reconstructed using a combination of photographs of the trenches and near-contemporary vertical air photos, and field drawings with co-ordinates on an arbitrary site grid. Five of the seven trenches have been re-located with some confidence using this information.

This paper is published with the aid of a grant from Historic Scotland.