Biggar Archaeology group

Bringing the past to the present

Interim Report on a small scale excavation at Calla Farm near Carnwath

by Tam Ward February 2013

Summary

A single Impressed Ware sherd and two other sherd fragments were discovered in an eroding bank beside a drainage ditch, pieces of slag were also picked up, suggesting a metal working site. The visible area of the exposure was straightened and produced more pieces of slag but no further pottery, however a basal 'patch' of charcoal was sampled and which gave a C14 date of BP 4698+-26. A trial pit measuring 1m square was also opened and which produced a few more pieces of the slag.

Introduction

During the course of arable fieldwalking in 2009 and which is part of the Biggar Archaeology Group's Pre-History North of Biggar Project, the materials given above were found. However, the site was noted outside the ploughed field and lies in rough pasture. The general area is well known for a large quantity of pre-historic cairns which includes a chambered cairn and a long cairn of Neolithic date, and a single cist, presumably Bronze Age, is visible in a nearby cairn to the site considered here (RCAHMS 1978).

The site lies on the lower SE flank of Hare Law at NT 00700 49053 in the Parish of Carnwath, South Lanarkshire, it is 242mOD and lies immediately outside the northern corner of the arable field and 250m NNE of Kerswell Mains Cottage (Figs 1 & 2).

The only finds made during the fieldwalking were a clutch of fourteen pieces of worked radiolarian chert forming a scatter of about 30m in diameter in the northern corner of the field. A core was the only diagnostic piece and the assemblage may date to Mesolithic/Neolithic times as such material was found at nearby Corse Law during forestry walking in 1988 (Clarke, 1989). Several lumps of metallic slag were also found (see Appendix I).

The site

The location has been exposed by cattle and sheep scraping/trampling activity on the northern edge of a machine cut drain (Fig 3) (Pl 1); displaying a section measuring 7.1m long and varying from 0.2m to 0.6m deep. The visible sandy soil was dark and relatively stone free; and lying for about 3m and on the eastern side was a thin horizon of peat about 50mm deep and which lay immediately below the turf layer which covered the whole section to about 150mm thick. Both the underlying natural sandy till and the turf surface sloped down from west to east.

Methodology

Since three crucial find types were made from pre excavation observation alone; the sherds, the slag and occasional flecks of charcoal, it was considered only necessary to engage in limited invasive work. The pre existing section was straightened allowing minimal intrusion into the deposits, the material cut away by this action measured from a few millimetres to a maximum of 0.3m in width. All of the ground in front of the section which sloped down into the ditch was also trowelled clean and a few other nearby small areas around the ditch were also cleaned up but with no archaeological results.

To test the site further a 1m square pit (Fig 3) was opened 1.2m back from the finished section and in a position aligned to where the original finds were made.

The section, pit and location were planned and photographed.

The excavation
The section Plates 1 & 2

Prior to excavation the decorated sherd was found near the top of the sandy soil layer and below it and extending to the base were the pieces of slag and other sherd fragments.

Because the alignment of the new section only allowed for straightening up the profile, the work was minimalistic. Five further pieces of slag were recovered bringing the total from the section to eleven. Three pieces of possible slag/baked clay? were also found and four chert flakes came from a specific area further upslope. Information on the section as a result of excavation was little changed; however an angular boulder lay bedded into the natural till and down slope from this stone, and probably as a consequence of its position, a lighter coloured sandy layer of about 100mm deep was seen. Lying embedded into this sand was a patch of charcoal enriched soil, seen as a dark area of about 0.4m in diameter against the natural sand, this was bulk sampled but no obvious feature was found to explain its presence.

The pit (Fig 3 & Pl 3)

The pit produced little to further clarify the nature of the site, seven more pieces of slag were found and like the section these were found from near the top to the base of the sandy soil layer. The sections exposed showed that the entire profile was similar to the main section and here the maximum depth was 0.6m deep with a fairly uniform 0.5m depth of the darker sandy soil. At the base of the darker soil however microscopic charcoal discoloured it even darker, none of this was sampled. A possible sub soil of up to 100mm deep was also visible lying on the natural till which sloped down slightly towards the section.

The finds

The finds have been listed as part of the overall PNBP (Appendix I) and form a small but important assemblage which may have significant implications for the archaeology of the area. Both the pottery and slag will be subject to expert analyses in due course however the following may be acceptable:

Pottery

The Impressed Ware rim sherd (19/1) (Pl 4 & Fig 4) can probably be ascribed to a Late Neolithic date on stylistic criteria and it is the first diagnostic piece of pre historic pottery from the area excepting for a single beaker sherd found below a nearby cairn (Ward 2005). The IW sherd has the distinct traces of vitrification around and within its abraded broken surfaces, a phenomena not associated with its manufacture but more likely to be a process in close proximity to intense heat, and one which superseded the bonfire temperature needed to bake pottery clay. This sherd has a fairly cleaned surface as it was exposed on discovery.

The other two sherd fragments (19/8 & 9) have not been cleaned but do not appear to have the same evidence of vitrification.

Fragments of baked clay mixed with a slag like surface (19/17) may actually be crucible or mould fragments; only expert analyses will confirm or otherwise refute this idea. However, the appearance of these fragments does seem to be consistent with association with high temperatures.

Chert

Four flakes of radiolarian chert of typical blue/grey colour were found almost together in the section when excavated. These do not appear to have any diagnostic attributes but expert analyses may change that.

The slag Plates 5 & 6

The following preliminary tests were carried out on a sample of the slag by Jim Ness (BAG).

Calla 'slag' was ground to a fine powder by mortar and pestle. It powdered very easily. A platinum wire was dipped in the powder and applied to a Bunsen burner flame to test for metallic or other elements. No change in flame colour was observed. Powder was also doused with hydrochloric acid. No reaction took place. It was concluded that the compound was most likely a silicate with very little if any metallic residue.

The pieces of slag vary in appearance and size. One small droplet (19/1) (Pl 6) may indicate splatter or over pour.

The largest single piece (19/5) measures 115x65x40mm. On the upper surface it is smooth but irregular and having a metallic brown coloured lustre. Gas bubble cavities lie beneath the surface and the piece then shows signs of what appears to be vitrified soil, as if the molten material had been poured over a ground surface.

See below for further analyses

Charcoal

The charcoal enriched soil, a sample of about 10 litres, was hand processed by flotation through 1mm and 0.3mm sieves. The flots were then dried at room temperature and the larger sized charcoal fragments were hand picked giving a weight of 6 grammes, the residue of the 1mm sample weighs 12 grammes. The 0.3mm sample was not weighed as it contains some grit and sand.

The stone residue of the sample was checked but nothing was found.

The charcoal was analysed by Dr Jennifer Miller of York Archaeological Trust and the following are the result:

Corylus (Hazel) 1 fragment 0.06 grammes

Quercus (Oak) 19 fragments 1.65 grammes

Primarily oak charcoal from major timbers with one hazel round-wood fragment recovered for AMS dating. Suggestive of structural component. Potentially Neolithic

The sample of Hazel was selected for radio carbon dating and the following result was obtained:

SUERC-45150 (GU29845)

Charcoal: Corylus

Radiocarbon Age BP 4698+-26 δ13C relative to VPDB -25.4 ‰

Calibrated date ranges at 95.4% probability

3628 (13.4%) 3590 cal BC

3528 (21.3%) 3492 cal BC

3470 (60.6%) 3373 cal BC

Mineral samples

Lying within the 1mm flot was a tiny piece of quartz which is suspected of having been burnt.

Also within the 0.3mm flot a crystallised substance measuring about 2mm across was found. This crystal is emerald green in colour and comprises of several tiny conjoined crystals. The sample was submitted for informal identification in BGS and was shown to be an organic substance of unknown type.

Discussion

The site is certainly unique in this part of Scotland. Weighing up the evidence of this chance discovery, and further research including slag analyses could show it to be evidence for metal working. The Impressed Ware sherd which overlay the slag is like Late Neolithic types. However, its context within the sandy soil which included the various lumps of slag may eventually be shown to be disturbed. The charcoal was certainly sealed below the entire deposit of sandy soil and the date obtained fits well with the pottery as being later Neolithic.

However, there remains a problem with the slag, the questions being; what age is it? and what metallic process was it involved with? Ferrous or non ferrous? (See below)

Evidence of the earliest pre historic metal working appears to be confined to the north east of Scotland where moulds for various objects have been found. There is no recorded evidence for such early metal working in southern Scotland to date.

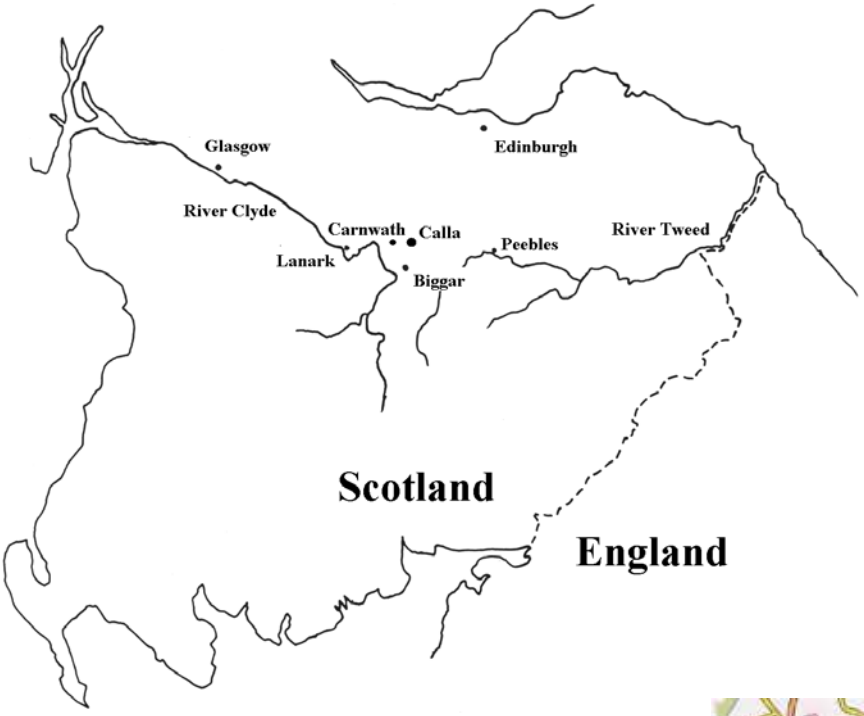

Fig 1

Fig 2

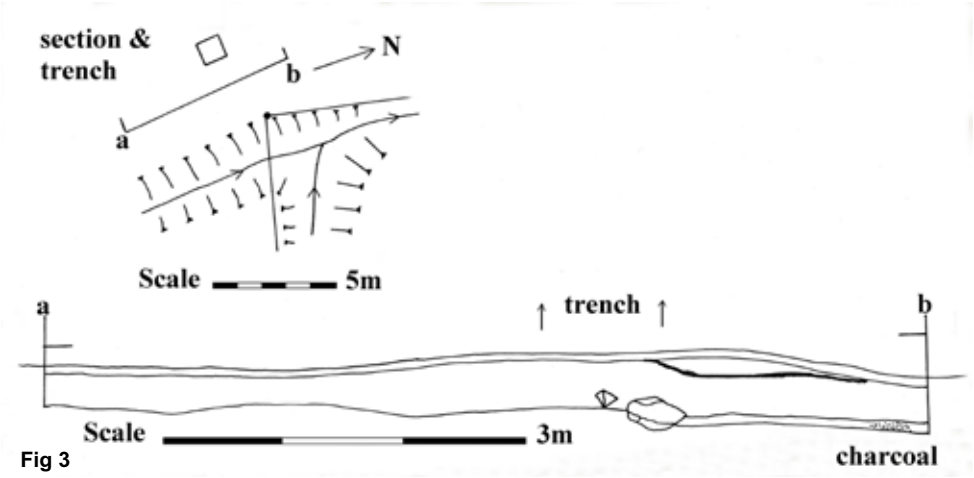

Fig 3

Calla

Fig 4

Plate 1

Plate 2

Plate 3

Plate 4

Plate 5

Plate 6

Conclusion

It is still unclear whether the various aspects of the soil profile are intermixed with different periods of time being represented. Much depends on the analyses of the slag which, if it can be proved that it is ferrous in origination, then the soil profile will clearly be shown to be mixed up. If the slag can be shown to be of non ferrous type, then the intriguing possibility of early prehistoric metal working remains.

Further work

All of the finds will eventually be subject to expert analyses in the first instance, but most especially the slag examples will need to be processed.

It may be necessary to conduct further fieldwork on the site to elaborate on points of uncertainty. Such work would be minimal to protect the site.

Addendum to first report above

Dr Effie Photos-Jones of the University of Glasgow has suggested that the waste recovered potentially relates to different stages in bloomery iron making.

The inescapable conclusion is that the slag material is the product of iron smelting and therefore has no association with the radiocarbon date from the site or the finds. The deposits, apart from the charcoal at the base of the feature, are therefore intermixed and certainly do not indicate any early prehistoric non ferrous metal working.

The true age of the iron slag, and its significance are indeterminate without recourse to further work on the site, however, it may be that an early Iron Age site is represented by the occurrence of the slag here. Some of the pottery which appears to be Impressed Ware of Late Neolithic date has been subject to severe heating as broken sherds, and it may be that smelting has taken place on an earlier site.

The nearest occurrence of iron smelting is at Wilsontown, near the village of Forth and only 8km to the North West. This was an 18/19th century endeavour of some importance to Scotland's industrial history. However, it seems unlikely that there could be any connection between the Wilsontown activities and those at Calla.

Final conclusion

It would appear that the site is the product of different periods of prehistoric activity and notwithstanding the fact that the slag is mixed with earlier material; the site may be an important prehistoric iron working place. No further work is anticipated by BAG.

Acknowledgement

Permission to conduct the work was kindly granted by Mr David Baillie of Calla Farm and the following people assisted with the site work; Fiona Christison, Jacquie Dryden, Richard Gillanders, Sandra Kelly, Jim Ness, David Oxley and Ian Paterson. Sandra Kelly also drew the pottery.

Dr Effie Photos-Jones seen the slag and considered it to be the product of iron.

Jacquie Dryden desk top published this report to the web.

To all, the writer is indebted.

References

Clarke A, 1989. 'Corse Law, Carnwath, Lanarkshire: a lithic scatter', Proceedings of the Society of Antiquaries of Scotland, 119 (1989), 43 –54

The Royal Commission on the Ancient and Historical Monuments of Scotland 1978. Lanarkshire Prehistoric and Roman Monuments. No's 1, 2 and 113.

Ward T, 2005. Excavation of three small cairns at Corse Law. www.biggararchaeology.org.uk.

Appendix I

List of finds and samples from the site

The numbers represent the Pre History North of Biggar catalogue system where individual sites are given numbered codes, in this case No 19. All numbers should be pre fixed with PHNB.

PHNB 19/1	Droplet of slag found in unexcavated section. Measuring 18x8mm it has a smooth surface. (Plate 6|)
19/2	Piece of slag found with above. Measuring 45x20x10mm it has one side (upper) smooth showing flow, it is metallic grey in colour and has gas bubble cavities.
19/3	Impressed ware rim sherd (Pl 4) found (with above) beside spring course at NW corner of field. Exact spot NT 00700 49053 along with slag (above & below). The sherd measures 45mm from the rim down and is 35mm wide, the rounded rim is 10mm thick but the sherd thickens to 16mm. The buff coloured sherd has what appear to be quartz inclusions up to 2mm in its matrix and appearing on all surfaces. The external surface is decorated with two bands of impression which may have been formed by a bird bone? Certainly the lower of the two bands has clearly been made with the same tool and one of the upper indents appears very similar. A further cordon of decoration may be indicated by two small slash marks immediately below the top of the rim and another impression between the two main bands may have been accidental. The sherd has abraded edges and around these there appears to be traces of vitrification, which suggest the sherd has been close to a source of exceptionally high temperature.
19/4	Chert 14 of. NW Corner of field at NT 0700 4904 c30m diameter scatter. One piece is a core.
19/5	Piece of slag found with above. The largest single piece it measures 115x65x40mm. On the upper surface it is smooth but irregular and having a metallic brown coloured lustre. Gas bubble cavities lie beneath the surface and the piece then shows signs of what appears to be vitrified soil, as if the molten material had been poured over a ground surface.
19/6	Piece of slag found with above and measuring 70mm by 30mm. A broken surface reveals a gas bubble of about 15x10mm. This has the appearance of a grey rock but the gas bubble cavity suggests it is indeed slag.
19/7	Five pieces of slag found with above. One piece appears to be vitrified soil and is brown in colour. Two other fragments are grey in colour.
19/8	Pottery. Small sherd 30x8mm showing internal curved face with outer surface eroded. Found with above. (Not cleaned).
19/9	Pottery. Small sherd 35x20x10mm thick, buff coloured. Found with above. (Not cleaned)
19/10	NO FINDS
19/11	5of pieces of slag. From excavation section.
19/12	7of pieces of slag. From excavation pit
19/13	3of pieces of slag/baked clay? From excavation section.
19/14	4of radiolarian blue/grey chert flakes. From excavation section