

# Report on the metalworking remains at Ballymakeery 1, Co. Cork (E4910)

Paul Rondelez

Independent Researcher

Macroom, Co. Cork, 7 May 2019

## **Introduction**

During archaeological investigations ahead of road construction work, a ringfort with associated features and a post-medieval farmstead were excavated. In total, just over 9.1kg of material related to metalworking activities was recovered. The assemblage represents typical remains of early iron smithing and includes both smithing hearth cakes and a tuyere front. One large cake weighing over 2.8kg is interpreted as related to bloom processing. None of the excavated features were related to metalworking and the activity, while most likely contemporary with the broadly 8<sup>th</sup> to 10<sup>th</sup> century ringfort occupation, took place outside of the excavated area.

## **Description of the material**

Most of the material found in-situ was recovered from two parallel linear features, C073 and C083, protruding from the north-eastern limits of excavation. All this material was weathered but while the slag (2534g) from fill C074 of linear C073 consisted mainly of smithing hearth cake material, the residues (76g) from fill C084 of linear C083 was more drippy (Fig. 1) and could represent smelting slag. Radiocarbon analysis of charred organic material from fill (074) returned a date broadly spanning the 10<sup>th</sup> century (95% probability).

A well-formed smithing hearth cake (1390g) with a pronounced protrusion on its upper surface (Fig. 2) was found in mid-fill C301 of ringfort ditch C020 and hazel charcoal from this fill returned a radiocarbon date in the 10<sup>th</sup> to early 11<sup>th</sup> centuries (95.4% probability).

Fill C165 of stone setting C138 yielded a vitrified tuyere front with remains of the blowhole (Fig. 3). Radiocarbon analysis on *Maloideaea* charcoal from this stone setting returned a date spanning the late 7<sup>th</sup> to late 9<sup>th</sup> centuries (95.4% probability).

The remaining material (5166g) was found in the topsoil and consisted of smithing hearth cakes and one large slag cake weighing 2868g (Fig. 4).

## **Discussion and conclusions**

Smithing hearth cakes and tuyere fragments are the characteristic macro-residues resulting from early smithing activities in Ireland. Smithing hearth cakes are accumulations of fuel impurities, hearth material and lost iron and can weigh up to and above 1kg. Substantially larger cakes, which are generally very homogenous with few air cavities, are interpreted as related to bloom processing activities, possibly representing 'slag baths' into which the newly made iron was submerged (Young 2012). Some of the material, consisting of more drippy material, might represent smelting waste.

Although much of the slag was found in topsoil, it is most likely that the whole assemblage is contemporary with the broadly 8<sup>th</sup> to 10<sup>th</sup> century occupation of the ringfort. Linear features C073 and C083 appear to be younger but the slag was considerably weathered suggesting a later re-deposition. The material consists of the waste of smithing, bloom processing and, possibly, smelting. These activities took place outside of the excavated area, possibly in the vicinity of where linear features C073 and C083 protrude from limits of excavation.

## **Bibliography**

Young T. 2012 *Evaluation of archaeometallurgical residues from Ardreich, Co. Kildare, [00E0156]* (= GeoArch Report 2012/8). Unpublished specialist report, GeoArch Ltd.

## Catalogue

Cut	Fill	Sample #	Feature	Description	Weight (g)
n/a	Topsoil	3	Topsoil	Partial rather dense irregular SHC	440
n/a	Topsoil	3	Topsoil	Partial (c. 60%) rather dense well-formed bun-shaped SHC with charcoal inclusions	382
n/a	Topsoil	3	Topsoil	Rather light irregular SHC with frequent cavities after charcoal	351
n/a	Topsoil	3	Topsoil	Fragment of a rather dense SHC	266
n/a	Topsoil	3	Topsoil	Six pieces of rather dense slag, some with cavities after charcoal	507
n/a	Topsoil	4	Topsoil	Large rather dense bun-shaped slag cake. Rather smooth lower surface, frequent cavities after charcoal on upper surface. Likely 'slag bath'	2868
n/a	Topsoil	4	Topsoil	Weathered, rather dense slag piece	352
020	301	2	Ringfort ditch	Dense, well-formed SHC with pronounced protrusion on the upper surface. Impressions after charcoal on the protrusion surface	1390
073	074	1	Linear	Small weathered rather dense SHC with charcoal inclusions	175
073	074	1	Linear	Five pieces of rather dense slag, some weathered, some with cavities after charcoal	392
073	074	6	Linear	Weathered rather dense, very irregular SHC.	532
073	074	6	Linear	Weathered rather dense partial SHC with cavities after charcoal on basal surface	511
073	074	6	Linear	Partial dense SHC	343
073	074	6	Linear	Sixteen pieces, mostly weathered, of rather dense to dense slag. Some with cavities after charcoal	581
083	084	18	Linear	About 40 small fragments of weathered slag, most are drippy	65
083	084	18	Linear	Fragment of heat-affected clay with adhering slag	11
n/a	092	5	<i>Deposit</i>	<i>Piece of natural quartz</i>	
138	165	7	Stone setting	Fragment of vitrified clay with convex front. Subsequent layers of vitrification indicate multi-phased use. Likely blowhole partially preserved, diameter cannot be estimated = tuyere front	36

## Figures



*Fig. 1. Weathered, drippy slag, possibly from iron smelting. Fill C084 of linear C083*



*Fig. 2. Smithing hearth cake with protrusion from fill C301 of ringfort ditch C020*



*Fig. 3. Tuyere front with remains of blow hole from fill C165 of stone setting C138*



*Fig. 4. Large slag cake, probably related to bloom processing, from topsoil*