THE EARLY ECCLESIASTICAL COMPLEXES OF CARROWMORE AND CLONCA AND THEIR LANDSCAPE CONTEXT IN INISHOWEN, COUNTY DONEGAL

COLM O’BRIEN, MAX ADAMS, DEB HAYCOCK, DON O’MEARA and JACK PENNIE
Bernician Studies Group,
The Language Centre, 6 Old Eldon Square, Newcastle upon Tyne NE1 7JG
bernicianstudies@yahoo.co.uk

Magnetometry surveys at the early ecclesiastical centres of Clonca and Carrowmore on the Inishowen peninsula of Co Donegal have shown new evidence of double-circle precincts. A set of calibrated radiocarbon dates within the range 6th–12th centuries from excavation of the precinct boundary ditches at Carrowmore confirms occupation in the early medieval era. The field evidence for early ecclesiastical enclosures throughout the peninsula is reviewed. The landscape context of the two case studies is evaluated through magnetometry survey of Gorey ringfort and the hillfort of Crockaughrim as part of a field appraisal of their hinterland and of the territorial unit of Magh Tóchair.

INTRODUCTION: TERRAIN AND PROJECT SCOPE AND AIMS
A prominent feature of the topography of the Inishowen peninsula in Co Donegal is Trawbreaga Bay, a natural tidal inlet facing north-west into the Atlantic (Fig 1). Behind the shelter of Doagh Isle, which all-but blocks the inlet, is an extensive area of low-lying alluvial and marine sediments, the lowest part of a basin across which rivers flow from higher ground to the south. Among these, Gleneely River runs north-west towards Trawbreaga Bay but as it reaches the flat land, it loops around in a wide
CLONCA

The ecclesiastical complex of Clonca occupies the edge of a platform of level ground a little below the 30m contour, immediately above the north-east edge of the valley floor of the Gleneely River, with higher ground north and east and a wide prospect west across the flat land towards Trawbrega Bay. Erenaghs (lay stewards) are recorded here until the early 17th century (Gwynn & Hadcock 1970, 376). Visible features of the site are a now-disused graveyard bounded by a stone wall and a ruined church of 17th-century construction within. A stone lintel above the west door appears to have been carved but the figures are so heavily weathered as to be hardly visible. Twelve metres beyond the south-west corner of the churchyard stands a high cross carved with both panels of interface and figurative scenes: two lions and two individuals understood to be St Paul and St Anthony; another thought to depict the New Testament miracle of the loaves and fishes (Harbison 1992 i, 44–5; figs 121–24). Sixty-five metres north-west of this, the ringed head of a large cross lies on the ground; a piece of cross-arm stored within the church is thought to be a fragment from this. Close to where the head lies is a boulder with a socket carved into it, of a size suitable for a mortise to take a high cross. Further west, across the road, a small stone slab carved with a ringed cross was found but subsequently removed for safety (Lacey 1983, 254–56). A holy well recorded by Mabel Colhoun (1995, 48–9) on lower ground across the road to the south is no longer visible.

In the autumn of 2013 the Bernician Studies Group conducted magnetometry survey under licence from the Department of Arts, Heritage and the Gaeltacht (licence number 12R79) in the fields under pasture on all sides around the graveyard with a Geoscan FM256 fluxgate gradiometer at a high resolution of 0.1NT at intervals of 0.25 X 0.5m on a non-parallel traverse of rectangular grids, and processed using Geoplot 3 software. This gave evidence of a double-ditch circular boundary surrounding the graveyard and the standing high cross as part of a complex, and in places densely clustered, palimpsest of boundary and other features (Fig 2).

On its south and east sides, the graveyard appears once to have occupied a more extensive area. In an arc around the graveyard from the north, to the west and south-west sides, at the edge of the plateau of land where the downslope to the valley floor begins, are the outlines of a double circle with diameters of some 80m and 95m. This looks like a precinct similar to that at Carrowmore (see below), but in a much more complex landscape setting. It seems that another double-ditched feature merges with this north-west of the graveyard, and around that point a double linear feature runs north-west, parallel to the field boundary. One might suggest that these features are remnants of droveways to manage the movement of livestock between the valley floor and the plateau land. North of the graveyard, and intersecting with the outer ring in a way which cannot be defined from the geophysics alone, are...
somewhat irregular linear features, one leading north to a tear-shaped enclosure. Areas of high magnetic anomaly could indicate metalworking. The standing high cross is well within the inner circle and in an area with a great density of small features, possibly graves, which seem to be set within a small single-ditch enclosure with a west-facing entrance.

There is sufficient complexity here to warrant further, more detailed and more extensive survey. Equally, there is scope for evaluative excavation to determine the nature, date and vulnerability of the sub-surface features identified here. However, the picture here is not so straightforward as it seems to be at Carrowmore and it raises the question of whether any excavation on a small scale would not merely serve to confuse interpretation. Whatever we are to make of these features, the richness and complexity of detail revealed in the geophysics warn against single-phase and mono-functional interpretations (O’Brien & Adams 2016).

CARROWMORE

On the south side of the Gleneely River valley, opposite Clonca, the land rises to 90m above sea level. At the foot of the hill, immediately above the alluvial deposits of the valley floor, is sited the ecclesiastical centre of Carrowmore, by the confluence of the Gleneely River with its left-bank tributary, the Carrowmore River. A minor road runs northwards down from the hilltop into the valley, passing through the former complex whose visible features are a disused graveyard defined by low earthen embankments west of the road, two high crosses, one on each side of the road, and other smaller stones.

Identification and previous investigations

Gwynn and Hadcock (1970, 30) and Lacey (2010) follow Reeves (1857, 405) in placing Both Chonais at the site of these two high crosses within the townland of Carrowmore. Prior to a magnetometry survey carried out by the Bernician Studies Group in 2012 (Adams & O’Brien 2013), the most authoritative statement of the field archaeology here, with a sketch plan, was in the survey conducted under the direction of Dr Brian Lacey (Lacy 1983, 248, fig 129), which notes that a series of monuments lie on both sides of the modern road. West of the road is a rectangular enclosure, of some 46m by 29m, defined by boundary embankments and divided internally into two parts by a low grass-covered wall. Within, a number of stones are recorded, projecting above ground level. A pair of stones (ibid, fig 129a) are interpreted as jamb-stones of an entrance near the enclosure’s south-west corner; a flat-topped boulder, possibly intended as a cross base, has a socket carved into the top (ibid, fig 129b); a slab lies close to the internal dividing wall (ibid, fig 129c); and towards its north-east end is a slab carved with a sword-like device and beside it a circle (ibid, fig 129d). East of the
road no earthwork features are visible, but there is
an earth-fast boulder into which are carved a small
hollow and a cross (ibid, fig 129g). There are two
high crosses, one west of the road, by the southern
edge of the rectangular enclosure (ibid, fig 129e),
the other east of the road, some 18m north of the
boulder, with a cairn of stones at its base (ibid, fig
129f). A well, closed up by the time of this survey,
lay in the eastern boundary of the eastern field
(ibid, fig129h). The fieldworker Mabel Colhoun
visited the site in the mid-20th century. In her
posthumously published notes (Colhoun 1995, 29–
30) she speculated that the boundary embankments
might be the foundations of a large building such
as a church; this seems unlikely, and her alternative
suggestion that they form the graveyard boundaries
is more convincing. She described the stones in
some detail, referring to the small hollow in the
earth-fast boulder in the eastern field as a bullaun
or basin; she noted an unconfirmed record of a
causeway exposed in peat digging leading north
across the bog towards Clonca; and she observed
the well while it was still in use (ibid, 51). The
descriptions in Harbison’s (1992) catalogue of high
crosses supersede Colhoun’s.

In the autumn of 2012 the Bernician Studies
Group conducted magnetometry survey under
licence from the Department of Arts, Heritage and
the Gaeltacht (licence number 12R109) on both
sides of the road in the vicinity of the visible features
with a Geoscan FM36 Fluxgate Gradiometer set at
0.1NT at intervals of 1m X 0.25m parallel traverse
of 20m X 20m grids and processed using Geoplot
3.0 software. This revealed for the first time clear
evidence of boundary ditches of a double-circle
precinct, visible as two bands of dark tone on the
survey plan, with diameters of some 115m and 60m
(Fig 3). The outer circle extends across both sides of
the road, with its westernmost limits eroded by the
gorge cut by the Carrowmore River; the inner circle
lies mostly west of the road, which clips its east
side. A gap of some 10m in the north-east quadrant
of the outer circle appears to mark an entrance, with
a suggestion of marker features at its terminals.
Small anomalies occur just outside the putative
entrance, indicating possible post-hole structures.
In the north-west quadrant, the alignment of the outer circle appears to be displaced to the north. This is a distortion of the result attributable to a steep slope down onto the alluvium. No sub-surface detail was visible within the area of the former graveyard, either in the magnetometry survey or in a subsequent resistivity survey of this area. Two sets of anomalies occur beyond the outer ditch, to the south-west. Adams and O’Brien (2013) give a fuller description.

Excavation
There had been no previous excavation at this site, nor at any of the other ecclesiastical complexes known on Inishowen, and so it was difficult from the magnetometry survey to assess the state of preservation of archaeological features beneath the topsoil. The features recorded in the survey span three fields, Fields 1 and 3 west of the road and Field 2 to the east (Fig 3), all of which at the time of the survey were in pasture and grazed by sheep, though from time to time they had been ploughed for re-seeding. (Field 2 was ploughed in 2012 and Field 1 with the rectangular enclosures was ploughed in 2013, right up to and clipping their boundary embankments.) The outer precinct boundary showed strongly on its south side to the west of the road, but east of the road the signal was more patchy. Observation of the southern (upslope) field boundary here suggested that there had been some element of terracing, with a lowering of the ground level upslope in the general area of the south-east quadrant of the outer enclosure. The project team was concerned therefore that archaeological deposits were currently being degraded. In the light of these circumstances, the Bernician Studies Group applied to the Department of Arts, Heritage and the Gaeltacht for permission to carry out evaluative excavation. This was granted under licence number 13E277 and a two-week excavation followed in August and September 2013.

Aims and methods
The aims of the excavation were:
1. to determine the nature and extent of damage to the monument caused by historic and contemporary agricultural practices and public site access;
2. to determine the nature, depth and stratigraphic complexity of the inner and outer precinct ditches enclosing the complex;
3. to test for the presence of buried ancient land surfaces and around the ditches and any associated banks; to assess the potential of the site for retrieving evidence of material culture (pottery, lithics, metalwork etc) and environmental data (seeds, pollen, organic materials);
4. to retrieve samples of carbon-based material for Carbon-14 dating from such ditch stratification as may survive; preferably of more than one phase;
5. to inform future research, conservation and management strategies at the Carrowmore ecclesiastical complex.

The group opened a trench of 2m by 10 m across each of the two precinct boundaries to evaluate the archaeological deposits. Trench 1, across the inner boundary, was in Field 3, in the south-west quadrant of the enclosure, and Trench 2 tested the south-east quadrant of the outer boundary ditch in Field 2. In both trenches, topsoil and turf were removed with hand tools down to the natural subsoil of glacial till, here a stiff, yellow/grey silty clay. Surfaces were trowelled clean, and features excavated with hand tools. In Trench 2 the depth of the outer ditch precluded excavation to natural for safety reasons. Deposits and features were recorded on single-context sheets; plans and sections were drawn at 1:20; photography was carried out with a Panasonic Lumix LX5 digital stills camera. The trenches were backfilled with hand tools at the end of the excavation and the turf restored.

Trench 1: the inner precinct ditch
Trench 1 was excavated on a broadly south-west/north-east alignment across the inner circular feature (Fig 4). This revealed an intact buried ground surface of small pebbles pressed into the underlying glacial till in the south-western half of the trench exterior to the ditch (Pl 1). Narrow lines of topsoil surviving as striations on top of the pebble surface suggested the movement of traffic across the area running towards and possibly across the ditch. These have been provisionally identified as the marks of a sled or slide-car dragged across the surface and pressing the pebbles deeper into the compacted till. It is uncertain whether these ran over the top of the uppermost ditch fill, but it is likely that they belong to a period when the ditch was deliberately filled in with stone and perhaps turf. At the north-eastern end of the trench a revetment of medium-sized stones ran parallel with the ditch and facing north-east. This feature was so close to the north-eastern edge of the trench, and with so little exposed, as to make assessment of its function impossible. It is not certain what relationship it bore to the ditch but it indicates that the area within the inner ditch is structurally complex. Between this feature and the inner edge of the ditch a series of linear cut-features and two stake-holes suggested domestic
or agricultural activity, again of indeterminate relationship to the ditch.

The ditch had been cut to a depth of 1.55m below the ground surface. The magnetometry survey showed a faint light-coloured band, suggestive of the remains of an embankment on the inner edge of the ditch, but excavation yielded no evidence of inner or outer banks. The ditch was of a sharp V-profile, approximately 2m wide at the top and cut through the glacial till. Four main phases were identified. The primary fills (38, 39, 40) are a series of stony slumps and perhaps water-derived deposits of silty clay, filling the base to a depth of about 30cm. Later, the fills came to include more organic matter and there was a distinct dark brown line of a buried topsoil or perhaps peat formation; then the ditch was re-cut (32). At some point after the re-cut, debris was introduced into the ditch, probably deliberately, and in more than one phase (14, 37, 28, 34). This debris included stone rubble, very small and decayed bone fragments, burnt material surviving as frequent charcoal fragments; ironworking debris and a series of small round polished pebbles interpreted as gaming counters. The very sharp V-profile of the ditch, quite unlike that of the outer ditch excavated in Trench 2, indicates an ‘ankle-breaker’ function.

Trench 2: the outer precinct ditch

Trench 2 was excavated on a broadly south-east/north-west alignment across the outer circular feature (Fig 5). Beneath the topsoil was a thick deposit of old ploughsoil, showing that, despite the concerns expressed before the excavation, any damage caused by ploughing in this higher part of the field had occurred in the past and that the site was now stable. Buried ploughsoil covered the upper fills of the ditch and a stone setting constructed on top of these fills. Ancient plough furrows cut into the glacial till below the buried ploughsoil; there are, therefore, at least three phases of plough use in this area.

Set onto the uppermost fill of the ditch, a dark brown layer with a humus content and scattered angular stone fragments, was a flat setting of stone slabs extending beyond the excavated area (Pl 2). Since this feature has such strong implications for interpreting the late stages of use of the site as a whole, and given its key stratigraphic position as providing a *terminus ante quem* for the final filling of the ditch, the excavators decided, rather than damage it, to leave it unexcavated apart from a half-section cut through the hearth F15 which took the form of a square setting of thin stone slabs (F5) set on edge. This section revealed laminated ash, burnt soil, charcoal and fragments of ferrous slag, with the occasional fragment of very decayed bone. One of the stones in setting F5, visible in Pl 2 as a rectangular block, had been crudely dressed with a chamfer and burnt *in situ*.

Given the decision not to excavate the stone feature, the ditch fills had to be investigated in a narrower cutting than had been intended, and for safety reasons it could not be completed to the bottom. The excavators judged from its profile that it could not have been much deeper than the 1.6m reached. The primary silting and slumping deposits followed by the formation of a dark brown turf layer (38) were similar to those of the inner ditch of Trench 1; but this outer ditch had a very different morphology. It was substantially wider, 3.6m at the top, with a U-profile. The middle zone of fills contained stone rubble, possibly from deliberate slighting of a revetment. It was striking that the north-western edge of the ditch had been revetted with very large boulders, more than 0.5m across; smaller but still substantial stones, probably from the same revetting, had tumbled or been pushed into
the bottom of the ditch. The exterior of the ditch may also have been revetted, but this could not be certainly demonstrated without a wider excavation area.

At a period after the formation of the brown peaty turf layer, another stone setting (F32) had been inserted into the ditch while it was still a visible feature and at a depth of 0.5m below the top fill. Again, it would need wider excavation for a confident interpretation of this, though it is possible that this represents a precursor to the later forge/hearth.

Dating
Carbonised seeds and hazelnut shells were recovered from flotation of soil samples taken on site (see below), and three samples were submitted to Queen’s University Belfast for AMS dating. This allows for a chronology for the sequence of ditch fills.

Outer ditch
1: (F38), a thin turfy layer immediately above the primary fills of the outer ditch gives a calibrated radiocarbon date of AD 670–870 at 95.4% probability (UBA-26934, 1258 +/- 32 BP).

2: A calibrated terminus ante quem of AD 1030–1160 at 95.4% probability (UBA-26935, 930 +/- 27 BP) for the whole ditch sequence is derived from mixed soil and charcoal fill (F11) of the small hearth (F15) positioned on top of the ditch fills and stratified below the old plough soil.

Inner Ditch
3: From the inner ditch, the fill layer (F35) immediately before the re-cutting gives a calibrated date of AD 590–660 at 95.4% probability (UBA-26936, 1418 +/- 27 BP).

In broad terms therefore, ditch filling, whether from natural silting or deliberate actions, began in the 6th or 7th century and was completed by the 12th. While the earliest dates for silting do not define the foundation date for the complex, the broad consistency of the radiocarbon dating and the historical record (see discussion below) lends confidence to both and credibility to the suggestion of a 6th-century foundation date. Re-cutting of the inner ditch indicates that enclosure, for functional or spiritual reasons, was considered necessary; yet filling of the outer ditch, deliberately or by natural process, was allowed to continue without re-cutting. This suggests some change in the use of zoning within the complex during its period of use.

Finds
A small assemblage of finds consists of three smoothing stones, one whetstone and one quartzite pebble, two lithic flakes, one small iron object, one piece of pottery, five small polished pebbles interpreted as gaming counters, and some fragments of residue from metalworking. All are from secondary contexts in the ditch fillings.
Stone
Smoothing stone SF3, Context 31, outer precinct ditch.
Ovoid; 48 x 39mm, light brown/green, fine-grained.

Smoothing stone SF8, Context 6, outer precinct ditch.
Oval disc; 48 x 32 x 14mm thick. Light brown, fine-grained; top and bottom surfaces are worn almost flat.

Smoothing stone SF10, Context 7, inner precinct ditch.
Rhomboidal, with flat top and bottom surfaces; 96 x 65 x 16mm thick. Top slightly concave; underside smoothed flat and polished from use. Same stone type as SF3.

Whetstone SF18, Context 28, inner precinct ditch.
Coarse-grained brown stone, elongated ellipse, convex in cross section, with a flat lower working surface; 100 x 26 (maximum) x 14mm.

Quartzite pebble SF44, Context 36, outer precinct ditch.
Large quartzite pebble, split with a flat inner face. Dimensions of inner face 53 x 56mm; domed in profile 44mm.

Flint SF13, Context 14, inner precinct ditch.
Yellow flint flake, pointed ovoid in shape, with cortex on its outer surface; 29 x 15 x 3mm.

Chert SF42, Context 32, outer precinct ditch.
Blade flake, straight-edged, snapped horizontally at one end and obliquely at the other. Steeply angled retouch along one side to form a scraping edge; 19 (maximum) x 14 x 6mm thick.

Gaming counters (Pl 3).
Five small, highly polished pebbles are interpreted as gaming counters. All come from the inner precinct ditch in fill layers introduced after the secondary re-cutting, stratified above the layer Context 35 from which the charcoal from which radiocarbon date no 3 (above) of AD 590–660 is derived.

SF36, Context 6 (Pl 3 top left).
Flat ovoid; 23 x 16 x 5mm; black with brown speckles.

SF35, Context 28 (Pl 3 top right).
Spherical; 10mm diameter; same stone type as SF36.

SF34, Context 28 (Pl 3 lower left).
Ovoid, light brown; 14 x 11 x 8mm thick. This is the same stone type as the smoothing stone SF8.

SF21, Context 28 (Pl 3 lower centre).
Ovoid, light brown with grey speckles; 17 x 15 x 9mm.

SF41, Context 34 (Pl 3 lower right).
Ovoid, light brown/green; same stone type as the smoothing stones SF3 and SF10.

There is an association of gaming boards and counters with monasteries in Ireland and western Scotland. A gaming board for merels (nine men’s morris), incised on a flat piece of limestone, was found in excavations at Devenish (Waterman 1979, 45, pl IIIb); another was recovered from an Early Christian context at Cathedral Hill, Downpatrick, during excavations between 1985 and 1987 (Brannon 1988). In the Irish-connected monastery of Inchmarnock, off the Isle of Bute, eight complete and two fragmentary boards were found, incised on local slate, for the games.
Metalworking debris
Naturally occurring magnetic minerals were found in all the samples sieved for plant remains (see below), though in small volumes (c 1 gram), and are of little archaeological interest. However, sample <3> from the fill material of hearth F15 produced c 25 grams of metallurgical hammer scale and provides strong evidence for local metalworking. Materials of archaeometallurgical interest were also recovered during excavation. These included a plano-convex hearth base, as well as some possible tap slags and fragments of possible furnace lining. The hearth base from context 34 in the post-recut fills of the inner ditch weighs 1420 grams and has overall dimensions of 108 x 155 x 40mm thick — slightly larger and heavier than is typical for such objects but still within the expected range. It is suggested that this is from a smithing hearth, rather than a bloomery, primarily because possible smithing evidence is present nearby in the form of hammer scale, but also because the volumes of tap slag recovered do not present clear evidence for tapped bloomery activity in the immediate vicinity. Also of note is a fragment of material from (8) which is a coarse, quartz-tempered, brittle ceramic; 126 grams, 27 x 48 x 52mm. This may be a fragment of vitrified hearth lining, and attached to the quartz-tempered ceramic was an area of glassy vitrified material with regular, red-orange to purple 2mm vesicles. The possible tap slags were all fragmentary and weakly magnetic and together represent 770 grams of material from plough soils above the fills of the outer ditch and from the inner ditch. The assemblage as a whole is quite small, but shows evidence of both smelting and smithing. The possible tap slags also suggest that the inhabitants were using a tapping bloomery, rather than a non-tapping type. What is not clear is exactly where the bloomery activity is taking place since, if in situ material had been recovered, more evidence of fuel, vitrified fuel ash, and fragments of furnace lining might be expected.

These finds of ironworking by-products leave little doubt that a small-scale industry was a feature of the site during much of the period of occupation and that it continued beyond the time at which the outer ditch had become almost completely filled in. Direct evidence in the form of small hearths was observed only at the final stage of filling of the outer precinct ditch and it was judged prudent not to attempt excavation of these features which could not be characterised in such a small excavation trench.

Ceramic
A single rim sherd of souterrain ware came from ploughsoil (6) immediately above the uppermost fills of the outer enclosure ditch (Pl 4). The sherd measures 6 x 4cm, is heavily abraded but of a hard, hand-made fabric. Although the rim is missing, an abraded carination suggests that it is from the shoulder of a vessel some 22cm in diameter. Another small, abraded sherd of a very similar fabric came from the buried plough zone in the same trench. Although souterrain ware is common on ecclesiastical sites, these pieces, residual in this context, are of little value for site chronology. They are, however, noteworthy as westerly outliers of the distribution of souterrain ware as currently understood.

Iron
Iron SF16, Context 14, inner precinct ditch.
Heavily corroded; a rod, circular in cross section, 4mm diameter; 63mm long and slightly curved. Possibly a pin.

Pl 4 Souterrain ware sherd.
Environmental samples

Introduction
Six soil samples were collected during the excavation, consisting of c 23 litres of sediment, in order to extract material pertinent to the understanding of the environmental and depositional history of the areas being excavated, as recommended by standard guidelines (IAI 2007; McClatchie et al 2015). Evidence for metalworking, as well as suitable material for radiocarbon dating, was also sought from the samples.

Method
The samples were processed using a standard methodology for non-waterlogged/dryland samples (as per Kenward et al 1980, 5–8); each sample being manually flotted and sieved through a ‘Siraf’ style flotation tank with floating material collected into a 250-micron geological sieve, while the heavy residue was retained within a 0.5mm plastic mesh, then air-dried and sorted by eye. All charcoal was retained either by being hand-picked from the heavy residue, or collected in the secondary flot. The residue samples were also scanned with a hand magnet to retrieve forms of magnetic material. After the heavy residue was examined it was re-flotted to maximise recovery of charred material. Plant taxonomic nomenclature follows Stace (2010). The accompanying table (Table 1) contains the individual details of the analysis sample by sample. In the text sample numbers are bracketed thus <>, with context numbers in rounded brackets.

Discussion of the plant remains
Considering the relatively small volumes of sample taken, the material which was examined produced high frequencies of remains in almost all cases; in total 8.5 charred cereal elements per litre of analysed sediment. This included charred domestic cereals, charred wild plants, and desiccated wild plants.

Trench 1, inner ditch (Fig 4)
Samples were taken from the ditch fills (in stratigraphic order: <1> (31) and <6> (35). Sample <1> (31) came from a small pit in ditch F5. It produced a small charcoal flot with some oats, barley, indeterminate charred grains and a small number of hazelnut shell fragments. The results here broadly fit with the interpretation that this feature may be an infilled tree-throw with small amounts of anthropogenically derived material incorporated into its fill.

Sample <6> (35) produced a small amount of burnt bone from the heavy residue, and a fragment of hazelnut shell. Oat grains (including an oat floret base), as well as a smaller amount of barley and some indeterminate grains, were recovered from the flot.

The samples from Trench 1 produced little archaeobotanical material. Grains were heavily charred and the level of charring might explain the infrequency which material such as chaff was recovered; the higher the temperature, or the longer the material is exposed to heat, the less likely that delicate chaff material would survive (Boardman & Jones 1990).

Trench 2, outer ditch (Fig 5)
Four samples were taken from Trench 2: <2> (17), <3> (11), <5> (6) and <7> (38).

Sample <2> (17), the hearth set on top of the ditch fills, produced 94 charred grains with both oats and barley being prevalent as well as hazelnut shell and a charred brambleberry seed (see Table 1). Charred spikelets were recovered and are suggested as being from of Parapholis cf. strigosa (Curved Hard-grass). The number of grains recovered here gives a stronger indication of the proportions of cereals being exploited near this site, with roughly even amounts of barley and oat. The spikelets of Parapholis cf. strigosa suggest the exploitation of material from an intertidal, saline environment (Akeroyd 1984, 228). The results here support the interpretation of this feature as a hearth. Whether the grass was being used as hearth tinder, or had another function, is not clear.

Sample <3>, ashy fill of hearth, (11) also produced oat and barley grains, as well as spikelets of Parapholis cf. strigosa and twelve fragments of hazelnut shell (the most from a single sample). In addition to the charred plant material 25 grams of anthropogenic magnetic material was also recovered. This included hammer scale and spheroidal hammer slag, as well as some fuel ash. The spheroidal hammer scale suggests welding or smithing may have been taking place near this feature. A larger volume of animal bone was also recovered from this sample than from others. This bone was burnt/calcined, and largely consisted of fragments of bones from medium-sized mammals (sheep, pigs etc), this being determined by the thickness of the bone. Some fragments of tooth enamel were also recovered, suggesting that more elements than the limb bones are represented. Although the material was largely unidentified, there was some evidence on the fragments of light butchery cutmarks. A possible bird longbone fragment was recovered, as well as a fragment of an unfused distal radius and a small pig phalange; the size of which suggests a piglet. The evidence here supports the interpretation of this feature as a hearth fill, though one which incorporates domestic refuse, as well as metalworking debris.
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<td>Y</td>
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<td>Y</td>
<td>?Y</td>
<td></td>
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**Residue contents (relative abundance)**

| Bone/teeth, burnt bone | 2 | 7 | 35 | 2 | 8 |   |   |
| Magnetic Residue | 28 |   |   |   |   |   |   |
| Nutshell (Hazelnut) | 1*| 12*| 1*| 1*|   |   |   |

**Flot matrix (relative abundance 1-3)**

| Charcoal | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Sclerotia (fungal resting body) | 1 |   |   |   |   |   |   |

**Charred plant remains (total counts)**

| Avena sativa (Domestic oat; floret base) | 1 |   | 1 |   |   |   |   |
| Avena sp (Oat type grains) | 3 | 48| 25 | ?5| 18 | 1 |   |
| Avena sp. awn (Fragment of oat chaff) | 1 |   |   |   |   |   |   |
| Hordeum sp. (Barley; grain) | 3 | 36| 18 | ?2| 4  |   |   |
| Triticum sp. (Wheat type grain) | 3 |   |   |   |   |   |   |
| Indeterminate cereal grain | 2 | 7 | 12 | 1 | 3 | 1 |   |

**Other plant remains (relative abundance)**

| Apiaceae (Umbellifers) | 1 |   |   |   |   |   |   |
| Cardus/Cirsium species (Thistle family) |   |   |   |   |   |   |   |
| Carex sp. (Sedge; trigonous type) |   | 1*|   |   |   |   |   |
| Chenopodiaceae (Goosefoots) |   | 1 |   |   |   |   |   |
| Corylus avellana (Hazelnut; shell) | 8*| 5*| 2*| 1*|   |   |   |
| Euphorbia helioscopia (Sun spurge) |   | 1 |   |   |   |   |   |
| Galium sp. (Bedstraw) | 1 | 2 | 2 | 1 |   |   |   |
| Leontodon sp. (Hawkbit) |   | 2*|   |   |   |   |   |
| Parapholis cf. strigosa (Spikelet) Curved Hard-grass | 5*| 1*|   |   |   |   |   |
| Persicaria sp. (Knotweed) |   | 1 |   |   |   |   |   |
| Polygonum sp. (Knotgrass) |   |   | 1*| 1 | 1 |   |   |
| Rubiaceae (Madder/Bedstraw family) |   | ?1*|   |   |   |   |   |
| Rubus sp. (Brambleberry) | 1 | 1*| 1 |   |   |   |   |
| Taraxacum officinale (Dandelion) |   | 1 |   |   |   |   |   |
| Unidentified seeds | 3*|   |   |   |   |   |   |

Table 1 Environmental analysis.
Sample <5> (6) produced a small quantity of bone in the heavy residue, and two possible barley grains, five possible oat grains and an indeterminate grain; in this case the charring was too extensive to allow a more firm identification. A charred oat awn (chaff fragment) was also recovered.

Sample <7> (38) produced little of archaeobotanical interest with only a single oat type grain and a single indeterminate grain being recovered.

Discussion of the heavy residues
Burnt bone was recovered from five of the six samples. This varied from 2 to 7 grams in four of the cases, with sample <3> (11) producing a much higher quantity of 35 grams. This suggests the disposal of domestic food waste refuse in this feature. Naturally occurring magnetic minerals were found in all contexts, though in small volumes (c 1 gram) and of little archaeological interest. However, sample <3> (11) produced c 25 grams of anthropogenically produced magnetic material and provides strong evidence for metalworking activity. Charred hazelnut shell was recovered from four of the six samples, generally as single fragment, but with a total of 12 fragments recovered from the heavy residue and flot of <3> (11). Counting hazelnut shell fragments is a rather crude method of assessing their relative importance since a single nutshell can fragment many times. However, in general it can be shown that samples <1> (31) and <3> (11) produced relatively more fragments than the other samples.

The charred cereal grains consisted mainly of oat grains, varying from 1 to 48 grains, and a total of 100 oat type grains. In addition two charred domestic oat floret bases were recovered, suggesting that at least some of this material derived from cultivated oats. Barley type grains were recovered from five of the six contexts and range from 2 to 36 grains per context. A total of 63 barley type grains were recovered, although the absence of barley chaff does not allow a firm identification of the type of barley present. Evidence for hulled barley was sought on the dorsal side of the grains but no clear evidence was found, largely due to the heavily charred nature of this material. Neither could it be determined whether any of the grains represented 6-row barley. Three possible charred wheat grains and twenty-six indeterminate grains were recovered. The prevalence of barley and oat is to be expected for environmental and cultural reasons (McClatchie et al., 2015). The wetter summers of Ireland are more suited to the growing of oat, rye and barley than for wheat. Wheat is often described as a luxury item in the Irish historical record and therefore may be more likely to be associated with higher status sites (Edwards 1996, 60; McClatchie et al., 2015, 184).

The wild plant remains consisted of small numbers of desiccated seeds which may be modern intrusive material, though it is assumed that most of the charred seeds are of archaeological origin. This includes the charred hazelnut shell, which was found in all of the samples (in either the heavy residue or the flot), except sample <7> (38). The recovery of curved hard-grass (Parapholis cf. strigosa) may provide evidence for the exploitation of coastal plant resources during the medieval period.

Conclusions
Archaeobotanically the results of this environmental assessment show variation across the different contexts excavated, but with archaeobotanical material found in all samples. This allows us to begin to suggest the primary domestic cereals at this site were oats and barley. The exploitation of wild resources is evident from the hazelnut shell and possibly also from the finds of curved hard-grass. Evidence for metalworking, possibly smithing, is present in sample <3> (11), the fill from the small hearth F15 above the fills of the outer ditch.

Evaluation
The findings from the excavation, tested against the evaluative aims defined above, can be summarised thus:

1: Despite concerns expressed before the excavation, it appears that recent ploughing has not been actively damaging sub-surface deposits; in fact, these are in some areas protected by an earlier ploughsoil. Recent ploughing has, however, eroded the boundary banks of the rectangular enclosures. There are no signs of erosion caused by either animal grazing or visitors to the site.

2: Excavation has demonstrated strongly defined and well stratified ditch-fill sequences to depths of 1.5m or more below the present ground surface.

3: An earlier plough horizon has been identified in Trench 2, and in Trench 1 a pebble surface survives immediately below the topsoil. Both of these afford protection to earlier cut features and stone settings. No traces were observed of upcast material of boundary embankments. Pottery and by-products of iron working were recovered and the potential for recovery of carbonised plant remains is shown to be good.

4: Samples of carbon-based materials were recovered for C14 dating.

5: The project team has reported findings to the appropriate central and local government bodies.
The results of the magnetometry survey and excavation at Carrowmore taken together constitute solid evidence for the presence of a formal enclosed precinct in use during the early medieval period, strongly supporting the identification of this place as Both Chonais, and they provide a convincing local landscape context for the two high crosses. The east cross stands some 12m directly outside what is interpreted as the main entrance through the outer precinct boundary, and the west cross is sited almost in the centre of the inner precinct. This is strong evidence that the enclosures and crosses (or any wooden predecessors) are contemporary and connected as elements of a coherent complex and that the crosses have stood on their present sites since the period of use of this complex. What neither geophysical survey nor excavation has so far been able to elucidate is the form, dating and layout of any domestic or ecclesiastical structures here. Evidence of features within the precincts is limited on account of the former graveyard, which occupies a large proportion of the inner precinct, and the limitations imposed on the magnetometry survey by metal-fenced field boundaries and the road. But a fair proportion of the outer precinct is potentially available for excavation, as is the southern part of the inner precinct, west of the road, with a reasonable expectation that any earth-cut features should survive.

In an appraisal of historical evidence for Both Chonais, Lacey (2010, 13) cites records in the Annals of Ulster of the presence here of a sapiens, or scholar, in the mid-9th century and of enernachs towards the end of the 10th and mid-11th centuries. As a terminus post quem for the end of the site's use as a religious precinct, the final record of the mid-11th century is consistent with that of the archaeological chronology from the ditch fills. Neither form of evidence, however, can say precisely when the establishment was abandoned. Although this place did at some time cease to be the home of a religious community, it has continued, and still continues, to be acknowledged as a religious site and in some ways used as such. The graveyard represents a continuing use of the inner precinct, though it is not known for how long; it has not been used within living memory. There is no direct proof of an unbroken continuity of use from the period when a living community was present, yet it would be a reasonable hypothesis to suggest that the west cross, standing towards the centre of the inner precinct and at the edge of the burial area, was significantly placed, perhaps marking and preserving the memory of the burial place or shrine of a founder saint, and that from an early stage other burials were grouped around this. This hypothetical model would argue for a continuum of burial practice beyond the lifetime of the community.

Clonca, not tested in excavation, has close affinities with Carrowmore, with a continuing use for burial in the innermost zone of a double-circle precinct, emphasised in this case with a ruined church. A high cross, also in the innermost zone, stands as an enduring marker of what might be interpreted from the magnetometry as an early, possibly founder-era, focus of burial; and another cross stood outside the precincts. But the greater complexity of boundary and other features detected at Clonca suggest a deeper time frame for occupation here, and hence some precursor to the ecclesiastical establishment, or ancillary functions in its immediate vicinity (O’Brien & Adams 2016).

Other early ecclesiastical centres of Inishowen can be interpreted within this model; Cooley graveyard, on the hillside above Moville overlooking Lough Foyle and known as the site of Domnach Bile, with Patrician associations claimed (Gwynn & Hadcock 1970, 399), is closely comparable. A high cross stands at the edge of a graveyard, in which grave-markers include stones inscribed with a ringed cross. A magnetometry survey currently in progress shows that these features lie within the inner circle of a double-circle precinct, conforming broadly to the same spatial patterning as seen at both Clonca and Carndonagh (Bernician Studies Group, work in progress). At Desertegny (Gwynn & Hadcock 1970, 379), on the west side of the peninsula overlooking Lough Swilly, a field wall is strongly suggestive of an arc of a circular precinct boundary, with a small graveyard and a now-ruined post-Reformation chapel; at Straid (ibid, 377) near Clonmany, on the north-west of the peninsula, a now-ruined post-Reformation church lies within a cemetery of row-graves. At Eskheen, in the south-east (ibid, 384), a ruined church, in use until the late 17th century stands within a graveyard whose south-western boundary wall possibly preserves something of the outline of a circular precinct. Plans are in hand to test these sites by magnetometry. Carndonagh, the Patrician Domnach Mór Maige Tóchuir (ibid, 380) has a high cross among a suite of carved stones, including the ‘marigold stone’ within the graveyard of a post-Reformation church still in use. Village development here limits the possibilities for testing for precinct boundaries, so also at Fahan (ibid, 36), where a ruined church, in use until the early 19th century, and an early cross-inscribed marker stand within a large cemetery; and Culdaff (ibid, 379), where the church stands on a prominent position at the head of the river estuary. The occurrence of a chapel, graveyard, high cross and, where...
tested, enclosure precincts in some combination is characteristic of the early ecclesiastical centres of Inishowen. We can think of the high crosses as still embodying memory of the sites’ status and, as we now know from magnetometry survey, a locational reference to their layout. They are still acknowledged and visited; and although without a survey of visitors one could not distinguish between religious impulse and cultural tourism as motivating factors, rainwater held in the bullaun cut into the earth-fast boulder near the east cross at Carrowmore is believed to have healing properties and formal rites are observed around its use.

Enclosure is a defining feature of religious institutions of the early medieval era in Ireland in general; O’Sullivan et al (2014, appendix 4.1) list 26 excavated cases in Ireland, to which Carrowmore can now be added. Sometimes there is a single precinct boundary, but often there is an inner and outer precinct, as at Carrowmore and Clonca, or, more rarely, a triple enclosure such as those observed at Nendrum on Strangford Lough (Lawlor 1925; re-appraised in McErlean & Crothers 2007) and recently at Clonfad, Co Westmeath (Stevens & Channing 2012). The ideology underlying this is understood to be a progression in degrees of sanctity, from outer to inner, with a concomitant functional zoning of spaces, with the sacred features of church, saint’s shrine and burial grounds in the inner core and more secular uses in the outer zones (O’Sullivan et al, 2014, 145–48). In scale and outline structure the Carrowmore and Clonca complexes are comparable with, for example, the combined inner and middle enclosures of Nendrum as they survive in their visible stone-walled form (Jope 1966, 292–95); or, to take cases in Scotland with Irish affinities, the putative inner precinct of Whithorn of Periods 1/3 and 1/4 of the developed monasterium (Hill 1997, figs 2.5, 2.6) and the terraced concentric enclosures at St Blane’s Church at Kingarth on Bute (Laing et al, 1998). Thus Carrowmore and Clonca suggest investment of resources on a large scale and carried through with purpose within a polity seeking to develop underpinning infrastructures.

THE SECULAR CONTEXT OF CLONCA AND CARROWMORE
To further the understanding of the ecclesiastical precincts within the local context of secular settlement, the Bernician Studies Group conducted magnetometry surveys at two sites within their hinterlands likely to be of early medieval date: Gorey fort, on the valley floor, a little less than 1km north of Carrowmore and 1km south-west of Clonca, and Crockaughrim Hill, 1km west of Carrowmore.

Magnetometry survey at Gorey fort
The ringfort at Gorey occupies a locally prominent position on a flat-topped circular hill of glacial-era sand and gravel with the Culdaff River looping around its north side. Defining the northern tip of Carrowmore townland, it offers a commanding view of the plain around Trawbreaga Bay as far as Doagh Isle and the sea in the west. A ford crosses the river within sight of the ringfort, some 100m to the west. As an earthwork monument Gorey is still extremely impressive, despite evident signs of damage from cattle trampling its ramparts and a dense overgrowth of gorse on its slopes and crest. Detailed examination of the visible features of the ramparts revealed that a sloping trackway approaches the enclosure from the west side and curves round the south edge of the mound towards the south-east, apparently making an entrance there. This is now obscured by gorse. The flat-topped summit slopes off on its south-west side across a saddle and on to a lower spur.

A magnetometry survey was conducted under licence from the Department of Arts, Heritage and the Gaeltacht (licence number 12R108) during the same season as the Carrowmore survey, with the same equipment and to the same standards (Fig 6). A 20 x 17m grid was surveyed on the crest of the enclosure whose internal diameter between

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The interior of the ringfort yielded clear evidence of a rectilinear structure aligned north-east/south-west and apparently defined by parallel ditches. There is sufficient detail on the plot to show that other structural or earthwork features survive, although it would not be possible to interpret these without either excavation or a more detailed resistivity survey. It is possible that the magnetic anomalies shown on the survey reflect not the outline of a domestic building but features defining a garth. The internal features here do not appear to be under immediate threat from physical disturbance, although parts of the ramparts have been damaged and continue to be threatened by cattle movement.

The survey of the saddle showed a broad anomaly some 5m across at its widest, which traced the north-east contours of the neighbouring spur. It appears to be earth-cut by human agency and not natural, but is irregular in width and ill-defined compared to what one might expect from a spade-cut ditch. Whether it was a formal means of delineating or protecting the hilltop enclosure cannot be determined from the survey alone.

The partial survey of the spur to the south-west of the saddle, which rises to some 12m above its lowest point, produced faint but still evident traces (especially when false-colour imagery is used to separate low levels of magnetic differentiation) of a rectilinear structure which can be interpreted as a building. It is aligned in the same orientation as the feature in the ringfort, with dimensions almost 20m in length suggesting a large house or agricultural building. Without further work its relation to the structure in the ringfort can only be a matter of speculation, but the survey results point to the possibility that the ringfort itself was but one component of a wider complex of features.

Magnetometry survey on Crockaughrim Hill

Studies of the settlement archaeology of the early medieval era in Ireland rely to a great extent on typologies of settlement enclosures, with the ringfort (the term is taken to include raths and cashels) being by far the most widespread and most numerous of the types, and the most studied (inter alia Stout 1997; Fitzpatrick 2009; and a recent review of the topic in O’Sullivan et al 2014, 48–55). But Lacey (2009), in reviewing the evidence from Co Donegal, has drawn attention to a class of enclosed sites, other than the ringforts, taking the form of large stone-built enclosures in hilltop or hill-slope settings. These, he suggests, might be elite secular centres existing alongside ecclesiastical enclosures and ringforts. While allowing for scant information on chronology, these might be understood as defensive or monitoring structures operating within the political and military geography of the early medieval period. Among nine examples recorded in Inishowen (Fig 1), the enclosure on the top of Crockaughrim Hill has close geographical proximity to the Carrowmore ecclesiastical site, just 1km away, in a way that suggests links between the two.

The hilltop of Crockaughrim is a flat boggy plateau 132m above sea level at the north-east and highest end of a rocky ridge extending for some 2km south-west/north-east and separating the basin of the Carrowmore River to the south from the flat alluvial plain at the edge of Trawbrega Bay (Fig 8). It is the most prominent topographical feature of the terrain between the Gleneely River to the east and the Glennagannon River to the west, with commanding views in all directions. Sited on the plateau and clear of the boggy areas, a roughly oval enclosure some 75m by 85m, known as Cashelbane fort, is defined by a rough stone wall set on an earthen bank. A modern field wall separates a small area on the west side from the rest of the enclosure.

In September 2015 the project group conducted a magnetometry survey under licence from the Department of Arts, Heritage and the Gaeltacht (licence number 15R0067). A Geoscan FM256 Fluxgate gradiometer was used for the survey; the sample interval used was 0.25m with a traverse interval of 0.5m at 0.1nT resolution. Data were processed with Geoplot 3 software. Ground conditions were good for the survey, with poor thin earth over a schist rock base, on two generally flat surfaces separated by a slight break of slope in a step less than 1m high running west/east across the internal area, and showing as a darker band across the survey plot (Fig 7); a sheep pen with iron fencing along the west side and a chain-link fence projecting into the survey area from the west hampered the survey, as did some gorse bushes. High readings on the west side correspond to a slight mound on the ground. The hilltop was used as a meeting place in the 19th century and this is thought to be a speakers’ mound (Seán Beattie, pers comm). The darker streaks running west/east across
the immediate local setting of the ecclesiastical complexes. Examination of the terrain within a 3km radius of the Crockaughrim enclosure, between the Glennagannon River on the west side and the Gleneely River on the east, out on to the low-lying land by Trawbreaga Bay to the north and into the interior to the south (Fig 8), reveals a dense clustering of ringforts of which Gorey is but one. To the north-west, ringforts on the Isle of Grallagh in Drumaville townland (NMS reference DG011-020) and Drumballycaslan (NMS Reference DG011-018) occupy locally prominent positions on rocky outcrops projecting above the flat land at the edge of the bay. Between Gorey and the crossing of the Glennagannon River near Carndonagh, the main road (R244) takes a northwards loop across the edge of the low-lying ground. This is an alignment of the 19th century; a now-minor road marks the older route which climbs steeply from Glennagannon Bridge, picking a course between north-projecting promontories above the low ground to the north and the broken craggy ridge to the south on which the Crockaughrim fort is sited, and down to the Gleneely/Culdaff River valley at the hamlet of Gorey. There is every reason to suppose from the topography that this is a long-standing routeway, passable under most weather conditions, and, allowing for the possibility of some small lateral shifts, amongst the oldest and longest-lasting features in this landscape. Five ringforts are

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aligned along this routeway. From west to east, the ringfort DG011-040, just on the 50m contour line, is marked on Ordnance Survey (OS) six-inch maps, but no longer visible as a surface feature; DG011-044 occupies the summit of a knoll immediately south of the road, and with extensive views in all directions; DG011-043, immediately north of the road, marks the edge of a north-facing promontory; DG011-045, just west of the hamlet of Cashel, lies north of the road; and DG011-046, is south of the road and just below the ridge of Crockaughrim Hill. In the south-west part of this circle, a ringfort DG011-052 is sited on the top of the locally prominent Dromore Hill, which looks out across the landscape in all directions — to boggy land at the upper reaches of Carrowmore River to the east, and towards the valley of the Glenanagannon River to the west. South-west below Dromore Hill and beside a small tributary of the Glenanagannon River, DG011-051 (though listed in NMS records as a mound) is an enclosure bounded by a much-robbed stone wall, possibly a ringfort. It occupies a plateau raised slightly above a marshy valley floor.

In the south-east segment of the circle, DG012-030 lies on higher ground, above the 100m contour, overlooking the valley of the Gleneely River to the east. This feature, recorded on the first edition of the OS six-inch map, is hardly visible in the field now, but the satellite view in Bing Maps (accessed July 2015) shows a faint cropmark. One kilometre north of this and also on higher ground above the valley, DG010-025 was recorded as a fort on the first OS six-inch map, but is no longer visible. A souterrain DG012-024 is recorded from 19th-century sources some 500m north-west of this, but the observation has not been confirmed in more recent surveys. East of the Gleneely River within the 3km radius the first OS map marks a ringfort DG012-026, which is no longer visible; it lies at the edge of the valley, below the 50m contour, just above an area of bog. At this point the valley of the Gleneely River begins to widen and no other settlement sites are recorded within the 3km radius from Crockaughrim.

The ringforts in this hinterland of the ecclesiastical complexes are all sited with a keen appreciation of topography in a landscape in which wet lands and the craggy ridge stretching south-west from Crockaughrim are bound to have made for difficulties before land drainage and engineering for raised roadways. Gorey fort watches over a ford from its knoll of glacial sand and gravel; the enclosures on the Isle of Grallagh and Drumballycaslan take advantage of hard-rock features to create settlements in the midst of extensive marshland; the string of five between Gorey and Glenanagannon Bridge reference a long-standing routeway between...
the two main river valleys of this area; the oval hill of Dromore is all but an island in a flat plateau; the others carefully pick raised land above river floodlands and marshlands. If these ringforts were in contemporary occupation (this would have to be tested by excavation), it would argue for intensive and careful use of this land during the period in which Clonca and Carrowmore housed religious communities. It invites speculation as to whether the religious houses were themselves agents for intensification of land use.

In a wider landscape setting, these are components of the small territory of Magh Tóchuir within the larger Cenél Éogain kingdom of the peninsula (Fig 9). A *magh* can be understood as an area of settled, agricultural land, as opposed to mountain, forest or bog, constituting the territory of a *tíath*, that is the people of a small sub-kingdom (Charles-Edwards 2000, 22), comparable with what the historical geographer Brian Roberts (2010) has identified in Northumbria as a cultural coreland. O’Brien and Adams (2016) offer a wider discussion of Magh Tóchuir in these terms. As a geographical unit, Magh Tóchuir is a basin of fertile land dissected by small rivers and streams descending from the main hill massif in the middle of the peninsula and across flat lands into the tidal inlet of Trawbreaga Bay.

Clonca and Carrowmore are among a set of early ecclesiastical centres, along with Carndonagh, Culdaff and Templemoyle, positioned around the bay in very particular landscape settings, being in each case at the edge of cultivable land and immediately above the flat terrain of alluvial and marine sediment at the fringes of the inter-tidal zone. So strongly marked is this features of their topography that one must assume that the positioning is deliberate. These are edge places, but whether the churchmen sought out the edges for spiritual reasons or to take advantage of the resources of two distinct ecological niches, the cultivated and the wild, would be difficult to know; the environmental evidence from Carrowmore suggests that solving this is not beyond the realms of archaeological testing. The large hilltop enclosures of Lacey’s classification are also sited with a clear landscape logic. Four look out across the bay and its flat lands, Glencree and Crockaughrim from the south side, and Doonmore and Crockraw on the Malin peninsula to the north. The four are inter-visible and each commands a wide prospect across the bay and into the interior areas in ways that suggest that they are markers of four principal sub-divisions of the territory. The close proximity of Carrowmore to Crockaughrim, already noted, is matched by Carndonagh in relation to Glenmakee and by Templemoyle and Culdaff in relation to Doonmore. Thus the field archaeology, assessed within its landscape setting, testifies to the integration of sacred and secular centres within systems of organisational complexity and hierarchy structured with reference to topography.

ACKNOWLEDGEMENTS

The excavation and surveys reported here were carried out by the Bernician Studies Group, a lifelong learning community in Newcastle upon Tyne, under the direction of Max Adams and Colm O’Brien; Deb Haycock supervised the excavations and Jack Pennie the magnetometry; Don O’Meara undertook processing of the environmental samples, contributing this section of the report and the appraisal of the metalwork fragments. Radiocarbon dating was done in the 14CHRONO Centre at Queen’s University Belfast; and in the Centre for Interdisciplinary Artefact Studies in the University of Newcastle. Raphael Hermann, under the direction of Dr Andrea Dolphini, carried out XRF analysis of samples of ironworking by-products.

The 2012 survey and the 2013 surveys and excavation were financed by the University of Sunderland through the good offices of Professor Ian Neal. The 2015 survey was carried out as part of a project supported by the British Academy. P&O Ferries and Lough Foyle Ferries generously defrayed the group’s travel costs for this work. We are grateful to the landowners and farmers on Inishowen who gave us access to their land: Paddy Mooney and Harry Molloy Jnr at Carrowmore; Tommy Doherty at Crockaughrim; Danny Green at Gorey; and the Department of Arts, Heritage band the Gaeltacht for access to Clonca. Seamus Canavan and his daughter Cressida made our visits comfortable in the Moville Holiday Hostel. Through the kindness of Martin McGonigle, the archaeologists John Cronin and Associates lent us equipment for the 2013 excavation. It was a pleasure for us to get to know Dessie McCallion, John Heggarty, Mervyn Watson and Sean Boyle from Inishowen who joined our excavation team at Carrowmore. On Inishowen, Dr Seán Beattie, Neil McGrory, and Eilis Haden have opened many doors for us and have been rich sources of advice and local knowledge. We value our academic collaborations with Dr Richard Tipping of the University of Stirling, with Professor Sam Turner and the McCord Centre for Historical and Cultural Landscape at the University of Newcastle, and with Dr Brian Lacey of Dublin who has throughout been most generous in sharing his knowledge and as a source of sound advice. To all of these we offer our sincere thanks.
NOTES
1 Carrowmore townland; centred at IGR 5065 4570; National Monuments Service reference DG012-002; Irish National Monument no 5.
2 Carrowmore townland; centred at IGR 5157 4574; National Monuments Service reference DG011-049.
4 Carrowmore townland; IGR 5144 4666; National Monuments Service reference DG011-028.
5 Carrowmore townland; IGR 5065 4570; National Monuments Service reference DG011-047.

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