ROMAN FORT ENVIRONS

ADDITIONAL GEOPHYSICAL SURVEY AT CAER GAI AND CEFN CAER

G1632

Report number : 635



Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

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Prepared

By

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Ymddiriedolaeth Archaeolegol Gwynedd Gwynedd Archaeological Trust

G1632 ROMAN FORT ENVIRONS, ADDITIONAL GEOPHYSICAL SURVEY AT CAER GAI AND CEFN CAER

1. INTRODUCTION

One of the most noticeable signs of the Roman occupation of North Wales is a network of forts, often visible as well-defined earthworks, sited at tactically important points within the landscape (Fig. 1). All of the surviving forts so far discovered in Gwynedd have been designated as Scheduled Ancient Monuments and as such have a high level of statutory protection. In many cases, however, the scheduled area only extends as far as the edge of the visible earthworks. A great deal of evidence has accumulated, both in Wales and further afield demonstrating that Roman forts should not be seen as standing alone in the landscape but instead viewed as the centre of a wider area of both military and civilian activity. Evidence from cropmarks, rescue excavation and chance finds has revealed the presence of extramural remains at several forts in Gwynedd but the evidence is in general fragmentary. Only the *vicus* at Caerhun, some extramural remains at Tomen y Mur, the military complex at Llanfor and a small extramural area at Caer Gai have been designated as Scheduled Ancient Monuments.

A Cadw grant-aided project was set up in 2000 in order to investigate the environs of all the forts suitable for survey in Gwynedd. A total of six forts were surveyed; Cefn Caer, Caer Gai, The environs of the now destroyed fort of Pen Llystyn, Bryn-y-gefeiliau fort and annexe, Canovium (Caerhun), and Llanfor. The surveys were followed by trial excavation at Cefn Caer and Caer Gai. The results were published in Britannia (Hopewell 2005).

The survey at Caer Gai produced good results but had been cut short by an autumn of exceptionally wet weather leading to flooding and damage to the gradiometer. Following suggestions by Dr Jeffrey Davies it was decided to carry out a further survey to cover the remaining three sides of the fort along with three small areas at Cefn Caer where the limit of Roman activity had not been reached.

2. METHODOLOGY

Fluxgate gradiometer survey provides a relatively swift and completely non-invasive method of surveying large areas. Roman military sites are well suited to this technique as significant magnetic enhancement of the soil is an inevitable result of the day to day activities in a Roman fort. The initial three years of the current project demonstrated the value of gradiometer survey. The surveys detected a wide range of features associated with the forts and their environs including ribbon development along the roads leading from the fort indicating the presence of *vici*.

Instrumentation

The survey at Caer Gai geophysical work was carried out using Geoscan FM36 Fluxgate Gradiometers. The survey at Cefn Caer also used a Bartington Grad601 dual gradiometer which consists of two gradiometers working in tandem. These instruments detect variations in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetised iron oxides which tend to be concentrated in the topsoil. Features cut into the subsoil and backfilled or silted with topsoil therefore contain greater amounts of iron and can therefore be detected with the gradiometer. This is a simplified description as there are other processes and materials which can produce detectable anomalies. The most obvious is the presence of pieces of iron in the soil or immediate environs which usually produce very high readings and can mask the relatively weak readings produced by variations in the soil. Strong readings are also produced by archaeological features such as hearths or kilns as fired clay acquires a permanent magnetic field upon cooling. Not all surveys can produce good results as results can be masked by large magnetic variations in the bedrock or soil and in some cases, there may be little variation between the topsoil and subsoil resulting in undetectable features.

The gradiometers are hand held instruments and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensors on the FM36 consist of two vertically aligned fluxgates set 500mm apart. Their Mumetal cores are driven in and out of magnetic saturation by a 1,000Hz alternating current passing through two opposing driver coils. As the cores come out of saturation, the external magnetic field can enter them producing an electrical pulse

proportional to the field strength in a sensor coil. The high frequency of the detection cycle produces what is in effect a continuous output (Clark 1990).

The gradiometer can detect anomalies down to a depth of approximately one metre. The magnetic variations are measured in nanoTeslas (nT). The earth's magnetic field strength is about 48,000 nT, typical archaeological features produce readings of below 15nT although burnt features and iron objects can result in changes of several hundred nT. The machine is capable of detecting changes as low as 0.1nT.

Data Collection

The gradiometers include on-board data-loggers. Readings in the Roman fort surveys were taken along parallel traverses of one axis of a 20m x 20m grid. The traverse interval was one metre. Readings were logged at intervals of 0.5m along each traverse giving 800 readings per grid. The original survey grids had been removed so the new survey was set up to overlap the earlier when applicable (mainly at Cefn Caer). The resurveyed areas in the overlaps produced results that were practically identical to those in the original surveys resulting in a seamless addition to the grey-scale plots.

Data presentation

The data is transferred from the data-logger to a computer where it is compiled and processed using Geoplot 3.0 and ArcheoSurveyor 1.3 software. The results are presented as grey-scale plots that have been integrated with the previous surveys along with revised interpretation drawings.

Definition of a Grey-Scale plot

Data values are represented by modulation of the intensity of a grey scale within a rectangular area corresponding to the data collection point within the grid. This produces a plan view of the survey and allows subtle changes in the data to be displayed.

Data Processing

The data is presented with a minimum of processing. High readings caused by stray pieces of iron, fences, etc are usually modified on the grey-scale plot as they have a tendency to compress the rest of the data. The data is however carefully examined before this procedure is carried out as kilns and other burnt features can produce similar readings. Corrections are also made to compensate for instrument drift and other data collection inconsistencies. Any further processing is noted in relation to the individual plot.

3. HISTORICAL AND ARCHAEOLOGICAL BACKGROUND

The Roman conquest of Britain was initiated in 43AD by the Emperor Claudius. The initial campaign was successful in subjugating the southern British kingdoms but probably had little impact on Wales. Its mineral wealth and important tactical position meant that invasion was inevitable and in AD 47 the army under the governorship of Ostorius Scapula began a campaign against the Deceangli of north-east Wales. A protracted and difficult campaign then ensued against the Ordovices and Silures culminating in an attack on Anglesey by Suetonius Paulinus in AD 60. The Boudican revolt in East Anglia, however, resulted in the redeployment of the legions and much of the territorial gains in North Wales were lost. The pre-Flavian campaigns are well documented by Tacitus but the archaeological record in Gwynedd is sparse. A series of marching camps would be expected to reflect the progress of the campaign and no archaeological evidence for the campaign against Anglesey has emerged. The complex of camps, possible stores base and fort at Llanfor remains one of the best candidates for pre-Flavian occupation (Davies 1980). The fort had probably been abandoned by the time that the early Flavian fort at Caer Gai was founded but could still be associated with the early Flavian campaigning (Arnold and Davies 2000). The camps appear to pre-date the fort suggesting an early date but hard evidence has yet to emerge. The marching camps at Derwydd-bach, Penygwryd and Tomen-y-Mur remain undated and could be Flavian. Pottery recovered from the annexe at Cefn Caer fort (Pennal) appears to be Pre-Flavian (Brewer 1978) but it is not known how this relates to the dating of the fort itself.

The attitude to the Welsh tribes changed significantly with the more aggressive policies of the new Flavian dynasty marked by the accession of Vespasian in AD 69. The conquest of all but the north-west of Wales was undertaken during the governorship of Julius Frontinus (AD 73-7). Cn. Julius Agricola became governor in AD 77 and was immediately faced with a rebellion by the Ordovices. The rebellion was crushed; Tacitus records that 'he cut to pieces almost the whole fighting force of the nation'. Agricola went on to conquer Anglesey thus extending Roman control across the whole of Wales. The network of forts and roads that can be seen across Gwynedd were mostly founded in the early Flavian period. The as yet undated fort at Llanfor could have been founded during the initial Frontinian campaign (Arnold and Davies 2000) and Ceramic evidence from Brithdir (Hopewell 1997) suggests Frontinian occupation although the fortlet itself remains undated. Other signs of the Frontinian campaign are less certain, the marching camps so far discovered in Gwynedd may date from this campaign and the more southerly auxiliary forts may have Frontinian origins. The auxiliary fort of Segontium, designed to form the hub of the Roman consolidation of North Wales is almost certainly Agricolan (Casey and Davies 1993) as is Pen Llystyn (Hogg 1968).

Agricolan campaigning in Scotland AD 78 initiated a period of gradual decline in the number of troops deployed in Wales. Many of the earth and timber forts were rebuilt in stone at the end of the first and beginning of the second century. In some cases, the reduction in troop numbers was reflected in a contraction in the size of the fort. Tomen-y-Mur was reduced in size by about a third (Jarrett 1969) and the fort at Pen Llystyn was replaced by a fortlet, possibly after a short period of abandonment (Hogg 1968). The process of garrison reduction gathered pace under Trajan and was most extreme in the period AD 110-25. It appears that the fortlets at Brithdir and Pen Llystyn were abandoned at this point (Hopewell 1997, Hogg 1968). Some forts have yet to be accurately dated but it seems likely that by AD 140 Segontium was the only auxiliary fort still in use in Gwynedd and this was operating with a much reduced garrison (Arnold and Davies 2000). Segontium underwent substantial rebuilding at the beginning of the third century. The mid to late forth century saw a dramatic increase in the levels of activity at Segontium and a probable reoccupation of Caerhun perhaps as a response to the threat posed by Irish Raiders (Casey and Davies 1993, Arnold and Davies 2000). It is probable that Segontium and the late naval base at Caer Gybi, Holyhead continued in use until about AD 393 when they were abandoned in response to the revolt of Eugenius in Gaul (Casey 1989).

3.1 The role of the *Vicus* and ancillary buildings

The vicus was a point of contact between the military and civilian population. The traditional view of the civilian vicus and military fort being mutually exclusive domains is no longer universally accepted and it is probable that there was a high degree of integration both spatially and socially between the two (James 2001). The large numbers of regularly paid troops within the fort naturally attracted traders and it can also be shown that goods for military supply were produced by the civilian population. Limited excavation within the vicus of Caersws auxiliary fort in Powys produced finds suggesting the presence of a tavern, along with copper and leatherworking workshops. Industrial debris has been recovered from an extensive settlement outside the walls of Segontium. Tanning and metal working areas in the annexe at Brithdir fortlet in Gwynedd could also be interpreted as being part of a vicus. Industrial debris makes such structures easy to identify, but the typical vicus contains number of buildings of indeterminate function and it is thought that these could have been eating or trading premises along with the houses of the civilian population some of whom may have had close links with the milites (Sommer 1984, James 2001). In many cases the fort became the nucleus of an extensive settlement and in the more prosperous areas of Roman Britain the settlements continued to be occupied after the army had abandoned the site. Current evidence suggests that the vici associated with the forts in Wales were very much dependent on the income from or presence of the military and did not survive beyond the abandonment of the forts.

Other more specifically military buildings that might be expected to be encountered in the environs of Roman forts include a bath house, a *mansio* (official inn or guesthouse), burial monuments, shrines, a parade ground, practice works, roads and leats.

3.2 The archaeology of Caer Gai and Cefn Caer - Pennal

Caer Gai

Caer Gai auxiliary fort (Fig. 2) stands on a rounded spur on the left bank of the river Dee close to the south- west of Llyn Tegid. The northern quarter of the fort is covered by a farm buildings and a seventeenth century manor house. The fort is clearly visible as a rectangular earthwork 128m x 120m with the bank standing to a height of 3m on the south-west. The south-west side and some of the north-east side retains a recut ditch. Parts of the original rampart wall can be detected in the present-day field boundaries.

Excavations in the southern part of the fort in 1965 revealed three phases of activity inside the turf rampart (Jarrett 1968). The rampart was datable to AD 70-85. Two phases of wooden barracks were identified with a further later anomalous phase of building on a different axis. Salvage excavations by Gwynedd Archaeological Trust in 1982 in the north-west rampart of the fort revealed three phases of defences; the turf rampart identified in 1965, a mid second century stone rampart cut into the original rampart and a massive possibly post Roman earth rampart (White 1986). A description of the fort in the Report of the Annual Meeting of the Cambrian Archaeological Association in 1884 is interpreted by White in an earlier paper (White 1985) as suggesting the presence of a post-Roman citadel. The report states that 'At a little distance [from the *vallum*] an outer dyke encloses a considerable circuit, probably 6 or 8 acres; and on the north-western side are large quantities of boulders, some standing as if they formed a scarpment or chevaux-de frise, and others dispersed as if they had been the foundations of some primitive buildings'. A further discussion by D.R. Thomas in 1885 (Thomas 1885 (i) and (ii)) includes a copy of an 'Old map of Caergai' (Fig. 3) that appears to show a curvilinear outer defence on the west and north of the fort along with local field names. White interpreted the curvilinear feature as the 'outer dyke' and the field name Wern Dwyndir (rough or hummocky land) as being the area of large boulders.

This interpretation is possible but not entirely convincing; the outer dyke is described in the 1884 report as enclosing a considerable circuit of between 6 and 8 acres, it is not clear if this includes the fort but this does not appear to correspond to the small enclosure shown on the 'old map'. Thomas (1885 (i)) also states that 'at some distance an outer embankment may be traced for a considerable portion of its circuit, having once enclosed many acres on the crown of the eminence on which it stands'. It should also be noted that Wern Dwyndir is on the east of the fort and not on the north-western side.

A wide range of extramural activity has been identified at this site. Robert Vaughan of Hengwrt (1592-1666) recorded the discovery of a coin of Domitian and an Early Christian stone with the inscription HEC [sic] IACET SALVIANVS BVRS (? or G) OCAVI(s) FILIUS CVPETIAN[I] (Nash-Williams 1950). Edward Lhuyd recorded in *Parochialia* (c.1665) that 'There was a chapel formerly in the field known as Kae'r Kapele, where there is a pavement when dug up'. Thomas (1885 (i)) also records that 'Bones have been dug up lately in this plot of ground, near the traces of the foundations of a building about 15 feet square, near the centre of the field. The outlines of the building are visible on the surface when the grass is scorched. This field is also called "Y Fonwent" or the graveyard'. A shrine consisting of a burnt square structure and part of an inscription in the name of the First Cohort of the Nervii possibly dating from the early to mid second century was discovered to the north-east of the fort in 1885 (Thomas 1885 (ii)). Flavian burials were also found to the north-east of the fort (Nash Williams 1950).

Aerial photography (Plate 1) has revealed evidence of road systems running from the south-east and north-west gates, along with a road running diagonally from the north-east gate. The outline of a building at the south-west end of Cae Capel could also be seen in enough detail to interpret it as a bath house (St Joseph 1977).

Cefn Caer – Pennal

The fort at Cefn Caer (Fig. 4) stands on a low spur about 100m north-east of the marshy flood plain of the Dyfi. The fort commands a view of both the highest tidal point of the river and its first good crossing point and was probably built in this location in order to allow the unloading of sea borne supplies (Bosanquet 1921).

The ramparts are clearly visible where they coincide with field boundaries to the south-west and northwest. Elsewhere they have been reduced to low spread banks. The sub-Medieval farmhouse of Cefn Caer occupies the western corner of the fort and a minor road running west from Pennal bisects the northern corner. A mound in the centre of the earthworks probably represents the remains of the *principia*. Cefn Caer was first recorded in 1693 by Maurice Jones, rector of Dolgellau in a letter to Edward Lhuyd. The remains appear to have been well preserved at this time:

The main fort was on the highest topp of the Hill and built quadrangular; and about it there was a strong wall and a broad ditch...And on the outside of the great ditch next the river Dyfi there were a great many houses built, and a little fort upon a lower banck which was built (as is supposed) of Brick, in that they are there very common. All the out walls are built of a rough hard stone.... From the fort to the water-side there is to this day a broad hard way paved with stones 10 to 12 yards broad in a straight line made through the marsh ground and meadow lands to the River side which is in length about 200 yards.

He also records a number of finds; a coin of Domitian, a little gold chain, a huge brass pan, a 'saphyr' [all from Cae Llwyn y Neuadd] and several pieces of lead and glass. He also collected local information stating that a well, built of lime and stone and at least '10 to 12 fathoms deep', had been found. It was also conjectured that the church at Pennal had been built with stones from the fort being built from 'rough stones with brick among them'.

Fenton visited the site in 1804 and recorded that the Vicar of Towyn had seen the Causeway running from Cefn Caer to the 'fordable part of the Dyfi opposite Garreg'. Fenton revisited the site four years later and 'Could see no ancient pitched way, unless the modern road to the River pursues the same Line'

There are local traditions of tiles, pottery, charcoal, masonry, charcoal and ashes being discovered on the site and in 1866 the Cambrian Archaeological Association made a small excavation and uncovered the remains of a well preserved hypocaust in the banks of the lane running in a southerly direction from the farm. They also recorded 'vast quantities' of ashes and charcoal in some of the hedge banks.

The only dating evidence from Cefn Caer is in the form of stray finds recovered from the site. A stamped tile attributed to the II Augustian Legion (AD 212-22) is said to have come from the fort (Nash-Williams 1969). The present owner Mr Elfyn Rowlands recovered two burnt central Gaulish lead-glazed bottles from the bank of the farm lane. These were reported as being pre-Flavian by R. Brewer of the National Museum of Wales (Brewer 1978).

Several features have been detected as parch marks on aerial photographs (Plate 2 and Fig. 5). Of particular note is, what appears to be a circular stone tomb to the south-west of the fort.

4. GEOPHYSICAL SURVEY RESULTS

The additional survey work was carried out in May 2005 and March 2006 by the author and Mr John Burman of Meirioneth Geophysical Survey Team. Mr Burman worked as a volunteer and added greatly to the scope of the project. The survey of the interior of Caer Gai fort and the high resolution survey of the annexe are entirely his work.

4.1 Caer Gai

Introduction

Evidence from aerial photographs and chance discoveries suggested that the most likely site for a *vicus* is in the large field to the north-east of the fort. A roughly rectangular area with dimensions of 140 x 170m, encompassing most of the field was surveyed in 2001. Additional areas in the interior of, and on the other three sides of the fort were surveyed during the present phase of the project. The results are presented as a grey-scale plot (Fig. 6) and an interpretation diagram (Fig. 7).

Results

Background noise levels (i.e. random variations in the data from subsoil etc.) were generally low and archaeological features produced fairly clear anomalies. The most obvious anomaly on the northeastern side consists of a road (1) running across the field. The road presumably runs out of the fort gate and turns towards the east-south-east, close to the edge of the survey area. A *juncus* free agger in the somewhat marshy field to the north east of the survey area represents a continuation of the road. Discrete thermoremnant responses within rectangular buildings (2) indicate a typical *vicus* roadside settlement. Evidence from Cefn Caer (below) suggests that these may be wooden buildings set with their long axes at right angles to the road. A well-defined group of six possible hearths (3) with no associated rectangular structures can be seen at the western end of the visible road. Comparable anomalies were detected at both Llanfor and Cefn Caer (below) and have been interpreted as ploughed out buildings with only the strong anomaly produced by the hearth surviving. A well-defined 35m long anomaly (4) appears to overlie the road. This was investigated during trial trenching in 2003 and was found to be caused by a repair in the road using a different type of stone to the original. A nearby area of high responses (5) was found to be a yard with material dumped over it (Hopewell 2003 and 2005). A further linear anomaly of unknown function (6) stands to the north-west of the area of high readings.

The northern third of the field produced very even responses with few visible archaeological features being detected. One small area of high responses (7) is visible. This appears to be rectangular with dimensions of 15m x 6m and could be interpreted as a small building. This was also investigated with a trial trench but results were inconclusive beyond the identification of a well-defined rectangular area of intense burning. A weak linear anomaly (8) to the south-east of this could represent a path or track from the feature.

The western side of the survey area is divided in two by a somewhat vague linear anomaly (9) which runs along the base of what appears to be a natural break of slope. This anomaly can best be interpreted as a ditch, probably dug to carry the run off from the slope although it could be interpreted as a road. An area of short linear anomalies along with stronger single anomalies (10) similar to the *vicus* alongside the road (2) can be seen to the north-east of ditch 9. It is worth noting that this area produced a higher level of background noise than its surroundings suggesting some artificial magnetic enhancement. A small circular anomaly (11) could be interpreted as a shrine or grave, similar to that detected at Cefn Caer. These anomalies are, however, very weak and poorly defined and while they superficially appear to represent further strip development alongside a road they may only be the result of plough scarring on a slight break of slope in the field.

The area to the west of ditch (9) comprises two areas of greatly differing responses. The northern part is magnetically very quiet. The southern part contains a mass of strong anomalies (12), some obviously linear, others less well defined. The anomalies are consistent with the remains of a large building or series of buildings, covering an area of 50m x at least 30m but no definite outlines can be traced. The linear anomalies are on a slightly different alignment to the fort itself and may therefore be either aligned with the road as it turns into the fort gate or possibly not contemporary with the fort. The area between the edge of the survey and the lane was unfortunately unsuitable for survey as it was

surrounded by a wire fence and was very muddy. It was, however, possible to feel a large amount of stone beneath about 40cm of mud when the area was walked over suggesting the presence of substantial foundations. It should also be noted that a small building is shown just to the south of this area on the 'Old map of Caergai' (Fig 6). The base of the building still stands against the field bank and it is possible that some of the stone has come from this source although this does not account for the linear anomalies.

The interior of the fort was surveyed but was found to be quite badly contaminated with ferrous material and most parts (e.g. 13) contained no interpretable anomalies. The remains of two, or perhaps three, pairs of barracks (14 and 15) lie alongside an internal road (16).

The two fields to the south-east of the fort produced very clear evidence for Roman activity. Road 16 continues (17) through an annexe that extends a short way beyond the edge of the current field boundary. The majority of the interior of the annexe was resurveyed at a higher resolution (0.5 x)0.25m) in order to recover the maximum amount of information. It appears to have been defended by a rampart (18) although this is a little unclear due to disturbance by field boundaries and the old coach road (19). A substantial building with dimensions of 48m x 45m stands to the south-west of the road. This produced a wide range of responses. The southern corner produced very high readings while the northern part is barely discernible. This could indicate that more than one phase of building is present but it seems more likely to be the result of the rear of the building being more deeply buried or perhaps just a greater amount of thermoremnant responses in the south of the building. The building appears to have a small central courtyard and to be divided into several ranges of small rooms these are most obvious on the north-eastern side. This layout suggests that the building can be interpreted as a mansio or official inn. The example at Godmanchester has a superficially similar layout (Green 1969). Another building lies to the north-east of the road. This is visible as a mass of thermoremnant responses. This is best interpreted as a bathhouse, both the furnaces and the fired clay bricks and tiles in the fabric of the building would be expected to produce high readings. Unfortunately little detail of the building itself is visible so this hypothesis cannot be verified. It is of course possible that this feature is a building of another kind that was destroyed in a catastrophic fire. The road continues in a straight line as far as the modern A494. There is a scatter of other activity on this side of the fort. Features 32, 33 and 34 are thermoremnant responses. Only 33 has any regular structure; the triple responses suggest ovens or hearths set in the shelter of the annexe rampart. A very strong response (22) in the angle of the rampart could be a large kiln but seems to be very clearly delineated perhaps indicating a modern ferrous origin. Linear feature 30 lies across the road and is probably a relict post-Roman field boundary. Feature 31 is probably a drain but could be of any period.

Further activity was detected on the south-west side of the fort. A road (23) running from the *porta principalis dextra* is faintly visible running on a slightly different alignment to the disused drive from Caer Gai farm. A branch appears to run to the south-east and is flanked on its south-western side by poorly defined buildings. These have a different layout to the structures in the north-eastern *vicus* but their plans cannot be fully resolved. The line of the road is also not entirely clear, it appears to turn to the east but the roadside activity carries on in a straight line. This is probably the result of a later, perhaps post Roman phase being present. Faint traces of the defences, probably a bank and ditch (25), of a second annexe are visible to the north-east of the disused drive. The return of the defences is lost in the roadside activity. Other linear features (27, and 36) on this side of the fort are probably relatively modern. It should also be note that the fort ditch 37 appears to have been kept open in post –Roman times. The upcast probably produced linear anomaly 38 and may have contributed to the confusion about the line of road 24.

Roman activity was predicted on the north-western side of the fort by aerial photographic evidence (Fig 2) but the geophysical survey produced little support for this. There is a level shelf immediately outside the fort, the land then drops away steeply to the north-west. Feature 28 probably represents a field boundary set along the break of slope. The projected line of the road from the aerial photographs seems to be very unlikely due to the steepness of the slope. Responses and noise levels across the level shelf are quieter than on the other sides of the fort suggesting lower levels of activity. Only faint traces of possible Roman buildings are present (e.g. 29). A modern track (28) and pipeline (39) also run across the survey area.

Conclusions and Summary

The geophysical survey has now extended to the edge of the major settlement around the fort. Funerary activity is to be expected at a greater distance along the roads but further survey is likely to produce diminishing returns. The overall results have set Caer Gai Roman fort within a wider landscape, revealing two areas of *vicus* settlement and an annexe containing what appears to be a substantial *mansio* and bath house complex.

4.2 Cefn Caer

Introduction

An irregular area of approximately 500m x 300m was originally surveyed, encompassing the whole fort and extensive extramural areas extending to between 50m and 250m beyond the ramparts. The survey was carried out in four separate areas that were divided by roads and field boundaries. The additional areas were added to the north-west edge, including an area adjacent to the sewage works, and to the south-east in the field between the fort and the Dovey marshes.

The most recent surveys were overlapped with the originals when in the same field. Two small gaps in the overlap in the northernmost area have been filled with a neutral grey on the plot. The resulting survey consists of five separate areas divided by field boundaries and roads

All five areas produced a similar range of results with relatively low levels of background noise. Ditches and roads produced weak and in some cases barely discernible anomalies. Buildings and occupation sites were visible as collections of strong anomalies many with readings of 20 to 30nT. Most archaeological anomalies produce readings of +- 15nT. The higher readings from Cefn Caer suggest significant magnetic enhancement, probably as a result of burning. This hypothesis is supported by the antiquarian references to charcoal and ash in the area of the fort. The surveyors also observed significant amounts of charcoal in an area of erosion in the northern corner of the fort. The very high readings around the edges of the survey areas were the result of fences, barns and, in one place, a cast iron bath.

A simplified interpretation plan was produced (Fig 8). This shows only the more definite anomalies along with outlines areas of more complex activity. It was felt that the grey-scale plot revealed the maximum amount of information and that any attempt to produce an interpretation plan showing all of the finer detail would tend to be over-complicated and obscure the weaker anomalies.

Results

The most noticeable set of anomalies form the close to square outline (135m x 125m) of the fort immediately to the east of the farm buildings. The rampart (1) is visible as a spread of moderate to high readings. The highest signals, in the northern corner of the fort, appear to be a result of burning, and deposits of charcoal can be seen eroding out of the field at this point. A single ditch (2) stands immediately to the outside of the rampart this can be seen as a faint anomaly around the northern and eastern corners of the fort. A 17-20m wide space (3) separates the inner ditch from an array of three outer ditches (4) on the north-west and south west sides of the fort. This area produced the quietest responses in the survey suggesting that it had been deliberately kept clear of all activity in order to preserve the integrity of the defences. The multiple ditches around the north-west of the fort are barely visible and the wide space between the inner and outer defences does not appear to be present. The fort ditches turn around the western corner of the fort to be lost amid the strong responses produced by the remains of the annexe.

It can be seen that the fort does not sit centrally within the outer defences. This may be due to topographic and other constraints but it is possible that the three outer ditches belong to an earlier phase and represent the defences of a larger wooden fort as opposed to the outer defences of the presently visible fort. Geophysical survey would probably be unable to detect earlier wooden buildings within most of the fort because they would tend produce very weak responses that would be masked by later activity. The area between the two sets of defences is however very magnetically quiet and weak

anomalies could perhaps be expected to be detected here. It is clearly beyond the scope of geophysical survey to produce a definite interpretation of the somewhat eccentric defences at Cefn Caer but the possibility that an earlier fort underlies the more obvious anomalies should be considered.

The internal arrangement of the currently visible fort can be seen with a reasonable degree of clarity. The most striking feature is the well-defined *principia* (5) with dimensions of 25m x 28m. The typical elements of a first century *principia* (Johnson 1983) are all visible. The entrance on the south-west leads into a courtyard with a portico on four sides bounded by a cross hall at the rear. At the rear of the building stand a set of five rooms comprising a central shrine room (*sacellum*) with offices to either side. The outline of the building is very similar to the *principia* at Gelligaer (Boon 1969) and Penllystyn. The large mound in the centre of the field suggests that the *principia* is stone built.

The usual arrangement of roads within the fort is well defined. The *principia* opens onto the *via principalis* (6), running from north-west to the south-east across the centre of the fort. A short length of the *via praetoria* (7) can be seen running at right angles to the *via principalis* but this is lost under the farmyard before it reaches the gate. The *via decumana* (8) running from the rear of the *principia* to the north-eastern gate (*porta decumana*) is well defined. The *via sagularis* (9) running around the inside of the ramparts is also visible in places. Two buildings can be seen to either side of the *principia*. The building to the north-west (10) is only partially visible but appears to be a substantial rectangular building and is best interpreted as the *praetorium* (commander's house). The building to the south-east (11) is less well defined consisting of a mass of linear anomalies, some of which appear to be on a slightly different alignment to the rest. This area of buildings extends behind the *principia* as far as the *via decumana*. It is probable that the anomalies represent several phases of building. *Horrea* (granaries) are commonly found in this area of the fort but there is nothing that can be interpreted as such in the results here. An alternative interpretation is that the many cross walls represent the divisions in a complex building such as a *fabrica* (workshop).

Elsewhere in the *retentura* one block of *centuriae* (barracks) (12) can clearly be seen, with the officer's quarters standing towards the corner of the fort. Some of the cross walls dividing the rest of the building up to form the *contubernia* can also be seen. The expected opposite set of *centuriae* (13) are very poorly defined in an area of what appears to be plough dragged remains. Short linear plough scars cross both the internal buildings and the rampart.

The *praetentura* appears to contain three ranges of buildings, those adjacent to the *via principalis* are rectangular in plan (14) with some cross walls visible at the south-east along with a fair degree of internal complexity, which could again represent several phases of building. The internal walls are most pronounced in the south-western half of the building and the building could thus be tentatively interpreted as a stable block with the stalls in this side of the building. The end of a rectangular building (15) with somewhat curved corners can also be seen on the north-western side of the *via praetoria*. The rest of the space in the *praetentura* appears to be taken up by two ranges of *centuriae*. Building 16 is reasonably well defined with some visible cross walls but only the narrow plot taken by building 17 gives any guide to its form.

Only two gates appear on the survey. The *porta principalis sinistra* (18) is visible as a break in the ramparts on the south-east but no detail of guard towers etc. can be seen. The *porta decumana* (19) is even less well defined. The other two gates could not be surveyed as they lie within the garden of the house and the outer farmyard. Neither has been built over and they could be relatively undisturbed.

A subrectangular annexe with dimensions of 110m x 75m can be seen on the south-western side of the fort. The edge of the enclosure is defined by a steep natural drop and a ditch (20) appears to run along the base of the slope. The road from the *porta praetoria* divides the annexe in two. A substantial rectangular enclosure (21) or building, with dimensions of 42m x 40m stands to the south-east of the road. The remains of stone walls standing to a height of around 0.4m can be seen in the sides of the farm track where it cuts the structure. This is similar to a large, close-to-square building discovered in the annexe at Caer Gai and could be tentatively interpreted as a *mansio* (official inn). A mass of high magnetic responses (22) defines the activity to the north-west of the road. Very little structural detail can be seen in this area but examination of the aerial photographs suggests the presence of a bathhouse. This hypothesis is supported by the fact that numerous pieces of Roman tile can be seen in the topsoil in the area suggesting that this is the site of the excavation made by the Cambrian Archaeological

Association in 1866. The results from the geophysical survey probably represent a spread of tile and *pilae* all of which, being fired clay, will produce strong magnetic responses.

The most noticeable of the extramural features are a series of rectangular enclosures, probably delineated by ditches, running from the outer defences on the north-east side of the fort. The very well defined anomaly (23) just to the north of the modern road defines the northern edge of these features. The grey scale plot is a little misleading, as it appears to show the anomaly running alongside the road in area A. Examination of the raw data reveals that the high responses here are a result of proximity to the fence and that the line of the feature probably runs along the modern road. A series of anomalies in area A (24) could represent the return of this feature, but the responses alongside the modern road are somewhat unclear. There does however appear to be at least one visible corner here. Another corner of a rectangular enclosure (25) can be seen on the inside of the (apparently) larger enclosure, but again only two sides can be traced. A further linear feature (26) along with an area of slightly increased noise can be seen to cross the inner enclosure close to the fort ditches. The multiple fort ditches in this area are not very well defined and it is possible that one, possibly the inner as it is on a slightly different alignment, could be part of the enclosures. The function of the enclosures is unclear, they are obviously of a different phase to the outer fort ditches and, they give the impression of cutting the outer ditch but this may be misleading. The road running from the *porta decumana* certainly appears to avoid the enclosures and the activity alongside the road also does not appear to extend into them suggesting that they were in use during at least part of the life of the fort. The function of these features is open to debate, the lack of noise and high responses seen over much of the survey area suggests that they were not used for the type of military or domestic activity seen in the fort and associated buildings and settlements. It is possible given the relatively level area in which these features are sited that the larger enclosure represents a small parade ground. There is no other level area that does not encroach into the marshes for some distance.

The rest of the extramural activity is centred on a series of roads running from the four gates of the fort. The extended via praetoria (27) runs through the annexe and then turns sharply to the south-east as it leaves the gate and appears to be leading towards the present road through the marshes. This suggests that the paved way noted in the early accounts of the fort may, as Fenton conjectured, follow the line of the modern road to the river. Beside the road at the very south of the survey area is a circular feature (28) showing very clearly on both the gradiometer results and the aerial photographs best interpreted as a stone built temple or tomb similar to that found at High Rochester (Bidwell 1997). The road running from the *porta decumana* (29) takes a sharp kink apparently to avoid features 23 to 26 before continuing in a north-easterly direction to the edge of the survey area. A considerable amount of activity (30), probably best interpreted as a vicus, can be seen alongside this road, concentrated at a distance of between 80 and 200m beyond the gate. The survey results consist mainly of linear anomalies between 10 and 15m in length running at right angles from both sides of the road with a spacing of 5 to 6m. These anomalies can, in places, be resolved into rectangular enclosures or buildings many of which contain a relatively strong single anomaly. Comparison with the results from Llanfor (Crew 1997), which clearly show rectangular plots or buildings containing a single anomaly interpreted as a hearth, helps to elucidate the Cefn Caer results. The basic structures seem to be similar in both cases although the somewhat confusing mass of anomalies in part of the Cefn Caer survey suggest that the buildings may have been rebuilt several times in different positions. Trial trenching in the 3rd year of the present project (Hopewell 2003 and 2005) confirmed that there were at least two phases of aisled wooden buildings. It should also be noted that this part of the survey exhibits a series of faint linear negative anomalies (31) which run across the road and are probably a result of later agricultural activity. The road appears to fork at the south-western end of the vicus with one branch (32) bypassing the fort. This is not entirely clear but would represent the most logical course of the continuation of road 36 (see below).

What appears to be a substantial rectangular building (33) with dimensions of 34 x 22m and at least one internal division, stands on the south-western side of the road leading from the *porta principalis dextra*. This could seen as another candidate for a *mansio* (official inn). The road beyond this point (35) is initially flanked on both sides by a series of small strong thermoremnant anomalies similar to the possible hearths in the *vicus* to the north-east. There are however no buildings visible here. These were initially interpreted as roadside funeral activity in the form of *bustum* burials but the extended survey revealed a series of buildings containing multiple hearths. These are clearly different to the buildings in the *vicus* to the north-east and can probably be interpreted as light industrial workshops containing small working hearths or ovens. The isolated hearths are therefore more likely to be linked

to industrial activity. The line of the road suggests that the current road to Pennal runs along the line of the Roman road . Another road (36) branches off to the north-east. This runs along a low terrace above Nant Caer and is flanked to the north-west for about 100m by buildings similar to those in the north-eastern *vicus*. Further interpretation of this area is problematic because there appear to be several phases of activity and the Roman road is cut by the modern. The turn from road 35 seems to be clear but its continuation is confused by another linear anomaly (47) perhaps a later field bank. Two possible lines of the road are visible although the northernmost is crossed by at least one rectangular building. The linear anomalies marking the edges of the buildings running a right angles to the road begin to turn at the eastern end of the settlement suggesting a turn towards the south-east perhaps indicating a link to road 32. The northern edge of the survey becomes progressively more difficult to interpret as it runs onto the slopes below the north-eastern *vicus*. High levels of noise and small thermoremnant responses extend beyond the end of the more obvious settlement but are disturbed by further relict field boundaries (40 and probably 41) and two large geological anomalies (45 and 46). Anomaly 34 marks the modern edge of the Dovey marshes.

Several other anomalies on the survey are of interest. The southern part of the survey displays a crisscrossing series of linear anomalies (37) which could be drains ditches or tracks of unknown age. A linear anomaly, with a rectangular enclosure of 20m by approximately 30m at the western end (38) of it, can be seen towards the north-eastern end of the survey area. This may be a larger plot relating to a phase of the *vicus*, but could delineate the edge of another alignment of the road from the *porta decumana*. An intriguing linear alignment of 8 small of anomalies at a regular spacing of 15m (39) can be traced to the south of the modern road to the north-east of the fort. They seem to be too close together to represent a fence line and too far apart to be the result of modern features such as telegraph poles and remain open to interpretation.

The south-eastern survey area contains no anomalies that are of any clear archaeological significance. A double linear anomaly (43) marks what was, until recently, the boundary with the Dovey marshes. A further linear anomaly 42 is probably a relict field boundary or drain and a large patch of noise (44) appears to be a natural variation. There is nothing to indicate the presence of a road from the *porta principalis sinistra* to the estuary.

Conclusions and Summary

The geophysical survey has now extended to the edge of the major settlement around the fort with the possible exception of the road towards Pennal. This has probably been disturbed by the sewage woks and modern road. Funerary activity is to be expected at a greater distance along the roads and the possible road docks and a crossing place of the Dovey have not been located with any certainty. Further work is clearly possible but further survey in the marshes would be problematic. The overall results have set the fort within a wider landscape, revealing a *vicus* in the form of ribbon development alongside a road, a possible industrial area, funerary activity, several enclosures and an annexe containing what appears to be a *mansio* and bath house.

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Fig.1 North-west Wales in the Roman Period



Fig. 2 Caer Gai, topographical survey and known archaeology



Fig. 3 The 'Old Map' of Caer Gai (Thomas 1885)



Fig. 4 Cefn Caer (Nash Williams 1969)



Fig. 5 Cefn Caer plan of features visible on aerial photographs (RCAHMW 2000)











Plate 1 Caer Gai, showing crop marks (Cambridge University Collection CB 13)



Plate 2 Cefn Caer showing cropmarks (from Sommer 1984)

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