CASTLE FARM, NEVERN, PEMBROKESHIRE: GEOPHYSICAL SURVEY 2012

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Gan / By

Philip Poucher

INVESTOR IN PEOPLE
BUDDSODDWR MEWN POBL

Ymddiriedolaeth Archaeolegol Dyfed Cyf
Neuadd y Sir, Stryd Caerfyrddin, Llandeilo, Sir Gaerfyrddin SA19 6AF
Ffon: Ymholiadau Cyffredinol 01558 823121
Adran Rheoli Treftadaeth 01558 823131
Ffacs: 01558 823133
Ebost: info@dyfedarchaeology.org.uk
Gwefan: www.archaeolegdyfed.org.uk

Dyfed Archaeological Trust Limited
The Shire Hall, Carmarthen Street, Llandeilo, Carmarthenshire SA19 6AF
Tel: General Enquiries 01558 823121
Heritage Management Section 01558 823131
Fax: 01558 823133
Email: info@dyfedarchaeology.org.uk
*Website: www.*dyfedarchaeology*.org.uk*

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SUMMARY

George Owen, writing in c.1600, recorded that during the medieval period Nevern, north Pembrokeshire, was a borough, consisting of 18 burgages. The location of these burgages has never been convincingly established. The current settlement is spread around the valley bottom on the banks of the rivers Nevern and Gamman and on lower hill slopes, but is overlooked by a 12th century motte & bailey on higher ground at the northern end of the village. Castle Farm and a field immediately south of the farmstead occupy relatively level ground immediately adjacent to the castle, and was therefore considered as a possible candidate for the location of the medieval burgage plots.

Pembrokeshire Coast National Park commissioned Dyfed Archaeological Trust to undertake the geophysical survey of the field immediately south of Castle Farm. The fieldwork was undertaken in March 2012.

The geophysical survey records several features within the field. It is likely some of these features represent modern service and drainage ditches, but there are some linear features at the southern end of the field that may be archaeological in nature.

However, no clear evidence of medieval burgage plots of settlement activity was revealed within the area surveyed.

1. INTRODUCTION

1.1 Project commission

1.1.1 Castle Farm, Nevern, lies adjacent to Castell Nanhyfer, a 12th century motte & bailey castle (PRN 1602), with possible iron age origins (PRN 1600). It has been reported (George Owen, writing in *c.*1600) that during the medieval period Nevern was a borough, consisting of 18 burgages. The location of these medieval burgage plots is unknown, the current village of Nevern is dispersed around the lower slopes below, and not easily accessible from, the medieval castle. Castle Farm, and an adjoining field to the south (SN 0809 4016), present a conveniently flat area of ground adjacent to the castle site, and was therefore considered as a possible candidate for the location of these medieval burgage plots.

1.1.2 Pembrokeshire Coast National Park commissioned Dyfed Archaeological Trust to undertake a geophysical survey of the field adjacent to Castle Farm in the hope of identifying the existence or absence of potential medieval burgage plots. The geophysical survey was undertaken in March 2012.

1.2 Scope of the project

1.2.1 The project aim was to characterise by geophysical survey, using a gradiometer, possible buried archaeological features, in particular possible medieval burgage plots.

1.3 Report outline

1.3.1 Because of the limited nature of this project, together with the considerable archaeological evidence in the wider area, this report is restricted solely to the results of the geophysical survey and subsequent test-pitting.

1.4 Abbreviations

1.4.1 Sites recorded on the Regional Historic Environment Record (HER) are identified by their Primary Record Number (PRN) and located by their National Grid Reference (NGR). Gradiometer readings are measured in nanoTesla (nT).

1.5 Timeline

1.5.1 The following table illustrates the approximate dates for the archaeological periods discussed in this report:

PERIOD	APPROXIMATE DATE
PALAEOLITHIC	*c.*120,000 BC – *c.*10,000 BC
MESOLITHIC	*c.*10,000 BC – *c.*4400 BC
NEOLITHIC	*c.*4400 BC – *c.*2300 BC
BRONZE AGE	*c.*2300 BC – *c.*700 BC
IRON AGE	*c.*700 BC – *c.*43 AD
ROMAN	*c.*43 AD – *c.*410 AD
EARLY MEDIEVAL	*c.*410 AD - *c.*1066
MEDIEVAL	*c.*1066 - *c.*1536
POST MEDIEVAL	*c.*1536 – *c.*1900
MODERN	*c.*1900 onwards

Table 1: Archaeological and historical timeline

2. THE SITE

2.1 Location and Archaeological Potential

2.1.1 Nevern is situated on the banks of the river Nevern, at its confluence with the smaller river Gamman. The Nevern valley itself is relatively open valley at this point with flat floodplains on the valley floor. To the south the land rises up gradually onto the northern slopes of the Preseli Mountains. The floodplains of the Nevern river and its confluence with the Gamman provide an area of relatively flat ground, at its widest on the northern banks of the Nevern. Beyond this, the northern side of the Nevern valley rises fairly steeply onto a long E-W ridge before the land rises again in a small but steep ridge a short distance to the north. Beyond this the land flattens out into a more gently undulating upland area.

2.1.2 The northern slopes of the Nevern valley are cut dramatically at this point by the Gamman. This cutting provides the promontory on which Castell Nanhyfer is sited. The settlement is irregularly laid out on the slopes to the south of Castell Nanhyfer and on the flat land mainly on the north banks of the Nevern.

2.1.3 The site itself consists of a single field, located on the ridge to the west of the castle, overlooking the village below. At the time of the survey the field was under improved pasture, surrounded by hedgerows. The buildings of Castle Farm form the northern boundary, a road skirting the western side of the castle forms the eastern boundary, to the south the land drops away through wooded slopes into the valley bottom below. Fields continue along the ridge to the west.

2.1.4 Nevern castle (Castell Nanhyfer) is a motte and bailey castle with an unusual 2nd stone-built defended tower on a rock-cut promontory in one corner of the bailey. This castle was initially built by the invading Norman forces under the Fitzmartins in the early 12th century. It was later captured by Lord Rhys in 1191 and held by him and his sons until 1195. The castle passed back to the Fitzmartins in 1196 but subsequently appears to have fallen out of use as Newport became the new centre of power for the Fitzmartins. It has been suggested that the first Norman motte and bailey castle reused and enlarged existing defences, possibly of Iron Age date.

2.1.5 Nevern itself also appears to have a history pre-dating the 12th century. At the foot of the slopes below the castle lies St Brynach's church. This is also a 12th century church but contains many early medieval features, including inscribed stones of the 5th or 6th century AD. The church is also believed to be on the site of a monastery established by Brynach in the 6th century. Some medieval texts mention supposed early medieval rulers of Nevern, including a Clechre or Clether (Brut y Tywysogion) in the 6th century, a Cian or Cynan (Annales Cambriae) in the 9th century and a Cuhelyn Fardd (Black Book of Carmarthen) in the 11th century. It has been suggested that if true, these rulers may have occupied the site later turned into a Norman castle. Fenton (1811) also claims that Meurig, the ruler of Dyfed during the time of Arthur, had his palace at Nevern.

2.1.6 George Owen, writing in *c.*1600, describes Nevern as "being some time a borough & having a portreeve & courts belonging to it is now decayed & become rural and the privileges discontinued. It consisted of 18 burgages". Unfortunately he does not cite where he got this information from but it is suggestive that there was an attempt to create a town at Nevern, presumably shortly after the Norman conquest of the area in the early 12th century.

2.1.7 Despite the relocation of the caput to Newport by the early 13th century any settlement established at Nevern may have remained as the church remained an important Parish church throughout the medieval period and Nevern lay on a pilgrimage route. By the 15th century the major landowners of the area are living

in outlying mansion houses, although one mansion house was located within the village itself, owned by a family claiming descent from Cuhelyn Fardd. This estate was gradually sold off in the early 16th century, and presumably the house was also abandoned, no trace of it now exists.

2.1.8 Some of the surrounding farms are mentioned early, such as Coedwynog to the east, first mentioned in 1331, and Llwyngwair, mentioned as belonging to the Cole's, a medieval Norman family. The 16th century saw the creation of many large gentry houses in the surrounding countryside that eventually became farmsteads by the 19th century. By the post medieval period it would seem the basic layout of Nevern as it is seen today had been established. George Owen (*c.*1600) and Fenton (1811) both describe a small rural village. The original Ordnance Survey surveyors drawing of 1810 shows a similar layout to today.

2.1.9 The geology of the area comprises of Ordovician sedimentary rocks with a band of Cambrian to Pre Cambrian acid lava and tuff to the south of the A487 and an area of sandstone along the coast to the north.

3. METHODOLOGY

3.1 A fluxgate gradiometer was used for the survey, which detects variations in the earth's magnetic field (full specifications are in Appendix 1). Readings were mostly taken at a medium resolution on traverses 0.5m wide and every 0.25m within a 20m x 20m grid across the site. In total an area of 1.26ha was surveyed.

3.2 Limitations

3.2.1 The survey was undertaken over two days in March 2012. Weather conditions were fine and generally dry. The fields were bounded by hedgebanks, containing wire fencing, and the northern edge was bounded by wire fencing wire a metal gate. These are likely to have obscured readings taken in their immediate vicinity. The field was of improved pasture and therefore had been at least lightly ploughed. The ground was relatively flat and under short grass, with a gradual slope to the south. Pacing lines were used throughout the survey and any variations in the data collections are likely to have been small.

3.2.2 The underlying geology and soils did not appear to cause any geological distortions of the geophysical survey results.

3.3 Processing and presentation

3.3.1 Processing of the geophysical survey data was performed using *ArchaeoSurveyor 2.5*, detailed explanation of the processes involved are described in Appendix 1. The data is presented with a minimum of processing but the presence of high values caused by ferrous objects, such as metal fencing, tends to hide fine details and obscures archaeological features, thus the values were 'clipped' to remove the extreme values allowing the finer details to show through. The survey was clipped to a range from 10nT to –10nT (Figures 3 & 4).

3.3.2 The processed data is presented as grey-scale plots (figure 3) overlaid on local topographical features (Figures 2 & 4). The main magnetic anomalies have been identified and plotted onto the background topographic detail as a level of interpretation (Figure 5).

3.3.3 Processing of the topographical detail was performed using Geosite software and illustrated and combined with the geophysical survey images using Adobe Illustrator ver.9.

3.3.4 All measurements given are approximate as accurate measurements are difficult to determine from fluxgate gradiometer surveys. The width and length of identified features can be affected by its relative depth and magnetic strength.

4. RESULTS

4.1 Geophysical Interpretation (Figures 5 to 7)

4.1.1 The geophysical survey shows a variety of possible archaeological activity throughout the surveyed area, therefore only the major features are discussed. Any interpretation from these geophysical results is by its nature speculative and precise details about the context, function, state of preservation and date of any archaeological features would require further intrusive investigation. The headings refer to features identified on Figure 5.

No. 1

Several strong discrete magnetically positive readings, often haloed with magnetically negative readings, are aligned along the eastern edge of the field. This alignment corresponds closely to a modern pipe laid through the field as described by the current farmer. The distinctive readings are often indicative of objects with a high iron content, and in this instance are likely to represent the metal clasps attaching the sections of buried pipe together. The pipe itself is not visible on the survey results, presumably because being plastic it gives off no magnetic signal.

No. 2

A linear feature crossing the field in a NNE – SSW direction. This feature is picked out with largely magnetically negative results, which can sometimes be typical of buried banks, walls or trackways. This feature however would appear too narrow and similar features in agricultural settings have often been found to correspond to late post medieval or modern ceramic or plastic field drains.

No.3

A linear feature running roughly east – west towards the southern end of the field. The feature is picked out largely by magnetically positive readings, often indicative of a cut feature such as a ditch or gully. This feature can be traced for *c.*25m, possible associated with linear feature No.4 to the west. The eastern end is obscured by the modern service pipe (No.1).

No.4

Two adjacent, faint, linear features, running roughly SW – NE. Both features are picked out by magnetically positive readings, often indicative of cut features such as ditches or gullies. The northernmost runs for *c.*22m, fading to the SW. The southernmost lies *c.*10m to the south, *c.*18m long, and at a slightly more acute angle than the northernmost linear. It is possible these linear features may be associated with a similar linear feature No.3. It is not clear what these features represent, but they may be archaeological in nature.

No.5

Close to the western edge of the surveyed area are a series of discrete anomalies formed by strong magnetically bipolar readings. Such readings are often indicative of objects or features with a high iron content. It is unclear from the survey along if this is an archaeological feature or relatively modern metal objects that are often detected spread through the plough soil.

5. CONCLUSION

5.1 The geophysical survey recorded several features within the field to the west of Castell Nanhyfer. It is likely some of these features represent modern activity within the field, such as service and drainage ditches, but there are some as yet unidentified linear features towards the southern end of the field that may be archaeological in nature.

5.2 No clear evidence of medieval burgage plots or settlement activity was revealed within the area surveyed. However, the survey results should not be seen as a definitive model of what lies beneath the ground surface, not all buried features will provide a magnetic response that can be identified by the gradiometer.

6. ACKNOWLEDGEMENTS

6.1 The survey was undertaken by Pete Crane (PCNP/DAT) and Phil Poucher (DAT). I am indebted to the landowner for allowing access to his land.

7. ARCHIVE DEPOSITION

7.1 The archive will initially be held by DAT, before being passed to the National Monument Record, Aberystwyth.

8. SOURCES

British Geological Survey, 1994, *The Rocks of Wales* 1:250,000.

Clark A J, 1996, *Seeing Beneath the Soil* (2nd edition). Batsford, London.

Poucher, P 2004 *Nevern, Pembrokeshire: Settlement Morphology, Topography and Archaeology* Dyfed Archaeological Trust Report 2004/36

Figure 1: Location map, based on the Ordnance Survey.

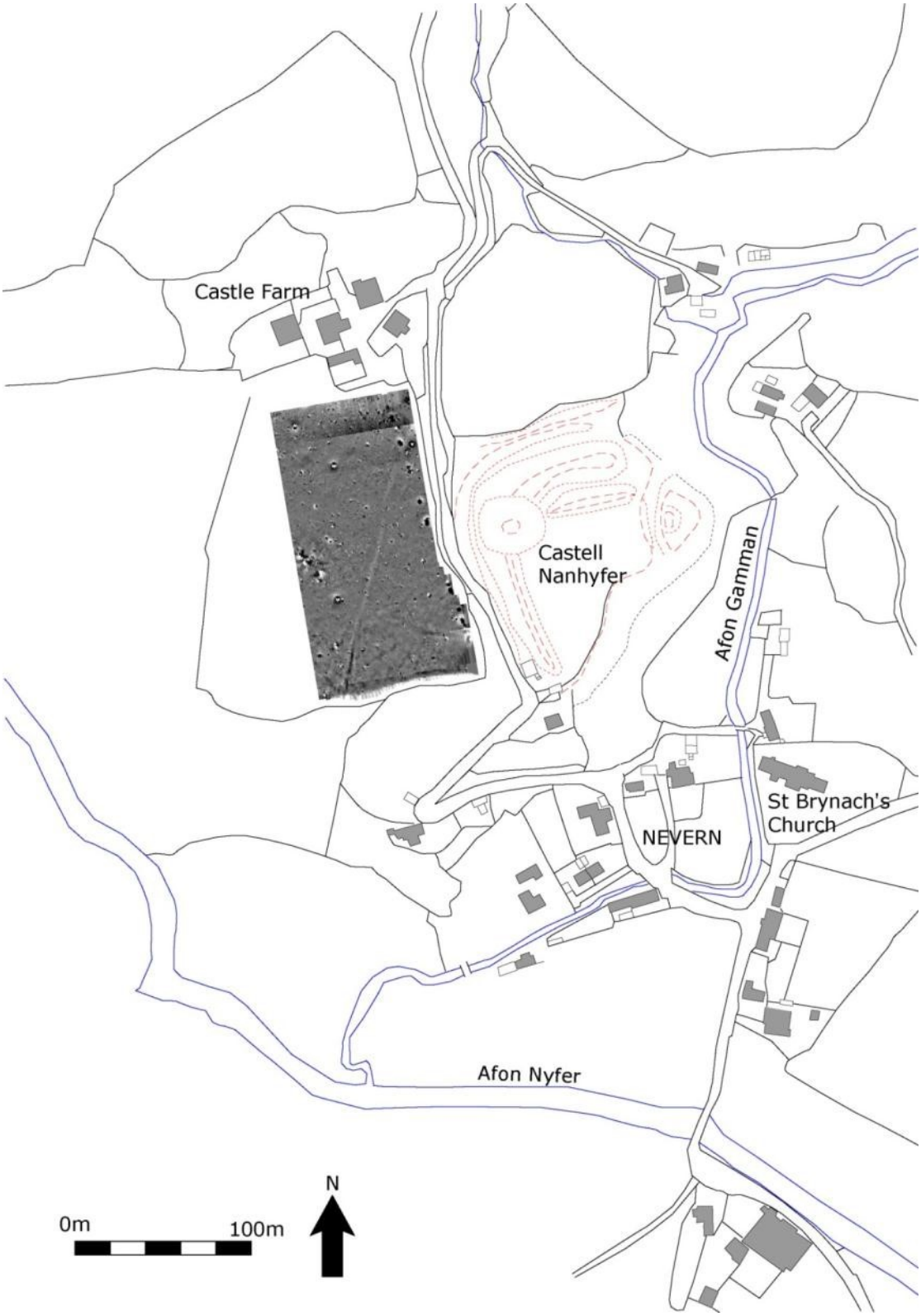

Figure 2: Location of survey area within the field, also showing the location of Castell Nanhyfer and local topographical features.

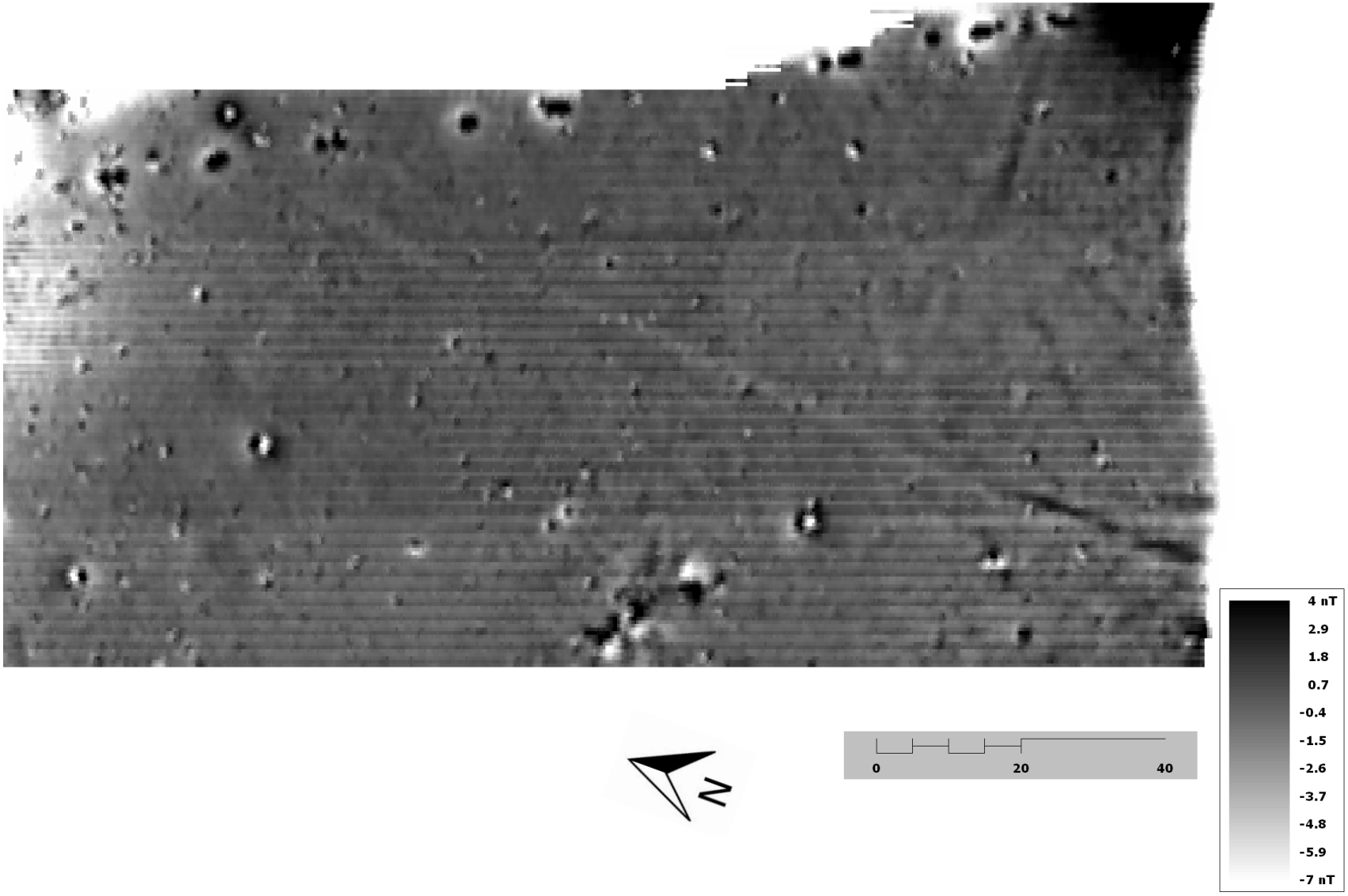

Figure 3: Geophysical survey results as greyscale plot. Scale in metres.

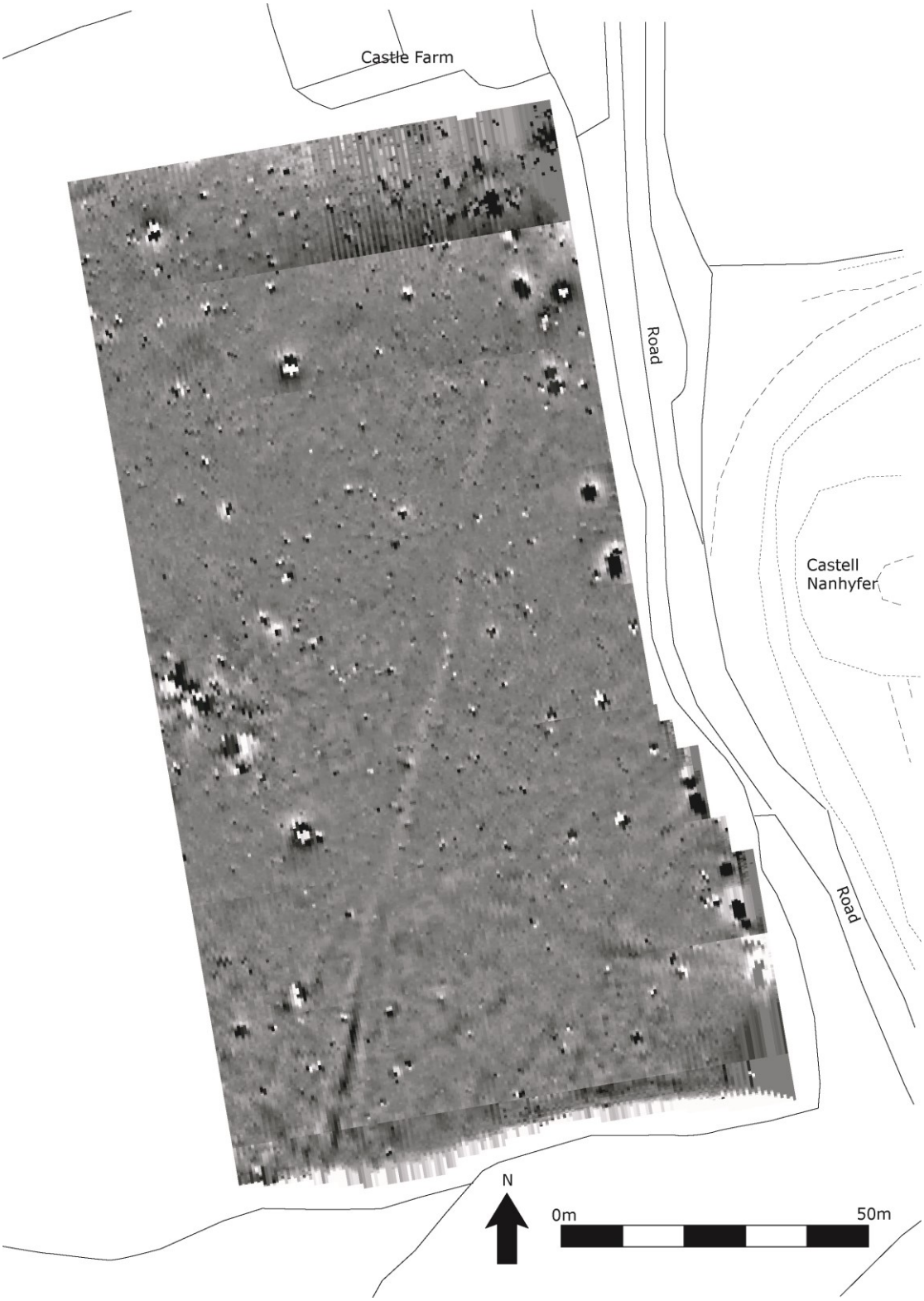

Figure 4: Geophysical survey results as greyscale plot, overlaid on local topographical features.

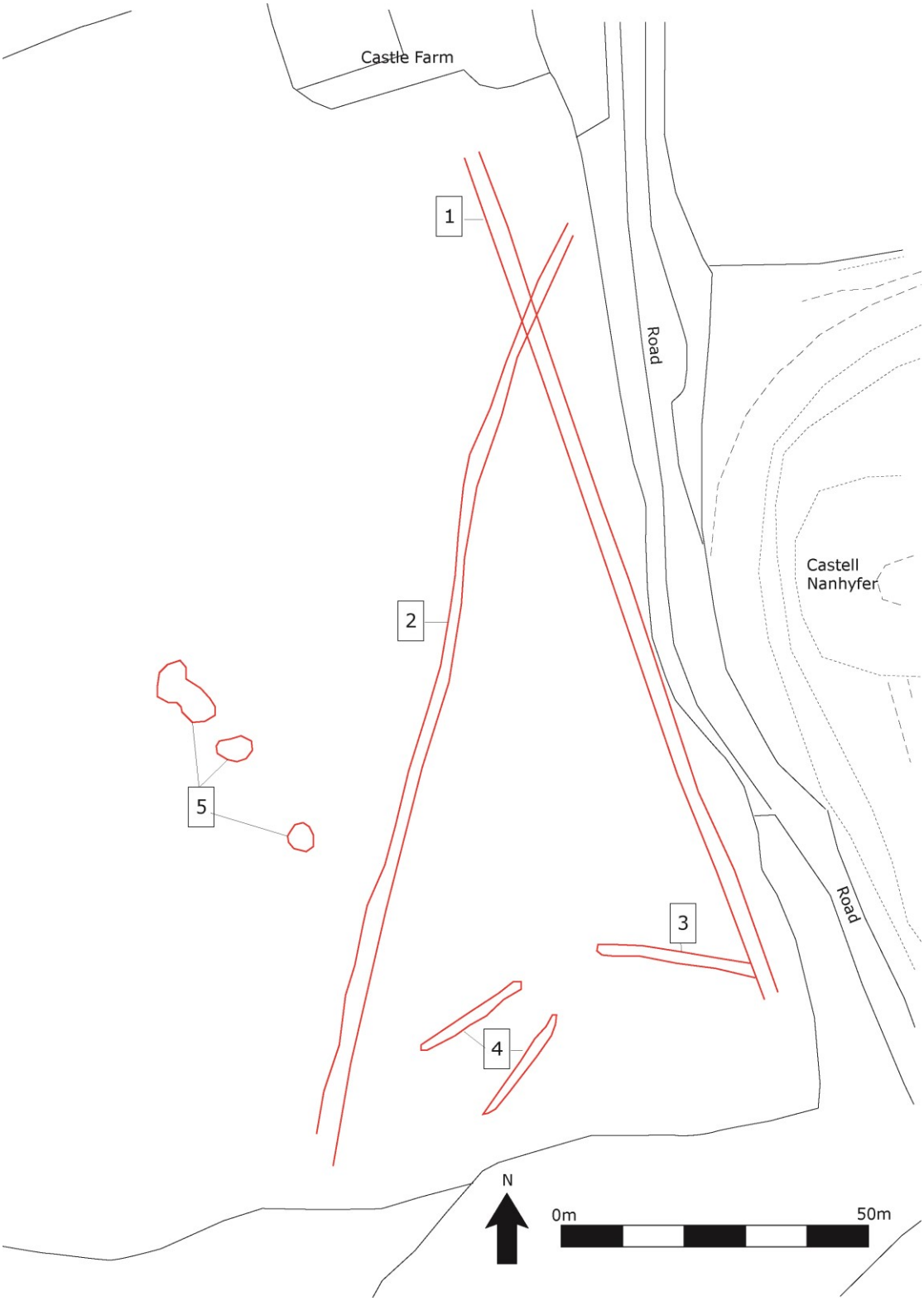

Figure 5: Main geophysical anomalies highlighted in red. Numbers referenced in the main text.

APPENDIX 1: METHODOLOGY AND INSTRUMENTATION

Geophysical Survey Instrumentation

A fluxgate gradiometer survey provides a relatively swift and completely non-invasive method of surveying large areas.

The survey was carried out using a Bartington Grad601-2 dual Fluxgate Gradiometer, which uses a pair of Grad-01-100 sensors. These are high stability fluxgate gradient sensors with a 1.0m separation between the sensing elements, giving a strong response to deeper anomalies.

The instrument detects 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. There are, however, other processes and materials that 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. Archaeological features such as hearths or kilns also produce strong readings because fired clay acquires a permanent thermo-remnant magnetic field upon cooling. This material can also get spread into the surrounding soil leading to a more generalised magnetic enhancement around settlement sites.

Not all surveys produce good results as anomalies can also be masked by large magnetic variations in the bedrock or soil or high levels of natural background "noise" (interference consisting of random signals produced by material within the soil). In some cases, there may be little variation between the topsoil and subsoil resulting in features being un-detectable. It must therefore be stressed that a lack of detectable anomalies cannot be taken to mean that that there are no below ground archaeological features.

The Bartington Grad601 is a hand-held instrument and readings can be taken automatically as the operator walks at a constant speed along a series of fixed length traverses. The sensor consists of two vertically aligned fluxgates set 1.0m apart. Their Mumetal cores are driven in and out of magnetic saturation by an 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 1996).

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 instrument is capable of detecting changes as low as 0.1nT.

Geophysical Survey Data Collection

The gradiometer includes an on-board data-logger. Readings in the surveys were taken along parallel traverses of one axis of a grid made up of 20m x 20m squares. The traverse intervals were either 0.5m or 1.0m apart. Readings were logged at intervals of 0.25m along each traverse giving 3200 readings per grid square (medium resolution on 0.5m traverses), or 1600 readings per grid square (low resolution on 1.0m traverses).

Geophysical Survey Data presentation

The data was transferred from the data-logger to a computer where it was compiled and processed using ArchaeoSurveyor 2.5 software. The data is presented as grey-scale plot where 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. A separate grey-scale plot with interpretation of the main features is also included as necessary.

Geophysical Survey Data Processing

The data is presented with a minimum of processing although corrections are made to compensate for instrument drift and other data collection inconsistencies. 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. The data on some noisy or very complex sites can benefit from 'smoothing'. Grey-scale plots are always somewhat pixellated due to the resolution of the survey. This at times makes it difficult to see less obvious anomalies. The readings in the plots can therefore be interpolated thus producing more but smaller pixels and a small amount of low pass filtering can be applied. This reduces the perceived effects of background noise thus making anomalies easier to see. Any further processing is noted in relation to the individual plot.

Reliability

Geophysical survey is an immensely useful tool but it should be realised that while a survey will detect a wide range of features, it may not detect *all* buried features. A gradiometer survey detects changes in magnetic flux density and relies on there being a detectable difference between the archaeology and the substrate. This may not occur for many reasons (e.g. a cut feature being backfilled with subsoil). It must therefore be stressed that a lack of archaeological responses from a geophysical survey does not prove that there is no archaeology present.

Grid locations

The survey grids were located by measurements to fixed points such as field boundaries located during the survey.

Bibliography

Clark A J, 1996, *Seeing Beneath the Soil* (2nd edition). Batsford, London.

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Paratowyd yr adroddiad hwn gan / This report has been prepared by

PHILIP POUCHER

Swydd / Position: ARCHAEOLOGIST

Llofnod / Signature .... Dyddiad / Date 07/02/13

Mae'r adroddiad hwn wedi ei gael yn gywir a derbyn sêl bendith
This report has been checked and approved by

JAMES MEEK

ar ran Ymddiriedolaeth Archaeolegol Dyfed Cyf.
on behalf of Dyfed Archaeological Trust Ltd.

Swydd / Position: HEAD OF FIELD SERVICES

Llofnod / Signature ..... Dyddiad / Date

Yn unol â'n nôd i roddi gwasanaeth o ansawdd uchel, croesawn unrhyw sylwadau sydd gennych ar gynnwys neu strwythur yr adroddiad hwn

As part of our desire to provide a quality service we would welcome any comments you may have on the content or presentation of this report

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