

**A NEOLITHIC CAUSEWAYED ENCLOSURE AT
NORTHBOROUGH, PETERBOROUGH, CAMBRIDGESHIRE**

Aerial Photographic Transcription and Analysis

February 1997

INDUSTRY AND ENCLOSURE IN THE NEOLITHIC.
A CAUSEWAYED ENCLOSURE
AT NORTHBOROUGH, CAMBRIDGESHIRE.

SUMMARY

This report concerns the aerial photographic survey of archaeological features in fields to the north east of Northborough Village, Cambridgeshire, centred at TF 156 084. A large, sub-oval enclosure, constructed of at least four rings of causewayed ditches was seen on aerial photographs taken in July 1996 by J. Pickering. Due to its causewayed construction, it was considered to be Neolithic in date.

1. INTRODUCTION

The photographic transcription of this site was undertaken between 19th and 21st February 1997, by Aerial Survey staff (Swindon) of the RCHME, as part of the Industry and Enclosure in the Neolithic Project.

All readily available photographs held by the Royal Commission on the Historical Monuments of England (RCHME) were examined in detail and a photogrammetric plan prepared at 1:2500 scale of all the archaeological features visible in the survey area. The photographic collection held by The Cambridge Committee for Aerial Photography (CUCAP) was also consulted.

The archaeological interpretation and photographic transcription were carried out by Carolyn Dyer, who also wrote this report.

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2. THE 1:2500 SCALE AERIAL PHOTOGRAPHIC TRANSCRIPTION

2.1. Objectives

The aim of this survey was to interpret and transcribe at 1:2500 scale, all archaeological features showing on the available photographs within the survey area. The survey was confined to four fields to the north-east of the village of Northborough, Cambridgeshire. Centred at TF 156 084. See Appendix 3, Fig 1.

The final objective was to produce an accurate photogrammetric plan of all the archaeological features within the survey area, in the form of an overlay to the Ordnance Survey (OS) 1:2500 scale plans. Target accuracy was $\pm 2\text{m}$.

2.2. Definitions

For the purposes of the present survey, cropmark features are defined as those which have been recorded by aerial photography as differentially coloured or textured marks in bare plough-soil, arable crops, grass or any other form of vegetation.

2.3. Photographic Sources Consulted

During the course of this survey, all the specialist oblique and vertical aerial photographs held by the RCHME were consulted. The CUCAP card index to their oblique collection was consulted but no coverage listed. The transcription was based entirely on photographs taken by J. Pickering in July 1996, copies of these images are now held at the National Monuments Record Centre (NMRC), Swindon.

It was not possible to carry out an exhaustive search for further photography that may be held by county councils, commercial air survey companies or private individuals. Although it is possible that some such coverage exists, it is unlikely to contain significant amounts of archaeological information not already recorded on the aerial photographs that were available for consultation.

2.3.1. *Quality and Reliability of the Photographs*

The enclosure was only visible on colour photographs from a single sortie undertaken by J. Pickering in July 1996. The quality of these photographs was excellent, the cropmarks being well defined and field control good.

Appendix 1 consists of a listing of the aerial photographs consulted, giving accession number, date flown and repository details.

2.4. **Survey Methods and Techniques**

The aim of the project was to produce accurate plots of the archaeological features using computer aided rectification. This was achieved through the use of the AERIAL software published by the University of Bradford which uses plane transformation techniques offering metrical precision in the region of $\pm 2.0\text{m}$ at 1:2500 scale.

Field control was derived from the current edition O.S. Plan: TF 1508.

The residual errors recorded during the rectification of the archaeological features were no greater than $\pm 0.4\text{m}$. Where archaeological features were plotted from more than one photograph, correlation was in all cases good, indicating that the features were located within 1.5m of their true ground position.

During the course of this survey, two separate photogrammetric plots were prepared, all of which were incorporated into the final drawing.

Appendix 2 consists of a listing of the digital file created during the course of the survey, giving file name, maximum residual error and digitised photograph reference number.

2.5. Cartographic Representation

At the time of plotting, the format of the published plans had not been decided. No topographical details of field boundaries have therefore been included in the pencil drawing.

Solid lines: Ditches or negative features.

Irregular stipple: Shallow or ill-defined cut features

3. PHYSICAL LANDSCAPE

3.1. Location and Topography

The enclosure lies 1 km from the west bank of the River Welland, immediately to the north-east of Northborough at TF 1557 0845. It is located on the river flood plain at approximately 6m above Ordnance Datum. The surrounding area is very low-lying, flat land and there is a high risk of seasonal flooding; it is likely that in Neolithic times when it was constructed, the enclosure would have been surrounded by marshy ground.

3.2. Geology and Soils

The underlying geology in this area is Jurassic Oxford Clay, a stiff blue clay containing unstratified bands of argillaceous limestone and this is capped by Pleistocene drift deposits and alluvium associated with the River Welland. Pelo-alluvial gley soils of the FLADBURY 1 SERIES (type 813b) occur on the alluvium of the Welland Valley. These consist of dark grey-brown stoneless clayey soils affected by ground water.

The enclosure lies close to the western end of Maxey 'island', a long low ridge of the Welland first terrace gravels, which is approximately 6.5km by 1km. The terrace gravels consist of varying thicknesses of current-bedded sand and gravel, made of limestone and flint. Typical brown calcareous earths of the BADSEY 2 SERIES (511i) cover the greater part of these gravels and consist of well-drained calcareous fine loamy soils. The aerial photographs indicate that the enclosure itself is positioned on a narrow gravel knoll, presumably an extension of the main Maxey 'island', which is visible as a lighter

cropmark than the surrounding alluvium. It would appear that the north-west edge of the enclosure is covered by alluvium which obscures the enclosure ditches in this area.

Evidence from the nearby causewayed enclosure at Maxey indicates that this alluvium was deposited from Late Iron Age times (Pryor 1983, 5) and it is likely that seasonal flooding meant that the area would not have been suitable for permanent settlement for a considerable length of time before that. Even though it forms part of the River Welland flood plain, in the Neolithic, this area would have been suitable for permanent settlement, (Pryor et al. 1985, 286). Excavations at Fengate demonstrated that during the Neolithic period, the fen edge was cleared of trees and parcelled up into a series of ditched fields, (Pryor 1980).

Information on the soils was obtained from the 1:250,000 scale Soil Map of England and Wales, published by the Soil Survey of England and Wales, 1983.

4. PREVIOUS WORK

4.1. Aerial Photographs

4.1.1. *Vertical Coverage*

Vertical cover is available for the survey area, dating back to January 1947 (CPE/UK/1932). The National Monuments Record (NMR) holds 10 vertical sorties of the area, all taken between 1947 and 1979. The enclosure is not visible on any of these photographs.

The vertical photographs offer an explanation as to why the site had not been photographed prior to 1996. The earliest images of the site date to the post-war period, when the whole area appears to have been under an arable regime. By the 1950s however, these fields were under pasture and all subsequent photographs indicate that this remained the case up to 1979. It is possible therefore that other than for a short period during and immediately after the war, the site had remained untouched by the plough. It is not known when ploughing recommenced in this area, but the 1996 photographs show that the site is once again under crop.

4.1.2. *Oblique Coverage*

As far as is known at the time of this survey, the enclosure is only visible on photographs from a single specialist oblique sortie, which was undertaken by J. Pickering in July 1996.

4.2. **Transcription and Field work**

Prior to its discovery in July 1996, no archaeological investigation had been carried out on this site.

5. THE ARCHAEOLOGICAL SITES

5.1. The Causewayed Enclosure

The enclosure which is visible as a cropmark is curvilinear and almost oval in shape, with its long axis oriented east-west. It comprises four concentric circuits of short ditches and causeways which appear to be paired, perhaps forming an inner and outer enclosure, (see Appendix 3. Fig 2).

The inner pair of causewayed ditches form an asymmetric, oval enclosure 170m by 130m, enclosing an area of approximately 1.75 hectares. The ditches of this inner enclosure lie 4m to 6m apart and vary in length from 4m to 18m, they are separated by causeways 1m to 5m wide. Approximately two thirds of the inner circuit is visible, whereas less than half of the outer circuit is visible. The inner ditches are generally broader than the outer ditches, being up to 3m across. Whilst the two arcs of ditches run closely parallel to each other, the positions of the causeways do not generally coincide.

The outer pair of ditches lie between 14m and 26m outside the inner enclosure and form a curvilinear enclosure, 230m by 180m, enclosing an area of approximately 3.32 hectares. This enclosure is less uniform in shape than the first, however the individual ditch positions and dimensions and the locations of the causeways of the two arcs match each other closely, suggesting that they were laid out at the same time and to the same overall plan. The ditch circuits uniformly lie 3m apart and are narrower than those of the inner enclosure averaging only 1m across. The ditches along the southern side form a smooth curve that runs closely parallel to the inner enclosure. At their eastern and northern sides however, they follow a more erratic and sinuous course.

On the south-west side of the outer ditch at TF 1552 0835, very faint cropmarks are visible lying 3m outside the enclosure. They appear to closely follow the outer ditch and may be traces of a fifth circuit.

The photographs show irregularities in the ground surface in the vicinity of the enclosure. Many of these features are likely to be natural, geomorphological features, associated with ancient water channels and irregularities in the surface of the underlying gravel.

Several more uniform, pit-like, features are visible inside the enclosure, these may be archaeological in origin and may be contemporary with the enclosure.

5.2. The Car Dyke

A broad ditch, 12m to 15m across and running in a north-north-east direction can be seen cutting across the centre of the enclosure. This can clearly be seen as an extant earthwork on vertical air photographs taken in 1979. It forms part of a series of watercourses constructed during the Roman period that extend from the River Cam at Waterbeach to the River Witham at Washingborough. These were considered to be Roman canals and have traditionally been known as the Car Dyke.

Research in the 1970s revealed that large areas of the fens had been subject to colonisation during the Roman period between 100 and 150 AD. The Car Dyke was therefore suggested to be a catchwater drain (Simmons 1978) possibly associated with land reclamation promoted by Hadrian after his visit to Britain and that this whole area may have been administered as an Imperial estate, (Frere 1978). The question of function is still unresolved but it is likely that drainage, land reclamation and waterborne transport all probably played an important role for this dyke system.

5.3. Other Archaeological Features

The faint cropmarks of a sub-circular ditch-defined enclosure are visible at TF 1559 0827. It is 23m across and probably represents the plough-levelled remains of a Bronze Age round barrow.

Fragments of a ditch-defined, rectilinear field system is visible overlying the causewayed enclosure and cutting across or cut by the Car Dyke. A double-ditched linear feature, probably a trackway runs east-south-east to the north of the enclosure. Two of the field boundaries run up to and stop at this feature, suggesting that the field system and trackway are contemporary. It is not possible to date these features from the cropmarks alone, however, considering that until recently the Car Dyke remained an extant, if denuded feature, it is possible that the field system predates the watercourse indicating a pre-Roman date.

6.1. CONCLUSIONS

The aerial photographs clearly indicate the presence of a large multi-ditched enclosure visible as cropmarks at TF 1557 0845. The enclosure is formed of a series of short ditches separated by causeways and has therefore been interpreted as a causewayed enclosure of Neolithic in date.

The enclosure is located in an area rich in Neolithic monuments. No less than four other Neolithic causewayed enclosures lie within 10km of the Northborough site. The Etton causewayed enclosure, which was excavated in the early 1980s (Pryor 1983 and Pryor et al. 1985) lies 2.4km to the west at TF 138 073. The site at Barholm, published by St Joseph (1970) lies 9.5km to the west at Barholm, TF 090 103 and a third enclosure is located at Uffington, 7km to the west-north-west at TF 054 080. In 1995, a fourth site was discovered by RCHME during aerial reconnaissance at Upton 9.5km to the south-west, (TF 100 006). In addition to these causewayed enclosures, the Neolithic complex at Etton, comprising henge monuments and a Cursus lies less than 3km to the west, near the village of Maxey. The Northborough enclosure must therefore be viewed as one element of an extensive Neolithic landscape.

During this survey it was noted that the shape and size of the inner double-ditched enclosure bears a remarkable resemblance to the site at Uffington; both are asymmetric, sub-oval and enclose an area of approximately 1.8 hectares. This sub-oval shape is also exhibited by the enclosures at Barholm and Etton. Causewayed enclosures of this oval shape are not common in other parts of England and this suggests that these Fenland sites may have been built by a geographically distinct group of people. Only one other oval causewayed enclosure has been recognised to date, at Southwick, Northamptonshire, (TL 049 929); which at 29km to the south-west may be considered to be an outlier to the same geographical group, (See Fig 4, APPENDIX 3).

Morphologically, the Northborough example is the most complex of this group of six enclosures. Being multi-ditched it seems likely that it had a fairly long period of use and underwent several episodes of construction. The differences in ditch width and causeway location exhibited by the circuits of ditches may suggest that they were not dug at the same time and the inner circuit with its relatively wide ditches may have been the earliest

phase of construction. The two outer ditches exhibit a high level of uniformity and are therefore likely to be contemporary. Whilst they generally follow the line of the inner enclosure, this is not a precise match suggesting that the two enclosures were not laid out at the same time. The outer enclosure is possibly the later addition to the monument.

This enclosure is known from a single set of aerial photographs taken in July 1996 and it is recommended that further aerial reconnaissance be undertaken in order to add detail to overall site plan. Non-destructive field investigation such as field walking would also be of value and may confirm the interpretation. When excavated, its neighbour at Etton proved to be rich in archaeological and environmental remains, its low-lying waterlogged position having led to the preservation of many organic materials. There is a high probability that the Northborough site is also at least partially waterlogged and on its western side where it is covered by alluvium the underlying archaeological deposits are likely to have been protected from ploughing man-made or natural erosional forces.

The field immediately to the west of the site has recently been developed as a housing estate. In the 1996 photographs continuing housing development can clearly be seen in adjacent fields. It is recommended therefore that the site be immediately considered for protection.

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APPENDIX 1

AERIAL PHOTOGRAPHIC SOURCES

OBLIQUE PHOTOGRAPHS CONSULTED

NGR Index number	Accession number	Frame	Date flown	Copyright
TL1508/5	16867	40	14-07-96	JAP
TL1508/6	16867	41	14-07-96	JAP
TL1508/7	16867	42	14-07-96	JAP
TL1508/8	16867	43	14-07-96	JAP

VERTICAL PHOTOGRAPHS CONSULTED

library number	Sortie number	Frame	Date flown	Scale	Repository
563	CPE/UK/1932	3081-82	17-01-47	9960	MOD
659	CPE/UK/2109	4052-55	28-05-47	9800	MOD
1829	58/2481	118-20	16-06-58	10000	MOD
1829	58/2481	147-50	16-06-58	10000	MOD
2165	543/2337	225-26	30-07-63	10000	MOD
3951	82/894	156-57	07-04-54	12000	MOD
4241	MAL/65093	15-16	03-11-65	12000	NMR
6953	39/3150T	3798-804	26-07-79	3300	???
7001	MAL/73004	110+102	09-02-73	15000	NMR
7002	MAL/73008	60-61	02-03-73	15000	NMR
10635	OS/71328	143-45	06-07-71	7500	OS

APPENDIX 2

DIGITAL FILE INDEX

DIGITAL FILES

Digital file name	Digitised photograph	Maximum residual error
NORTHBRO.DIG	TF1508/6	± 0.4 m
NORTHBRI.DIG	TF1508/8	± 0.3 m

APPENDIX 3

SITE PLANS

