

**REPORT OF TOPOGRAPHIC SURVEY OF 'ROY'S ORCHARD',
PIPE ASTON, HEREFORDSHIRE**

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PROJECT CODE: PPA20041

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AUTHOR:

M. ROSEVEARE BSc(HONS) MSc MEAGE

ArchaeoPhysica Ltd.

POSTAL ADDRESS: PO BOX 530, SHREWSBURY, SHROPSHIRE. SY5 6WH UK

TELEPHONE: +44 (0) 7050 369789

E-MAIL: mail@archaeophysica.co.uk

WEB: www.archaeophysica.co.uk

Report of Topographic Survey of 'Roy's Orchard', Pipe Aston, Herefordshire

1.1 Introduction

- 1.1.1.1 A topographic survey to locate and record earthworks was commissioned by Dr. Allan Peacey of the Pipe Aston Project, funded by the Local Heritage Initiative, as part of ongoing research into early tobacco pipe manufacturing within and around the village. The orchard is situated at SO 462 722 within a corner of what appears to have been a Saxon or Norman planted settlement. Immediately to the east of the orchard is a low ring-work while a motte-and-bailey castle stands at the opposite end of what was once the main street.
- 1.1.1.2 Work on the Pipe Aston Project, including surveys in 2002 by ArchaeoPhysica, has demonstrated that tobacco pipe manufacture was widespread as a cottage industry by the early 1700's and that substantial features survive, including kilns and wasters. These are mostly located in modern gardens near the existing roads though some have been found further afield where pockets of suitable clay exist.
- 1.1.1.3 At the time of survey (30th August 2004) the orchard had not been grazed for a while and the grass had become long enough to mask smaller earthworks. This did not prove too much of a problem because the fairly high spatial resolution of the survey was sufficient to capture detail even where this was not immediately visible.
- 1.1.1.4 Within the orchard, recent excavations by the Pipe Aston Project have revealed the sites of two kilns and also a masonry structure. In addition there are low mounds of gravel, perhaps removed from the clay during processing, and visible adjacent to the modern stream channel. Other earthworks, some fairly major, mark former plot boundaries that seem to relate to individual burgages that have been absorbed within the modern boundary. Among these larger earthworks there are numerous more subtle examples that before this topographical survey were hard to understand but now appear to reflect multiple phases of reuse of the land.

1.2 Methodology

- 1.2.1.1 The survey used a TopCon 212 total station operating conveniently from a single set-up point at co-ordinates (1000, 2000, 100) on the local grid.
- 1.2.1.2 The co-ordinate system used in this report is the local site system for convenience. Field margins, railings, fencing roads and gateways have been accurately surveyed in, along with the brickwork of the stream culvert.
- 1.2.1.3 Field survey consisted of the collection of a loose grid of points across the whole site at between 3m and 5m intervals depending upon the uniformity of the terrain. Visible earthworks were surveyed in detail to capture their 3-dimensional shape and to create breaklines in the data to constrain the subsequent grid production process.
- 1.2.1.4 Once downloaded from the total station the data was corrected for minor errors, e.g., point sequence for breaklines, etc., and split into data from which to form a topographic model, e.g. spot heights and breaklines, and general mapping data, e.g., fence lines.
- 1.2.1.5 The topographic model was generated by interpolation of the data to a 1m x 1m grid using a kriging algorithm. A variogram was generated for the raw data and then a variogram model fitted to this to ensure accurate interpolation; details of this are

shown on drawing 1 of this report. Golden Software's Surfer 8 was used for this and for production of the models and images in this report.

- 1.2.1.6 Three types of imaging have been used in this report; conventional topographic models, e.g. surface and contour plots, the former represented as wireframes and 'artificial sun' plots (drawings 1 & 2). The second, usually rather powerful technique, is the use of perspective relief models that are also lit (drawing 3). This allows the ground to be visualised as if devoid of vegetation and the interaction of the terrain and the simulated lighting allows extremely subtle variations in topography and texture to become visible.
- 1.2.1.7 The third sort of imaging (drawing 4) is a specialised topographic technique called terrain slope analysis that calculates the absolute value of the maximum slope at all grid nodes in the data set. This derived data represents the slope in degrees and is particularly valuable for the detection of buried structures where the earthwork may be quite low, but could still be defined by a sharp transition. By definition, any anomalous slope relates directly to the presence of an earthwork and hence the technique is excellent for the objective extraction of information and the detection of subtle features.

1.3 Results

- 1.3.1.1 The letters in green in the text that follows appear on drawing 4.
- 1.3.1.2 The data set has proved informative with a large amount of detail; it is difficult, however, to offer a detailed interpretation of many of the features. There would appear to be little correspondence with the geophysical data sets collected a couple of years ago (ArchaeoPhysica, 2002). There is a possible exception in the electrical resistance data where a division of electrical properties may correspond with earthwork C.
- 1.3.1.3 The earthwork labelled A is the edge of the current entrance into the orchard from the lane. It seems likely that this entrance has been established for a long time, perhaps contemporary with the creation of the orchard.
- 1.3.1.4 Linking this entrance with a gateway in the east boundary is a narrow and slightly eroded track through the orchard. This appears to cross plot boundaries, which implies that the track must post-date these.
- 1.3.1.5 The southern limb of earthwork B is visible as a distinct change in level north to south and looks like a burgage boundary. What is less evident on the ground is that it seems to be continuous with a plot edge near the northern edge of the orchard. This northern section may also be a former continuation of the stream channel to perhaps the site of a ford near the current bend in the road.
- 1.3.1.6 At D there is similar earthwork that runs east then north to meet the northernmost plot edge (part of B). Between B and D there is a roughly level area that is almost certainly the site of a burgage and presumably once contained buildings. This is a significant find as it demonstrates that the orchard occupies a part of the village that was previously settled and is therefore evidence of shrinkage.
- 1.3.1.7 Passing beneath this is a slight earthwork C that seems to correlate with a distinct change in the electrical properties of the ground (ArchaeoPhysica, 2002). The earthwork could therefore be of natural origin.
- 1.3.1.8 Earthworks E and G are more difficult to interpret. Once again, they seem to enclose a regular-shaped roughly level area and are therefore almost certainly of artificial origin. It would be unusual to have plots aligned across burgage divisions

unless these plots were late, e.g., post medieval. The identification of G is less certain than of E, which seems to join D adjacent to the present track through the orchard.

- 1.3.1.9 Within this enclosure there are a number of low parallel earthworks that continue eastwards, e.g., at H. These are thought to be remnants of an earlier orchard layout or alternatively could be due to cultivation in an earlier phase.
- 1.3.1.10 A particularly striking earthwork is at F. This is best appreciated in the contour plots of drawing 4 which show a strong linear earthwork crossing the north-eastern corner of the orchard and continuing into the modern stream gully. It seems fairly clear that this gully has cut through the earthwork which may originally have continued to sweep westwards to form a continuation of B. Within this sweep the ground is generally slightly higher which is typical of the build up of ground within long-settled areas. Could this earthwork mark the rear of the Saxon or Norman settlement? The close proximity of a ring work (immediately east of the orchard, in the next field) may also have a bearing on the interpretation.
- 1.3.1.11 In addition to the specific earthworks above there are numerous small linear changes in slope. Some of these are probably due to use of the site as an orchard but for many it is impossible to offer any sort of interpretation and only excavation is likely to reveal their full nature.
- 1.3.1.12 The excavations have revealed remains of masonry structures and the topographical data contains evidence of at least one empty burgage plot. It seems likely that further structures exist buried within the orchard and the results of the project so far suggest that substantial evidence for the development of the settlement may survive.

1.4 Conclusions

- 1.4.1.1 It is probably correct to assume that the site was within what appears to have been a Saxon or Norman-founded settlement and was probably occupied by buildings and associated burgages. The present open nature of the site is perhaps due to contraction of the settlement within the medieval or early post-medieval period. The tobacco pipe industry may well be associated with regrowth of settlement as people took advantage of the resource.
- 1.4.1.2 All these activities, spread over a considerable range of time, seem to have left evidence in the form of earthworks and this is particularly evident from the terrain slope analysis.
- 1.4.1.3 The overall picture that is emerging from the Pipe Aston Project is that this orchard may be considered extremely important as an archaeological resource. While it is currently not under any threat the long term security of the site needs to be considered and an application for it to be included on the Schedule of Ancient Monuments should not be ruled out once the Pipe Aston Project has completed its investigations.

1.5 Bibliography

- ArchaeoPhysica 2002, "Clay Tobacco Pipe Kiln Surveys", Pipe Aston Project, unpublished.