Historic England

Research Report Series 74/2024

An Archaeological Survey of the Parwich Rings

Parwich, Derbyshire

David Went and Jackie-Ann Judge

Landscape Archaeology

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2024

NGR: SK 1720 5761

Print: ISSN 2398-3841
Online: ISSN 2059-4453

Summary

An extensive pattern of 173 (known) small ring features, defined by shallow ditches and low external banks, extends across a broad dry valley near the village of Parwich in Derbyshire. This survey, utilising archive aerial imagery and drone-acquired surface models alongside ground-based observation and analysis, amplifies earlier ground surveys published in 1962 and 1997 and improves considerably upon their accuracy. The earlier surveys were accompanied by sample excavations aimed at establishing the rings' origin and purpose, definitive evidence for which was not forthcoming. Without artefacts, human remains or indications of burning, the excavators were left with no firm conclusions, though both speculated on the possibility of funerary practices dating from the early to mid-Bronze Age. Scientific dating evidence obtained from a single ring sampled in 1999, as yet unpublished, points to medieval or post-medieval construction, but a wider range of samples may be required before such a date could be regarded as conclusive. The present survey does not attempt to determine the rings' date or function. It records patterns and morphology, and compares the evidence seen here with suggested parallels elsewhere. Its main purpose is to lay the foundation for further archaeological research which is required if the mystery of the Parwich Rings is to be satisfactorily resolved.

Contributors

Drone photography and lidar was captured and processed by Matthew Bristow and David Went of Historic England's Landscape Archaeology Team (LAT). Jackie-Ann Judge, Archaeological Technician Apprentice, transcribed and analysed the features revealed in the aerial imagery, assisted by Sally Evans and David Knight of the Aerial Survey Team. Ground-based investigation of features was undertaken by the authors, supported by Marcus Jecock and Jonathan Last, also of LAT. All photography is by the authors unless otherwise stated.

Acknowledgements

The authors would like to thank the Parwich Parish Council and the farming tenants, Mr Dickinson and Mr Shaw, for access and permission to conduct the survey. Thanks are also due to staff at the Peak District National Park, particularly Anna Badcock, Team Manager Cultural Heritage; Natalie Ward, Senior Conservation Archaeologist, and Joe Bawden, Farm Advisor, for bringing this site to our attention and for all manner of practical assistance. The authors would also like to thank Daryl Garton and Graeme Guilbert for their generosity in sharing their previous research, including pre-publication information, which is fully acknowledged in this report.

Front cover image: Ring No.102, south field (see Figure 30 for location) viewed from the south-east, while in use as a temporary take-off and landing site for the DJI M300 drone used to capture the photogrammetric and lidar terrain models (March 2023 © Historic England).

Archive location

All project data is accessioned to the Historic England Archive, Swindon. The report can be downloaded from the Historic England Research Report Series database and that of Archaeological Data Services, York. Digital copies have been submitted to the Historic Environment Record at the Peak District National Park Authority, as well as to key local record offices and public libraries. The investigation has been registered under OASIS id:nmrl-519580.

Date of survey/research/investigation

Aerial images for the surface and terrain models were acquired on 27 March 2023. Field surveys were carried out on 13-14 December 2023, 13-15 February 2024, 25-27 March 2024 and 29-30 April 2024. The report was written in August-October 2024.

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Introduction

An extensive pattern of small ring features, defined by shallow ditches and low external banks, straddles the lower slopes and floor of a shallow dry valley in the parish of Parwich, in the Derbyshire White Peak (Figure 1). This highly localised pattern was recognised as a significant archaeological phenomenon in the mid-20th century, prompting surveys and sample excavations carried out in 1958-60 and 1991. The authors of those investigations (Lomas 1962; Makepeace 1997) both speculated that the rings related in some fashion to funerary practices dating from the earlier Bronze Age, which would place them within a rare category of upstanding prehistoric monuments, invariably meriting statutory protection. However, the excavations revealed neither human remains, nor artefacts, nor any evidence of burning. Without such evidence their age and purpose remained uncertain, and no such protection was afforded. Scientific dating evidence obtained from a single ring sampled in 1999, as yet unpublished (Guilbert and Garton in prep), points to medieval or post-medieval construction, but a wider range of samples is required before such a date can be regarded as conclusive, and even then, the rings' purpose remains to be determined.

This investigation of the Parwich rings was designed in response to a request from the Peak District National Park Authority (PDNPA) to enhance understanding of these enigmatic archaeological features in order to assist in their future management and preservation.

The approach taken in 2023-2024 was to create an accurate plan of the visible rings based on drone-acquired surface models, augmented by all available aerial photography, Environment Agency lidar, ground-based observation and limited ground survey. The results offer a considerable improvement over the accuracy of the ground surveys published in 1962 and 1997, and reveal a slight increase in overall numbers, although equally some rings appear to have been lost to agricultural activity over the intervening periods. The present survey does not attempt to determine the rings' date or function. It records patterns and morphology, and compares the evidence seen here with suggested parallels elsewhere. Its main purpose is to lay the foundation for further and more invasive research which is required if the mystery of the Parwich rings is to be satisfactorily resolved.

A note on terminology

Previous authors have described the features at Parwich as ring-ditches or ring-banks, depending on their view of their most definitive characteristic. Though correct, both terms are somewhat loaded with established archaeological meanings which may be misleading in this case, and they tend to obscure the fact that banks and ditches occur together. Ring-bank and ring-ditch are cited below in the context of earlier researches, but the more neutral term 'rings', as used in the title and elsewhere in this report, may be more appropriate.

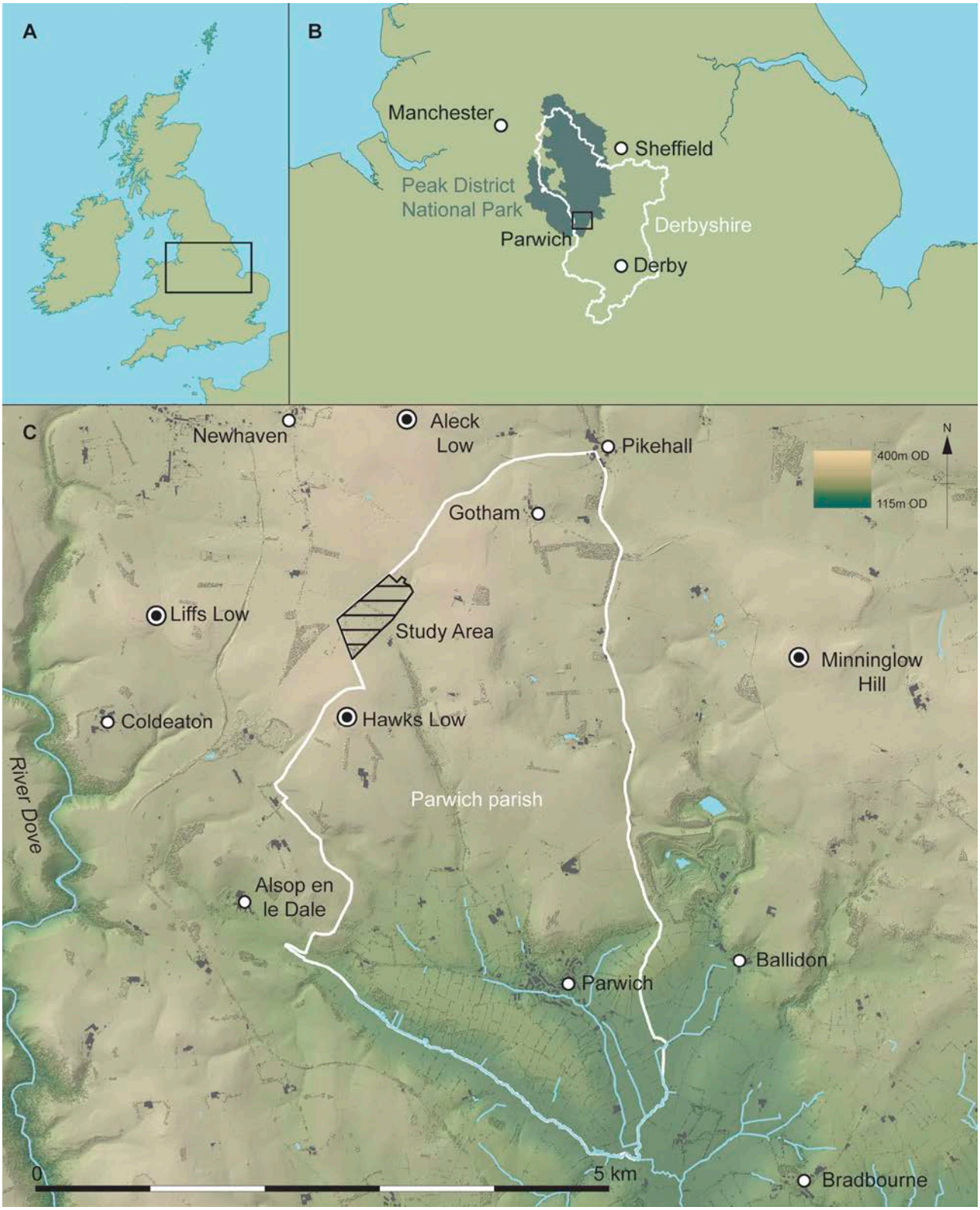

Figure 1: The location of the Parwich rings and other places mentioned in the text.
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Background

Location, topography, geology soils

The cluster of rings lies within the parish of Parwich, approximately 10 kilometres north of Ashbourne, in the White Peak area of the Derbyshire Peak District (Figure 1). It extends across an area of about 15ha straddling the base and lower slopes of a shallow dry valley between Hawks Low Common to the south and Cardlemere Lane to the north. The visible pattern is almost entirely confined within two fields, located north and south of a lane which runs through the valley toward the village of Parwich some 3.5km to the south-east. The approximate centre of the cluster (SK 17200 57614) falls within the southern field, which contains the greater proportion of rings. On this side the rings extend about 350m away from the lane, where the land rises some 25m from the 335m above Ordnance Datum (OD) level of the valley floor. On the north side the furthest features lie some 200m from the road at around 350mOD, just below a run of limestone outcrops from which the area of the fields took its former name of White Cliffe Common (*see* Figure 5)

The two fields have different histories of recent land use (see below), but share the same underlying bedrock of the Monsal Dale Limestone Formation (BGS 2024) and superficial deposits of free-draining, loamy, slightly acidic but base rich soils (LandIS 2024).

Previous research and documentary history

The rings were first recorded by John Lomas, following their initial discovery during a survey of the boundary area between Hartington and Parwich in 1957. A group of about 100 ring-ditches were noted, described as ‘low banks enclosing shallow ditches round raised central areas’. Most seen were circular, a few oval, and one was described as a figure of eight. Ranging from 12-50ft (3.65-15.24m) in overall diameter, none were more pronounced than a foot (0.3m) measured from the bottom of ditch to top of bank (Lomas 1962, 91). The group was surveyed in 1958, recording 28 in the southern part of the north field and 70 across the south field.

The two fields in which the rings were found have a particular history which sets them apart from their immediate surroundings. Prior to the Enclosure Act of 1788 they formed part of Hawkslow Common, latterly falling with the acreage allotted to Sir Charles Levinge (ibid). Fifty-four years later, when the 1842 tithe award (D1856/A/P1/13/1) was produced, ownership had evidently transferred. The north field (parcel 195), then known as ‘Big part of White Cliffe Common’, was occupied by Thomas Shaw and George Brownson, and the south field, ‘Little part of White Cliffe Common’ by William Calladin, but both fields were owned by the ‘Surveyors of Highways Benjamin Lees and another’.

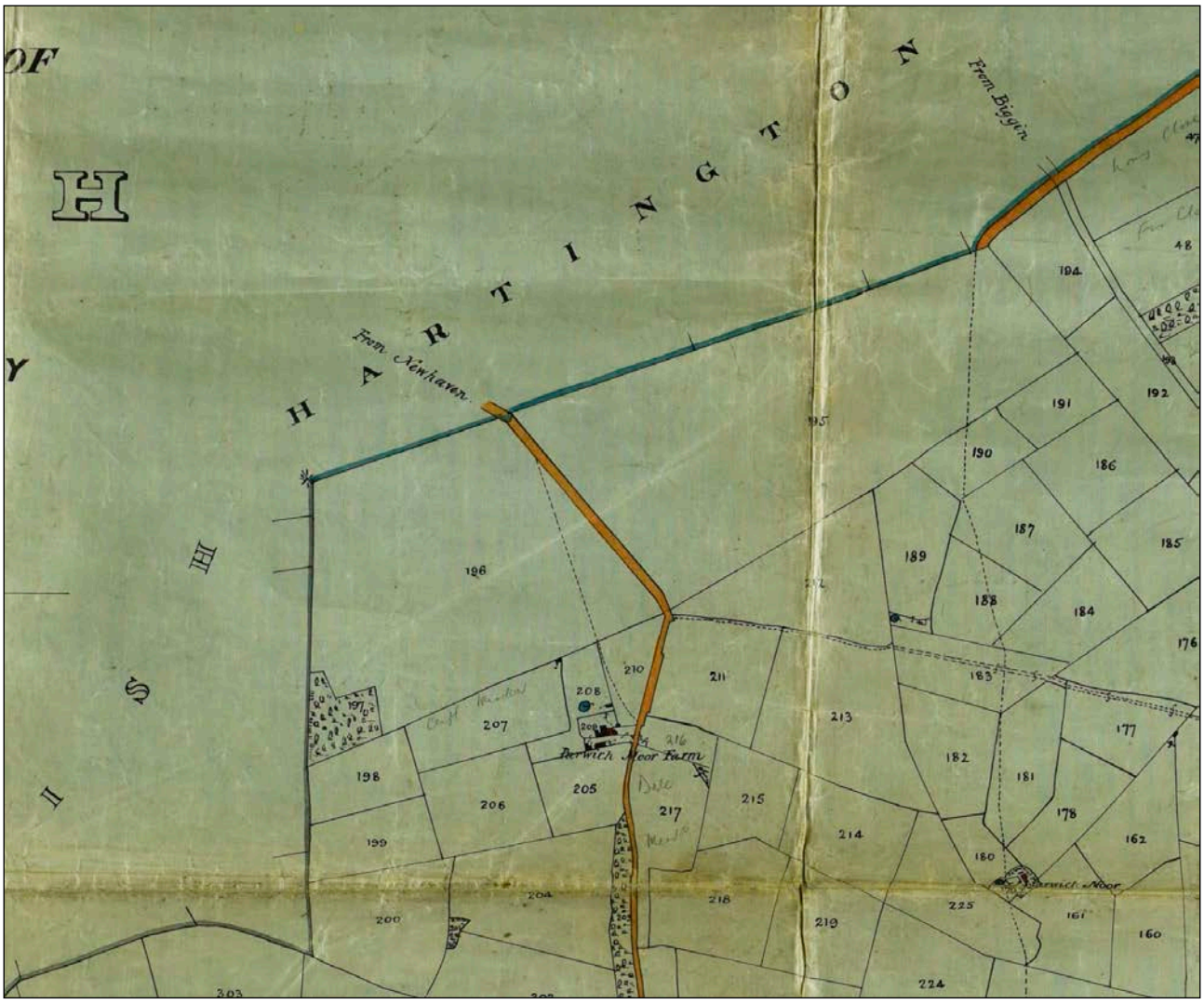

Figure 2: Extract from the 1844 Parwich tithe map showing the two fields (195 and 196) to either side of the Newhaven-Parwich lane. D1856/A/Pi/14 Reproduced with permission from the Derbyshire Record Office.

Tenure remained unchanged at the time of the 1844 tithe map (D1856/A/P1/14/1) which shows the two fields hard by the eastern boundary of Hartington Nether Quarter Township (Figure 2). Lomas refers to a 1847 tithe award which stated that the land was held as above, but on behalf of 'Beresford's Charity'. However, no such dated award could be found in the Derbyshire Record Office or The National Archives, and it is to be wondered if there was some confusion with a parcel of indentures appointing trustees to the charity's lands in Parwich (D3104/2/4 Beresford Charity papers 1811) none of which has any bearing on the fields in question.

At the time of the 1844 tithe map, a single farmstead, Parwich Moor Farm, stood in isolation near the southern boundary of the south field (Figure 2), over which it held no tenure. The situation remained essentially the same at the time of the 1898 Ordnance Survey (OS) 25-inch map (surveyed 1879) which characterised both ring fields as rough

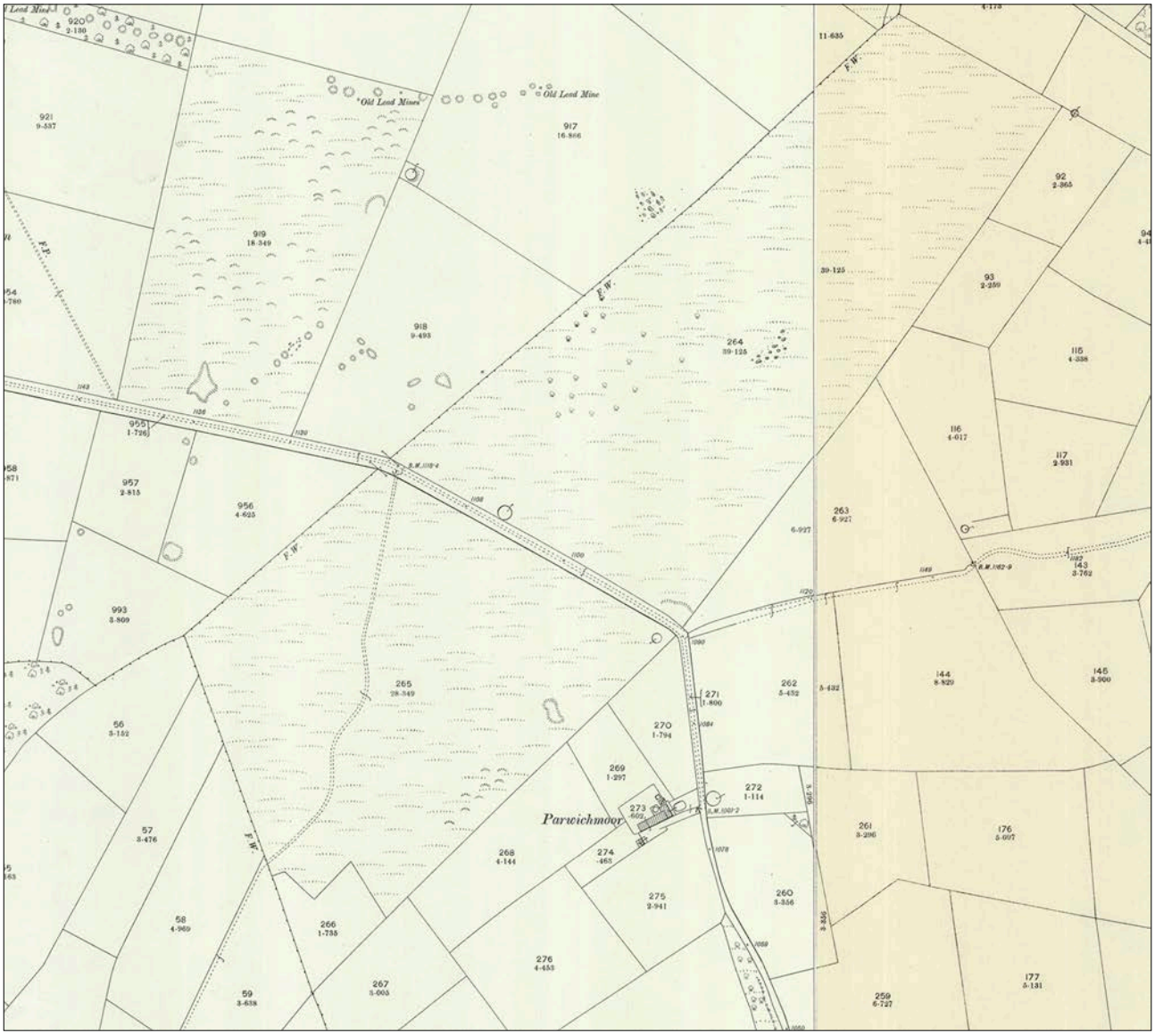

Figure 3: Extract from the 1899 OS 25-inch Derbyshire sheets 33.5 and 33.6 (surveyed 1879, revised 1897-8). Not to scale. Reproduced with permission of the National Library of Scotland.

pasture, with clumps of furze in the south, a patch of irregular trees in the north, old quarries in the southern corner of the north field and part way along the south field's southern boundary, and single dew ponds on either side of the lane (Figure 3). The map shows an irregular track running across the south field in the direction of Hawks Low, but, curiously, there is no indication of the lead rakes (see below) that remain so evident across the southern field, and which according to local wisdom reported by Lomas were thought to be no less than two hundred years old (1962, 93). Other old mine workings are marked by the OS in the vicinity, but these may have been of more recent memory, or of a more recognisable form.

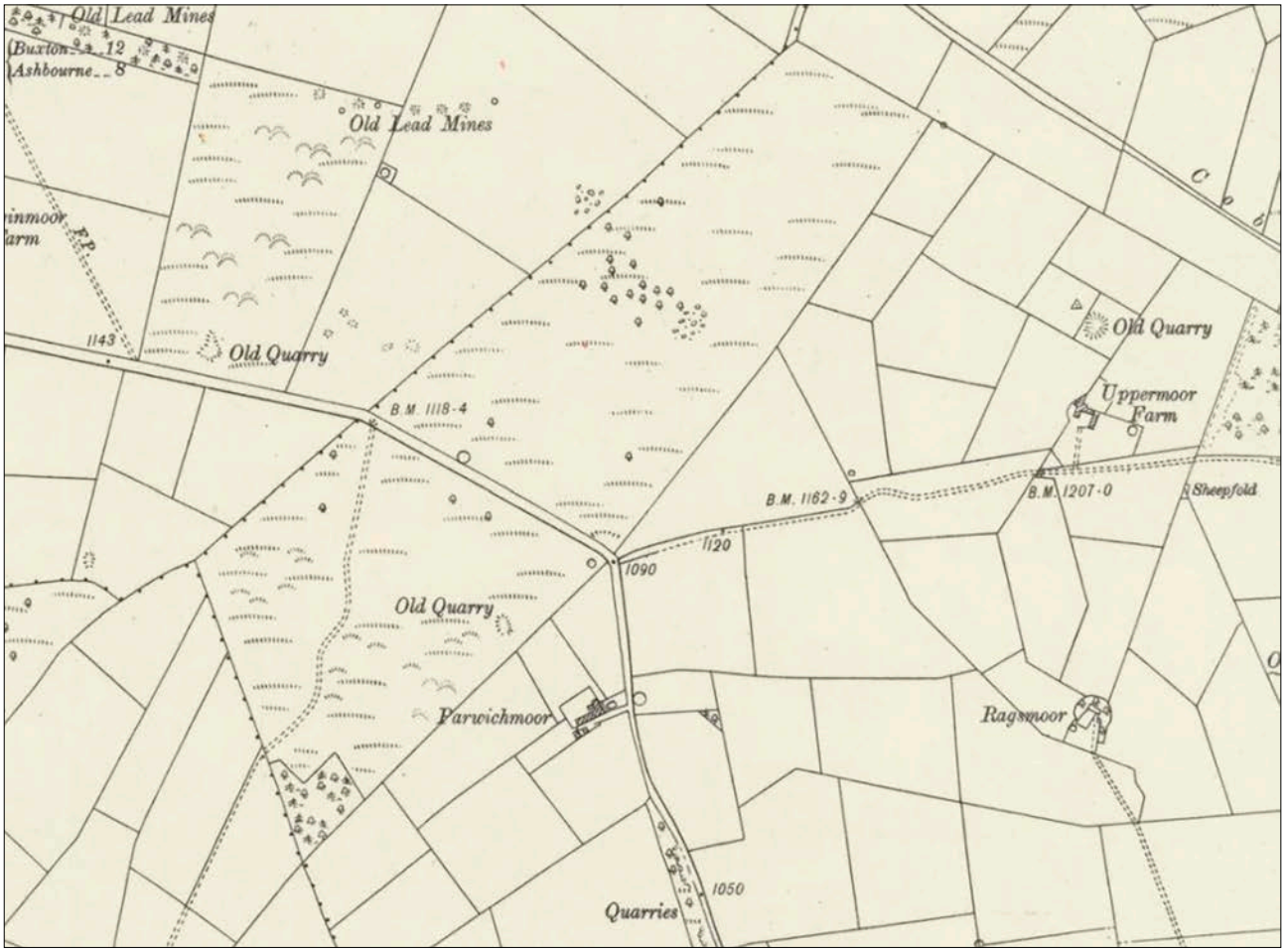

Figure 4: Figure 4: Extract from the 1923 OS 6-inch map (revised 1920) Sheet 33 NW. Not to scale (reproduced with permission of the National Library of Scotland).

By the time of the 1923 6-inch OS map (revised 1920) a further farmstead, Uppermoor Farm, had been established to the east of Parwich Moor Farm (Figure 4). This farm subsequently acquired the tenancy of the north field and undertook considerable work to improve the pasture, including at least one episode of ploughing (Dickinson, Uppermoor Farm, pers comm 2024), but at the time of Lomas's survey he saw no indications that either field had been cultivated or significantly improved. Both fields were still covered with moorland vegetation, including heather and bilberry, with large patches of bracken and gorse, and he speculated that their particular history, derived as they were from common moorland and subsequently owned by rather remote individuals or institutions, might have prompted short-term leases and no interest in long term improvements, thereby assisting in the rings' localised survival. He did note, however, that the use of fertilizers and controlled grazing was then encouraging grasses of better quality and enabling more of the ring-ditches to be seen (Lomas 1962, 91).

Figure 5: Aerial view of the south field and the lower slope of the north field taken from the west. Parwichmoor Farm (now Whitecliffe Farm) in the distance. R Andrews HEA 34204-003 28-NOV-2023 © Historic England Archive.

The 1974 OS 25-inch map depicts areas of rough pasture largely confined to the limestone outcrops in the north field, and to the eastern quarter of the south field, although the rest of the south field (as too the outcrop to the north) is also shown with symbols indicating a light covering of trees, doubtless the same clusters of hawthorn that still dominate much of the southern field today (Figure 5). In 1974 the south field had not been subdivided with internal fences, nor had the detached farm buildings been built in its northern corner. Both were in evidence when the rings in the south field were surveyed in 1991 (Makepeace 1997,18, and *see* Figure 30 below). The improvement within these fenced pastures in the south field, and across the lower slopes of the north field, readily apparent on Figure 5, is discussed further in the Survey Results below. Makepeace also identified some slight traces of earlier ploughing in the south field, to either side of the northern lead rake (Figure 8) which are similarly reviewed in light of the recent survey results.

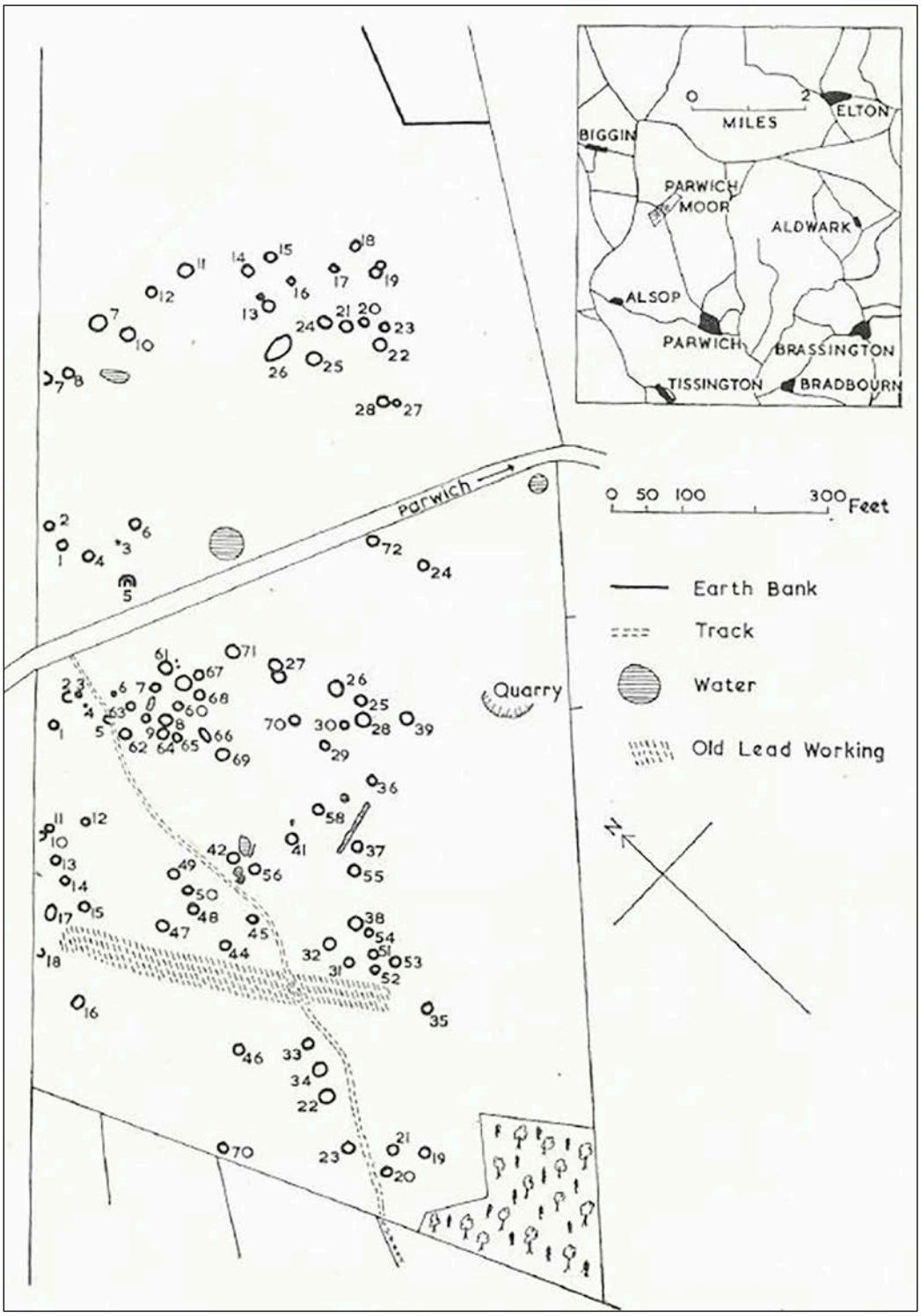

Figure 6: Plan of the ring-ditches on Parwich Moor (Lomas 1962, 92 Fig 27). Reproduced with permission from the Derbyshire Archaeological Society

Lomas's Investigations 1958-60

Survey

Lomas surveyed the visible rings across the two fields in 1958 (Figure 6). He marked 28 rings in the north field, including a figure of eight ring (19) and a large oval example (26). No.7 is used twice on the published plan, but the draft for that plan in the Derbyshire Record Office (D369-G-Bar-69-77 North Sheet) shows that the one to the east was intended to be No.9. In the south field, Lomas portrayed 70 ring features on his published plan, including one double ring or figure eight (27) and an oval ring (66), but here too there are some discrepancies. Lomas's number sequence reaches 72, but some numbers are absent and 70 is used twice. According to the draft plan for the south field (D369-G-Bar-69-776) No.57 is the unnumbered ring bracketed by 61, 67 and 68 on the published plan. Nos 43 and 57 are absent from the published plan, but shown immediately to the north of 42 on the draft. No.70 is duplicated on both the draft and the final version, but if one is presumed to No.40, then all numbers from 1 to 72 are accounted for.

In terms of visible relationship to other features Lomas mentions two rings cut by the enclosure wall which can be assumed to post-date the act of 1788, and he depicts three with this possible relationship in his survey: one ring in the north field (the western No.7) and two rings in the south field (18 and another next to 11). He also notes that one ring (presumably either Figure 6: 31, 44 or 52) 'is situated close to and is partly covered by spoil from the lead workings, which may be over 200 years old' (1962, 93).

Lomas refers to a single outlying ring, then still visible in a narrow unploughed field, to the north-west of the north field, alongside Cardlemere Lane (SK173 584), which he suggested as a lone survivor of many others (1962, 93). Subsequent improvement makes this impossible to confirm on aerial photographs amidst a diffuse pattern of old quarries and possible lead prospection.

Excavation

Lomas placed trenches across four rings between 1958 and 1960, as well as inserting bore holes in 20 others to trace the presence of a yellow silt layer in the ditch fills, which he viewed as being particularly significant.

Only one excavated ring is clearly identified on the plan, that being No.35 (see Figure 6, located in-line and south-east of the lead rake). Lomas considered this to be a representative example (Figure 7, possibly the top section labelled 'I'). A three foot (0.91m) -wide trench cut across the centre revealed a layer of soil blackened by undecayed vegetable matter beneath the strong matted turf, measuring 3 inches (7.6cm) deep across the centre and up to 14 inches (35.5cm) deep in the ditch. The outer bank

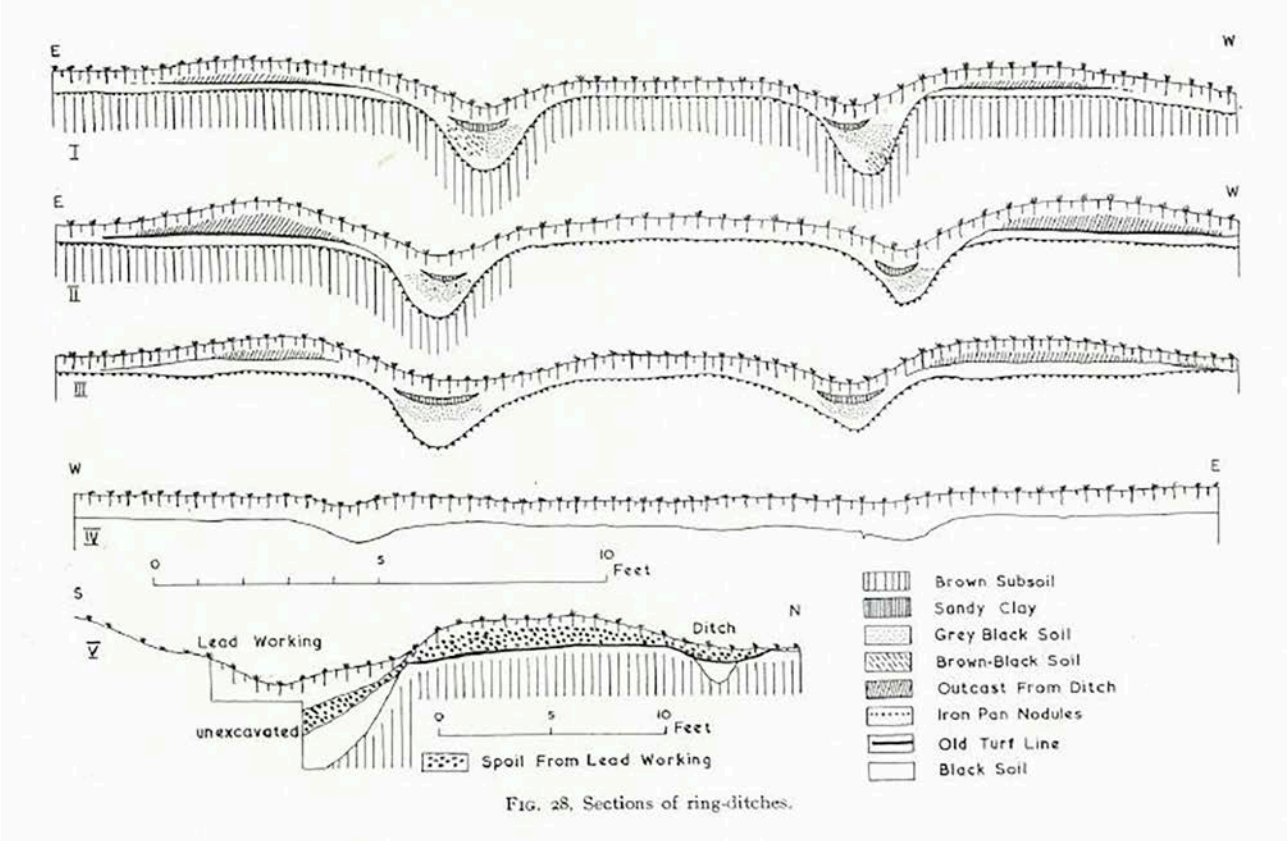

FIG. 28. Sections of ring-ditches.

Figure 7: 'Sections of ring-ditches' (Lomas 1962 Fig.28). Reproduced with permission from the Derbyshire Archaeological Society.

contained a layer of lighter soil derived from the excavation of the ditch, overlying what appeared to be the dark line of the original turf. Within the ditch a thin lens of yellow, rather sandy, silty soil was observed, contrasting with darker soils above and below. No objects of archaeological interest were found (1962, 95).

The second trench spanned a ring 'sited to the north of the long line of old lead workings that stretches across the field' (Figure 7, V) and 'clearly showed that the spoil material (from the rake) overran the completely silted up ditch' (ibid). This may have been one of the rings marked on Figure 6 as 31, 44 or 52 (see Survey Results and Appendix 1 below).

The third trench, crossing an 'indistinct type', is poorly recorded (Figure 7, IV), but in its shallow form it apparently conformed to the pattern of the others, except for the absence of the yellow sandy silt. There is no information to place this ring on Lomas's plan.

The last trench investigated, a 'plainly formed example,' was structurally the same as the others, except that the yellow sandy, silty layer was rather less distinct. This ring is, again, not referenced on the plan, nor is its location described in the text. Indeed, it is unclear which of the three unassigned section drawings (Figure 7, I, II and II) refer to this

ring or the first to be dug (No.35). It is also unclear why five sections are drawn, but only four trenches are mentioned in the text. Sections II and III could, conceivably, be two sides of the same trench.

A small mound situated near the entrance to the smaller field was the fifth object to be tested. This consisted of nothing more than a layer of black soil rather thicker than in surrounding area. Given this description and the absence of any mention of a ditch, this mound seems unlikely to count as one of the rings, though Lomas may have mapped it as such (No.24 or 72; ibid 95 and fig.27).

No objects of archaeological interest were recovered by Lomas's excavations, which left the questions of date and purpose open to speculation, supported only by the limited environmental samples examined by the contributing specialists, I W Cornwall and G W Dimbleby.

Cornwall's soil analysis found that phosphate traces could not be used to determine the presence of funerary activity given the acidic nature of the soils, which would also prevent the survival of bone. Furthermore, the tiny grains of charcoal present in the primary ditch fills could not be discounted as natural. Cornwall's greatest interest, however, was in the yellow sandy-silt lenses found in most of the sampled ditch fills. He interpreted this as a locally-derived wind-blown deposit, originating during the 'Sub-boreal climatic phase, corresponding broadly to our Early Bronze Age', which, as two-thirds of the ditch fill had already accumulated, suggested to him that the 'construction of the moment must have preceded the wind-activity by a century or two at least, perhaps longer, and so probably the work of Neolithic people' (Cornwall, cited in Lomas 1962, 96-97). Studying the pollen samples, Dimbleby determined that the mixture of grasses and tree species in the buried land surface beneath the banks reflected construction in the Sub-boreal/Sub-atlantic transition - the Late Bronze Age or Early Iron Age (Dimbleby, cited in Lomas 1962 98-99). Lomas clearly took these conclusions as proof, entitling his 1962 article 'A Bronze Age Site at Parwich', though they are now highly debatable on several counts (see Discussion, below).

Makepeace's Investigations 1990-1991

Survey

Examining the site in 1990 G A Makepeace found Lomas's plan to be inaccurate. His subsequent survey in 1991 (Figure 8) raised the tally to 140 rings in the south field alone. The north field was not included, perhaps as it had been ploughed since 1962, destroying or reducing many of its features. The southern field retained its thorn scrub, but the grassland had been much improved here since Lomas's day, by clearance, and the use of liming and fertilizers, and it had acquired the additional farm buildings and fenced subdivisions mentioned above (Makepeace 1997,17).

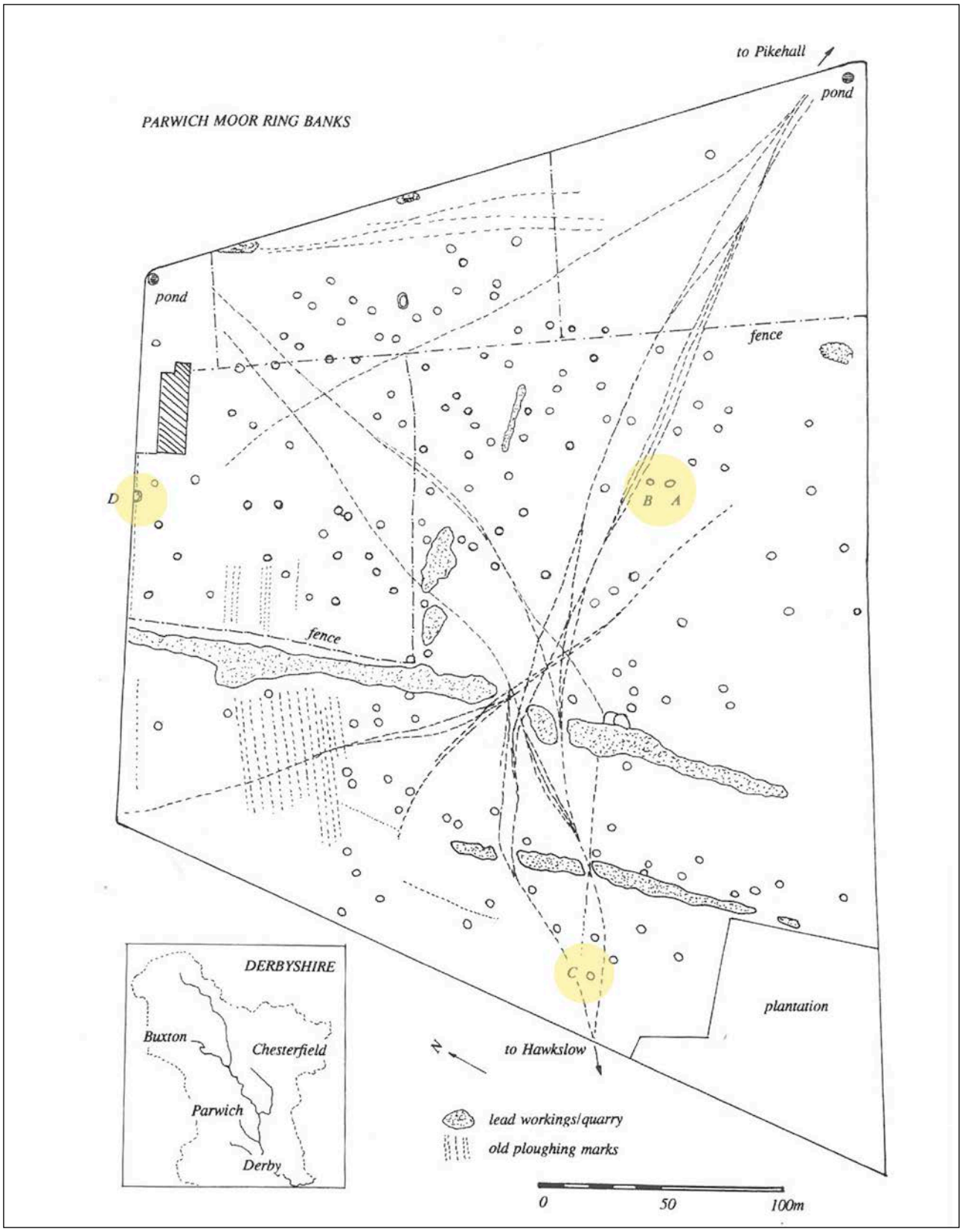

Figure 8: Location plan of the 'ringbanks on Parwich Moor' (Makepeace 1997, Fig.1). Reproduced with permission from the Derbyshire Archaeological Society. The plan is oriented with north-east at the top. Excavated rings A-D are highlighted.

Makepeace's plan is certainly more accurately surveyed than that of Lomas, although the means by which it was achieved are not reported. In addition to the rings, he shows the recent farm buildings and fences, the parallel lines of two lead rakes, several quarries and numerous skeins of tracks, the latter mainly following two long-established routes. One route ran from north-east to south-west linking Biggin to Parwich, and is shown as such on the OS 25-inch map of 1879 (the point at which it exited the south field is now marked by a blocked gateway in the west wall). The other route is described by Makepeace as the continuation of an old track from Uppermoor Farm to Alsop le Dale; but it is older still, forming a continuation of Cobblersnook Lane from Pikehall, as shown on the OS 6-inch map surveyed in 1877, and only later adopted as the lane to Uppermoor Farm. Makepeace's survey also recorded traces of ploughing in the south field, possibly cut by the more northerly rake.

Makepeace supported Lomas's assertions that (some) rings are older than the rakes and the enclosure walls. He also reported the appearance of two, possibly three, rings just beyond the north-west corner of the south field which had been captured on an aerial photograph by Derrick Riley, as well as his own discovery (with Dr D Shimwell), of two further examples in the Alsop Moor plantation, some 250m west of the south field, suggesting (as had Lomas) that the rings may have been a more widespread phenomenon (ibid 19).

The rings themselves were described as generally having a circular outer bank and inner ditch with a central platform, which (*contra* Lomas) may or may not include a low mound (the bank being higher than the central mound in most such cases). The forms varied from round to oval, with one large ovoid/rectangular example. The majority ranged between 6m and 8m in diameter, with both larger and smaller examples. Some were extremely slight, only detectable in low sunlight or from richer grasses growing over the ditches. Makepeace saw no distinct pattern in their distribution nor in the slight variations in form. He did note that some had been heavily mutilated by burrowing animals (ibid).

Excavation

Four ring-banks were selected for investigation, identified by the letters A-D on the survey plan (highlighted on Figure 8). Rings A-C were excavated almost entirely leaving narrow baulks to retain sections and profile, whereas ring B was sampled by a broad trench across the centre (Figures 9 and 10).

Ring A: an ovoid example, with a substantial bank formed from dumped material, derived from the ditch and perhaps from the area of the platform which appeared to have been lowered during construction. Patches of the old ground surface/turf layer were preserved beneath the bank. The ditch, originally steep-sided with a flat base, 0.5m wide and 0.25m-0.3m deep, revealed a number of stages of silting.

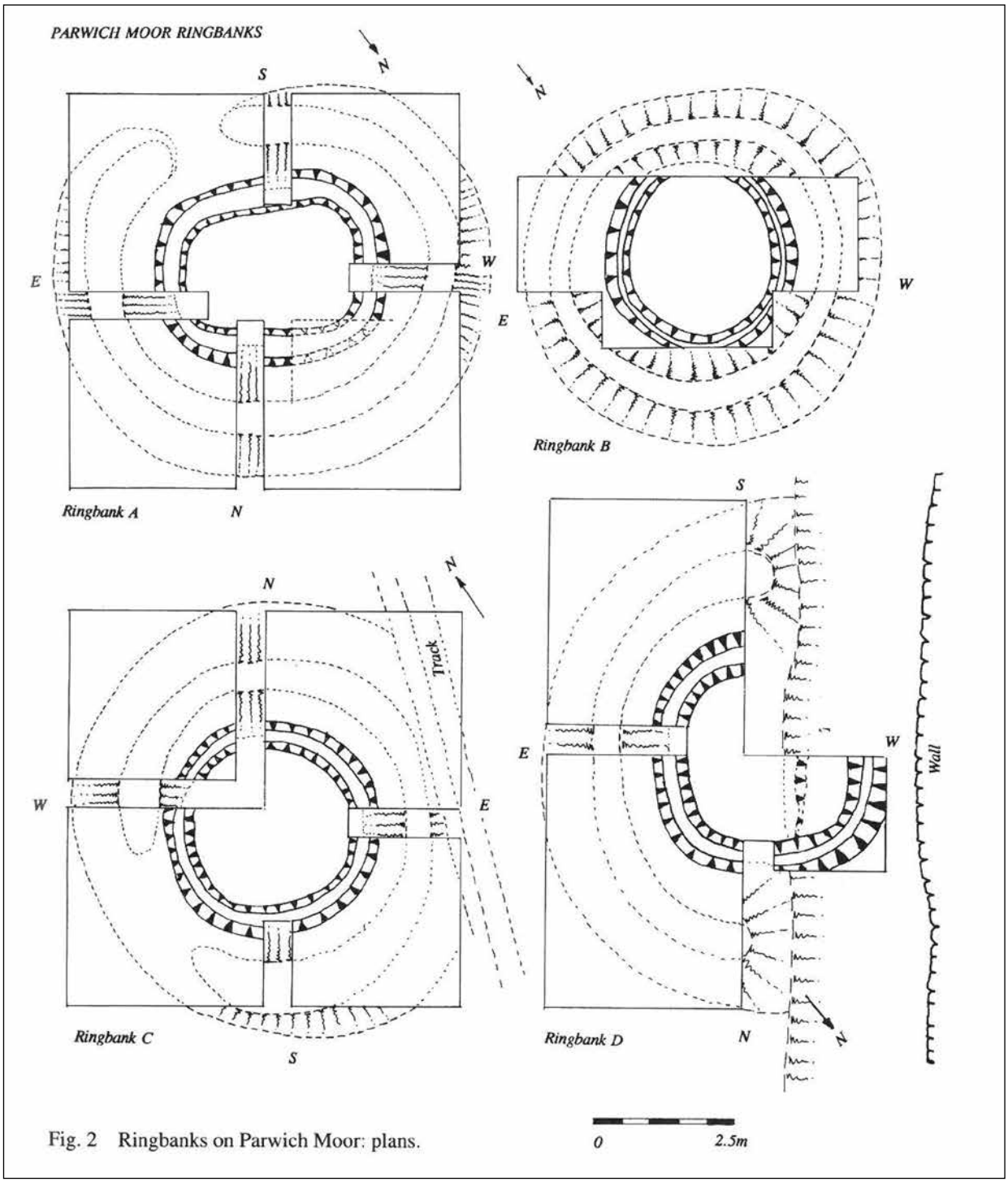

Fig. 2 Ringbanks on Parwich Moor: plans.

Figure 9: Plans of the excavated Parwich Moor ringbanks (Makepeace 1997, Fig.2). Reproduced with permission from the Derbyshire Archaeological Society

Ring B: circular and lower in profile, with a narrow and shallow ditch, 0.2m-0.25m wide and 0.1m-0.125m deep.

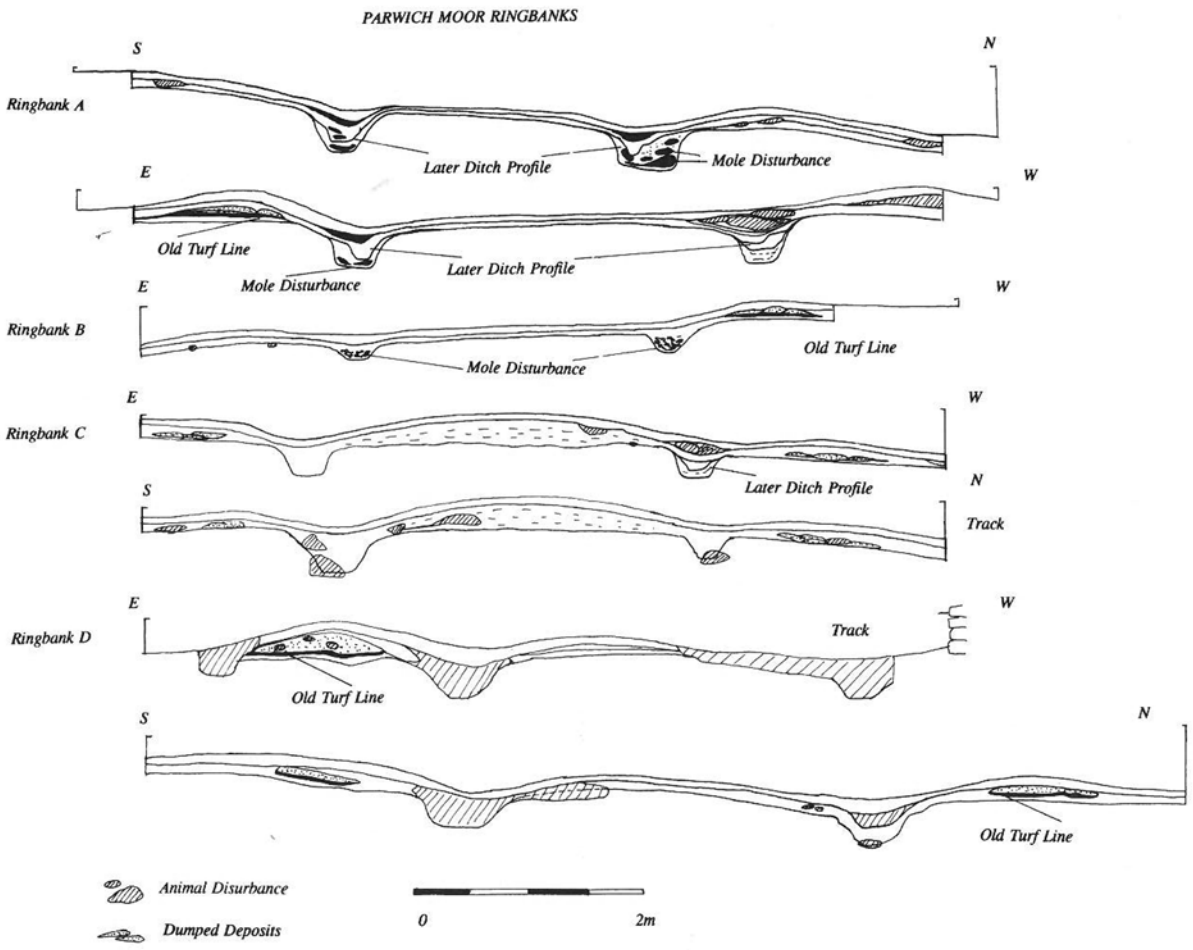

Figure 10: Section drawings of the excavated Parwich Moor ringbanks (Makepeace 1997, Fig.2). Reproduced with permission from the Derbyshire Archaeological Society.

Ring C: circular, clipped by the old track to Hawkslow, with a ditch similar in size to that of A, included a central mound standing 0.24m above the original surface. The mound showed thin black peaty lenses indicating the stacking of turves.

Ring D: large and ovoid, was truncated by a track running alongside the western field wall, the lower courses of which were dug though the outer bank. The central platform had been stripped of any original surface deposits, and the bank likely created with material from the (0.25m deep and 0.3m wide) ditch, covering the old land surface in the process.

All four ditches showed considerable mole activity, often taking the form of runs following interfaces between different stages in the silting process. No artefacts were found, nor signs of burning, nor any indications of pits or post holes, the latter being sought as a

point of comparison to similar-sized rings recently discovered through excavation at Lismore Fields near Buxton (Garton 1991, Fig 1.2; Makepeace 1997, 19-23, and *see* discussion below).

Pollen analysis from the buried turf horizons beneath the banks of A and D revealed mostly grasses and heather, some hazel, alder and lesser quantities of oak and birch, generally similar to the profiles recorded by Dimbleby in the early 1960s. Drawing comparisons with more recent samples collected on the limestone plateau of the Peak District, Makepeace speculated that these too reflected a Sub-boreal, Zone VIIb, date, from c 1500 to 500 BCE. However, the complete absence of flint, pottery, charcoal, pits and post-holes was puzzling if activity was taking place in this period. The acidic soil might account for the absence of bone, Makepeace agreed, but it could not mask the concentration of phosphate if the platforms had been used to lay out bodies in some form of funerary ritual. He saw no evidence that they could be used for stock control, and threshing or drying would have left positive markers in the pollen record. He speculated on the possibility of some later industrial process, such as the preparation of barium oxide (for the ceramic and glass industries) from locally occurring barytes, but for that the ditches would need to hold water, and there was no evidence that they had done so.

In conclusion, Makepeace found it easier to dismiss various purposes suggested for the rings – tent pitches, tree-ring banks and hay stacks – rather than to submit a particularly compelling case for their origin. However, he did postulate, the phosphate evidence notwithstanding, that this concentration of small monuments might represent mortuary and perhaps excarnation practices linked to patterns of Neolithic open settlement across the White Peak. Furthermore, he noted their similarity in form to Early Bronze Age ditched (disc) barrows as well as much larger Neolithic henges, and also to the ring features discovered at Lismore Fields, Buxton, and those of the Middle Bronze Age urnfield cemetery recently excavated at Brightlingsea in Essex (ibid 24-25).

Guilbert and Garton. Scientific Dating 1999

Visiting the excavations in 1991, Graeme Guilbert and Daryl Garton, then attached to the Trent & Peak Archaeology Unit at the University of Nottingham, thought it generally improbable that such slight features could have survived from prehistory; added to which, the dark turf signatures found beneath the banks seemed to indicate a lack of leaching and compression compatible with a prehistoric date (Guilbert and Garton forthcoming).

In pursuit of more definitive evidence for the date of construction, they returned to the site in 1999 to re-excavate one of Makepeace's sections in order to obtain thermoluminescence (TL) dating evidence (Guilbert and Garton 2001,223). They planned to sample ring D, but that had been covered by a dung heap, and the adjacent five rings had been destroyed. The other three Makepeace sites, A-C, did not offer the

0.1m depth of undisturbed overburden required for a trustworthy sample, so a fifth ring located some 25m to the south-west, adding ‘E’ to Makepeace’s series, was chosen on account of its relatively large bank and apparently unexcavated appearance. (Guilbert and Garton, in prep).

Following a topographic survey of the earthwork a 1m wide trench was excavated across the bank and samples taken in sequence through it and the underlying material. The black soil, presumably the old turf line, sandwiched between the subsoil and the upcast bank, was the main target. This was found not to be greasy, as described by Lomas, but dry, powdery and nowhere greater than 0.04m thick, apparently neither leached nor compacted to any great degree. Two samples from this material were processed by Quarternary TL Surveys, Nottingham. These returned dates in the mid-second millennium BCE which appeared to support both Lomas and Makepeace’s assumptions of a Bronze Age date. The authors of this work were, however, far from convinced by the results, given a number of possible error factors including the potential for earlier material being redeposited during construction or contamination through significant animal disturbance. Enough uncertainty remained to seek corroboration using radiocarbon dating (ibid). Two dates, obtained from a single sample of the humic layer, indicated that this soil was buried sometime *after* the period spanning the eighth to tenth centuries CE; in other words the banks were a product of medieval or later activity, which was considered a more reasonable hypothesis, bearing in mind the physical condition of the earthwork and the buried soils (Guilbert and Garton, in prep). Garton (forthcoming) discusses the implications of this dating evidence in relation to the excavated ring features at Buxton, and other, more widespread examples, in a forthcoming chapter of the Lismore Fields monograph. These comparisons are explored in the Discussion below.

Survey Method

The scope of the aerial mapping in this project was focused on the two fields containing the visible concentrations of rings. The mapping of this area aimed to serve two main functions:

1. To identify the number and distribution of rings across the two fields

2. To assist in identifying relationships between the rings and other surrounding features in order to develop a chronology

The depiction of the earthwork rings and other features in the survey plan (Figure 30) is based upon visualisations derived from digital terrain models captured using a combination of drone-acquired photogrammetry and lidar. These were recorded on 27 March 2023 using a DJI M300 quadcopter drone equipped with a P1 camera and a L1 Zenmuse lidar sensor, operated by Historic England (Civil Aviation Authority ID GBR OP-8NJJ9W4XXCV7) and piloted by Matthew Bristow (CAA Flyer ID GBR-RP-JPSVNXSYC46J). The flights were programmed and controlled using 'DJI Pilot 2' proprietary software, utilising Trimble's Virtual Reference Station (VRS) system to provide real-time corrections to the drone's on-board Global Navigation Satellite System (GNSS) providing locational control and positional accuracy of 0.02m

The P1 sensor captured a mosaic of overlapping aerial photographs at heights of between 50 and 70m above ground level, providing a ground sample distance of approximately 4cm per pixel. The photographs were processed in Agisoft Metashape to provide a seamless orthomosaic image and a digital surface model (DSM). The L1 lidar sensor was similarly flown between 50 and 70m above ground level. Processing and visualisation were carried out in accordance with published guidelines (Historic England 2017). Both lidar and height data were processed using Relief Visualisation Toolbox 2.2.1 (Kikalj and Somrak 2019; Zakšek et al 2011) to produce 2D GeoTIFF images. The visualisations applied to these images were '16 direction hillshade' (for example see Figures 11 and 12), 'slope', 'simple local relief' and 'positive openness' Lidar was also viewed as 'live' data in Quick Terrain Reader v8.0.4. The lidar and photogrammetric files proved to be complementary: the former more useful in areas with trees and hedgerows, the latter providing more detail in areas of open grassland. In both cases the terrain models were processed to a resolution of 0.10m to reduce the background 'noise' of low vegetation. Georeferenced imagery was loaded into ArcGIS 10.8.2 as layers which were then used to identify, interpret, and map all significant features (*see* Figure 30). Monument polygons were drawn around features in accordance with Historic England's 2019 mapping conventions and standards, and a related attribute record was created for each polygon. A Warden (Historic England Research Record) record was created for each feature, recording the attributes shown in Table 1.

Table 1: Aerial mapping attribute data

Attribute	Description	Sample data
LAYER	Mapping layer in which feature has been mapped	DITCH
HE_UID	Historic England Research Record Unique Identifier	0000000 (N/A)
PERIOD	Date of feature (HE Thesaurus)	POST MEDIEVAL
NARROWTYPE	Specific monument type for individual features (HE Thesaurus)	STONE QUARRY
BROAD_TYPE	Broader monument type to enable grouping of individual features (HE Thesaurus)	QUARRY
EVIDENCE_1	Form of remains as seen on PHOTO_1 (HE Thesaurus)	EARTHWORK
PHOTO_1	Source feature was mapped from	SFM (STRUCTURE FROM MOTION)
EVIDENCE_2	Form of remains as seen on PHOTO_2 (HE Thesaurus)	EARTHWORK
PHOTO_2	Latest available source to give indication of current state of preservation	SFM (STRUCTURE FROM MOTION)
HER_NO	Historic Environment Record concordance UID	N/A

The completed aerial transcription map was taken into the field for verification and additional notation over several days between December 2023 and April 2024. The map and underlying terrain models were stored on a Trimble TSC7 controller linked to a Trimble R10 and R12 GNSS survey system, operating a local base station established with VRS, and set to record with accuracy of 0.025m and 0.04m in the horizontal and vertical planes. Notebook annotations and ground photos were referenced to numbered features on the aerial transcription and new GNSS points.

Analytical field survey using graphical (tape and offset) methods was undertaken as a training exercise in one small area, to record the relationship between two rings and the southern lead rake (Figure 24). Following best practice (Historic England 2018), measurements were taken from a baseline set parallel to the main feature, the end coordinates of which were recorded with GNSS equipment. The survey was carried out at a scale of 1:200 as it suited both teaching requirements and the degree of detail to be recorded.

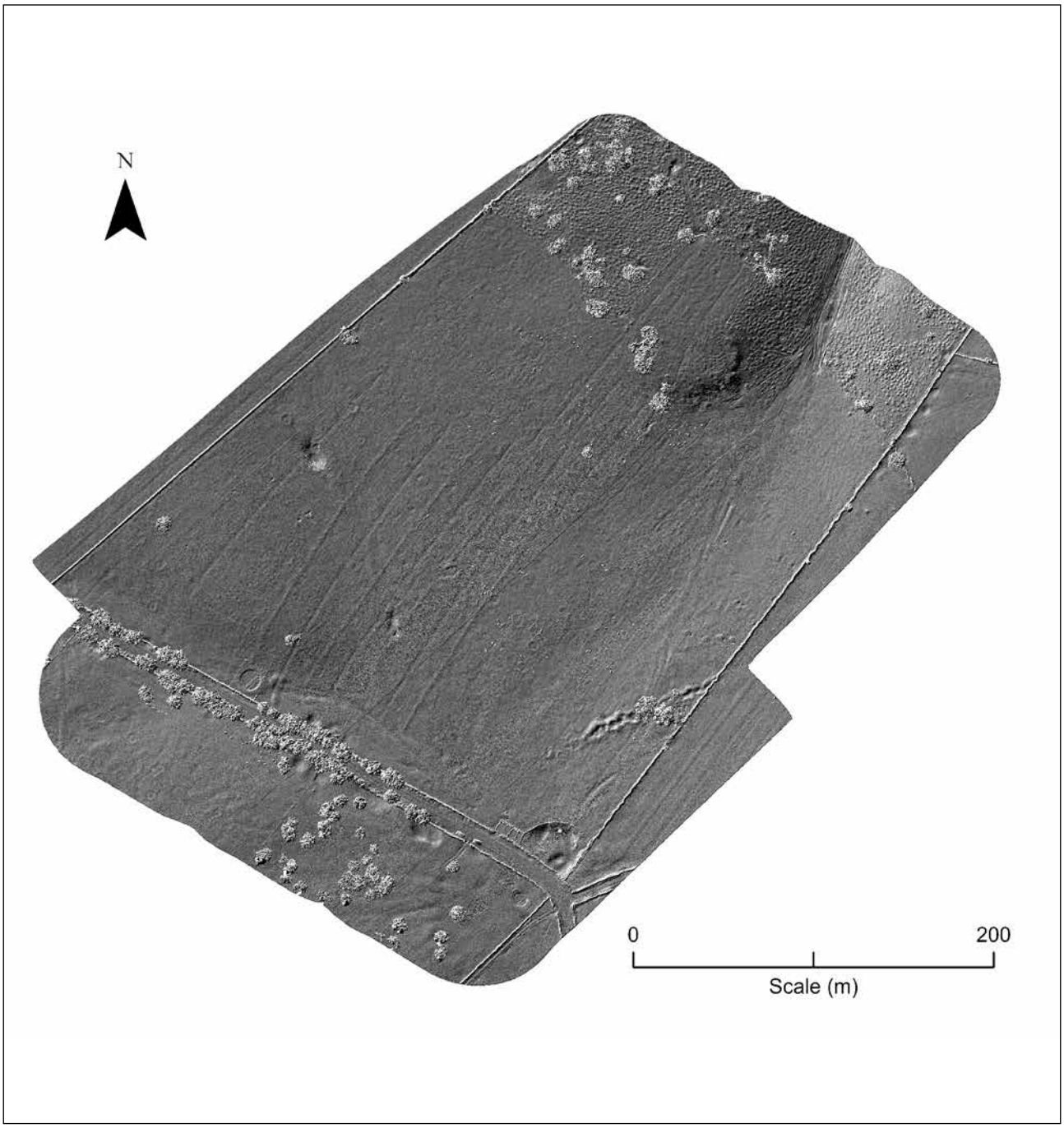

Figure 11: Multi-direction hill-shade digital surface model (DSM) of the north field (White Cliff Common, Parwich) showing the pattern of rings and other earthworks. Derived from drone-acquired photography, March 2023. © Historic England.

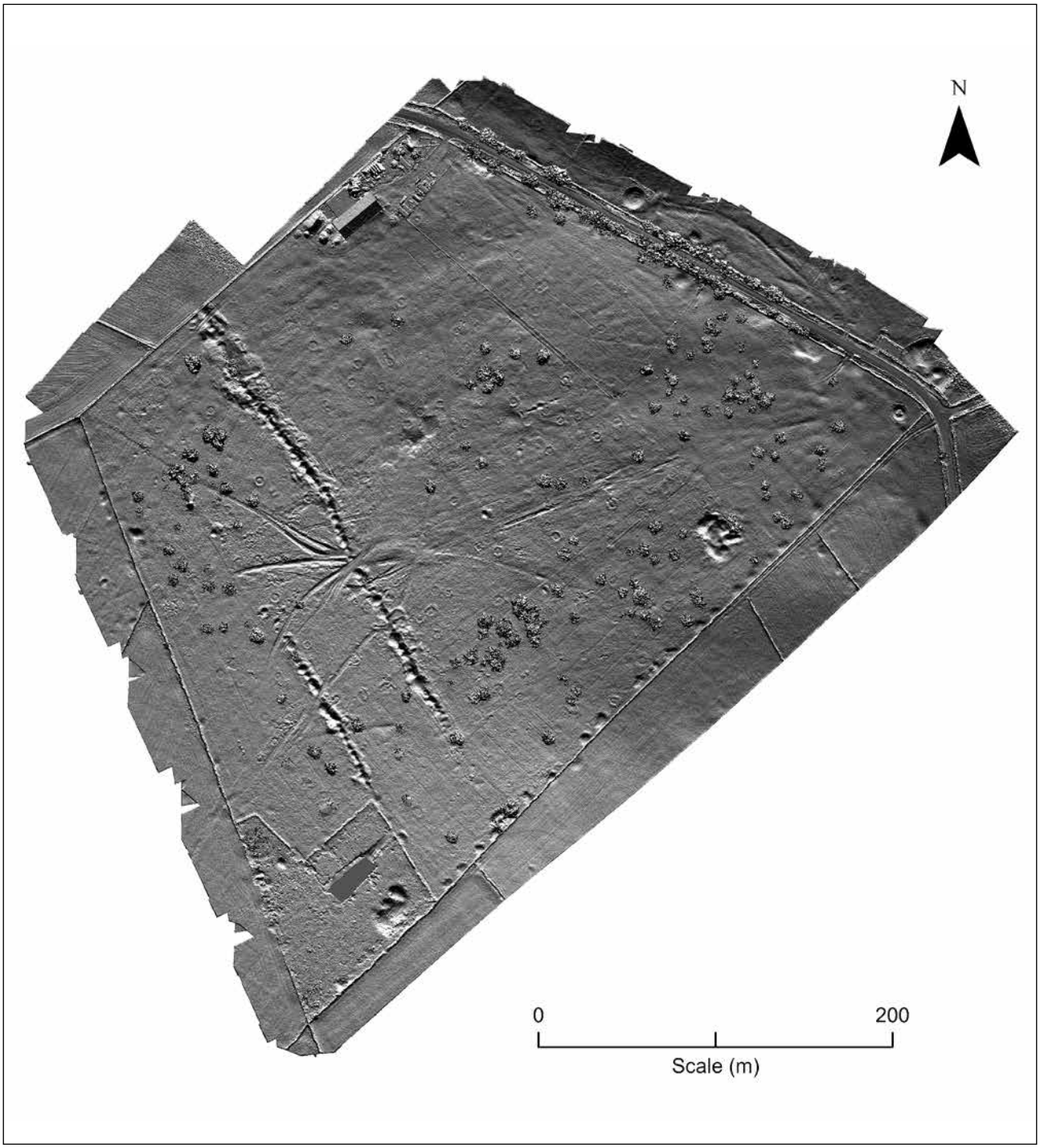

Figure 12: Multi-direction digital surface model (DSM) of the south field (White Cliff Common, Parwich) showing the pattern of rings, rakes and other earthworks. Derived from drone-acquired lidar, March 2023. © Historic England.

The project also included a review of some 240 vertical and oblique aerial photographs taken by multiple organisations and individuals between 1950 and 2019 now held in the Historic England Archive, as well as more recent aerial reconnaissance photographs taken by Historic England, and ortho-rectified vertical photographs spanning 2000-2021 and infra-red imagery (2010-2021) supplied by Next Perspectives through the Aerial Photography for Great Britain (APGB) agreement (*see* Appendix 2). These sources were of value in charting changes in land use, and for seeking cropmark or other evidence for the survival of rings beyond the two fields.

Publicly accessible lidar from the Environment Agency (at 1m resolution) was also consulted but, due to the small size and nature of the rings, was found to have limited application.

Survey Results

Figure 30, together with the tabulated list Appendix 1, depicts and describes all the rings recorded by aerial and landscape survey in 2023 and 2024. Figure 30 also shows other relevant features including the lead rakes, trackways, quarry pits and boundaries transcribed from the aerial sources, while Figure 24 shows the detailed analytical field survey undertaken to illustrate the chronological relationship between rings and rake. Figures 11 and 12 show examples of the drone-derived digital terrain models used as the primary survey tool.

Through a combination of aerial mapping and ground survey (e.g. Figure 13) a total of 173 rings were identified, distributed across both fields but with a considerably higher density in the south field (126 visible rings), compared to the north (47 visible rings).

Figure 13: GNSS survey in progress 14 Dec 2023. Ring 27, south field, viewed from the north-west. © Historic England.

In the south field the rings are more densely clustered toward the centre and north, becoming more dispersed towards the south-west and east, the latter direction perhaps due to the masking effects of modern farm improvement and the passage of farm vehicles through the only field entrance from the lane. A few rings marked here by Lomas and Makepeace are no longer visible. Similarly, in the north field, the rings are noticeably clustered toward the centre, approximately equidistant from the lane to the south-west and the limestone outcrops to the north-east, with a more diffuse pattern extending to

the north-west and south-east, broadly contained between the 340m and 345m contours. The degree of separation in both fields varies considerably, the most densely populated areas having an average separation (excluding paired rings) of about 9m, while the most dispersed examples fall 50m-70m apart from their nearest neighbours. This pattern, of course, may reflect variable survival, rather than an original distribution.

Once transcribed, the rings were measured systematically in ArcGIS. The external diameter of the ditch was determined as the primary feature, given that banks were inconsistent and often extremely slight. For the more damaged or irregularly shaped rings, the measurement was taken at the widest point. Although Makepeace and Lomas' broad estimates of the rings' average diameter (6m-8m) remains unchallenged, it is worth noting that the range extends much further, from 2.9m to 11m. Ditch widths are relatively consistent around 0.8m to 1.2m. The other measurements given in Appendix 1 are rough estimates based on observation in the field, but suggest a range of 0.05m to 0.2m both for the heights of banks and the depths of ditches.

Figure 14: GNSS survey in progress 13 Feb 2024. Ring 40, south field, viewed from the north. © Historic England.

The majority of rings have a consistent appearance: a circular ditch defining the inner space or platform, in turn surrounded by an external bank, the latter frequently widespread, evidencing damage and wear over time, or perhaps a lack of consistent construction. This shape does vary however, and a number of the rings, as noted by Lomas and Makepeace, are oval, and a few are sub-rectangular or even sub-triangular in plan. Internal platforms are mostly flat, occasionally slightly domed, and appear to be predominantly level with their surroundings. In the few instances where some evidence

Figure 15: Ring 44, south field, viewed from the north-east. 13 Feb 2024. © Historic England.

of additional height was recorded (e.g. ring 102), it did not exceed 0.2m. Some of the rings contain two slight mounds or platforms within a single ditch (Rings 20-21, 72-73, 114-115, 116-117, and 153-154). This could be that one ring is slightly superimposed on another, but the absence of banks between the platforms suggests that they were intentionally created in this way.

Modern or relatively modern land-use is certainly a determining factor in the survival of the rings within the two fields. In the south field, all of the rings recorded in the fenced enclosure adjacent to the lane are reduced to the point of being nearly invisible on the ground except in the most favourable light conditions, substantial pasture improvement having taken place since the times of Lomas's and Makepeace's surveys. A similar process of improvement has also taken place in the fenced enclosure to the south-east, abutting the north-west field wall, although the effects are not so pronounced as seen alongside the lane. Some degree of improvement also seems to have taken place further east alongside the lane, within the area shown as formerly fenced on Makepeace's plan, although curiously without having removed the scattered hawthorn trees. Activities surrounding the farm building as it has evolved and expanded have resulted in the loss or burial of some rings marked on Makepeace's plan, notably the excavated Ringbank D (see Figure 8).

Figure 16: Ring 59, alongside the south-east wall, south field, viewed from the north-east. Note the small quarry holes along the wall, and contrasting landuse either side. 13 Feb 2024. © Historic England.

Figure 17: Ring 102, south field, viewed from the north. 14 Feb 2024. © Historic England.

Figure 18: Ring 106, south field, viewed from the north-east. Possible candidate for future excavation. 14 Feb 2024. © Historic England.

Figure 19: Ring 109, oval, south field, viewed from the north, with 107 in the distance. 14 Feb 2024. © Historic England.

Almost all of the rings in the north field show some signs of cultivation damage. Lomas reported this field covered with moorland vegetation in 1958, though there were moves afoot to improve the pasture, leading to an episode of ploughing and re-seeding in 1960 (Lomas 1962, 91). Makepeace (1997, 17) reported that this field had been ploughed and 'many of the ringbanks and other features have been destroyed or greatly reduced in height', hence his decision not to include this area in his survey. This concurs with a conversation with the current farmer, who recalled this field being broken to the plough in the 1960s (Dickinson, pers com 2023). It does not account, however, for the regular parallel marks at roughly 15m intervals visible in the terrain mapping (Figure 12) running counter to the contours. The present farmer is adamant that the field is free-draining and does not require underdrainage; but this pattern is compelling evidence of an earlier campaign of field drains, most probably inserted in the mid- to late 19th century and linked to an enhanced natural catchment running along the foot of the slope. Since the field was covered in moorland vegetation in the late 1950s, and had to be improved by spraying and ploughing in the 1960s, it would seem apparent that this earlier episode of moorland reclamation was not sustained. A number of rings are clearly cut by these linear features.

Makepeace recorded small areas of plough marks in the southern field, to either side of the northern end of the larger lead rake, suggesting piecemeal attempts at improvement or patches of cultivation. These were still evident on the ground in 2023-4, though the terrain model shows that they were only a small part of far more widespread improvement activities within this field (leaving aside the more modern changes mentioned above). These patterns are difficult to distinguish clearly given the plethora of modern vehicle tracks. However, there are clearly-defined drainage channels, similar to those in the north field, running parallel to the south-eastern field wall and extending over as much as a quarter of the main field's width, and the accompanying improvement might have a bearing on the comparative sparsity of rings in this area. As in the north field, some rings are clearly cut by these channels.

The only areas which show no signs of improvement are small fillets of rough and hummocky ground set amidst the diverging trackways between the rakes, and alongside the track leading to the blocked gate in the western field wall. It may be notable that two rings in the latter area (1 and 2 on Figure 30) are among the best-preserved examples in the south field, perhaps because this old drove and its margins retain a small corridor of relatively undisturbed moorland. The southern corner of the south field is plantation woodland, mostly sycamore, overlying a small quarry and a possible lead prospection pit. No rings were visible in this area, but deep leaf mould and undergrowth prevented any proper survey.

The fields contain a number of other features besides the rings, the most dominant being the two lead rakes, about 30m apart, that extend across the south field from NNW-SSE (also *see* Figure 5). The north-eastern rake is the longer and more pronounced of the two. The rakes are formed by strings of closely spaced pits following the veins,

Figure 20: Double platform Ring 116, south field, within the improved area alongside the lane, viewed from the north. Pole at the centre of each platform. 14 Feb 2024 © Historic England.

Figure 21: Ring 144, a good example in the north field, viewed from the south-west. Limestone outcrops visible in background. 14 Feb 2024. © Historic England.

Figure 22: Ring 146 alongside the north-west wall, another good example in the north field, viewed from the south-east. 14 Feb 2024. © Historic England.

Figure 23: Ring 167, oval/sub-square, north field, viewed from the south-east. 14 Feb 2024. © Historic England.

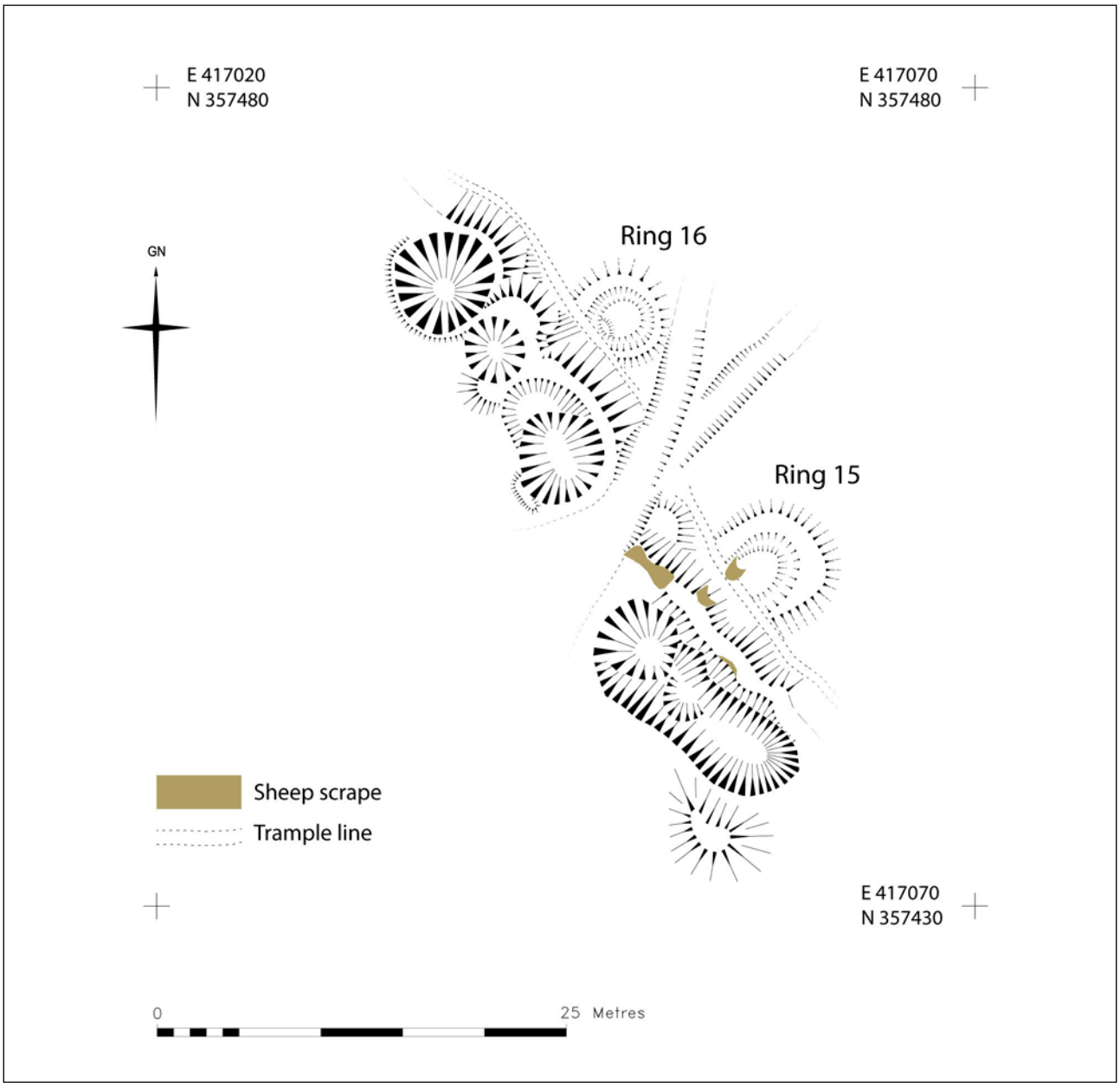

Figure 24: Detailed measured survey of the intersection of the trackway with the south-western lead rake and the ring features to either side (Nos 16 and 17 on Figure 30) . Despite the trample line along the northern side of the spoil, it is clear that the upcast from the rake spilled over the circumference of the ring. Surveyed at 1:200 scale. © Historic England.

with associated upcast predominantly on their north-east, downslope, sides. There are indications of small platforms between some spoil banks, potentially used for shelters or as areas of processing the ore. The most curious of these is No.11, at the southern end of the south-western rake, which appears to be a rectangular ring cut by mining. Where relationships exist, as previously observed, the rakes and their upcast invariably post-date the rings, broadly placing the rings no later than the mid-18th century (eg. Lomas 1962, 93). This relationship is illustrated in the hachured survey drawing included as Figure 24.

Small linear hollows near rings 100-103 in the south field and 128-130 in the north field have no obvious purpose, but may represent attempts to follow minor cross-veins or ‘scrins’ departing from the main rakes.

An angled ditch in the north field, seemingly a drainage channel or partial boundary feature, truncates the bank surrounding ring 134. This ditch appears to be an attempt to sub-divide the main field and presumably post-dates the enclosure act of 1788 and the walling-up that followed.

Beyond the northern terminal of the angled ditch, the terrain model recorded clusters of ragged ring-like features leading up toward the margin of the limestone outcrops. Inspection on the ground and comparisons with air photography showed these to be transient marks left by modern ring-feeders and livestock movement around them. The same markings were noted in the south field, particularly around the intersection of the trackways and rakes. There is no confusion between ring features and ring-feeders. The latter tend to leave a shallow mound of residual feed, a narrow groove marking the base of the portable cage, and a broad halo of animal trample, but none of these include an encircling ditch or bank (Figure 25).

Figure 25: Example of recent ring-feeder positions in the northern field with active feeders in the distance. Viewed from the south-west. Feb 2024. © Historic England

Of the numerous quarries present, the majority are small pits dotted along the lines of the drystone walls, most likely dug to supply wall stone when the 1788 enclosure award was enacted. Smaller pits toward the centre of the south field may be the result of lead prospection, but the larger examples, particularly those toward the lane, are more likely for stone, perhaps related to the supply of road dressings in the mid-19th century when both fields were owned by the 'Surveyors of Highways'.

Trackways mapped from the aerial imagery are similar to those marked by Makepeace in 1997 (see Figure 8), although the transcription and associated fieldwork supports a more nuanced sequence. An early version of the Biggin to Parwich route, from north to south-west, was cut through by the north-east rake, after which all routes were funnelled across a large gap in the lead diggings further to the north: either left as a concession to local uses, or to meet the miners' practical needs. The east-west route, extending from Cobblersnook Lane, has continued as the principal access for farm vehicles, masking and distorting earlier evidence of the tracks. Nevertheless, here, as along the Biggin-Parwich routes, it is rare to see a track impinge heavily on a ring, and there are no examples of rings constructed over a track. The implication is that the tracks developed around the positions of existing rings, whether those rings were broadly contemporary or long-standing features of the field.

The modern, cement-lined dew ponds in the eastern angle of the south field and mid-way along the southern margin of the north field, are highly noticeable on the terrain model (Figures 11 and 12). These are marked on the survey plan, along with others mapped by the OS.

Comparisons and concordance

Lomas identified 98 rings across the two fields, considerably fewer than the 172 identified by the aerial mapping, and doubtless a reflection of the 'moorland' condition of the fields at that time compared to 2023-4, when both fields were very closely grazed. Lomas's overall distribution patterns appear very similar to those revealed by the new survey, but the inaccuracy of his survey is such that it is not possible to compare his results with those of the present survey with any confidence.

Lomas excavated trenches across four rings between 1958 and 1960, referenced only one on his survey plan (*see* Figure 6, No 35). The best candidate for this is the present Ring 31, judging by its prominence and proximity to the rake. Other rings – 25, 27, 29, 48 and 53 – are offered as potential candidates for Lomas's other major interventions, based on slight and inconclusive traces of previous excavation which are not related to the activities of Makepeace, Guilbert and Garton. The whereabouts of the 20 borehole samples taken by Lomas cannot be determined.

Makepeace's plan of the south field records 140 rings, 15 more than the number identified from the terrain model. Attempts have been made to rectify Makepeace's plan with the recent survey in order to establish an exact concordance, but although the broad patterns are indeed similar, and we can correlate some individual rings or clusters between the two surveys, the differences in survey accuracy and depiction prevent a comprehensive match. Any attempt to reconcile the two plans more closely would present more problems than solutions.

The number of rings which seem to have disappeared between 1991 and 2023 includes Makepeace's excavated example 'D', which was found to be covered by a dump near the farm building and unavailable for further sampling in 1999 (Guilbert and Garton in prep). In addition to 'D', two, perhaps three, other rings could not be distinguished in the same field, more likely due to the effects of subsequent pasture improvement, and a single ring shown by Makepeace on the north-east side of the farm building is now lost to activities in the yard. In the adjacent field, alongside the lane, at least five rings surveyed by Makepeace could not be detected, again as a likely consequence of agricutural improvement. Further to the south-east, another ring (Figure 30, Ring 110) now appears alone where Makepeace recorded two.

Makepeace's four excavations are clearly marked on his plan (Figure 8: A, B, C, D). Ring D is lost, buried or destroyed, as mentioned above. Rings A and B can be identified as Nos. 46 and 47 respectively on Figure 30, and Ring C is No.1. Makepeace made good each of these mounds after excavation, but slight traces of disturbance, including vestigial section lines, remain visible.

The ring chosen for scientific sampling by Guilbert and Garton in 1999 is No.44 on Figure 30, set between two trackways converging on the gap in the north-east rake. This identification was confirmed in the field (Guilbert, *pers com* March 2024).

Discussion

The current work provides a complete and accurate map of the pattern of rings now visible across the two fields, complementing and occasionally contradicting the earlier surveys. Some of the discrepancies arise from the inaccuracy of the earlier plans, particularly in the case of Lomas's work, although certainly some rings visible then and still in 1991 are no longer so because of the damage done by farming activity.

In terms of dating evidence nothing has been added to the conclusions reached by the earlier and more invasive investigations. Previous authors noted the relationship of the rings to the enclosure walls, built after 1788, and the lead rakes which are likely to be have been worked in the 18th century or thereabouts. The present survey was unable to distinguish any distinct evidence for a ring cut by a rake, but we too identified several rings partly covered by spoil from the workings. All of the tracks, whether cut by the rakes, or channelled through gaps within them, appear either to respect or slightly impinge upon the pattern of rings, suggesting that the rings were visible but perhaps no longer actively maintained when those routes were most in use. In the absence of any documented reference to their presence, it would appear likely that the rings pre-date the 18th century, possibly by some wide margin.

Both Lomas, and to a lesser extent Makepeace, were persuaded of a Late Neolithic or Early Bronze Age origin, resting their arguments on rather circumstantial environmental data and a lack of any compelling evidence to the contrary. Neither one discovered any convincing proof of date or function. Both favoured a funerary purpose but, although human (or animal) bone might not survive in the acidic soil, evidence of burning should have left some trace had pyres or cremated remains been present at any time. Makepeace (1996, 25) speculated, in the absence of such evidence, that bodies might have been exposed, or excarnated, within the ditches (if one casts doubt on the earlier phosphate analysis). But this still does not explain the absence of any related material evidence from periods when such material is known to exist and to appear in other funerary contexts. The reasons for pursuing this line of reasoning appear more to do with the proximity to other more recognisable funerary monuments, and a superficial resemblance to other forms of prehistoric earthwork.

There are many examples of Neolithic and Bronze Age burial monuments in the locality. The Bronze Age Hawkslow barrow lies only 0.8km to the south west of the Parwich rings, and the largest Neolithic chambered tomb in Derbyshire stands on Minninglow, five kilometres to the east, together with a Neolithic long barrow and three Bronze Age barrows (Lomas 1962, Barnatt 1989). Lomas also cited barrows on Aleck Low and Nettly Knowe, respectively 1.5m east and south-west, to which could be added the Liffs Low bowl barrow, 1.5km west, all three excavated in the 1840s and either Bronze Age in date, or in the case of Liffs Low, possibly in the Middle Neolithic (Bateman 1849, 41-43, 68-69). Makepeace (1996, 25) noted the similarity between the Parwich rings and the forms of Early Bronze Age disc barrows and Neolithic henges: all circular with

internal ditches and external banks. But this analogy does not extend very far. Disc barrows, among a variety of barrows encircled by ditches with outer banks, range from 12m to 60m in diameter, enclosing one or more small mounds, invariably covering burials in pits, normally cremations, accompanied by pottery vessel, tools and personal adornments. In other forms of barrow, a much larger single mound takes up all or most of the space within the encircling ditch, covering both primary and secondary burials. Henge monuments are generally far larger than barrows, comprising a central space enclosed by sizeable banks and ditches. They are typically less than 100m in overall diameter, although the Thornborough henges in Yorkshire are twice that size, and there are still larger examples at Avebury and Durrington Walls in Wiltshire (Wainwright 1990, Harding 2013). As at Arbor Low, 6m north of Parwich, and the 'Bull Ring' at Dove Holes, nearly 14km to the north-west, some henges enclosed stone circles, and others, such as Arbor Low, included upright stones as portals at one or more entrances (Barnatt 2019, 163). These impressive monuments are generally accepted as places where Neolithic people, thinly scattered across the landscape for much of the year, would come together seasonally for tribal ceremonies and festivities (ibid 163-4). A rare form of henge-like monument, known as a hengiform, is perhaps a closer match to the Parwich rings. These are typified by circular ditches 5m to 20m in diameter with external banks. However, they are also characterised by one or more well-defined breaks or entrances, and by the presence of cremation burials, graves pits and postholes (Last 2018, 11). Only about 30 such sites are known nationally, and none amassed in clusters such as seen at Parwich.

Makepeace (1997, 25) also reflected on the similarity between the Parwich rings and ditched features of a comparable scale recently revealed by excavations at Lismore Fields, Buxton, and further afield at Brightlingsea, Essex, both of which he understood to represent large open cemeteries comprised of individual burial plots, wherein the ditches alone survived after centuries of ploughing. We will return to the Lismore Fields example a little later, but first we must consider the parallels suggested with Brightlingsea and (by implication) other urnfield cemeteries in the East Anglian tradition.

Brightlingsea belongs to a number of Middle Bronze Age (1500-1100 BC) cemeteries discovered in the area between Colchester and the Crouch estuary and more broadly within the Thames Estuary region, in which cremation burials are associated with groups of small ring ditches, very similar in form to contemporary cemeteries found across the North Sea in Holland (Bradley 2019, 231). This practice preceded a wider transition which saw a move from inhumation to cremation spread across much of central Europe and its margins, beginning around 1300-1250 BC (Sørensen and Rebay-Salisbury 2023, 1-2).

The superficial similarity between the pattern of rings at Parwich and that excavated at Brightlingsea in 1989-90 is obvious (*see* Figure 26). The Brightlingsea cemetery, excavated in advance of gravel extraction, included 31 clustered ring-ditches, although unexcavated examples seen from aerial photography extended further afield and

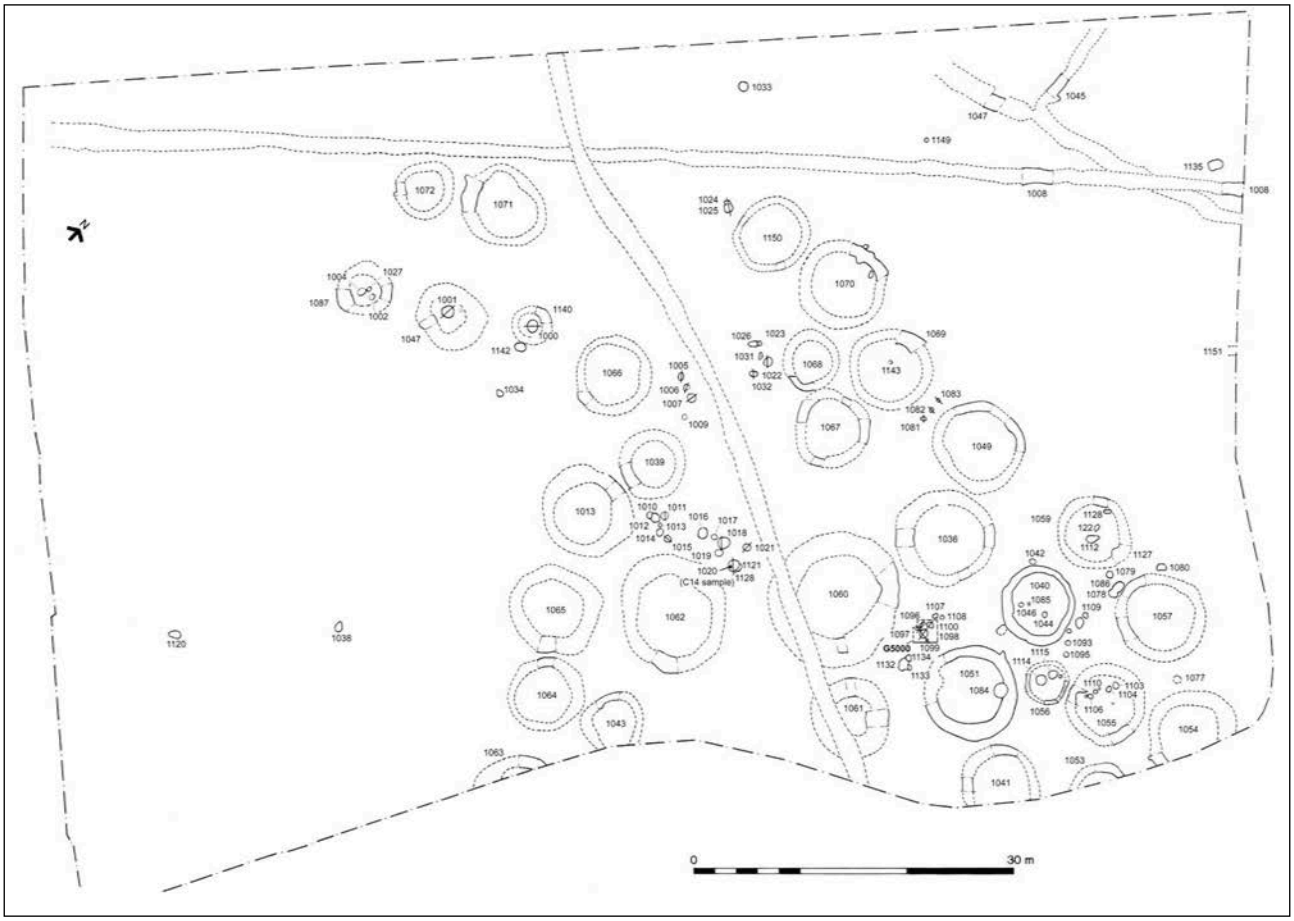

Figure 26: Brightlingsea: the Middle Bronze Age cemetery plan (Clarke and Lavender 2008, Fig 6). © Essex County Council. Reproduced with permission.

perhaps raised the number to as many as 50 (Clarke and Lavender 2008, 56). They appear to have been laid out with reference to each other, with few instances of intercutting despite being so closely spaced. Ten of the rings had internal diameters of 4m or below, the mean external diameter was 7.34m, and the mean ditch width 1.16m (ibid 10, 64). In both spacing and size, therefore, the pattern is not dissimilar to Parwich. But there the similarity ends. Forty-eight cremation burials, 34 of which accompanied by urns, were recovered, mostly from the intervening spaces between the rings. Only three rings, those among the smallest on the site, were found to contain burial evidence. Given that the intervening burials were cut into the natural subsoil, but no such cuts were found within the rings, the authors speculated that some burials may have been placed within upcast mounds within the rings which were subsequently lost to ploughing. They considered, in light of comparable sites, that ten or more burials per mound, both primary and secondary, would not have been unusual in this context (ibid 61).

One such analogous site was excavated at Ardleigh, north of Colchester between 1955 and 1980 (Brown 1999). The core of the Middle Bronze Age cemetery here extended over about six hectares and included several hundred cremation burials, many with

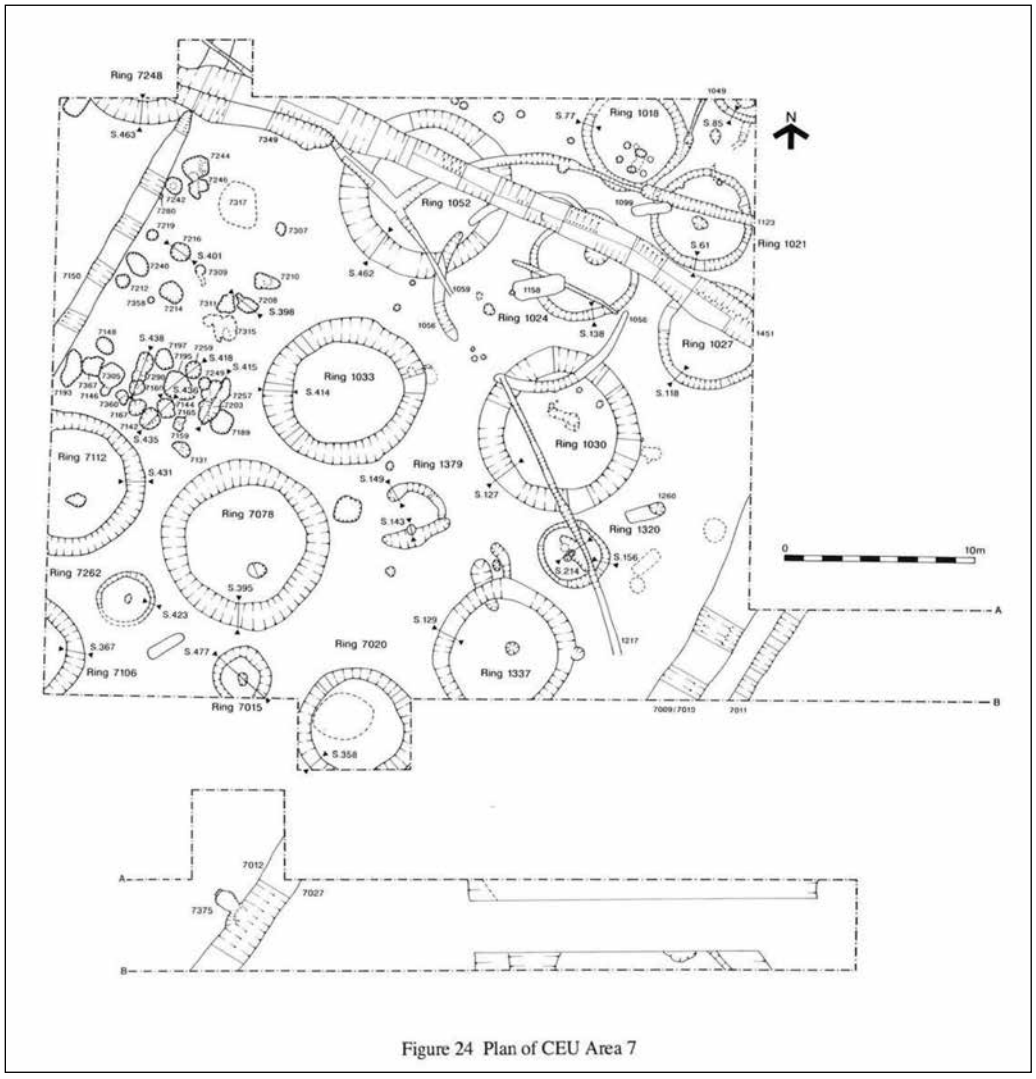

Figure 27: Ardleigh, Colchester: Plan of the area excavated by the Central Excavation Unit in 1979-80 (Brown 1999, Figure 24). © Essex County Council. Reproduced with permission.

urns in local (Ardleigh) variations of the widespread Deverel-Rimbury form. One area, measuring 32m by 42m was excavated fully by the Department of Environment in 1979-80 (ibid 35-65 and *see* Figure 27). This revealed 14 complete or near complete ring-ditches and parts of three or four others, apparently representing sequential development in four groups ranging in size from 3m to 9m in diameter. The four smallest rings, comparable in size to those at Parwich, each contained central pits holding cremated bone. Here too it was speculated that burials had been incorporated in upcast mounds within the larger rings, and later lost as those mounds were ploughed away (ibid 164-5). It is worth noting that the close proximity of the smaller rings recorded here implies a lack of any external banks (*see* Figure 27).

This Ardleigh burial tradition was encountered more recently at St Osyth, set within a Neolithic causewayed enclosure on the Tendring peninsula south of Brightlingsea (Germany 2007). Here 22 ring-ditches were arranged in an arc around the south side of

an earlier pond barrow, including annular and penannular variants ranging from 3.8-7.8m in diameter and 0.4-1m wide, again superficially quite similar to the Parwich examples. Again, however, evidence of funerary activity lay in abundance all around the rings: 11 cremation burials, seven in bucket urns, were interred in adjacent pits. Burials with the rings were less common, only six divided between four of the rings, suggesting once more that burials were lost where mounds had been swept away (ibid 43).

These three cemeteries, and others in Essex such as Chitts Hill, Little Bentley, Little Bromley and Thorpe le Soken (Crummy 1977, Brown 1999, Germany 2007, Clarke and Lavender 2008), all share a superficial similarity to the scale and pattern of the Parwich rings. However, given the complete absence of cremated remains and more particularly of associated pottery vessels normally found in abundance, there is no case for Parwich forming part of a similar Middle Bronze Age tradition.

A cluster of similar-sized ring-slots and post-rings was discovered during the excavation of the Neolithic settlement at Lismore Fields, Buxton in 1984-6 (Garton 1991; Garton, forthcoming). These rings, located only 18km distant from Parwich, could present a more direct parallel. Nine rings were excavated. Seven were defined by narrow slots (four complete circuits, two partial arcs and one D-shape), and two by arrays of post holes (one circular the other D-shaped). Both forms fell within two broad categories with diameters (3.0-3.4m and 4.35-4.55m) not dissimilar to the Parwich rings. Makepeace mentioned the Lismore Fields rings alongside those at Brightlingsea (1997,25), but subsequent post-excavation analysis has cast doubt on a prehistoric date for these features. At Lismore Fields a post-ring and a ring-slot each cut into the fills of Neolithic post-holes, and all the lithics found within these ring features is considered residual from the earlier settlement. In the absence of suitable deposits for radiocarbon dating, absolute dating appears almost as elusive here as at Parwich. However, in relative terms, one post-ring was earlier than a post-medieval ditch and both ring types are earlier than post-enclosure (18th-century) land drainage and lime-burning (Guilbert and Garton forthcoming).

Garton’s work explores many comparators for the Lismore Fields rings, dismissing parallels with much larger Neolithic post rings, stake rings found in Bronze Age barrows, or single ring prehistoric round houses. For the post rings, the closest match found was from Easton Lane, Winchester, Hampshire, where a ring of 16 posts was discovered within an angle between Middle Bronze Age field ditches. Pottery and bone from within two post holes indicated a very late prehistoric, Iron Age date. In discussing its purpose (Fasham et al 1989, cited in Garton forthcoming) the original excavator drew comparisons with recent European and Scottish corn stacks constrained by rings of posts driven into the ground. Garton references other similar arrangements, augmented by ropes, used until recently in western Ireland, and speculates on similar stacking arrangements for other gathered materials, such as hay, heather, bracken, peat and turf, all documented in the relatively recent past. The possibility of small pens for captured wildfowl was also raised, based on examples in 17th-century Staffordshire.

In the absence of entrance ways, elevated phosphate values, burning, pottery or other material evidence, the Lismore Fields ring-slots also seemed unlikely as hut circles or funerary monuments. Instead, Garton discusses the possibility that these too served as the bases for stack stands, citing a comparable example in South Dorset (Woodward et al 1985) but noting that it was larger, contained stake holes in the base of the ditch and a socket for a central post. Further examples of early and high medieval ring-ditches and post-rings for stacks collated by Gardner (2013) from Lincolnshire, Northamptonshire, Yorkshire, Kent, Oxfordshire and Norfolk, also share similar characteristics to the features at Lismore Fields. Garton notes that 19th-century Derbyshire stack stands tended to be platforms or rafts of faggots without a surrounding ditch, but those found in more northernly areas were invariably ditched (Ramm et al 1970) or formed as a stone base or 'hemmel' (Hartley and Ingilby 1990). Ramm and his colleagues recorded 122 such earthworks across seven parishes on the Cumberland-Northumberland border, proposing that most if not all served as stack stands rather than alternative attributions as sheep stells, cockfighting pits or hut circles. They mostly occurred in close groups of between two and five, some showing signs of sequential development, and from the available evidence appeared to be hay ricks closely associated with the expansion of permanent cattle pastures in the 18th and 19th centuries. All but 25 of these stands were circular. They ranged from 7.6-15.8m in overall diameter, which is somewhat larger than the Parwich rings, and also differ in having external ditches surrounding the encircling bank, which, together with their typical positions on sloping ground, served to keep their slightly raised platforms well-drained (Ramm et al 1970, 54-60).

Ditched stack stands with external banks occur in other areas of Upland Britain, for example the 'turf' steadings of Bodmin Moor, used to store and dry peat ready for transport to the place of use (Herring et al 2008 123-4, figs. 101-2). These platforms, usually playing-card shaped, but occasionally circular, are typically 5m by 3.5m and rarely more than 4.5m wide to match the maximum span of the roof, often thatched with flat peat turfs called skimmies (ibid 117-124). Other temporary peat stores could be more substantial, such as the 'peat scales' or 'peat cotes', small drystone huts seen in Eskdale and other parts of the Lake District and recorded from the late medieval period, though surviving examples probably date to the 18th and 19th centuries (Wainwright 2000, 130-131). Peat stacks can, however, also be more ephemeral. Exmoor has sub-rectangular or circular ditched and banked enclosures ranging from 4m to 12m in diameter, including examples of conjoined mounds, most tentatively identified as 19th-century peat-drying stacks linked to nearby cuttings and associated habitations (Riley 2014,39-41). Excavation of three such earthworks on Davidstow Moor in 1942 found that the stands had not been prepared in advance, and, as on Bodmin Moor, the ditches were dug after the stacks were complete. This would explain why the upcast was thrown outwards, in some cases forming an outer bank - a practice that was recorded as late as 1942 (ibid 41-42; Christie and Rose 1987, figs 16 and 17).

Having considered the Lismore Fields rings as potential remnants of stack stands, Garton (forthcoming) reflects on the possibility that the Parwich rings could be better preserved examples of similar features, here lacking the damage caused by post-enclosure ploughing. The radiocarbon dates obtained in 1999 and the relative dating provided by the rakes and walls suggests a time frame equivalent to stack stands recorded elsewhere.

Adding one other excavated example, at Wormhill near Buxton, Garton charts three Peak sites with comparable rings within a 20km radius. The Wormhill example lacked dateable finds, despite its location within a scatter of prehistoric artefacts, and therefore, like Lismore Fields, provided nothing to contradict the medieval (or later) date suggested for this class of feature (ibid). She notes that in all three cases the rings occur on former common (or at least unenclosed) land, away from arable fields, and as such the activity is unlikely to have had anything to do with drying corn. Her conclusion is that the drying of moorland vegetation is a more probable explanation, such activities, involving peat, turves (shorn of earth) and other heathland plants, being well-attested in the medieval period in Yorkshire (*cf* Hartley and Ingilby 1990 ff). More particularly she points to Scurfield's discovery (1999, note 4) that the value of turves and heath on the Hartington demesne lands, between Parwich and Buxton, was equal to that of the meadow and lead mines combined in 1298.

Valley peat might have been the object at Lismore Fields, but there are no substantial deposits in the vicinity of Parwich. Shimwell's pollen analysis from the 1991 excavations indicated that the rings were constructed in 'open grassy heath' (Makepeace 1997, 23-4). Drawing on examples from Cornwall, Garton comments that grassy turf rather than peat may have been gathered and dried at Parwich, the clustering of these rings having some similarity to the loose groups of steads recorded in areas of pared hillside or downland turf on Bodmin Moor (Garton forthcoming, cf. Herring 2008, 124, maps 1-3).

The gathering of grassy turf as a poor fuel, or for thatching or fencing, could explain the Parwich rings, signifying an activity carried out piecemeal on the common margins of the parish in the medieval or post-medieval period prior to enclosure in the late 18th century. A sequence could be inferred to explain this process. First, the area of the stand is marked out by the ditch, the size being a matter of tradition or convenience, with the upcast forming an external bank. Next, the platform within the ring is stripped of turf, the turves pared to remove clinging soil and stacked. More turves are then added by stripping the surrounding ground to bring the stack to a workable height. In this scenario the stripped areas are represented by the space retained between the majority of rings, and the proliferation of rings represents the repetition of the process, extending ever outwards from one or more initial 'cores' until the reaching the limits of the available ground. At each stage of development, the turves are carted away for use in the village and outlying farms.

This is not a perfect model. Would turf, probably cut in a dry season, need to be stacked or stored for any length of time before being taken to a place of use? Why,as Garton (forthcoming) has asked, would turf lines be repeatedly discovered below the banks if harvesting turf was the principal concern? Why are there no substantial mounds left at Parwich, when abandoned stacks, either in part or whole, are found in many other peat cutting areas (e.g. Reilly 2014)? Furthermore, although the spread of rings on the south flank of Leskernick Hill, on Craddock Moor, on the west side of West Moor and elsewhere on Bodmin Moor offers a similar distribution pattern (Herring et al 2008, figs 1-3), the density of Cornish steads, four, perhaps five per hectare, nowhere approaches the concentration recorded at Parwich. The ratio of stands to the area of turbary, even allowing for sequential development, appears far too great at Parwich, especially as there seems to be no reason why one season's stand could not be reused rather than replicated.

What other explanations fit the evidence? One possibility is bee-keeping. The value of bees, honey and wax was highly significant in the medieval period and remained considerable until substitutes such as sugar and paraffin wax became commonplace in the late 18th and 19th centuries. Rents were levied or gathered in quantities of hives, beeswax and honey up to the end of the Norman period, as were tithes for many centuries afterwards (Walker and Crane 2001, 11-16). It may be significant that the Domesday Book mentions Parwich alongside Darley, Matlock (Bridge?), Wirksworth and Ashbourne as five manors which, together with their berewicks, rendered 6 ½ sesters (about 13 pints or 7.4 litres) of honey in the time of Edward. The only other holdings in Derbyshire to pay honey as part of their dues (5 ½ sesters) were the three manors of Hope and its berewicks (Williams and Marton 2003, 743-4; Grierson 1987, 80-85).

A survey of inventories from Derbyshire for the period 1583-1691 indicates that bees were largely kept by the more well-to-do members of society, whereas other Derbyshire records suggest that cottagers might have shared hives. One of the most complicated holdings was that of John Rogers, a linen webster of Killamarsh, in north-east Derbyshire, whose 1662 inventory included '1 hive of beese 6s., half a hive of beese 3s. 4d., 3 partes of a hive of beese 3s., half of 3 hives of beese 15s (Hopkinson 1987, Db2, cited in Walker and Crane 2001,16). Records of the period 1530-1740 indicate that the average number of hives held by bee-keeping households was five and a half, though at the more exceptional upper end of the spectrum this could rise close to 30. Average holdings did not vary much among the higher social classes, but women, craftsmen and labourers generally had fewer hives (Ibid 17-18)

Portable wicker or woven straw skeps have existed in England since at least the 6th century and these, when not confined to the homestead in special wall recesses (bee boles) or shelters, may have been transported to areas of heath and moor during the heather flowering in late summer (Walker 2011). This was certainly the case in 1768 when Thomas Wildman wrote that 'If there is a heath at a convenient distance, the hives

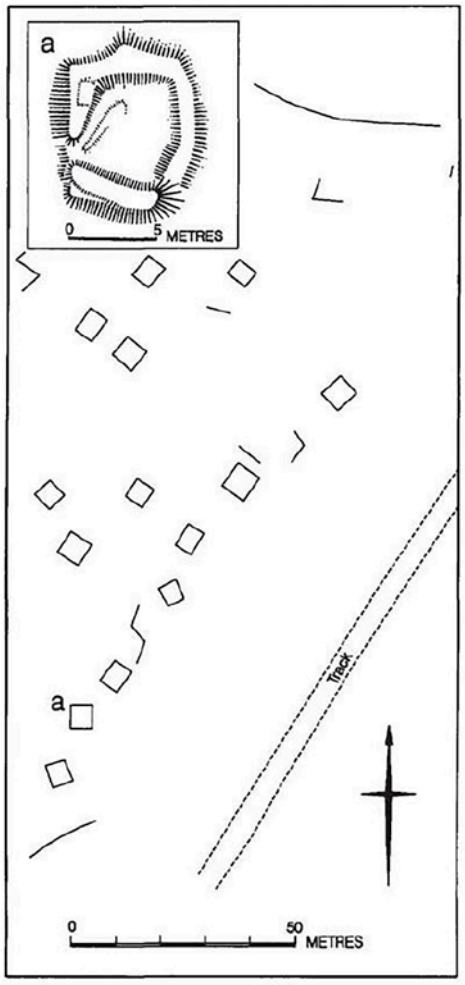

Figure 28: 'Holmsley Ridge' type bee garden enclosures near Brockenhurst (Smith 1999, Figure 22). Reproduced with permission from the Hampshire Field Club and Archaeology Society.

being carried thither, would considerably lengthen out the season of collecting honey'. Jacob Isaac's 'The General Apiarian' published in 1799 and written from a Devonshire perspective, advised carrying swarms into or near to the heath in mid-July so that honey could be taken from the cottage-hive (skep) when it was brought home at Michaelmas (both cited in Walker 2011, 138).

Memories of this activity were recorded in Derbyshire in 1907 when it was said that:

> "as elsewhere, the ancient traditions lingered long; and year by year, when the warm weather came on, the bee-keeper of the Peak would carry his skeps, or wheel them in a hand-barrow (choosing, if he were a prudent man, the night hours for the transit), out on to the moors. And there, amid the wild thyme and heather, he would set the bees down, and leave them all the summer through to gather in their store as long as the flowers were in bloom, bringing them back again into shelter at the first approach of winter. The honey, then an indispensable commodity in every

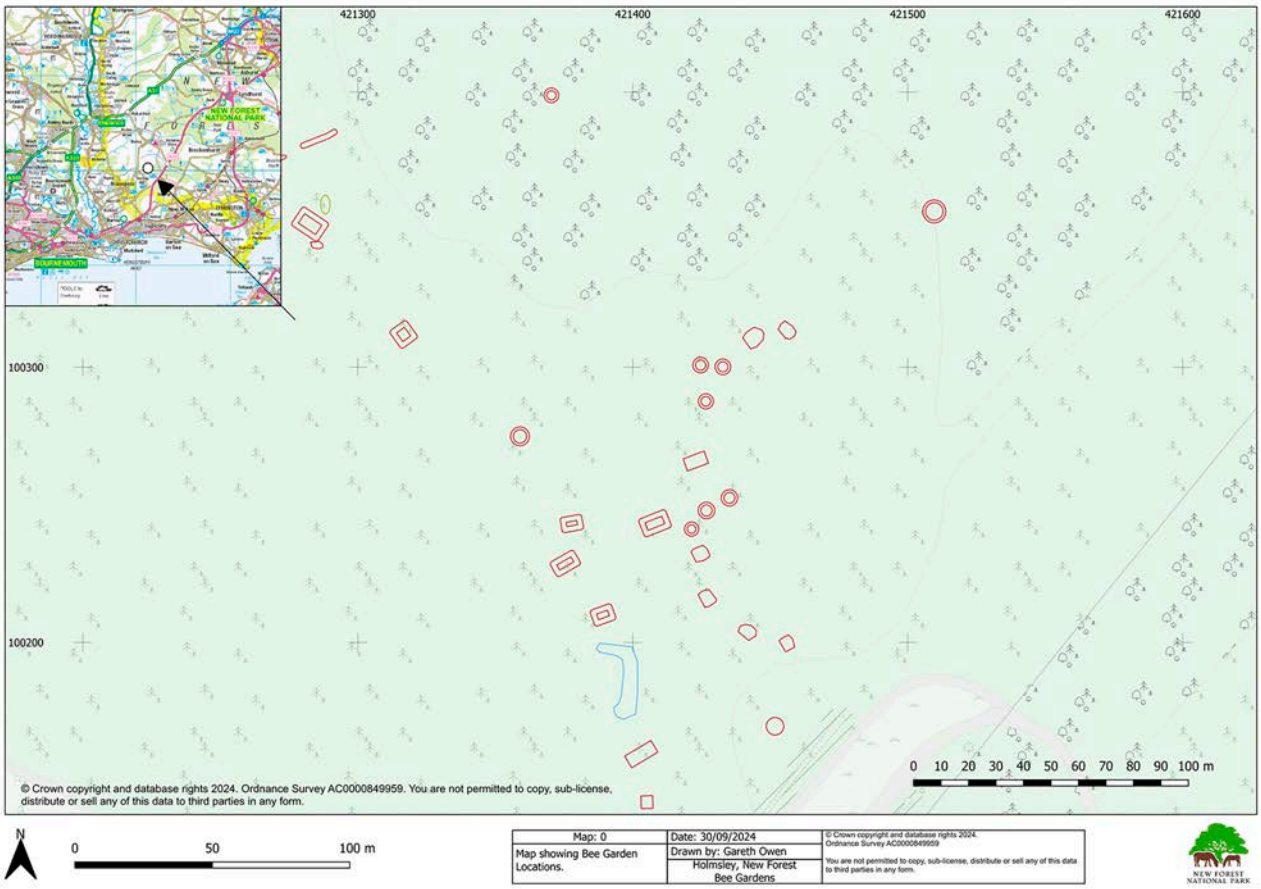

Figure 29: Map showing bee garden locations, Holmsley, identified from lidar. Reproduced with permission from the New Forest National Park Authority (NFNPA). © Forest Research based on Cambridge University Technical Services and NFNPA data.

> household, would be carefully strained and separated from the comb; helping to pay landlord's rent in kind, while the wax would go in tithes and free-will offerings to the service of the church." (Vallance 1907, 241)

On the North York Moors near Whitby, in the late 19th century, a bee garth contained some 40 straw skeps, each elevated on three wooden props and a rounded flat stone. At nearby Calton many people came with skeps, and in 1953 over a hundred stands were counted, with other rows of 30 and 25 nearby. Similar numbers were placed on stones at Rudland Rigg and Saltersgate, the latter having 300 hives when a horseman was badly stung there in 1856 (ibid 140).

At least 300 hives are reported at the village of Beaulieu in Hampshire in the 13th century, and this was not unusual for the area (Vernon 1981, cited in Walker 2011). Here, within the New Forest, skeps needed protection from cattle, ponies and pigs, resulting in numerous small enclosures. In 1635, when some 44 bee-keepers were fined for making such enclosures in defiance of Forest Law, it was typically a more permanent than migratory practice, spanning the entire summer (ibid 141). Writing in 1910 Heywood Sumner, recorded ‘ banked up rings which mark the sites of ‘bee-gardens’ – places where beehives were put out when the heather bloomed’ in the north western part of the Forest, and further elaborated on these practices in his book *The Ancient Earthworks of the New Forest* (1917) based on oral histories of mid-19th century bee-keeping (Sumner cited in Walker 2011, 142; Sumner 1917, 128).

Records of these sites began to be collected systematically in the 1960s and several were excavated in the 1980s in advance of gravel extraction. Although alternative explanations, such as pillow mounds (artificial warrens), pig pounds or military activity could be easily dismissed, the attribution of function was largely a matter of place-name evidence, as none of the excavated earthworks revealed any direct indications of bee-keeping or datable material (Walker 2011, 143, Smith 1999, 40-42). The parallel with Parwich is noteworthy.

Excavated and surveyed examples fall into two main forms, the ‘Holmsley Ridge’ type found across the south of the Forest, and the ‘Ibsley Common’ type, in the north west. Several hundred of the former type have been recorded. These are rectangular or square, and very occasionally circular, defined by low banks (0.2m high) with internal ditches, and varying in size up to 8m in width or diameter. Only about 20 of the second type have been found. They are similar, but with external ditches. It is assumed that the banks were topped with brushwood or stakes, at least when the hives were in place (Walker 2011,142),

The Royal Commission on Historic Monuments of England (RCHME) carried out investigations in the New Forest in the 1990s, recording many supposed bee gardens and noting their proximity to areas of heathland (Smith 1999, Fig 21). In one particular area near Brockenhurst a group of more than 20 enclosures was surveyed, these arranged in loose rows over an area of approximately 150m by 80m (Figure 28). In an interesting parallel to Parwich, also observed among the much larger and random pattern recorded on Holmsley Ridge, none overlapped, suggesting they were laid out with respect to each other (ibid 41-42).

More recently, the availability of high resolution lidar over the New Forest has extended the ability to map these relatively ephemeral features. A good example is provided by Figure 29 showing an area of Thorney Hill Holms, south of the Holmsley Ridge. The scale and proximity of these features suggests a parallel with Parwich, although equally the preponderance of rectangular examples sets the two patterns apart.

Conclusions and recommendations

In summary, the Parwich Rings remain something of a mystery. This survey has provided an accurate and comprehensive plan of their visible distribution alongside a description and gazetteer of their various sizes and configurations; but it has not (nor was it expected to) provided any definitive answers regarding date or purpose.

The present authors are not the first to question the prehistoric origin of the rings, whether based on proximity to known prehistoric sites, or their apparent similarity to Middle Bronze Age urnfield burials. The lack of material evidence for any form of funerary practice, and indeed the absence of artefacts of any kind, undermines such theories, as too the humic nature of the buried turf revealed by excavation beneath sections of their banks. Two radiocarbon dates taken from those deposits in one ring suggest that construction took place no earlier than the period 800-1000 CE, though further sampling is required to establish whether those dates are matched elsewhere and therefore characteristic of the wider pattern. At the other end of the spectrum, it would appear that some rings predate the mining of the lead and the construction of field walls following the Act of Enclosure in 1788, which together with an apparent absence of documented references to their existence, suggests that their use had ended decades if not centuries before.

The function of the rings is likely to have been intrinsically linked with their location in a former area of common moor or heathland. Parallels have been drawn with various forms of stack stand for moorland vegetation, and with bee gardens, either of which might have been used to derive a product from the landscape, whether turf, or honey and wax.

Further research may shed further light on these unresolved questions. Geophysical survey could be deployed to test whether the earthwork rings are the sole evidence for this period of activity, or if other evidence has been overwritten by the visible pattern, or remains undetected in the spaces between the rings. It would be helpful to excavate a further sample of rings in detail, seeking opportunities to corroborate or extend the range of scientific dating, and retrieve samples for further environmental tests. To that end, we have identified a number of rings (see Appendix 1) which may be the most suitable candidates, based on their survival as earthworks, and a reasonable chance that they were not extensively disturbed by Lomas in the early 1960s. It might also be useful to extend excavation into the intervening spaces between the rings, particularly if guided by geophysical results. A wider investigation of documentary sources such as post-medieval inventories and wills (which lay beyond the scope of this survey) might also reveal whether bee-keeping has a particularly relevant history in this part of Derbyshire.

The Parwich Rings are, undoubtedly, a unique feature in the landscape of Derbyshire. Irrespective of whether further investigations take place soon or not, it is important to ensure that the pattern of rings remains visible and viable for future research.

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Appendix 1

Table 2: Parwich Rings Gazetteer: measurements and observations (refer to Figure 30 for locations)

Green numbers: south field; blue numbers: north field. Features 1-37 observed on the ground 13 Dec 2023; features 38-125 13 Feb 2024; features 126-173 14 Feb 2024.

Survival. A: the best examples, all components appearing complete, reasonably robust and clearly visible. B: some apparent loss of elements, but essentially complete.C: elements missing or a significant percentage absent. D: sparse or highly denuded examples.E: Uncertain.

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
1	4.5	Circular	Makepeace 'C'	Mound, ditch and bank well-defined. Mound and bank 0.2m high. well-constructed, but slightly oval shape to mound and odd straight line through bank. Can be identified as Makepeace 'C'.	A
2	4.4	Circular		Well-defined mound, ditch and bank, except where eroded by trackway.	A
3	5.2	Circular		Minimal mound. Ditch and bank visible. Bank slightly irregular	B
4	8.1	Oval		Slight mound, very slight ditch and virtually no trace of bank (extremely spread).	C
5	4.3	Sub-square		Extremely faint on the ground. Almost invisible.	D
6	5.0	Circular		Quite faint. Ditch visible and traces of bank but not much sign of mound.	C
7	4.2	Oval		Slight but visible mound, ditch and bank. Bank slightly irregular.	B
8	4.3	Circular?		Trace of curved ditch, but inconclusive. Scored through by wear along trackway.	D
9	3.4	Circular/ irregular		Slight mound, bank faint on north side.	C
10	4.5	Circular		Complete but slight. Maximum feature height/depth 0.1m.	B
11	6.0	Sub-square		Ditch and mound. Slight bank. Possible that this is a platform related to lead working, rather than a ring. Although appears to be cut by rake.	C

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
12	5.5	Sub-rectan-gular		Slight mound. Good bank, best on the north (downhill) side. Slight ditch.	C
13	4.5	Circular		Mound, but no other definable fea-tures. Unconvincing at ground level.	F
14	3.1	Circular		Slight indications of a ditch, very spread bank, not very convincing but possible.	E
15	4.7	Circular		Pronounced mound 0.2m high and very good clear ditch with outer bank (sub-square) to NE. Upslope (SW) ditch and bank infilled/overlain by lead rake upcast. Potential excavation can-didate (See Figure 24)	A
16	4.6	Circular		Very slight mound. Ditch shallow but clearly defined. Low outer bank. Ditch and bank to SW seems to disappear under the spread of upcast from rake. (See Figure 24)	B
17	3.2	Circular		Broad, well-defined bank. Narrow ditch and low but visible mound. Smaller than average with wide spread bank.	B
18	4.4	Circular		Defined mainly by the ditch and traces of bank. Interior largely level.	C
19	6.6	Circular		Large example. Well-defined outer bank, especially to the west. Narrow ditch and broad internal platform.	B
20-21	2.5-3.1	Double/ circular		Conjoined ditches, both circular. 20 has a defined mound, clear ditch, strong bank to west. It appears super-imposed over NW part of 21, which may be an earlier ring. Surrounding mound is merged as one.	B/C
22	4.2	Circular		Convincing, but rather broken and partly overlain by spoil from a possible lead prospection pit to south. Mound visible but damaged. Ditch visible. Slight traces of the outer bank to north.	C
23	3.9	Circular		Clear ditch, minimal mound, good (though spread) bank.	B
24	6.1	Circular		Damaged (two breaks in bank) and slight, but all elements visible. Central area level	C
25	4.7	Circular	Lomas?	Platform and ditch fully visible in-cluding a rather broad bank, but max height/depth only 0.1m. Suggestion of previous excavation - Lomas?	B

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
26	4.0	Circular		Feature mostly defined by the ditch. Very slight platform mound. Scant traces of bank. Close to rake but no clear relationship. Perhaps slightly overlain by rake upcast and denuded by working damage.	C
27	4.7	Circular	Lomas?	Well preserved appearance, but probably excavated in part. NE half of the mound has been reduced with a partition line. Very clear bank 0.15m high and 1m wide, with a break to the SE. Lomas excavation?	A
28	5.6	Circular/ oval		Level platform framed by ditch and bank to east, but SW side heavily disturbed by grooves and ridges related to a hollow way which is in turn cut by the rake to north. Bank in three parts	D
29	4.7	Oval	Lomas?	Very pronounced bank around two thirds of circumference to south, 0.2m high and 1.5m wide. Ditch also well-defined. Mound appears half-sectioned, with the north side reduced and spoil mound to north. Perhaps Lomas?	A
30	4.1	Circular		Good bank to south. Bank and ditch clipped by the rake side on NE side. Low central mound.	B
31	4.5	Circular	Lomas No. 35?	Clearly-defined low mound. Ditch well-defined on all but nearest part to rake. Possible that rake upcast covers bank to NE. Excavate? Given vagaries of Lomas' plan, this may be his excavated ring No.35	B
32	3.8	Circular		Low fragmentary bank on uphill (south) side. No sign of mound. Trace of ditch to west. Possible, but dubious.	E
33	4.3	Circular		Ditch slight but visible. Very slight bank to SE, spread and slightly squared. No evident mound. Plough mark (?) cuts through N-S.	D
34	4.3	Circular		Very slight evidence of a platform. Mostly defined by a faint ditch 0.8m wide x 0.05m deep. Battered with very spread bank.	D
35	5.4	Circular		Slight mound. Very faint ditch 0.5m x 0.1m. Faint bank.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
36	5.7	Sub-square		Slight mound, good bank 1.0m wide and 0.15m high. Slight ditch, mostly visible to the west. Damaged, particularly along NE edge.	C
37	4.5	Circular		Very slight annular ditch 1m wide and 0.05m deep. Scarcely any bank or mound visible at ground level. Battered.	D
38	3.3	Circular		Clear annular bank 1m x 0.15m. Very shallow ditch defining very slight mound. Broken through in middle by trampling/movement.	B
39	3.7	Circular		Small example. Good bank to SW (uphill); damaged downhill. Traces of mound/platform. Rather trampled appearance.	C
40	5.5	Sub-square		Well-preserved bank 1.3 wide 0.3m high to NW and downhill, broken to SE. Mound (slight) defined by ditch	B
41	4.6	Circular		Full annular bank, best to SE, 0.8m wide and 0.15m high. Complete slight ditch defining very slightly domed mound which is almost triangular in plan.	B
42	2.9	Circular		Well-preserved slightly smaller than average example. Bank 1m wide and 0.2m high, best to SE and W. Platform defined by ditch.	B
43	7.0	Oval		Damaged, but bank remains clearly visible except to NE. Trace of ditch around most of circuit. Appears to be a spread or dump of material to the SE.	C
44	3.9	Circular	Garton & Guilbert 1999	Well-preserved bank 1.3 x 0.3m forming complete circuit. Slightly mounded platform defined by complete ditch 0.1m deep. Excavated and reconstructed	A
45	5.0	Irregular		Platform distorted and elongated NE-SW. Bank broken to the E but otherwise complete circuit. Seemingly sub-square rather than round, but that might result from trample alongside adjacent routes.	B
46	4.6	Sub-square	Makepeace A?	Sunken platform surrounded by a large ditch. 0.2m deep from outside. Bank 1.3 x 0.3m. Suspect this is reconstructed, possibly Makepeace ‘A’.	A

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
47	3.8	Circular	Makepeace B?	Small rather battered ring, especially to the NE. Trace of mound. Vehicle damage. May be Makepeace 'B'.	C
48	4.3	Circular	Lomas?	A large robust feature, but damaged to the NW. Internal mound domed 0.2m high. Bank 1.2m x 0.2m Ditch overlain by extended mound. Perhaps previously excavated (Lomas?)	B
49	4.1	Sub-square		Largely complete bank, broken to the E. Mound low but complete. Ditch sporadic but complete. All low.	B
50	3.9	Sub-rectangular		Good mound and bank to SW, broken bank to NE. All disturbed by track to north. Bank maximum 1.2m wide and 0.2m high.	C
51	3.9	Circular		Very faint bank 1.0 x 0.05m. No evident mound. Trace of ditch, very slight. Damaged through proximity to later quarry?	D
52	4.1	Circular		Dubious. Slight trace of bank to south. Very degraded.	E
53	4.6	Circular	Lomas?	Bank 1.4 wide and 0.2m high, Well-defined but damaged by tracks. Ditch-defined platform. Possible traces of excavation	B
54	5.1	Oval		Abutting 53. Bank 1.3m wide and 0.1m high, damaged to SE. Traces of ditch define level platform.	C
55	3.8	Circular/ irregular		Small. Ditch around SE half. Slight bank, degraded to the NW and broken to ESE. Ditch defines platform.	C
56	4.1	Circular/ irregular		Full circuit of bank present 1.2m wide and 0.15m high. Narrow ditch defines platform. No mound.	B
57	5.4	Oval		Faint but fully visible bank circuit 1.2m wide x 0.1m high. Slightly oval ditch in plan.	C
58	5.4	Circular		Low and spread but complete. Bank spread (0.05m high) and square in plan, broken by narrow slot to NW. Shallow ditch defines platform.	C/D
59	5.3	Oval		Oval ditch, oriented E-W, clipped by (modern?) track to NW. Bank 1m wide and 0.2m high. Platform defined by ditch, no added height.	B

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
60	4.0	Circular		Battered by modern track and perhaps plough line cut through from NE to SW. Bank most visible to SW and SE. Faint traces of ditch.	C
61	4.5	Circular		Extremely faint and small	E
62	4.0	Circular		Small and well-formed, but damaged. 1.2m wide and 0.2m high bank, clipped by track on NW side. Break in bank to N. Mound with slightly domed profile.	B
63	4.0	Circular?		Small and well-formed mound with slightly domed profile. Ditch and bank incomplete: truncated on SE side by a trackway which is earlier than (cut by) the rake.	B
64	6.3	Oval		Oval oriented N-S. Very denuded. Only slight traces of platform and mound. Abuts ring 65, but the relationship is unclear.	D
65	4.3	Oval		Questionable platform defined by oval ditch, oriented E-W, faint and partial bank. Almost touching 64.	D
66	5.1	Circular		Circular depression with traces of ditch. Faint, spread and distorted bank. In modern improved pasture.	C
67	4.2	Circular		All parts present but not prominent. Suggestion of break in bank. In modern improved pasture.	B
68	4.1	Circular		All complete, but very low. Platform defined by ditch. Bank 0.15m high. In modern improved pasture.	C
69	3.9	Circular		All complete, but very low. Platform defined by ditch. Bank 0.1m high, very spread with break to E. In modern improved pasture.	C
70	3.7	Circular		All complete, but very low. Platform defined by ditch. Bank 0.05m high. In modern improved pasture.	C
71	4.1	Circular		Very faint, but apparent from grass colour variation. Slight bank 0.05m or less, with break to the north. Trace of ditch. In modern improved pasture.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
72-73	3.3/4.2	Double (circular)		Two ring ditches, north (73) 4.2m diameter; south (72) 3.3m diameter; set 2.5m apart and connected by a single ditch, the pair surrounded a spread bank 0.05m high. In modern improved pasture.	C/D
74	4.9	Circular		Faint but complete, with slight bank 0.05m high and trace of mound. In modern improved pasture.	C
75	5.0	Circular		Complete but quite level. Bank 0.05m high. Platform defined by trace of ditch. In modern improved pasture.	C
76	4.2	Circular		Complete but almost level. Bank 0.05m high. Platform defined by ditch, possibly distorted by improvement to appear triangular. In modern improved pasture.	C
77	3.5	Circular		Extremely faint, spread and distorted by modern pasture improvement	D
78	5.0	Circular/ oval		Extremely faint. Needed lidar or extremely good low light to detect on the ground. Platform defined by ditch. In modern improved pasture.	D
79	4.4	Circular		Bank 1-1.2m wide and 0.2m high on all but NE side. Platform defined by ditch, reduced by improvement, but not as much as rings to the SW. In modern improved pasture.	B
80	4.8	Sub-square		Complete but very slight, 0.05m-high circular defining bank, sub-square ditch and platform. NE edge overlain by fence line and a narrow ridge of less trampled ground below the wire. In modern improved pasture.	D
81	4.0	Circular		Convincing, but distorted and extremely faint. Crossed by fence line. In modern improved pasture.	D
82	4.5	Circular/ oval		Extremely faint, crossed and partly masked by fence line. In modern improved pasture.	D
83	4.0	Circular		Very battered and affected by underlying natural drainage channel with sporadic hollows. Bank 1.0 x 0.1m. In modern improved pasture.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
84	4.7	Circular/ oval (but very misshapen)		Faint but visible bank and platform defined by traces of ditch. In modern improved pasture.	D
85	4.5	Sub-square but misshap-en		Very faint, almost lost on SE side. Ditch is main feature. Depth 0.05m at most, defining extent of platform. Bank very spread. In modern improved pasture.	D
86	3.5	Circular/ sub-square		Very disturbed, possibly by activity as-sociated with the adjacent quarry. Faint and sporadic traces of ring, slightly sub-square.	E
87	4.0	Circular/ oval	Lomas?	Complete but with slight damage to E - a trench perhaps? Platform defined by ditch. Bank c 1.0m wide and 0.2m high from base of ditch.	B
88	3.4	Circular		Good if broken bank circuit 1.1m wide and 0.2m high. Platform defined by slight and irregular ditch.	C
89	4.3	Circular/ sub-square		Completed but rather battered and knocked down with squared and mis-shapen bank. Wide platform defined by narrow ditch.	B
90	3.6	Oval/ circular		Complete but spread bank, possible break to NW. Platform defined by ditch.	B
91	4.3	Circular		Complete circuit of bank and ditch-de-fined platform. Well-formed bank 1.0m wide and 0.15m high. Some breaks in line with adjacent packhorse route.	B
92	4.7	Circular		Mostly visible as bank on the ground, 1.2m wide and 0.1m high, complete but very faint.	D
93	4.3	Circular		Very widely-spread bank, very slight especially to the NE; mostly defined as a slight saucer depression. On route of NE/SW trackway.	D
94	4.6	Circular? (only part remains)		Clear partial bank 1.2m wide and 0.2m high, except to E where under a hawthorn tree and distorted by the root mound.	C
95	4.1	Circular		Battered but nearly complete. Lost part of bank to SE where clipped by strand of packhorse route. Slight mound.	C

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
96	3.3	Circular/ oval		Quite well preserved except where disturbed by packhorse track on E side.	D
97	3.4	Circular		Complete but battered full circle ditch. Bank rather lost to NE, 1.3m wide and 0.15m high to S. Platform defined by ditch.	C
98	4.4	Circular		Partial survival of spread bank (0.1m high) and faint ditch outlining platform. Near a modern gateway which may account for damage.	E
99	4.0	Circular/ oval		Very slight, but complete circuit of bank and ditch. Almost a sunken circle. Bank merges with that of 100.	D
100	5.0	Oval		Mostly a saucer-shaped depression, defined by a 0.1m deep ditch. Bank very slight and merges with that of 99.	D
101	5.3	Oval/ sub-square	Lomas?	Robust ring feature. Slightly sub-square. Platform appears to have been half or quarter sectioned, reducing the NW quadrant. Mound is slightly elevated. Bank to SE is 0.3m high.	B
102	4.6	Oval	Lomas?	Complete but possibly reconstructed post-exc. Full circuit of bank c 1.0m wide and 0.25m high, with small break in SE side. Ditch 0.1m deep. Mound slightly raised c.0.2m. Possible spoil mound to SE.	A
103	4.3	Circular/ Oval		Mostly defined by low spread bank 1.0m wide and 0.1m high, and slight trace of ditch defining the platform. Abuts natural drainage (solution?) hollow which, given upcast, may have been prospected.	C
104	4.6	Circular but misshapen		Crescent of bank on upslope, mostly lost to the E. Faint impression of ditch/ platform. Two breaks in bank to N and E	C
105	3.9	Circular		Low fragmentary bank on all sides, best to NE. Platform defined by sporadic traces of ditch. Brake in bank to ES has distorted ditch.	D
106	4.6	Circular		Slightly oval or sub-square feature. Raised mound, slightly elongated NE/ SW. Bank best to SE, NE and SW, 1.2 x 0.15m. Well-defined. Possible excavation candidate.	B

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
107	4.0	Circular		Good, similar to 106, but less prominent. Slightly raised mound 0.05m. Bank open or broken to W. Narrow ditch.	B
108	4.6	Circular		Robust feature. 4m ID. Slightly sub-square. Very slightly raised platform defined by narrow and shallow ditch. Bank 1.5m wide and 0.2m high, broken to N. Uncertain if previously disturbed. Could be a good excavation candidate.	A
109	5.5	Sub-rectangular		Large sub-square feature 5.5 x 3.6m (ditch). Mound elongated NE-SW. Very spread bank 2.0m wide by 0.1m high and broken to the N. Ditch shallow, wide and ragged.	C
110	4.3	Circular/ oval		Slightly oval and saucer-like. Bank strongest on SW side and very slight to NE.	C
111	3.9	Irregular		Saucer-shaped depression with traces of bank to NW. Platform and ditch barely discernible on the ground. Disturbed by trackway on S side.	D
112	-	Incomplete		Crescent of bank with a hawthorn tree growing on and possibly obscuring the NE side. Uncertain if a ring feature.	E
113	4.9	Circular		Complete but extremely slight and spread. Bank 0.05m high. In modern improved pasture.	D
114 -115	4.7-5.2	Double, sub-square/ oval		Conjoined-ditch double ring (114 sub-square, 115 oval) surrounded by single broken and spread bank, nothing above 0.05m high. In modern improved pasture.	D
116-117	3.7-5.0	Double, Circular/ sub-rectangular		Conjoined 2-platform feature (116 oval, 117 sub-rectangular) in an elongated enclosure defined by a denuded bank, overall11.7.m NE/SW and 8m SE/NW. All very faint. Bank/ditch inward scarp c.0.2m. In modern improved pasture.	D
118	4.3	Circular		Trace of platform mostly defined by inward fall of very slight but complete circuit of bank. In modern improved pasture.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
119	4.2	Circular		Very slight ring feature mainly defined on the ground by inward fall from bank/ ditch forming complete circuit. 0.05m max depth. In modern improved pas-ture.	D
120	4.3	Circular		Very spread and denuded. Slight domed rise to platform, but main feature is the inward slope of the bank/ ditch. In modern improved pasture.	D
121	4.8	Circular		Much the same as 120. Bank 1.8m wide and 0.05m high. Faint trace of ditch. Inward fall is the main feature. Modern improved pasture	D
122	4.0	Oval		Mostly visible in inward slope from spread bank, 0.05m or less high. Ghost of a complete circuit, virtually no ditch definition. Modern improved pasture.	D
123	4.4	Circular		Mostly seen from inward fall from bank to ditch (0.05-0.1m), no defined inner ditch scarp/platform visible at ground level. Largely vanished to the NW. In modern improved pasture.	D
124	4.8	Circular		All present but very slight 0.05 - 0.1m in height/depth. Complete circuit and faint outer edge of platform. In modern improved pasture	C
125	4.8	Sub-square		Sub-circular depression, defined by inward fall of bank/ditch, and vestiges of outward fall. Almost lost. In very improved pasture.	E
126	4.3	Circular		Dubious remnant of ring feature heavi-ly disturbed by erosion associated with the adjacent track and recent worn footpaths. N section of bank and ditch not visible.	D
127	4.9	Circular		On the ground appears as a C-shaped bank without evident mound, platform defined by fragment of ditch. Break in bank to SE may be original.	D
128	4.1	Circular		Small. C-shaped ditch. Bank 1.8m wide and 0.2m high from inside (0.1m from outside). Gaps to NE and SW possibly result plough damage.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
129	4.3	Irregular/ triangular		Denuded. C-shaped bank, broken and open to the NW. Mostly defined by the inner fall of the bank and very slight ditch defining the platform, which is a rounded triangle.	D
130	3.5	Circular/ irregular		Denuded. Banks and platform mainly visible as changes in grass tone. Sub 0.05m earthworks.	E
131	4.6	Oval		Fragmentary and flattened, possibly slightly square. Defined by inner fall of bank/ditch 0.1m.	D
132	3.7	Circular		Defined by inner fall of bank and trace of ditch around platform. Bank spread and irregular c. 0.15m high. Small gap to the NE. Other upcast or dumped material to the E.	D
133	3.7	Circular		Saucer-shaped depression defined by inner fall of spread bank which has slightly squared outline. Ditch barely visible on the ground.	D
134	5.6	Oval		All elements visible, but very low. Bank 0.1m. Trace of ditch defining platform. Bank upslope to E cut away by boundary ditch.	C
135	4.7	Circular		All element visible but slight. Full bank circuit (max 1.5m wide, 0.1m high) but less pronounced with possible gap to SE. Very slight ditch defines the platform.	D
136	4.1	Circular		Very distorted. Spread bank 1.5m x 0.05m. Very slight ditch defines level platform.	D
137	5.6	Circular (pair?)		On the ground rather dubious - mostly defined by crescent of bank to the NE, 0.15m high. Aerial more convincing. Bank merges with that of 138	D
138	4.4	Circular/ incomplete (pair?)		On the ground traces of bank and a ditch are visible defining part of platform, cut by modern linear feature (drain?) on SE side, removing both bank and ditch. Bank to SE merges with that of 137	D
139	3.8	Circular		Good standard of preservation for this field. Ditch 0.5m wide with small, well-defined level platform. Bank 0.15m high.	C

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
140	4.3	Oval		On the ground a rather dubious feature, defined by possible fragments of bank and platform. Very spread and distorted.	E
141	5.4	Circular		Defined by broken and spread circuit of bank 1.4m wide and 0.15m high. Shallow ditch, 0.5m wide, defines platform.	C
142	4.3	Circular		Ditch 0.4m wide defines level platform. Bank 0.1m high, damaged to SE. All quite flat.	C
143	5.7	Oval		Appears very fragmentary on the ground. Crescent bank to N (upslope) and trace of platform.	D
144	4.6	Circular		Substantial for north field. Spread remains of bank 2.0m wide and 0.2m high may indicate that it was exceptionally a large bank to start with. Ditch 0.5m wide defines slightly domed platform. Cut by drain line to NW. Bank broken and lower to SW.	B
145	4.7	Circular		Complete but low. 0.5m-wide shallow ditch defines platform. Bank, 1.5m wide and 0.15m high, is best upslope to NE, and very spread to SW.	C
146	4.7	Circular		Sited over a shallow natural channel which drops into solution hollow to the SE. The earthwork shows plough marks, but it must have been a considerable size to begin with to have remained so visible. Complete bank circuit 1.2m wide and 0.2m high. Ditch 0.5m wide. Slightly domed platform.	B
147	3.5	Circular/ oval		Most of the bank circuit survives, spread wide at 0.05m. Slight ditch defines the level platform. Damaged and diminished.	D
148	4.5	Circular		SW side lost to trample alongside the enclosure wall, and perhaps the construction of the wall itself. Bank 1.0m wide and 0.1m high Fragments of slight ditch defines flat platform.	D
149	4.1	Circular		Defined by complete but very ploughed down and spread bank 0.1m high. Ditch and platform barely discernible on the ground. Aerial shows split platform, probably damage.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
150	4.9	Oval		Faint ring, very similar to 149, but ditch and bank incomplete or reduced on NE side.	D
151	5.2	Oval		Ploughed down but with a strong bank (0.15m high) on the upslope sides. Shallow ditch defines slightly domed platform (not raised).	C/D
152	3.2	Circular		Bit of internal fall from bank, but no distinguishable ditch or platform when viewed on the ground. Preservation better on NE side.	D
153-154	11.0	Double, oval		Double enclosure. Two irregular platforms (153 and 154) bounded by an oval ditch and separated by a narrow ditch or saddle. Surrounding bank stands to 0.25m max, best to NW, and broken to W. NE platform (154) very slightly domed. Feature may have been damaged by a later drain on the NW side.	C
155	3.9	Circular (pair?)		South ring in possible pair surrounded by conjoined or merged bank At ground level this ring appears rather pond-like – largely defined by inward slope of the bank, which has an almost imperceptible outward fall.	D
156	4.0	Circular (pair?)		North ring in possible pair surrounded by conjoined or merged bank. Bank 0.1m high. No distinct platform. Very slight ditch impression.	D
157	3.8	Sub-rectangular		Very ploughed-down small ring. Bank 0.05m high. Faint trace of inner scarp/ ditch, but platform barely defined.	D
158	3.4	Oval		Small ring. Similar to 157. Possibly oval or elongated downslope by ploughing.	D
159	4.2	Circular/ sub-square		Largely defined by denuded bank with break or damage to SW. 0.1m high max.	D
160	5.5	Circular		Damaged and denuded, but most of bank visible with a small break in the E side. Very faint definition of ditch and platform.	D
161	5.4	Oval		Ploughed down. Spread bank open to the NW, 0.1m high. Shallow ditch defines flat platform.	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
162	4.3	Circular		Clearly defined by inward ditch/bank scarp, but flattened. Spread bank touches with that of 163, but it is not clear if these were constructed as a pair or simply placed close together. The latter seems more likely	C
163	3.4	Circular/ irregular		Less substantial than 162. Bank indistinct, but appears to touch that of its neighbour. Mostly defined by inward bank/ditch fall, but distorted ditch/ platform (almost triangular in plan) could be result of ploughing. Drainage channel runs close to W side.	D
164	3.0	Circular		Small ditch and very low spread bank, 0.05m high.	D
165	4.6	Oval/ irregular		Very good for this field. Must have been substantial prior to ploughing as remains clearly visible. Bank 0.2m high forms complete ring. Ditch minimal, just enough to define flat platform.	B
166	4.4	Circular		Similar to 165, but slightly more beaten down. Complete bank.	C
167	5.7	Oval		Bank 0.2m high defines complete circuit (close but not touching 166). Ditch slightly better defined than adjacent rings. Platform elongated NE/SW.	B
168	4.5	Circular		Very good for this field. Complete circuit of bank and ditch. Ditch 0.6m wide defining slightly domed platform. Bank 1.2-1.5m wide and 0.1-0.2m high. Evidently ploughed in line with slope.	B
169	3.9	Circular/ oval		Complete but denuded. Ditch defines very slightly domed platform (no added height). Bank spread and irregular 0.05-0.15m high.	B
170	5.0	Circular/ irregular		N part survives as crescent of battered bank, almost gone. Slight definition of platform. Ditch fragmented – probably circular.	D
171	4.6	Circular		Just visible bank 1.5m wide and 0.05m high. Slight inward fall defines very slightly domed (no extra height) platform. Very faint.	D
172	4.3	Oval		Much like 171. Most visible around the SW side. Irregular bank largely invisible on the E side and generally irregular	D

Feature No. (refer to Fig. 30)	**Max ditch diameter** from aerial sources (metres)	**Ditch shape** (from aerial sources)	**Previously excavated**	**Observations**	**Survival**
173	8.5	Oval but may be distorted		Possible elongated or double platform enclosure. Very battered, presumably by stock movement. Inner fall of bank only 0.1m.	D

Appendix 2

Table 3: List of aerial photographs and sources

Historic England Archive verticals

Sortie No	Camera position	Frame No	Date flown
RAF/541/551	RP	3128-3131	04-Jun-1950
RAF/541/551	RS	4154-4157	04-Jun-1950
OS/72307	V	368-373	12-Aug-1972
OS/72307	V	404-409	12-Aug-1972
OS/72308	V	439-444	12-Aug-1972

Historic England Archive obliques

Film No	Frame No	Date flown
2376	57	06-Dec-1984
2376	59	06-Dec-1984
2376	61	06-Dec-1984
17270	51-52	19-Mar-1999
17258	12-13	19-Mar-1999
34104	015-032	21-Jun-2019
34105	001-086	21-Jun-2019

Aerial Photograph for Great Britain (APGB) Photography

Type	Resolution	Date flown
RGB	12.5cm and 25cm	28-Sep-2011
RGB	12.5cm and 25cm	07-May-2018
RGB	12.5cm and 25cm	30-May-2021
RGB	25cm	04-Sep-2000
RGB	25cm	08-Aug-2009
Colour Infrared	50cm	08-Aug-2009
Colour Infrared	50cm	07-May-2018
Colour Infrared	50cm	30-May-2021

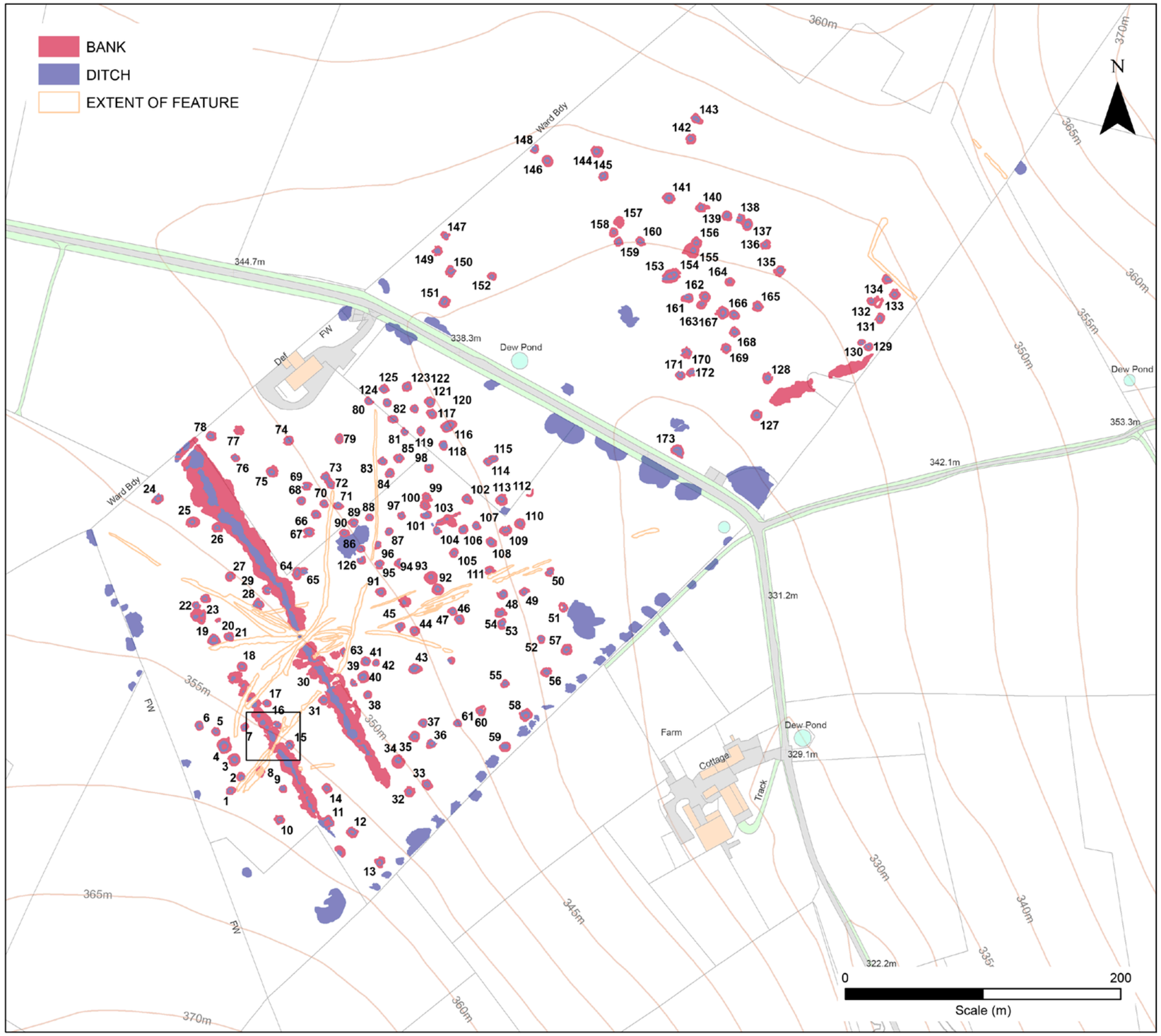

Figure 30: Whitecliffe Common, Parwich. Features mapped from drone-acquired digital terrain models and verified by ground observation. Ring-features numbered 1-173. Rectangle marks location of detailed survey Figure 24. © Historic England. Base map © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 1000024900.

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