

ART. I – *Earthworks, parchmarks and cropmarks: results of Cumbria County Council's 2006 aerial photographic survey*

BY ARNOLD WEBSTER AND RICHARD NEWMAN

**D**URING 2006 Cumbria County Council commissioned a series of aerial photographic flights to identify and record previously unknown archaeological sites and to enhance the record for some known sites. The photographs were taken by Tim Gates, a specialist in aerial photography. The purpose of the initial two flights, carried out in early May, was to record earthworks during optimal conditions of low vegetation growth and evening sunshine. These flights had been planned almost a year in advance and were targeted at areas for which the County aerial photographic coverage was lacking, such as the northern Howgill Fells and Lazonby Fell. They were also intended to improve the coverage for areas such as the southern Cumbrian Pennines between Casterton and Sedbergh and the rising ground between the A596 Wigton to Maryport road and the Lake District National Park boundary, both areas partially covered by previous published surveys (Higham, 1979; Bewley, 1994). Subsequently, in July 2006 a further two flights were commissioned to take advantage of the parched conditions produced by the unusually hot weather of that month. Throughout England July 2006 proved to be an exceptionally productive month for discovering archaeological sites via aerial photography, as buried remains were revealed as parchmarks or cropmarks. In Cumbria these July flights were targeted at those areas considered most likely to produce good results in such conditions, the Solway Plain and the Eden valley. Whilst both areas have been the subject of much past aerial photographic survey, beginning with St Joseph's photographs in the 1950s (Blake, 1959; Bewley, 1986 and 1994; Higham and Jones, 1975), the extraordinary conditions of July 2006 ensured that a number of previously unrecognised sites were recorded for the first time.

The May surveys recorded sites primarily in monochrome print format with subsidiary colour transparency coverage. In July, in addition to monochrome print and colour transparency photographs, high-resolution colour print photographs were also taken. All the aerial photographic coverage was oblique, with the majority taken at an altitude of between 760 m (2,500 ft) and 915 m (3,000 ft) above the ground. Each photograph has been given an accession number and in this paper the numbers of the relevant photographs to each site are given in brackets after the grid reference for each detailed site entry. The recorded archaeological sites have been plotted on to an Ordnance Survey base map using the County Council's Geographical Information System (GIS) and the information has been accessioned into the County Council's Historic Environment Record. All measurements given in the text have been taken from aerial photographs and calculated using the GIS, no field survey work was undertaken and any such future work may lead to a revision of the quoted measurements. The term earthwork is used for features represented by banks or ditches visible from the air in conditions of low angled sunshine and low vegetation growth. Parchmarks is the term used for features appearing as lighter or



PLATE 1. Enclosures and Ridge and Furrow at Ellergill: Tebay and Orton:  
NY 6416 0508 (CCC/06/A/34-36). Copyright Tim Gates.

darker defined shapes in pasture or harvested cornfields as a consequence of differential water retention. Cropmarks refer to areas defined by different rates of crop growth or darker or lighter colouration within cultivated fields and is again caused by differences in water retention. The earthwork sites at Ellergill, Great Salkeld and Wardhall Guards were all subsequently visited and field observations have been used to amplify the data contained on the aerial photographs. These and the site at Ewe Close were all brought to the attention of English Heritage and proposed for statutory protection as scheduled ancient monuments in August 2006.

The circular hengiform, parchmark sites at Kingmoor near Carlisle, the possible cursus at Wetheral, and the late prehistoric/Romano British settlement at Standing-stone near Wigton, were proposed for scheduling in November 2006.

In addition to the sites discussed in detail below the surveys revealed much new minor historic landscape detail, including a variety of previously unrecorded former boundaries of unknown date, and previously unseen details relating to otherwise well known sites. Small previously unrecorded earthwork sites were scattered along the Pennine edge in the south of the county, including the likely remains of shielings near Middleton and bell pits near Casterton. Considerable new detail was recorded concerning the northwards continuation of the multi-phase landscape palimpsest previously recorded and statutorily protected at Leck and Casterton Fells. This included enclosures, boundaries, building remains and round barrows and is indicative of a potential need to extend the statutorily protected area.

#### **PREVIOUSLY UNKNOWN EARTHWORK SITES**

**Enclosures and Ridge and Furrow at Ellergill, Tebay and Orton: NY 6416 0508** (CCC/06/A/34-36) (Plate 1). Clearly defined earthworks form a series of enclosures on both sides of a track leading between the two surviving farms at Ellergill, within the parish of Tebay but close to its boundary with Orton. The enclosures appear to be the remains of up to five crofts and are indicative of a shrunken medieval, or possibly post-medieval, settlement. Field observation noted the remains of possible building platforms within the enclosures and of a probable fold/animal pen adjacent to the track leading to Long Gill, which follows the corridor formed by an outgang to Tewitt Hill. The settlement earthworks extend over an area about 168 m in length. An area of broad ridge and furrow earthworks lies to the east of the Ellergill settlement earthworks and on the west of Langdale Beck, centred on NY 6429 0509. It abuts a small rectilinear earthwork, possibly the remains of a pen, and a hollow-way. Although physically connected with the Ellergill settlement earthworks, these remains lie in the parish of Orton and are more likely to be historically associated with the settlement of Langdale, which also exhibits earthwork evidence for settlement shrinkage.

**Mound at Stoney Green, Salkeld Dykes, Great Salkeld: NY 5431 3690** (CCC/06/E/54-55). A wedge or teardrop-shaped mound approximately 38.7 m long by 21.6 m wide at its broadest northern end, is visible to the south of and abutting a post-medieval field boundary on the north of a field known as Stoney Green to the west of Great Salkeld. Field observation confirmed that the site is a long barrow of Neolithic date. It is made of stone rubble with a possible kerb, perhaps enhanced by a former dry-stone wall enclosure boundary on the east side. The entrance at the northern end of the barrow has been removed by excavation which appears to have opened up the main chamber, the base of which may survive. The excavation probably took place before the mound became tree covered, which is how it is depicted on the 1st edition Ordnance Survey map of 1867. The height of the mound at its highest point is *c.*2.5 m. The excavated area measures approximately 13 m by 8 m.



PLATE 2. Hollow-way, enclosures, ridge and furrow and associated earthworks: Wardhall Guards, Plumblund: NY 1322 3851 (CCC/06/F/4-13). Copyright Tim Gates.

### ENHANCEMENTS TO KNOWN EARTHWORK SITES

**Enclosures east of Ewe Close Enclosure, Wardhall, Plumbland: NY 1416 3803** (CCC/06/F/1-3, 14-15). To the east of the scheduled monument of Ewe Close, a “D”-shaped enclosure of presumed Iron Age date, are the earthworks of a series of small rectilinear closes and/or possibly building foundations. Although previously known, these remains had not been accurately plotted and were regarded as merely an appendage to the Ewe Close enclosure. The earthworks appear to be stone-founded banks aligned off a western spine and seem to be the remains of a nucleated settlement. There is a larger sub-rectangular enclosure on the south-eastern corner of the site, possibly appearing to overlie part of the complex of smaller enclosures and hence of later date. The site has been disturbed by quarrying. The small enclosures are clustered on the northern end of a banana-shaped ridge, extending over an area 154 m in length by 85 m wide. The southern end of the ridge lies within an improved field and it is possible that the enclosures extended southwards for another 100 m or so but that the earthworks were removed through ploughing. There is an indication of a hollow-way or ditch marking the eastern side of the ridge, which is overlain by part of the larger, later, sub-rectangular enclosure. Dating is uncertain, but it is most likely that the putative settlement earthworks are of a Romano-British origin with the larger, later, enclosure being medieval in date.

**Hollow-way, enclosures, ridge and furrow and associated earthworks, Wardhall Guards, Plumbland: NY 1322 3851** (CCC/06/F/4-13) (Plate 2). Part of this complex of earthworks had been previously noted and attributed to the abandoned manorial complex of Wardhall, but the new photographs showed a far more extensive complex of earthworks than previously observed. Whilst the north-western corner of the site can be ascribed to the Wardhall manorial site and may represent the ploughed out remains of a post-medieval formal garden, the remainder of the site seems to consist of the tofts and crofts of a medieval settlement situated either side of two streets at right angles to one another. It is conceivable that the putative formal garden remains obliterated earlier tofts and crofts. The streets intersect at approximately NY 1308 3838. The south-east to north-west street is approximately 320 m in length, and the south-west to north-east street is about 450 m in length. Numerous building foundation and property boundary earthworks and areas of broad ridge and furrow can be identified, together with a possible moated site at NY 1310 3878. The latter has been truncated by the post-medieval wagon-way that served Wardhall quarries (disused by 1900). The wagon-way also bisects one of the hollow-ways and some of the settlement earthworks. In all, this extensive site appears to represent a large planned settlement and presumably equates with the medieval settlement of Wardhall township.

### PREVIOUSLY UNKNOWN PARCHMARK AND CROPMARK SITES

**Features south-west of Brough Castle and Roman fort, Brough: NY 7907 1399** (CCC/06/I/1-4). A series of linear and small curvilinear parchmark features lie immediately south of Brough Castle and the Roman fort. They are difficult to interpret; but possibly relate to the Roman fort.



PLATE 3. Enclosures north of Wormamby Farm: Beaumont: NY 3350 5909 (CCC/06/K/17-21).  
Copyright Tim Gates.



PLATE 4. Settlement and associated enclosures north of Standingstone: Woodside:  
NY 2515 4926 (CCC/06/L/9-12). Copyright Tim Gates.

**Enclosures north-west of Sidelands, Long Marton: NY 6573 2471** (CCC/06/I/5-6, 8-9). The parchmarks consist of two rectilinear enclosures (approximately 45-50 m square), with a possible street defined by parallel ditches, and remnant long narrow field enclosures nearby to the south and north-east. A north-south double linear feature appears to abut the western enclosure at its north-western corner. The parchmarks appear to relate to former settlement, and a Romano-British or medieval date is most likely.

**Enclosure on Brandcrook Hill, Long Marton: NY 6557 2439** (CCC/06/I/7, 10-13). A sub-circular enclosure (approximately 50-60 m in diameter) with associated linear parchmarks may indicate a late prehistoric or Romano-British farmstead with associated fields.

**Enclosure with linear parchmarks north of Lintongill Cottage, Skelton: NY 4152 4425** (CCC/06/J/1-5). This parchmark site reveals a possible rectangular enclosure (approximately 30 m in length and 25 m in width, with possible internal structures) with linear parchmarks attached to it on its north-eastern, southern and south-eastern sides. The purpose and date of the features are unknown.

**Enclosure north-west of Hillside, Heskett: NY 4247 4336** (CCC/06/J/6-10). Parchmark forming a rectangular enclosure (approximately 35 m by 30 m) on the western side of a modern road, immediately north-west of Hillside, with possible associated linears opposite in the field on the eastern side of the road. Probably of Romano-British or later date.

**Trackway south of former Garlands Hospital, St Cuthbert Without: NY 4332 5339** (CCC/06/J/14-15). A double-ditched probable trackway showing as a parchmark alligned north-east to south-west with an enclosure boundary at right angles and attached to its southern side. The enclosure boundary parchmark is not evident as an extant boundary on the 1st or 2nd edition OS Maps and thus as an extant feature is likely to predate the late 19th century.

**Enclosures north of Poplar House Farm, St Cuthbert Without: NY 4285 5367** (CCC/06/J/16-18). Two curvilinear enclosures are revealed by parchmarks, one of which is approximately 60 m by 75 m with the other appearing to be slightly smaller. They are probably prehistoric settlement enclosures, though no internal features are apparent. To the south, on the other side of the main road, are other parchmarks including an enclosure boundary parallel to the road, with two other smaller boundaries running off it at 90 degrees to the road. These parchmarks are all considered to relate to former field boundaries and most likely to be post-medieval in date.

**Linear parchmark east of High Cummersdale Farm, St Cuthbert Without: NY 3953 5362** (CCC/06/K/1-2 and CCC/06/J/35-36). A linear parchmark, which is approximately 600 m in length and does not relate to 19th century mapped field systems.

**Trackway west of Scotby, Wetheral: NY 4383 5451 (CCC/06/J/19-21).** A double-ditched trackway aligned east-west and 2-3 m wide, appears to pre-date the surviving medieval and post-medieval field system and road system.

**Cursus-like feature with linear parchmark, Wetheral: NY 4351 5513 (CCC/06/J/22-29).** A parchmark forming a long narrow cursus-like feature is evident in the same field as a linear parchmark that does not relate to any former field boundary shown on the 1st edition OS Map. In addition, a ring-ditch appears to the north-east at NGR NY 4363 5529 within a school playing field and is possibly associated with faint rectilinear features. If the cursus-like parchmark is showing the ditches of a cursus it would be of Neolithic date. The ring-ditch is likely to be of Bronze Age origin and indicative of the former existence of a round barrow on the site.

**Curvilinear parchmarks and cropmark complex west of Knockupworth Cottage, Beaumont: NY 3702 5686 (CCC/06/K/10-13).** Immediately to the south of the line of Hadrian's Wall are the curvilinear parchmarks of a probable late prehistoric settlement (approximately 50-60 m in length). Evaluatory excavations immediately to the north and east, in advance of the Carlisle Northern Development Route, revealed ditches, pits and postholes, and whilst no artefacts were found associated with these features they were considered to be of Iron Age or Romano-British date (Rees, 2003, 13-14; McCarthy, 1997). In the field to the west is a complex of cropmarks including rectilinear boundaries of small enclosures, probably representing a late prehistoric field system, and a larger very regular rectilinear enclosure, seemingly overlying the field system, and of a probable Romano-British date. This latter enclosure may be a temporary military camp, and its visible features extend for approximately 80 m in length. There are two known temporary camps 640 m and 880 m to the west. Hadrian's Wall vallum is visible as a parchmark to the east running north-west to south-east. A recent evaluation of the vallum in this area showed that its ditches retained waterlogged deposits with considerable potential for the survival of palaeoenvironmental remains (Glendinning, 2005, 13). The proposed Carlisle Northern Development Route road scheme will cross the line of the vallum but will avoid the crop- and parchmarks of the settlement, field system and putative temporary military camp.

**Enclosures north of Wormamby Farm, Beaumont: NY 3350 5909 (CCC/06/K/17-21) (Plate 3).** Parchmarks revealed two rectilinear enclosures, one within the other. The larger enclosure is 64 m by at least 105 m and the smaller one inside measures about 90 m in length, but its width was not measurable. This site is situated between Hadrian's Wall and the vallum and may predate them. Its interpretation is uncertain, though a Romano-British date seems likely. The larger enclosure has rounded corners and its playing card shape suggests a temporary military camp. The enclosure within it, though physically associated, appears to be chronologically distinct. A curvilinear boundary to the east may be a later field boundary. Either side of this linear are a number of pit-like features and there are further pits in the south-west corner of the smaller enclosure.



**Enclosure south of Wiggonby House, Aikton: NY 3035 5239** (CCC/06/K/34-37). Parchmarks revealed a trapezium-shaped, rectilinear enclosure approximately 60-70 m long and 50 m wide, with an associated linear cropmark running eastwards from its southern side. Function and date are unknown, but its relationship to the identifiable medieval landscape pattern suggests that it is pre-12th century.

**Enclosure immediately south-east of Moorhouse Hall, Woodside: NY 2688 5089** (CCC/06/L/4-8). Parchmarks form a rectilinear, squarish-shaped enclosure, with linears extending from its corners. The enclosure is approximately 50-60 m square. Date and function are unknown, but a probable Romano-British or later origin is likely. Further undefined parchmarks appear to extend into the field to the south.

**Settlement and associated enclosures north of Standingstone, Woodside: NY 2515 4926** (CCC/06/L/9-12) (Plate 4). To the immediate north of Grange Gardens estate on the north side of Cross Lane at Standingstone, parchmarks were recorded that are indicative of the remains of a settlement with an attached and probably chronologically associated rectilinear enclosure to the east. The area of probable settlement remains measures 60 m by 40 m but its southern part has clearly been destroyed by the construction of the Grange Gardens estate. This particular area was not evaluated before development. To the east, the later extension of the estate can be seen to have destroyed the southern end of the rectilinear enclosure, the surviving area of which measures 100 m by about 40 m. This now developed area was evaluated and subsequently excavated ahead of development by CFA Archaeology Ltd in 2004. Their excavation identified a probable ring ditch, assumed to be of prehistoric date, and a sequence of boundary ditches (Mitchell, 2006, 227-8), of which the last phase probably equates with the rectilinear parchmarks noted to the north. In addition they found other ditches including one forming a small enclosure and which contained a sherd of third or fourth century Black Burnished ware in its primary fill (Mitchell, 2006, 227). The noted parchmarks are thus likely to relate to late prehistoric and Romano-British settlement and farming activity. The site seems not to extend further to the south, as evaluation trenches excavated in 2003 at Grange Bank south of Cross Lane found little of archaeological interest (Clark and Wearing, 2003).

**Enclosure west of Speetgill Wood, Westward: NY 2826 4662** (CCC/06/M/14-15). Cropmark immediately west of Speetgill Wood reveals a squarish enclosure approximately 900 to 1,000 square metres in area, probably a former field of unknown date.

#### ENHANCEMENTS TO KNOWN PARCHMARK AND CROPMARK SITES

**Enclosures north of Wragmire Moss, Wetheral: NY 4550 4999** (CCC/06/J/11-13). Two roughly rectilinear adjoining cropmarks equate with two known enclosures (approximately 30 m by 20 m, and 40 m by 20 m from west to east) attached on one shared side. South-east of the enclosure is a linear cropmark running south-west to north-east which appears to represent a trackway with ditches on both sides.

**Enclosure complex between Greystones Lane and Powlees Lane, Kingmoor:** NY 3775 5739 (CCC/06/K/3-9) (Plate 5). A multi-period parchmark and cropmark landscape was revealed near to Kingmoor, mainly situated between Greystone Lane and Powlees Lane. This had been partially mapped by English Heritage's Hadrian's Wall National Mapping Programme, which identified part of a curvilinear enclosure with nearby, and of a different phase of land use, a rectilinear enclosure with associated linear boundaries (Boutwood, 2005, 9, Fig 6). The new survey information indicated that the curvilinear feature was part of a circular enclosure, approximately 120 m in diameter. A previously unknown further circular enclosure, perhaps only 50 m in diameter, was noted to the north-west of Powlees Lane (centred at NGR NY 3759 5751), but unlike the larger enclosure it has indications of an entrance. The two circular enclosures appear to be the earliest visible features within the palimpsest and may be characterised as hengiform enclosures and thus likely to be Neolithic in origin. These features are overlain by a later boundary



PLATE 5. Enclosure complex between Greystones Lane and Powless Lane: Kingmoor: NY 3775 5739 (CCC/06/K/3-9). Copyright Tim Gates.

system with associated enclosures of probable Romano-British derivation. Part of this palimpsest will be affected by the construction of the Carlisle Northern Development Route, which is planned to pass adjacent to but not through the larger of the circular enclosures. As yet (November 2006) this area of the road route has not been evaluated because of access restrictions.

**Curvilinear and linear parchmarks, near Tile Kiln Wood, Beaumont: NY 3511 6078 (CCC/06/K/14-16).** To the east of Tile Kiln Wood, curvilinear parchmarks representing former boundary ditches were observed. These appear to be associated with similar known parchmarks in the field to the south. Further to the south within this field are linear parchmarks indicative of former field boundaries. The curvilinear parchmarks are likely to represent Iron Age/Romano-British activity.

**Sub-rectangular enclosure, associated parchmarks and Roman road, Thursby: NY 3204 4984 (CCC/06/K/25-29).** A known sub-rectangular enclosure represented by parchmarks was revealed to be situated on the north of a wide linear parchmark (190 m long and approximately 16 m wide inclusive of agger). This represents a Roman road and was part of the road from Carlisle to Papcastle for which previously identified stretches exist to the north-west and south-east. Consequently the sub-rectangular enclosure is probably representative of a Romano-British farmstead.

**Mealo Hill settlement, Hayton and Mealo: NY 0829 4150 (CCC/06/L/26).** The known Romano-British enclosure and scheduled monument at Mealo Hill was shown to be associated with the linear parchmarks of a likely associated field system which extend into the present field immediately west of the scheduled monument.

**Trackway at Red Dial, Westward: NY 2613 4566 (CCC/06/M/2-6).** A stretch of double-ditched trackway, indicated by parchmarks, is known to be associated with the rectilinear enclosure parchmarks of a putative Romano-British settlement at Red Dial. The trackway was shown to extend for a further 330-350 m from the enclosure, in a south-easterly direction towards Overgreen, but becoming less distinct and possibly opening out into a funnel-like shape at NGR NY 2629 4555. Assorted linear and curvilinear boundaries run from this area and it is suggestive of a stock gathering function. To the south-west it also links with another set of previously known parchmarks indicative of another trackway. Overall the enclosure, trackways and some of the field boundaries appear to represent a dispersed Romano-British settlement pattern.

**Enclosure and probable Roman road at Greenrigg, Westward: NY 2804 4636 (CCC/06/M/12).** A known sub-rectangular enclosure has been revealed to be a double-ditched enclosure (approximately 60 m by 50 m) containing a smaller, about 30 m square, internal enclosure, in one corner. To the west of the sub-rectangular enclosure another 30 m square enclosure was revealed. These enclosures probably form a farmstead of Romano-British date. To the south of this site is a west to east linear parchmark which appears to be a 250 m section of a Roman road centred at NGR NY 2797 4610, with an indication of an agger.

## Discussion

One of the most obvious conclusions is that, despite at least thirty years of quite intensive aerial photographic survey in parts of Cumbria, notable blank areas of coverage remain (Brennand *et al.*, 2006, 19) and even within the better covered areas, new discoveries are possible, given appropriate conditions. As would be expected, new earthwork remains are likely to be concentrated in upland areas, but the lack of appreciation of the extent and nature of the well preserved and substantial earthworks at Wardhall Guards serves as both a warning and an inducement. They highlight the potential for the survival of still unidentified earthwork sites in the rolling landscapes that form so much of Cumbria outside of the fells. The potential for discovery in the well surveyed Solway Plain was also revealed, where the complexities, variety and extent of the relict landscapes, exhibited through parchmarks and cropmarks especially, was emphasised.

It would be desirable to follow up the aerial photographic identifications of the earthwork sites with detailed ground survey, as was carried out in the Howgill Fells for some of the sites identified there by aerial photography as part of the Yorkshire Dales Project (Bowden, 1996). Ellergill and Wardhall Guards especially would benefit from detailed topographical survey. For parchmark and cropmark sites too, geophysical survey may assist in defining further detail. Although the former RCHME had the resources to follow up aerial photographic site identification with some ground survey, the problem of dating sites and interpreting their function remained without sample excavation (Bowden, 1996, 11). This is true also for cropmark and parchmark sites, though with these, intensive field walking following ploughing, and under pasture conditions appropriately organised and archaeologically-supervised metal detecting surveys, can assist with dating and sometimes functional interpretation. The research initiatives pursued by the late Professor Barrie Jones (Jones, 1993; Wolliscroft and Jones, 2004) and by Bob Bewley (1986 and 1994) allowed the sample investigation of some cropmark and parchmark sites, especially in the Solway Plain, but there are no current similar initiatives. Without resources devoted to such work by either central government agencies or university departments, the only option for exploring and dating these sites in a systematic way will be through local society volunteers and enthusiasts developing targeted projects. Otherwise, the main opportunity for examining some of these sites in detail, and for exploring their interrelationships, is likely to come through the archaeological investigations that will be required in advance of the development of a major infrastructure project such as the Carlisle Northern Development Route. This transect through the hinterland of Hadrian's Wall, and a landscape rich in earlier sites evidenced through parchmarks and cropmarks, will provide a considerable opportunity to examine archaeologically the development of settlements and field systems in part of the Solway Plain.

In line with the previous research work of Brian Blake in the 1950s and more recently Bewley and Jones, many of the sites noted have been loosely attributed to the Romano-British period. The many observed enclosures have been interpreted as "native" settlements, yet as has been often noted, the dating evidence for these sites is scarce (Boutwood, 2005, 21; Philpott, 2006, 73-4) and without excavation dating on typological grounds is not advisable (Shotter, 2004, 139). Where dating evidence

is available it has tended to suggest a second to fourth century range (Blake, 1959; Bewley, 1994) and this has been linked to a supposed settlement expansion brought about by stable conditions from the late second century (Shotter, 2004, 144). Even so, we must be aware of potential bias in the finds record that may under-represent both earlier and later activity on these “native” sites (Higham, 1982, 32; Bewley, 1994, 35). Not only will a refinement of chronology require further excavations on these sites, but such investigations, along with geophysical survey, are a necessary precursor to defining a morphological typology of these enclosures. Simplistic typologies based on available aerial photographic evidence will be misleading, as clearly indicated by the additional site detail recorded from aerial photographs for some sites in 2006 compared with earlier surveys.

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