Tissington Silo
Level 3 Survey - Historic Building Recording
Client: Tissington Estate

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14th March 2022

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Executive Summary

The limestone tower located to the west of Gag Lane on the Tissington Estate is a prominent feature of the local landscape. Despite an exhaustive search of the Tissington Estate archive, newspaper accounts, and discussion with Lyn Willies and Adam Russell of PDMHS[1], John Barnatt (ex. Peak Park archaeologist), who has known the building for 20 years, and local tenant farmers, we are no closer to a definitive answer to the original or later function of the building. Its former use (or uses) is a mystery, but we do have a few tentative suggestions based on deduction and we have eliminated a number of uses. The three uses which we have eliminated are a silo (for silage), a limekiln, or a windmill. The potential former uses we can support are an observatory or a munitions store (possibly for artillery practice during WW1).

Location

The tower is built into the east face of a former limestone quarry at grid reference: 415926, 351747 (SK 15926 51747), What3Words: corn.revolting.trainers.
The structure sits 275 metres to the west of Gag Lane, and approximately 1.4 kilometres due east of the River Dove. It falls within the parish of Tissington St. Mary and lies on the Tissington Estate. It sits at 284-290 metres AOD in an upland pastoral area which was historically mined for lead and later quarried during the nineteenth century.

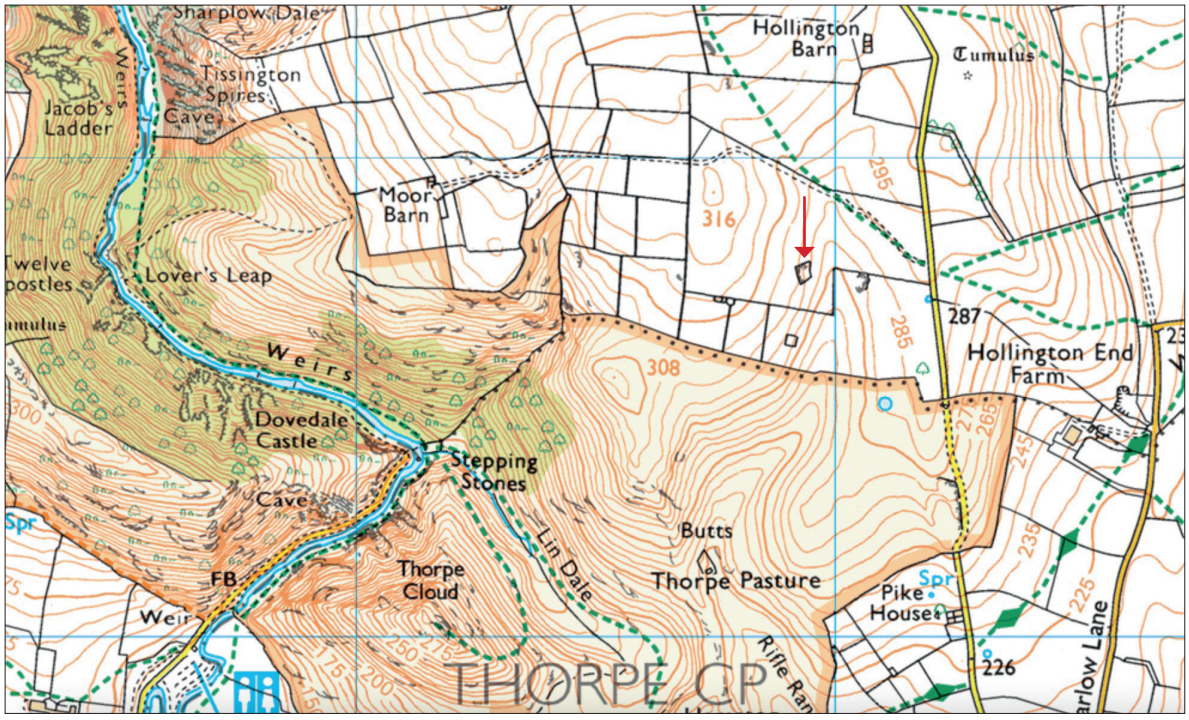

Plate 1 - Ordnance Survey Explorer map at 1:25,000 showing the location of the tower (arrowed) relative to Gag Lane, Thorpe Pasture and the Rifle Range and Butts.

1 Lynn Willies comments: I would expect the quarry was for very local use, perhaps walling or for fields, house or barns. It is far too small to require such a large powder store. Anyway the beds are fairly thin and blocks would usually have been levered or wedged out and in any case the building's position indicates it is post-quarrying. I am assuming there is no large quarry just over the hill top. It would not be suitable for quarry machinery of any type I know of.
It is unlikely to have been designed for military explosives – (my trade at one time) these are usually single storey structures with decent access outside at least for a trolley and space to allow stacking if high, but might have wartime re-use.

Plate 2 - Aerial Photograph 12.5cm, 2021 - © Bluesky plc.

Local Landscape

The site falls within the Landscape Character Type known as the White Peak, locally as 'Limestone Plateau Pastures'. The solid geology is of carboniferous limestone, and specifically it falls on a quarried outcrop of Hopedale Limestone Formation - Limestone. This is a sedimentary bedrock formed approximately 329 to 337 million years ago in the Carboniferous Period.

The local landscape is distinctive for its limestone geology, with limestone outcropping, often emphasised by small quarries. Drystone boundary walls of limestone are frequently intersected by dewponds for watering livestock, shared between fields, and within the corners of fields there is evidence for old sheepfolds, with occasional fieldbarns or outfarms (e.g. Hollington Barn). Close to the small quarries there were historically limekilns, which were identified in the late 19th century as 'old limekiln' on OS maps, rather than working kilns.

To the south of the tower lies Thorpe Pasture, an open area of grazing, with evidence for lead mining following veins with 'old Shaft' named on the OS maps. On the east side of Thorpe Pasture is one of the larger quarries, although still small. On the west side of Thorpe Pasture is Lin Dale at the foot of Thorpe Cloud and on the south side is Hamston Hill and then further south still is the settlement of Thorpe. Roughly central to Thorpe Pasture is a shallow valley named as Waddell in 1875, and the site of a Rifle Range from 1902.

The land within the large field has historically been used for sheep grazing and the soils are too thin for it to have provided a rich grassland for silage, although cattle have occasional summer grazing to the north of Thorpe Pasture.

Archive Deposition

A full digital copy of this report, incorporating both PDF and CAD drawing files of the surveyed quarry and plan, elevations and sections, will be found at OASIS (via ADS Easy) – project ID. Tissington Silo (20011963).

Survey

James Brennan Associates has produced the detailed measured drawings including external elevations and sections at 1:50 scale, and a topographical survey of the quarry face and the context, incorporating the floor plan of the structure. These can be found in Appendix 2.

Photographs of the tower and its setting are included in the digital archive deposited with ADS Easy. In total there are 45 record photographs and we have selected 16 mages for reproduction and comment in this report.

Research

The assessment includes full map regression via Groundsure mapping and Emapsite to assist in determining the origins and phasing of the structure. This relies the Ordnance Survey records from the 19th and early 20th century, and early 20th century estate maps in the Derbyshire Record Office. All Ordnance Survey maps are included in Appendix 1. These are supplemented with mapping from the Derbyshire Record Office, which is included in this report.

The assessment has investigated sale catalogues and farm rental account books for the Tissington Estate located in Derbyshire Record Office, as well as estate maps and the Valuation Office survey information from 1910-1915.

In addition, we have investigated aerial photographs held by the Peak District National Park dating from 1972 (not reproduced) and aerial photographs held by Historic England (reproduced in this report).

History and Documentary Evidence

The 'Plan of the Tissington Estate,' for Sir Hugo M Fitzherbert, dated 1908, (ref. DRO - D239/BOX/16) identifies the land associated with our tower building (not shown) as plot number 271 and it is recorded as 'In Hand', along with 10 separate small fields to the west and south, typically of between 2 and 3 acres. The combined acreage is 27.73 acres for the small fields with the large field occupying on its own 31.50 acres. This remote, detached portion of the estate, which is in the same occupation as the hall and Tissington Hall Farm, is a relatively small area of land which is owned and occupied outright by the estate. The purpose of retaining this small detached portion 'in-hand' is unclear, although it does provide an access track from Gag Lane to Moor Barn, which is in a separate tenancy at this time. This leads us to question, was it possibly certain types of shooting rights that they were protecting or simply mineral rights? The contrast between the small field parcels and the large area, of which the quarry and silo is a part, is also interesting. The combined areas of the Tissington Hall Farm land around the hall and this detached portion are a very small area, so it was not operating on the industrial scale of a model farm.

Plate 3 - Tissington Estate Map Title of 1908 (DRO - D239/BOX/16)

Plate 4 - Extract from the Tissington Estate map of 1908 (ref - Derbyshire Record Office - D239/BOX/16). The pale green water colour 'wash' shows the area which is held 'In Hand' by the estate in 1908. At this date the site seems to still show the limekiln on the east side of the quarry (see inset above).

To the immediate south and east the field parcel is labelled as Bentley Firs Farm (plot 321) and this incorporates the quarry on the east side of the shallow valley. This is a detached part of Firs Farm in 1927.

The next available map in date order is the Valuation Office Survey (Domesday) which was carried out in 1910 under the 1909-1910 Finance Act. The land ownership map of 1910 (D595/LV/38/5) is based on the 1899 OS map. This identifies the field parcel as 'Part 1838', which is identified in the accompanying schedule in the field book (D595/R4/1/9) as Tissington Hall Farm.

Plate 5 - Extract from the 1910 Valuation Office map (ref - Derbyshire Record Office - D595/LV/38/5). This shows the site of the later tower to be Part of 1838 Tissington Hall Farm.

The historic map sequences in Appendix 1 show that the site is a former quarry, which had a lime-kiln on the outer easternmost face until ca. 1900. Then at some point between 1900 and 1922 the limekiln was removed and a new structure was built against the quarry face. This structure is the 'silo' or tower. The first map to show the building is the 1922 OS map (see plate 7).

The 1927 Estate Plan (ref. DRO - D239/BOX/16) shows several of the small fields are in a different tenancy and a reduced acreage for Tissington Hall Farm.

It does appear that the site of the tower has something to do with the land being kept 'in hand'.

Plate 6 - Extract from the 1929 Estate map for Hall Farm Tissington (Derbyshire Record Office - D239/BOX/16). This map which is still based on the 1898 6-inch OS map, shows the land (and tower) occupied by Hall Farm, which includes a sizeable part of the park, in pale green.

Plate 7 - Extract from the 1922 Ordnance Survey map (1:2500), the first map to show the tower.
Note that there is another small structure to the immediate north-east of the quarry, within the walled enclosure, possibly a hut?.

Description

The tower was built between 1900 and 1922. The map evidence suggests it was not built until after 1908.

The site of the quarry falls within the farm holding of Tissington Hall Farm by 1910. It falls within the parish of Tissington St. Mary and lies on the Tissington Estate within an area which was retained 'in-hand' by the estate.

The building is constructed from random rubble limestone, brought to rough courses, with a slender dressed limestone lintel to the door opening; the other lintels are missing.

The masonry is of stepped construction in three tiers to the tower, with a now intermittent wrought-iron band to the lowest stage of the tower. This would have terminated before the doorway, so did not wrap around the entire structure and did not form a continuous girdle. The limestone is roughly mortared with lining out to the pointing and a mortar fillet to the two 'steps'.

The outside form of the tower is square to the west with a semi-circular eastern face. The inside of the tower is curved on plan, with curved internal walls to the inner 'corners' against the quarry face. The internal walls are finished in continuous concrete / cement render. There is no evidence now for any internal floors, even though the structure has a high intermediate-level window to the south to the second stage of the tower above the doorway and another opening to the western gable at the third stage of the tower. The apex of the gable is missing but the lower verges remain and provide the evidence for the original pitch of the roof. This would have been part conical to the east over the semi-circular part of the plan, with a squared gable to the west, with plain flush verges. Slots within the wall-head indicate the location of the former rafters and the wall-plate sits on the inside of the wall, which indicates that the rafters were tied to the internal wall-plate via trimmers. It seems likely that the rafter feet projected considerably beyond the vertical wall-plane, as there is no corbelled masonry.

The former gable to west is now missing its apex, with square faced upper walls and a former window opening.

The wall head has a stepped profile, the internal ledge forming the location for a former continuous curved wall-plate; a fragment remains. Remains of bolts and threaded nuts are still evident as intermittent fixings for the wall-plate.

Internal lintels are missing; that to the doorway has rotted away and was probably timber, given the narrow dimensions; that to the second stage of the tower was deeper and may have been metal or steel which has been robbed out, although it would be very difficult to remove the first floor internal lintel without a scaffold. There are some signs of distortion and flaking to the internal cement render around the second stage 'window', so some evidence that the lintel may have been forcibly removed. The upper level external lintel to the 'window' over the door would have originally matched that below, in a fissile thinly-bedded limestone, and probably cracked and split, which is why it does not survive.

The former joinery to openings is missing; the door and second stage 'window' were very deeply set and fixed to the inside of the tower, almost flush with the internal wall; the joinery frame to the third stage of the tower was fixed to the outside face of the masonry, and the cement render was built up to it; this may indicate that the opening was a later addition contemporary with the internal rendering of the tower.

Plate 8 (ref. ext01_02_01_22)
The tower from the north, built into the quarry face, which appears to have been deliberately part-removed to accommodate this structure.

Plate 9 (ref. ext05_02_01_22)
The tower from the south, with a single point of entry and single window at the second stage of the tower.

Plate 10 (ref. ext13_02_01_22) View of the tower built into the east face of the quarry. To the immediate left is the rubble base of the former limekiln, which has been largely dismantled, leaving a platform. It seems highly likely that the highly durable carboniferous limestone stones for the limekiln were robbed out and re-used for the tower.

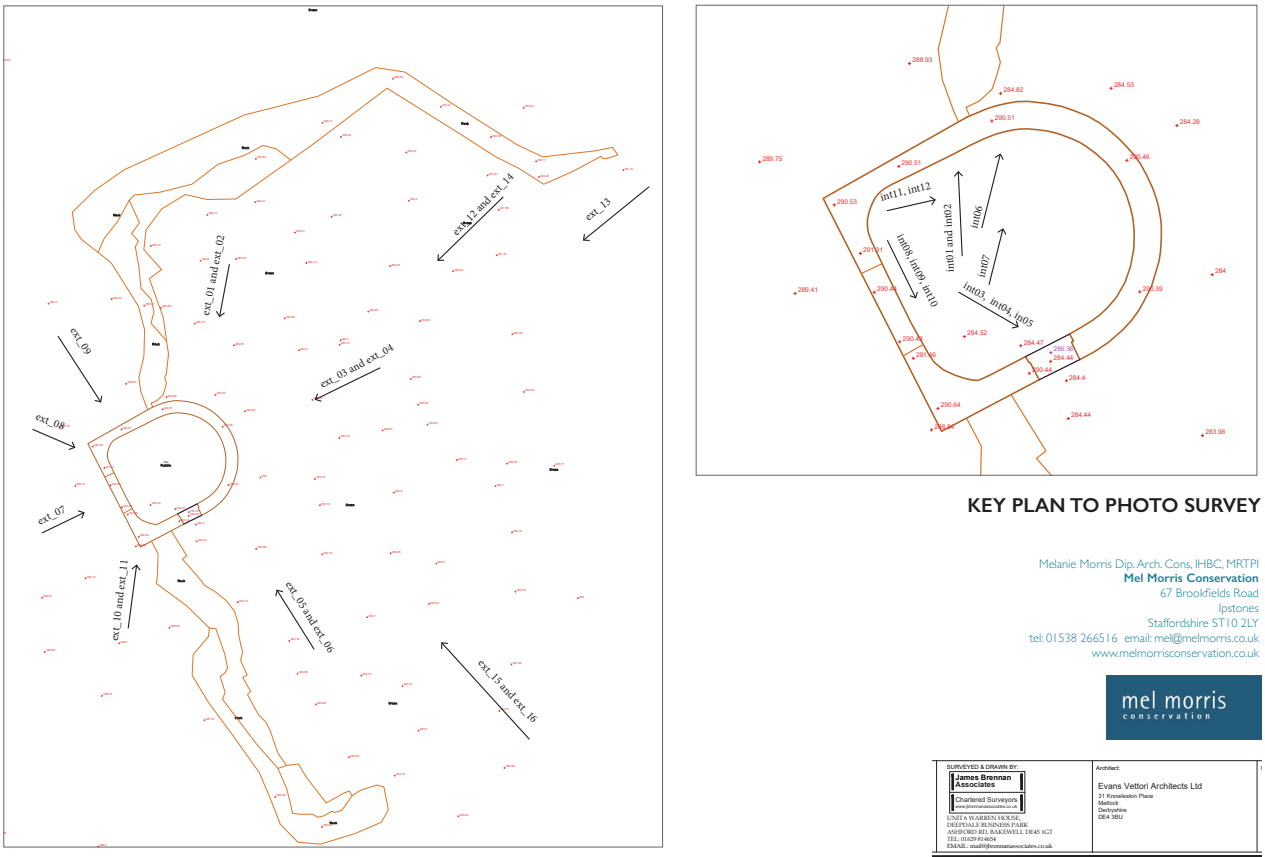

Plate 11 - Key plan to the record photographs. This is also reproduced as a separate PDF

The floor of the structure is largely rubble limestone fill. There are no signs that this is rubble from collapse of the gable of the structure, so careful investigation and excavation will be needed to determine whether the limestone is part of the original finish or whether the structure had a flat floor. If it had a flat floor, excavation may be able to determine whether there were any fixings in the floor for machinery or a staircase.

The cementitious render on the internal walls of the structure and the wall-head consoldiation could be sampled in the lab to identify the mortar / render mix, as this could help to determine any repair methodology. Given the dating evidence, there should not be assumptions that lime mortar or render is appropriate in this instance as cement renders were typically adopted in the early twentieth century.

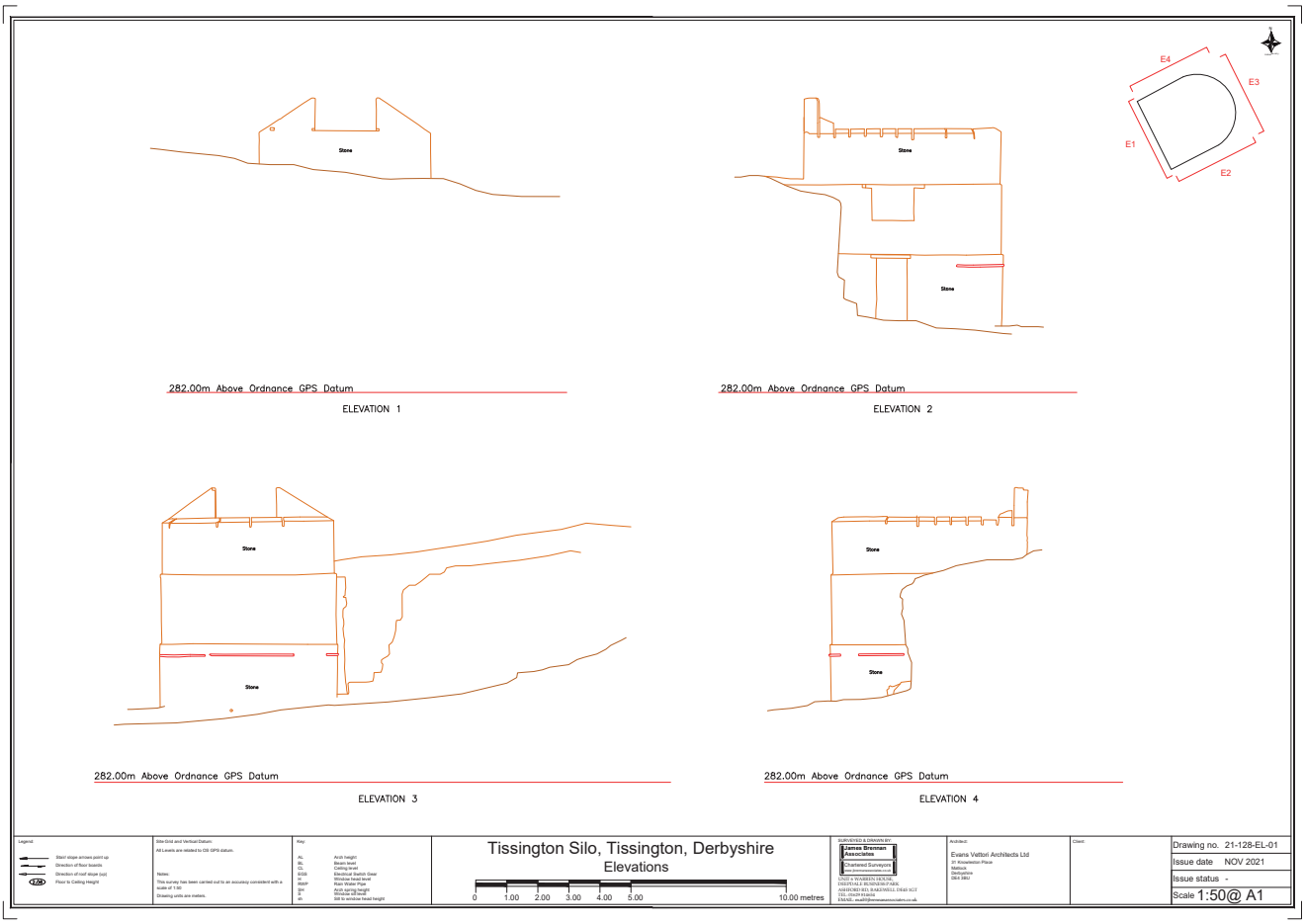

Plate 12 - Measured survey elevations of the tower (James Brennan Associates). This sheet is also reproduced as a separate PDF for scaling purposes.

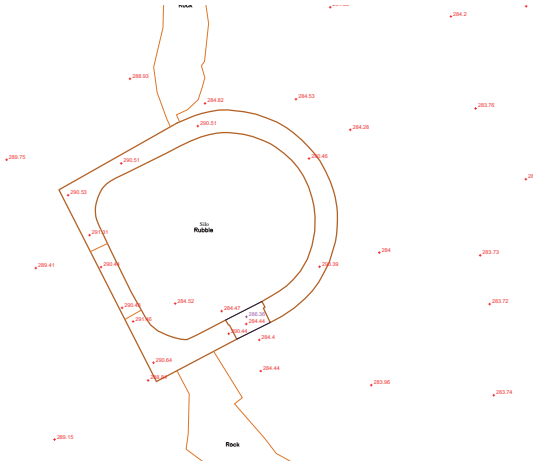

Plate 13 - Detail of floor plan of the tower, showing the semi-circular curved walls to the front and the squared walls to the rear, which have been built into the cut-out rock face. This shows a substantial amount of rock was quarried out to accommodate this structure.

Plate 14 (ref. ext09_02_01_22)
This shows clearly the curved form of the building on plan and the wall-head with the narrow slots for the former rafters, which suggests an insubstantial roof.

Plate 15 (ref. ext08_02_01_22)
West former gable at the third stage of the tower, with the apex missing and mortared capping to the walls.

Plate 16 (ref. ext06_02_01_22)
Bottom stage of the tower with step evident, which runs in-line with the door lintel, and length of wrought iron strap,.

Plate 17 (ref. detail_banding_3_020122)
Section of wrought-iron or steel strap to the bottom stage of the tower, which has been part mortared onto the surface of the stone and attached with a series of square-headed bolts and squared 'washers'.

Plate 18 (ref. detail_west_gable_southern_eaves_020122)
A small fragment of the timber inner wallplate pokes out from the wall. Cement render has been buttered over the wall-head to protect it and appears to have been added in anticipation of a roof.

Plate 19 (ref. detail_north_eaves_wallplate_020122)
The wall-plate on the north side of the tower is missing but the slot where it has rotted away remains, with clear sight of a bolt on the same alignment.

Plate 20 (ref. detail_lintel_020122)
Fissile limestone lintel over the only doorway. The lintels to the back have rotted away. A crack fracture suggests some slight movement.

Plate 21 (ref. detail_north_eaves_wallhead_020122)
Detail of the location of former narrow rafters. Considering that there was no roof in 1945, these have stood the test of time remarkably well. The lack of projecting masonry suggests that the rafter feet would have projected far beyond the wall.

Plate 22 (ref. int04_02_01_22)
Internal cement-rendered walls. The internal lintel over the door was probably timber, which has rotted away over time. The external stone lintel over the window has collapsed, creating the impression of a larger internal lintel now.

Plate 23 (ref. int08_02_01_22)
Wall-head at the upper stage of the tower, with shelf for the former wall-plate still visible; a deeper slot within the internal masonry / render (top left) may have formed a cross-bracing piece. Cement render reveals that the west gable 'window' or opening was face-planted, whereas the window to the middle stage of the tower was fixed to the back of the opening and finished flush.

Plate 24 (ref. int02_02_01_22)
Junction of rubble floor and rendered walls

Plate 25 (ref. int12_02_01_22)
Location of internal wall-plate and threaded bolts

Plate 26 (ref. int07_02_01_22) - rubble stone floor

Aerial Photography

Aerial photography is limited for this area but a search of aerial photography in the Historic England archive has produced several RAF verticals from sorties in 1945 and 1948:

RAF/541/109 – frame number 3217 (27 July 1948) - library number 934
RAF/541/109 – frame number 3218 (27 July 1948) - library number 934
RAF/106G/UK/488 – frame number 3073 (08 July 1945) - library number 3609
RAF/106G/UK/488 – frame number 3074 (08 July 1945) - library number 3609

The earliest of these from 1945 (RAF/106G/UK/488 – library no. 3609, frame number RP 3073, dated 8th July 1945) contains a reasonable quality view and shows the building very much the same as it is today; i.e. roofless. If the building had a roof we would not be able to see the west gable, as it would be oversailed by the roof.

An aerial photograph from 1972 (held by the Peak Park) also reveals that the building was roofless at that time. The concrete capping, therefore, is likely to have been repaired when the roof was removed, as it is still largely intact. At both dates the quarry was surrounded by a walled enclosure, preventing access by livestock.

All that we can deduce from the aerial photography is that the site does not appear to be in active use at that time and that it is extremely unlikely that the roof was of a permanent finish, as blue clay tiles or stone slate would have lasted longer than 20-30 years, as the structure was erected by 1922. The balance of probability is that the roof was of a temporary material, such as corrugated sheet iron, and that when this was removed the roof timbers were also removed.

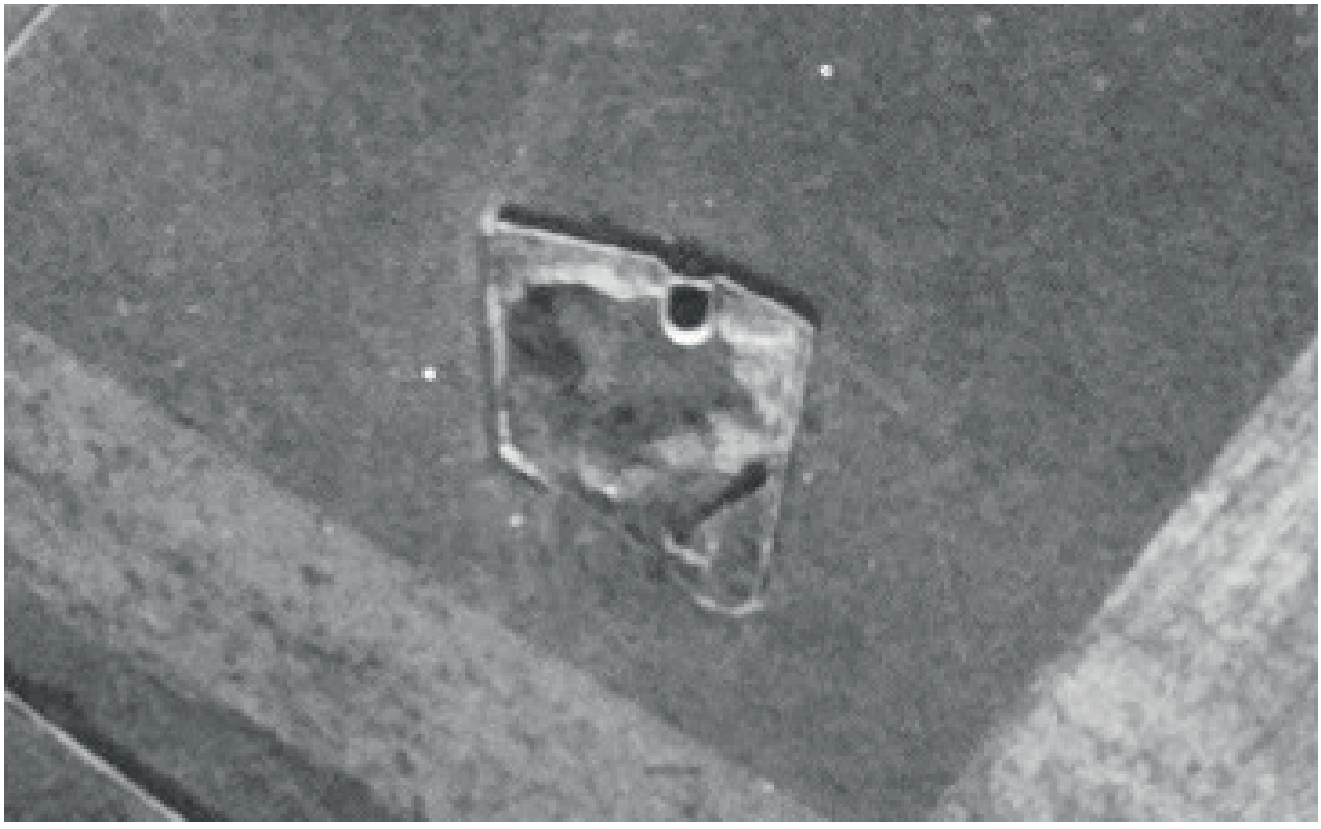

Plate 27
RAF/106G/UK/488 – library no. 3609, frame number RP 3073, dated 8th July 1945 (Historic England Archive)

Discussion of Evidence

Option 1 - Powder House

Powder houses are rare in England although there are several in Derbyshire. They were commonly (but not exclusively) associated with the lead industry and provide a secure dry store for explosives away from habitation and from the main workings. Most powder houses are connected to a lead mine (there is one at Millclose Mine which is listed grade II and late 19th century, with an arched vaulted roof and was originally lined in timber). There is also a circular powder house at Magpie Mine, now roofless. Other examples can be found in Cornwall associated with metallurgical mining. They are commonly built with a curved plan, or curved internal walls, to create a strong structure which would withstand outward force from potential explosion. They are universally a single-storey structure.

It is possible that the structure was built for industrial use. If it provided a dry store for storage of gunpowder in association with local quarrying, it is a puzzle as to why it would be a multi-staged (multi-storey) structure. This quarry was clearly not working and there is no evidence for other working quarries in the immediate area at that time.

Conclusion: the balance of probability is that this is highly unlikely, as it is too remote from the local surviving quarrying operations in the early 20th century. It is also contrary to the single-storey form which is found universally within the region. There is no obvious explanation for its height and the purpose of this height for a powder house, in association with quarrying or mining.

Option 2 - Silage Tower

There has been a suggestion that the structure was built as a silage tower. A field shelter can be seen for the first time on the 1922 OS map, built in front of the northern wall of the large field, although this was removed by 1975. This was probably built to accommodate cattle. If the estate was over-wintering cattle in the fields it may have decided to construct an experimental silage tower for winter fodder, although it would be normal in the region to use hay and for this to be stored above the cattle. This is a pastoral landscape and has been used historically for sheep grazing, not cattle rearing, as the soils are thin and not conducive to silage / cattle stock grazing. The building was not a grain store, as there is no arable production in this upland area.

If it was a silage tower it would be storing an early hay crop or cut grass. Silage compacted down and air tightness was critical; the cylindrical form was the result of experiments in the 1880s and 1890s with square plan tower and large clamps, where air pockets developed as the silage compacted, resulting in biodegradation.

One of one of the earliest tangible survivals of the introduction of the concept of silage making in England is a grade II listed silage clamp dating from 1885, at Lulham Court Farm (ref. UID 1250710). It is the earliest silage clamp known to survive in England; it was awarded a prize at the Royal Agricultural Society in 1886, who have descriptions and drawings of it. [N. Harvey, The Farm Buildings of England and Wales, 1984, opp. p 208 and footnote 50, p 200.].

By 1900 silage was being installed largely in cylindrical towers. In 1911 the Portland Cement Company published Concrete Silos: A Booklet of Practical Information for the Farmer and the Rural Contractor, which provided detailed information on how to construct a concrete cylindrical silo. There were various publications, including 'Hanson, E. S. 1916. Concrete silos; their advantages, different types, how to build them'. Early silage production in the UK was heavily influenced by US examples and experimentation.

Two critical factors are shape and smoothness of internal walls.
E.S Hanson stated;

> "(9) Shape. The cylindrical silo is most economical of material, easiest to provide with resistance to working strains, easiest to fill. The absence of corners makes it practically impossible for air pockets to form if reasonable care is exercised in filling.
> (10) Smoothness of Interior Walls. By having the interior walls smooth and free from ledges or offsets, the silage will settle down perfectly, thus effectually excluding the air and also allowing the largest possible amount of silage to be placed."
> (page 29 - Hanson, E. S. 1916. Concrete silos; their advantages, different types, how to build them)

There are a pair of linked silage towers dating from 1917 at Briantspuddle (UID 1323419). These towers are all cylindrical and not stepped. There are a pair of grade II listed silos at Wilsic Lodge farm (UID 1286234) dating from the 1920'S. Built from reinforced concrete, they are a pair of freestanding cylindrical silos with integral ladder turrets; the northern silo has an embattled parapet.

There are problems with the silage tower hypothesis: all known contemporary examples are based on cylindrical tower silos built or finished in concrete; this tower is not cylindrical; it has a stepped form and a square back to the quarry face; there is also a high-level 'window' or 'hatch' opening in the tower, which is alien to the principle of a uniform silage tower; access to extract the silage would have been very difficult, unless a mechanical hoist was employed but there is no evidence for this; it is very remote from any of the farms, whilst all known contemporary silos are set within farmsteads; the upland location makes it highly vulnerable to frost; frosted silage is harmful to cattle.

As silage developed, the early silos extracted the silage from the top of the tower (the small door opening at ground level is impractical for this function). In the case of the Tissington silo it is difficult to see how extracting from the top could be very practical as access is far from easy built against the quarry face and they would have needed a mechanical hoist. The clay pipe at the base of the Tissington tower may be a drain point for the silage or a more recent intervention. The opening above the door may have provided an access hatch, although cart access was difficult to this level of the quarry and the sloping ground militates against cart access.

There is a clear impression of dwindling interest in silage after 1900, although it was revived to some small extent by the example of Mr George Jacques of Tivetshall in Norfolk, who built a tower silo for oats and tares in 1910 (H I Moore, Grass and Grasslands, 1966, p 108). Cheshire County Council erected a tower silo at their farm institute at Reaseheath (after 1919), and a few of the larger farmers in the county also invested in them. In Hertfordshire, too, silage was popular in the period between 1918 and 1923.

"In his revision of Ernle's English Farming Past and Present, completed in 1936, Sir Daniel Hall observed that in about 1920 there was a considerable recourse to silage made either in the wooden silos imported from America or round silos of reinforced concrete; a mixture of oats, tares, and beans being the crop most favoured for preservation as a succulent fodder for the winter feeding of milch cows" (ref. Silage in Britain 1880-1990: The Delayed Adoption of an Innovation, Paul Brassley, Ag Hist Rev, 44, I, pp 63-87).

Conclusion: there is no compelling evidence that this was part of large-scale, experimental silage production; the fields supporting that are too small in area and it is completely remote from Tissington Hall Farm, or any others, where the silage would be needed for winter fodder. The practical limitations of getting access to the silage militate against such a use.

Option 3 - Artillery Storage

It is possible that this structure was built in association with military practice or civil defence for WW1. The structure is overly large for small firearms store, such as for the Rifle Range, but it may have been used to store larger artillery for WWI target practice and shelling.

The nearby Rifle Range and Butts on Thorpe Pasture was established by 2nd Voluntary Battalion Sherwood Foresters in 1902 on land belonging to the Tissington Estate[1]. The Rifle Range at Thorpe Pastures, to the south, is quite remote, located 600 metres from the tower as the crow flies, but over steep terrain.

A tenancy agreement was arranged in 1914 by Sir Hugo Meynell Fitzherbert (1872-1934) with the Sherwood Foresters. Under the title of Territorial Recruiting, Thorpe Rifle Range is mentioned specifically in the Derbyshire Advertiser and Journal, on Saturday 11th July 1914. It is possible that there was an association with perhaps the 4th North Midland Howitzer Ammunition Column or the 2nd Derbyshire Howitzer Battery.

It is plausible that there was some artillery practice, using the local upland moors, which may have needed a secure store for artillery shells. There are no records in the newspapers of artillery shelling. Precisely why the store would need to be three stages is unclear, unless it was simply and specifically taking advantage of the dual height for multi-level storage and access.

The Rifle Range and Thorpe Pastures were owned by the estate until 1973 when it was sold by Sir John Fitzherbert to the National Trust (pers. comm. Sir Richard Fitzherbert). Adam Russell of PDMHS has commented: [some] large estates hav[e] land requisitioned for firing range use in WW1. He cites an example at the back of Harpur Hill where the Chatsworth Estate gave over the land down to Greensides Farm to use as a mortar testing range, to test trench mortars. Frith Artillery Range at Greensides Farm is recorded in the National Trust HBSMR.
https://heritagerecords.nationaltrust.org.uk/HBSMR/MonRecord.aspx?uid=MNA191822
See also: https://buxtoncivicassociation.org.uk/the-frith-artillery-range-harpur-hill/
It is possible that other estates were doing the same, but on a lesser scale.

Conclusion: Although Lynn Willies considers that the building does not exhibit any of the characteristics of an artillery magazine store, as this is located on Estate land and was kept 'in-hand', it cannot be discounted. It incorporates the strong structure needed as a magazine for the storage of artillery.

Option 4 - Windmill

All local upland Derbyshire windmills are tower mills and were conical in shape. This enabled the sails to be rotated into the wind from any direction. Given the proximity to the quarry face, this would be a practical impossibility. The apex of the tower and the wall-plate is too small in section to support the frame of a ring-beam for the rotating headstock. There is no economic logic to constructing a tower mill in the early 20th century. These were largely obsolete by the 20th century, although there are recorded practices of reconstructed mills and transfer of mill equipment (e.g. Heckington Windmill).

Conclusion: this is the least likely use given the constraints of the quarry.

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1 2nd Voluntary Battalion Sherwood Foresters, C Company 'Ashbourne Volunteers' were using the "New Rifle Range" at Thorpe Cloud which was opened on June 20th 1902 (Ashbourne News). This was funded by subscriptions and a War Office grant. The Ashbourne Rifle Club was later created and were using the range in until December 1916 when practice was suspended because of so much enlisting amongst the members. The Sherwood Foresters continued to use the range intermittently in 1918.

Option 5 - Observatory

An observatory might have been either intended for star gazing or for observing military manoeuvres or shelling. Observatories are typically towers, with conical roofs. Where there is a dark sky and high-level access, as in this location, star-gazing is a possibility. Early observatories or observation towers tend to be highly decorative features, with classical details. Certainly, if the estate was building this as a bespoke structure, we would expect to see more of a monumental or architectural appearance, with less mundane construction details. Nevertheless, the access window to the west gable provides a possible use for access for a telescope and horizontal sliding shutters, as does the semi-circular roof. A military observatory would have required less self-conscious and more pragmatic design, so this is an equal possibility. The roof construction of an observatory was lightweight and was designed to be opened up for a telescope. The 1945 aerial photo indicates no roof structure and no surviving roof timbers either. This does seem to suggest that the original roof was lightweight and may have been metal clad, where this was plain sheet metal panels, or corrugated steel or zinc. If the building had no specific function after WW1 and WW2, then maintenance of a roof would have been an unnecessary expense. The aerial photos clearly show that the roof was removed by 1945 and suggest that the tower and the wall-head was consolidated by 1945.

Conclusion: there is a possibility that the tower was originally used as a short-lived observatory, but if that is the case, there is no evidence that it had a subsequent meaningful use.

Conclusions and Significance

Without knowing precisely what the function of this structure was, it is difficult to be specific about its significance. Truthfully, if it is either an observatory or a WWI artillery store, then it has above average significance in the region, as these are both rare. However, we cannot say this definitively. There is no building that we can positively identify which is comparable.

The structure was built to withstand significant outward force and the location, built into and against a solid masonry quarry face, and the curved plan form, stepped construction and iron banding, all provide evidence of a very strong structure built to withstand pressure.

The site was chosen for its remoteness and for the fact that the redundant quarry face provided a suitable strong backdrop.

There is no evidence for increased local quarrying in the early 20th century in the vicinity (although Tissington and Thorpe Quarry still existed and the estate was paying royalties on them in 1909) and the lead industry, which has some remnant earthworks, was largely redundant by the 20th century in the local area.

The site also made use of the different levels by having an access hatch at the upper level. The lower level is not easily accessible as the presence of the earthworks of the former limekiln and quarry workings limit vehicle access to the steep southern slope.

The stepped form and the presence of iron banding around the base altogether suggest one of several possible functions:

- a 'powder house' for storing gunpowder or a munitions / artillery magazine store, or
- another purpose for withstanding outward explosions. We have considered the possibility of a firework store, or
- An observatory for looking at the night sky or for observing other activity on the estate. We do

know that at artillery sites, such as Trawsfynnydd Artillery Camp, there was an observatory built on top of Craig y Penmaen to observe shelling. It would be an exceptionally good location for an observatory and the plan form and conical roof would have enabled a rotating large telescope, although the roof is not conical, so has limitations. If it was an observatory, the roof would have had a metal clad finish, with sliding panels. This hypothesis is supported by the evidence that the roof was missing by 1945.

If it was either an observatory or artillery store then in all likelihood it would have had an internal floor, and this may account for the presence of a 'window' or hatch over the door. There is no sign of an internal floor now.

There has been a suggestion that the building may have been a silage tower, or a silo. It would not have had an internal floor and the impression now is that the building may have been built with continuous cement rendered walls, but there is no reason why a silo would be built in this location. Powder houses did have rendered walls, which were often lined in timber to keep the powder dry. It seems most likely that the structure was adapted at a later date by re-rendering the inside but for what purpose remains obscure, unless it was simply an effort at consolidation.

East Midlands Historic Environment Research Framework
Provision is made for updating the East Midlands Historic Environment Research Framework (EMHERF) where the results of a fieldwork project contribute towards agenda topics.

Strategic Objective 9H
Characterising the rural environment: identify and record historic buildings and landscape features

Although this record provides a record of a structure within the countryside, we cannot definitively identify whether it had a military, industrial, agricultural or leisure use. Further archival research on estate records held by the Tissington Estate or by the Derbyshire Record Office may eventually in time provide the missing link but identifying its original function remains elusive at the present time. We will, however, request an update to the Historic Environment Record, which suggests that the building is a limekiln, which it definitely is not.

Sources Consulted and Bilbiography

British Newspaper Archive: Searches – Thorpe Cloud Rifle Range
Historic England - NHLE database and Archives for aerial photography (Swindon)
Peak District Mines Historical Society
Peak District National Park Authority - aerial photography and photographs
International Silo Association

Derbyshire Record Office:
Domesday 1910 – land values maps and schedule
(Tissington Hall Farm)
D595/LV/38/5
D595/R4/1/9

Tissington Estate papers:
D239/BOX/16
1929 map of Tissington Hall Farm

Map of 1908 of the Tissington Estate
Map of 1927 of the Tissington Estate

Rentals:
D239/F6309 and D239/F6320
Tissington Hall Farm – late Joseph Williamson (1921 rental)

Historic Environment Record
SNA66992 - Report: Alice Ullathorne (Peak District National Park). 2004. National Trust South Peak Estate Survey: Area 3 - Dovedale South (Vol 2: Site Details & Management Recommendations). p.91 (Illustration 11).

Publications
"Concrete Silos – A Book of Practical Information for the Farmer and Rural Contractor"
Universal Portland Cement Company, 1914

"Concrete Silos – Their Advantages, Different Types, How to Build Them", E.S. Hanson, pub. Chicago, 1916

Silage in Britain 1880-1990: The Delayed Adoption of an Innovation, Paul Brassley, Agricultural History Review, 44, I, pp 63-87

N. Harvey, 'The Farm Buildings of England and Wales', 1984, opp. p 208 and footnote 50, p 200

H I Moore, 'Grass and Grasslands', 1966, p 108