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**Ayscoughfee Hall
Spalding
Lincolnshire**



Plate 1: The fountain prior to dismantling

**Report on the condition and proposed rebuilding
of the Mary Ann Johnson Fountain**

February 2022

Abstract

This report concerns the Mary Ann Johnson Drinking Fountain, previously at Ayscoughfee Hall in Spalding, but dismantled in 2018 and now in store at Holbeach. An inspection of the dismantled pieces was made and their condition assessed. The weight is also estimated. It is determined that cleaning would be desirable, as well as some relatively minor repairs. However at least one of the stones (course I) might be considered for replacement, and more significantly the top two courses of stone are missing as well as the cross.

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Introduction

General

This report concerns the Mary Ann Johnson Drinking Fountain, which from circa 1956 to 2018 was in the grounds of Ayscoughfee Hall, Spalding, Lincolnshire.

It has been commissioned by Andrew Oglesby of Oglesby & Limb Ltd, architects, of Spalding on behalf of South Holland District Council.

The brief for the report was to carry out an inspection of the dismantled fountain in its store in Holbeach; to determine its condition and to prepare a report on this together with a proposed method statement, and costs, for any remedial work and its re-erection.

Separate advice will be required for the design of the new footing. An estimate of weight is given here, but a structural engineer should check the ground conditions of the proposed new site, and specify the type of foundation.

A survey was carried out on the 20th of January 2022 by Dr David Carrington ACR FSA of Skillington Workshop Ltd, who is also the author of this report. Any future reference in the first person is to the author.

Terminology and assumptions

Any reference to 'left' or 'right' is to that of the observer, not of the object. If reference is required to the object's side then the terms 'proper left' or 'proper right' will be used.

Weights stated are to the best approximation based on an assumed density of 2.6 tonnes/m³ for granite and 2.5 tonnes/m³ for the sandstones¹. Note that weight can vary for porous stones depending on their moisture content, and where there are carved details I have estimated the approximate percentage volume taken of a six-sided shape to estimate weight. A safety buffer of maybe 15% could be added to the weights.

¹ Taken from Smith, M.R. (ed) (1999) *Stone: Building stone, rock fill and armourstone in construction*, London: Geological Society. This is a typical density for granite but the density of red sandstones varies considerably from 2.0 – 2.8 tonnes/m³. Porosity and water absorption also varies. For granite it is very low, but for sandstone can be in excess of 10%. 2.5 tonnes/m³ seems to be a mid-range density to work to.

History

The Mary Ann Drinking Fountain

This is best summarised by quoting from Andrew Oglesby's email to me on 1/12/21:

We are currently working on a project to re-erect a stone drinking water fountain at Ayscoughfee Hall and Gardens in Spalding, South Lincolnshire. Ayscoughfee Hall is a Grade 1 listed former dwelling (now a museum) that stands in ornamental gardens (which themselves are grade 11 listed). In the late 19th Century, Mary Ann Johnson (whose family resided at Ayscoughfee Hall) donated around £1500 to the Spalding Water Works Company to enable them to install water mains for potable water to serve several areas of the town (this because there was a high infant mortality rate locally at the time). The water company installed the mains and then erected an ornamental drinking water fountain in the town as a memorial to Mary Ann Johnson (though she was still alive at that time). The date of erection of the fountain was 26th August 1874. The fountain stood in Hall Place in the town centre for 80 years, but was relocated to Ayscoughfee Hall Gardens in 1954 to allow for road layout changes in the town that impacted upon its original position. It was initially stored, but was then re-erected in 1956. It remained in this location until recently when it was dismantled to make way for the building of a WW2 memorial. Since then (2-3 years estimated) the fountain has been in store in pieces. The council now wish to re-erect the fountain in a new location within the ornamental gardens at Ayscoughfee.

I can add a little bit to this. The designer was the London architect Robert Jewell Withers, who was at the time working on the new St John the Baptist church in Spalding. Withers deserves further academic study. He carried out much church building and restoration work as well as domestic and industrial building design, working widely in England and Wales as well as in Belgium and in America.

Drinking fountains in general

Drinking fountains became popular in Great Britain in the second half of the 19th century, driven by a combination of rising populations – particularly in towns and cities – and demand for better quality water. They were typically paid for by public subscription or by donors. The first in London was built on Holborn Hill in 1859, paid for by Samuel Gurney. They had various different forms but invariably seem to have had cups on chains. Hygiene issues with the shared use of cups and contamination of the piped water became an increasing concern during the 20th century, and by the 1970s most had been taken out of use, paralleled by the availability of bottled water.

Skillingtons have conserved various Drinking Fountains over the years, including one at the Pavilion in Matlock (Derbyshire) in 2004 and one at South Park, Darlington (County Durham) in 2005.

Construction

The fountain comprises 15 or 16 courses of stone with a metal cross on top. The layout is shown in the drawing below (plate 2), omitting the top course or two of stone and the cross, neither of which were present in the store. I think, looking at the photo of the Fountain prior to dismantling (plate 1 on the front page) there are probably two missing stone courses, firstly a red sandstone course about 125mm thick with one roundel on each side; then some kind of arched finial stone, maybe 300mm high. The cross looks from the colour photo to have been brass (it has green corrosion) but we know the holding down rod was iron.

Each course is given a letter, starting with 'A' for the bottom course.

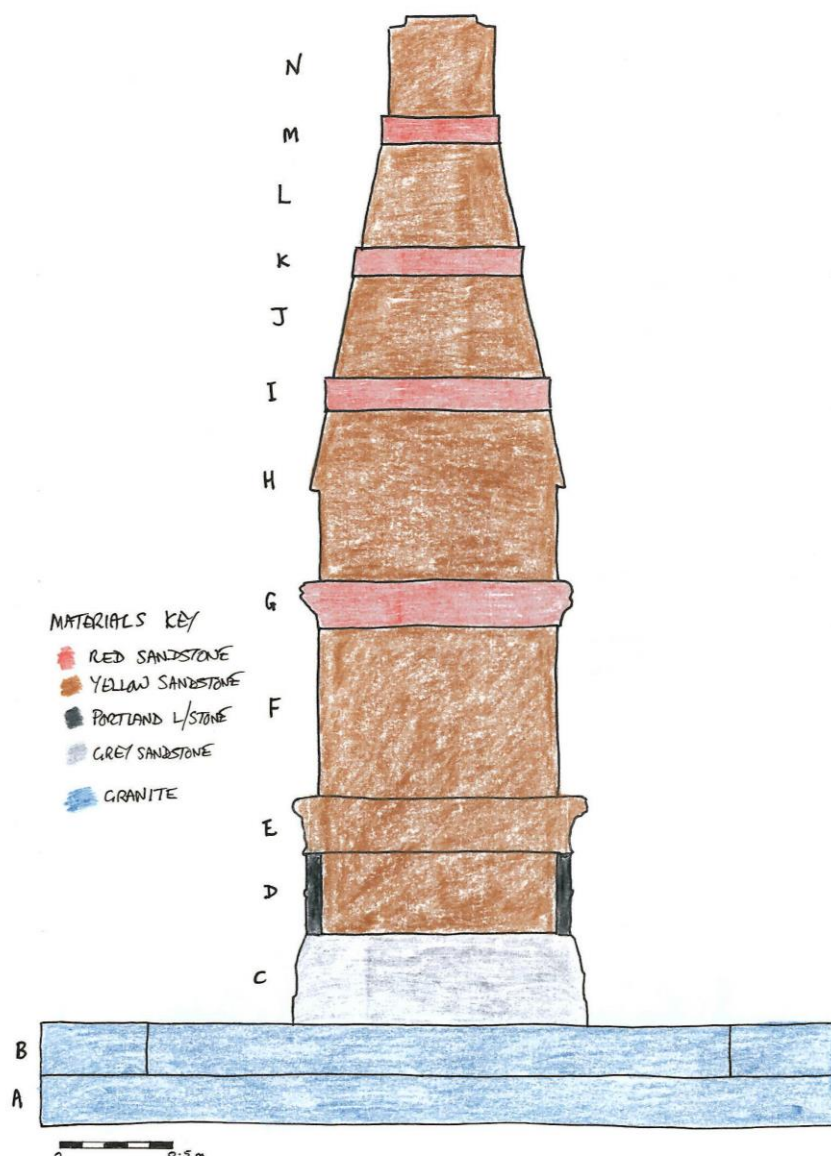


Plate 2: Sketch reconstruction of the Fountain showing set out and materials of the various stages

A variety of materials have been used. There is a grey granite, a grey sandstone, a yellow sandstone, a fine-grained red sandstone, a limestone (for the column shafts) which looks to me like Portland stone, and then of course the copper pipework.

Course A comprises 8 nr stones and would presumably have had a solid (brick) masonry core construction. There are four little bowl-shaped hollows clearly associated with the water. The footprint is circular, with a diameter of 3.55m, and the height of this course being 225mm.



Plate 3: one of the Course A stones, showing one of the four little bowls or cup hollows. I don't fully understand how these function.

Course B, again of granite, also comprises 8 nr stones, but here with only a small open space in the centre which might have been left hollow. There are 4 nr rectangular pieces, each with a hollowed out 'scoop' at one end which must sit over the cup hollows in course A. On the upper edge are light chafers along the exposed side edges to take the sharpness off the arris. The 4 nr plain quadrants are clearly set back from the rectangle. The height of this course is again 225mm.

Course C, a grey sandstone, is octagonal with extending bases for the column shafts looking like ears on alternate sides. The hollow centre is also octagonal and is circa 760mm wide face to face. The height is 408mm, and the size overall circa 1310 x 1310mm in plan.

Course D, of yellow sandstone, is a hollow octagon with hollows cut in alternate sides to take the column shafts. The hollow centre is also octagonal and is circa 760mm wide face to face. The walls where full thickness are circa 152mm thick, and the height of the stone is 360mm. It is actually two stones, because one side is a separate piece of stone, presumably designed this way to give access to the plumbing in the hollow centre. It would not have been easy to remove the stone, so this can only have been for very occasional and emergency use only. The Portland limestone column shafts, also (of course) 360mm high are 162mm in diameter with a central projecting ring moulding extending by 40mm. This has a straight chamfer on the top and a drip in the underside. They look to have been secured in place by small slate square pins (they didn't give a ready on a hand-held metal detector) set in hard grey cement.



Plate 4: Courses C and D, still together, showing the hollow construction, and the separate panel on Course D.

Course E, of yellow sandstone, is 250mm thick (height), a single piece of stone, octagonal with bowls set on alternate sides, and a hollow centre. The bowls are clearly designed to site on top of the shafts in Course D. The hollow centre is also octagonal and is circa 760mm wide face to face. The stone as a whole is circa 1150mm wide face to face and 1570mm diagonally across at the widest part (with the bowls).

Course F, again of the yellow sandstone, sits above the bowls. Again octagonal, it is slightly smaller width-wise than E, being 1055mm wide face to face externally and about 750mm internally. It is 760mm high and has a roundel in each alternate face, the pipe outlet being in the centre.

Course G is red sandstone, and is a solid octagon with an overall width of 1235mm face to face measured from the outer part of the moulding, or 1000mm at the top. It is about 200mm thick (for some reason I failed to write down the measurement for its thickness), with the moulding comprising a straight chamfer at the top, then a stiff-leaf frieze below in the concave section, and a roll mould at the bottom.

Course H is a solid octagonal piece of yellow sandstone, 755mm high. The lower part is vertical, then there is a slight projecting lip before it tapers back to a reduced diameter at the top. In alternate faces there are little gables, which were above the bowls, within which is a shield with the Johnson family arms. There is a single Lewis hole in the top, which is 970mm wide face to face.

Course I is red sandstone, and is a solid octagon with an overall width of 915mm face to face measured at the top, tapering to be slightly wider at the bottom. It is 150mm thick. The detail on each side is of four rebated roundels. There is a single Lewis hole in the top. There is also a little stone indent, I assume original, to the upper moulding.

Course J is of yellow sandstone, confirming the alternating pattern of red and yellow in the 'spire'. It is a plain tapering octagon, 458mm high and with an overall width of 748mm face to face measured at the top, where there is a single Lewis hole. There is also a pile of iron corrosion flakes in the centre at the top, indicating that the holding-down part of the cross at the very top was iron and terminated just above this stone.

Course K then is of red sandstone, and is like course I but with three roundels per side and is 125mm thick. It has an overall width of 730mm face to face measured at the top. There must be a central hole for the holding-down rod hidden below cement mortar still in place.

Course L is of yellow sandstone, another plain tapering octagon. In the centre is a Lewis hole as well as a circa 35mm diameter hole right through, for the holding-down rod. It is 465mm high and 525mm face to face measured at the top.

Course M is of red sandstone, with two roundels per side, a tapering octagon with a hole in the middle (it looks like this has been set through where a Lewis hole was), 125mm thick and 515mm across at the top.

Course N is octagonal again, but this time has a fairly naïve arcading design around it. It is 450mm high, 490mm across (face to face) at the bottom (so course M projects by about 12.5mm or half an inch all the way round) and 305mm across at the top. It has the usual hole right through for the iron cross.

Course O isn't present in store, and from what I understand can't at present be found. Looking at the photograph from before the Fountain was dismantled it may even be two courses of stone, the bottom being with one roundel per side (diminishing from I, K and M), the upper part looking as if it has (staggered?) crockets on the sides. My best guess is that this stone, or stones, were 375mm high.

Weight estimate

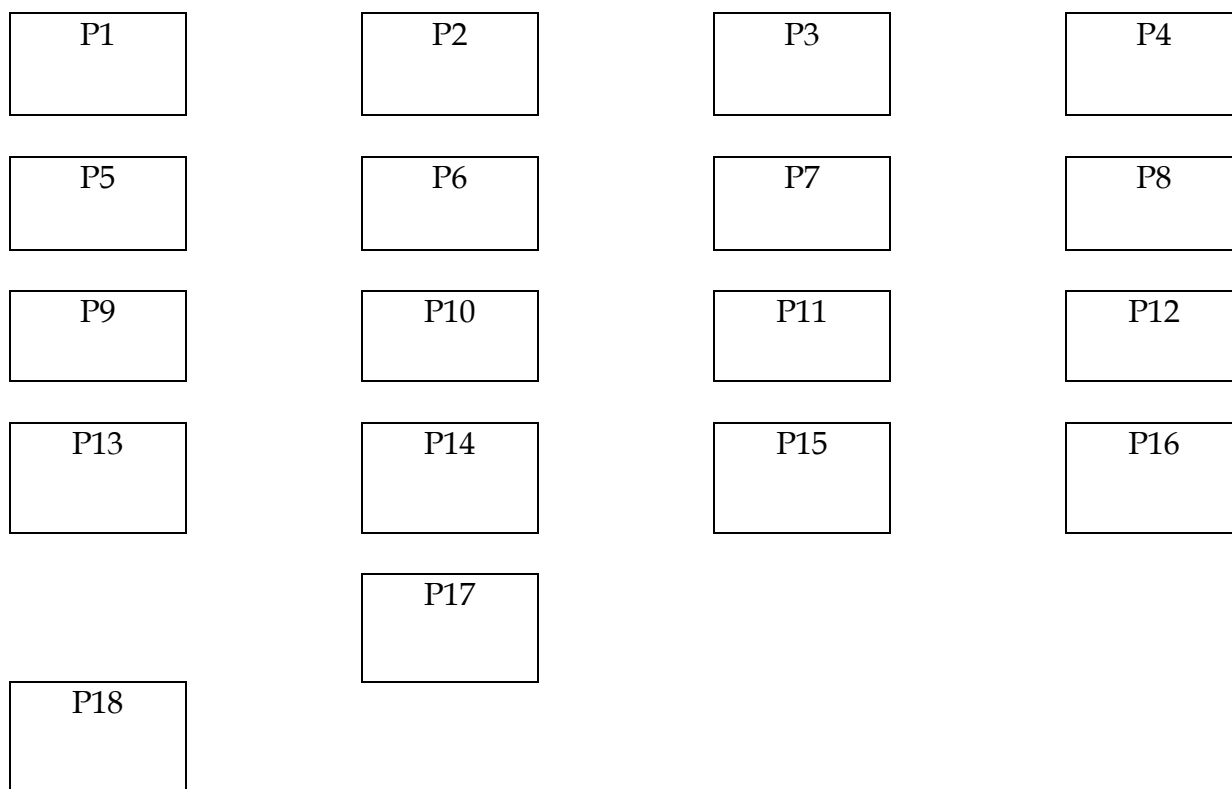
Course A, granite:	5.85 tonnes including assumed solid core
Course B, granite:	3.65 tonnes
Course C, grey sandstone:	1.65 tonnes
Course D, yellow sandstone:	0.4 tonnes
Course D, column shafts:	0.1 tonnes
Course E, yellow sandstone:	0.5 tonnes
Course F, yellow sandstone:	0.95 tonnes
Course G, red sandstone:	0.4 tonnes
Course H, yellow sandstone:	1.5 tonnes
Course I, red sandstone:	0.25 tonnes
Course J, yellow sandstone:	0.6 tonnes
Course K, red sandstone:	0.15 tonnes
Course L, yellow sandstone:	0.3 tonnes
Course M, red sandstone:	0.05 tonnes
Course N, yellow sandstone:	0.15 tonnes

Giving a total of around 16.5 tonnes. Allowing for the missing courses and the cross, and perhaps a supporting brick pier in the hollow centre, **we should allow a weight of about 20 tonnes**. This is a long way off the 78 tonnes I have seen given elsewhere as an estimated weight. At around 2.5 tonnes/m³ this would require some 31m³ of masonry. Even if the structure was solid we would be looking at less than a third of this.

Condition report

The dismantled elements are stored with on pallets or on supports to keep them off the ground. The layout at the time of the survey was as shown below, with a total of 18 'pallets' numbered P1 to P18:

Rear wall of Store



Course A was on 'pallets' P2, P6, P7 (two stones), P9, P10, and P14 (two stones).

Course B was on 'pallets' P1 (two quadrants), P5 (the four straights), P6 (one quadrant) and P9 (one quadrant).

These are the granite elements. All appear structurally sound – as would be expected with reasonably careful handling due to the strength and durability of the stone, but very dirty. The soiling is dust and mud rather than chemical alteration products, as well as some algae and lichen on old upper surfaces. Some pieces (such as those on P7 and P9) retain a fair amount of old very hard cement mortar. There is some very slight evidence of localised flaking of the granite on the underside of the scoops on course B.

Courses C and D are both on P18 except for the column shafts which are on P7. P18 has collapsed under the weight. The Course C stone, which is an unidentified grey sandstone not used elsewhere on the fountain, is in quite poor condition with a

spalling and disaggregating surface. There is a crack, probably going all the way through, on one side, perhaps a stress fracture from when the pallet collapsed. The two courses, and the 'door' on course D, are cemented together. Course D is potentially very weak at the corners of the octagon due to the thinning of the stone where there are hollows for the columns, and with the separate access stone. It is generally okay but is very dirty, and on one side a weak bed in the stone has started to weather. This last is not actually much of a problem but more a matter of note. There is lots of cement around the access stone.

The column shafts are dirty, chipped in places, and have lots of residual cement mortar.



Plate 5: The Portland limestone column shafts.

Course E is on P3. It looks weathered but is structurally sound. It is moderately dirty.

Course F is on P4. It looks weathered but is structurally sound. It is moderately dirty.



Plate 6: Courses F and, partly visible to the right, H.

Course G, on P12, is in poor condition to the exposed surface where there is much loss of surface detail due to disaggregation and wind erosion, but is structurally sound.

Course H is on P8. It looks weathered but is structurally sound. It is moderately dirty.

Course I is on P15. It is in very poor condition with the outer, exposed surface breaking up badly due to both disaggregation and delamination. In fact the roundels are really only clearly visible on one of eight faces. There are also some spalls to the underside, perhaps due to handling damage as this is such a fragile piece of stone. However, it probably remains structurally functional – but only just. See plate 7 on the next page.

Course J is on P11. It is weathered, with algae and lichen as well as surface dirt, but is pretty stable and structurally sound.

Course K is on P13. It is heavily weathered on one side – was the stone naturally weak here? Structurally though it is sound and on other sides the detail is clearly apparent. Structurally it is sound, and overall the condition much better than that of course I.



Plate 7: Course I.

Course L is on P16 – a wooden pallet which has collapsed. It is weathered but structurally fine and appears stable. Quite a lot of cement bedding mortar remains in place.

Courses M and N are both on P17, separate, but with plenty of cement bedding mortar still on the stones. N is heavily weathered on three sides but not too bad on the other five, but as with K is structurally sound and I see no reason why I can't be re-used. N, in yellow sandstone, is weathered in places but is fundamentally fine.

Feasibility of reconstruction and estimates

Cleaning

The Granite elements would benefit from being cleaned, for which I would recommend a superheated steam cleaner such as the DOFF or Thermatecth machines, used by a suitably experienced conservator. This can't realistically be done in situ in the store area and is probably best done either at Holbeach once lifted outside of the store – handling being the principal difficulty due to their size and weight – or on the reconstruction site in the days prior to rebuilding.

Old cement mortar will need careful removal by hand using sharp chisels.

The sandstone elements might be best cleaned by bristle brush and clean water rather than by using the steam cleaner. I am not generally in favour of biocide treatments in situ due to the risk of contaminants getting into the ground, but if these were to be cleaned in a controlled area that can be mitigated and I suggest that a biocide pre-treatment is carried out.

Structural repairs

Course C, where cracked, could benefit from having a stitch or cramps inserted into its rear. These should be of 316 grade stainless steel set into Hilti HY resin, size and shape to be determined. I would move the stones into a better working space before doing this.

Replacement stone

Where stones survive I have generally taken the view that if they are able to perform their job structurally then they are okay to re-use. The stone forming course I is however a candidate for potential replacement. It is so weathered that the detail is barely discernible, and it looks to me as if the weathered face may even leave a slight rebate (and water trap) in section between the stones above and below. Weatherings could be made using mortars, but this nonetheless is a strong candidate for a replacement stone.

The stone or stones comprising courses O and P would need restoring in new stone, and the cross replacing. Both of these would require an element of design.

Surface treatment and repairs

Course C could be re-used as it is, accepting the weathering. Indeed, to separate it from course D could cause more damage to both courses. Given that we are looking at a weathered surface to start with then realistically I suggest just brushing off loose material. In conjunction with this some carefully matched lime mortar weathering

fillets along exposed edges of larger but relatively stable delaminations might help prevent water penetration and slow down further weathering.

The red sandstone is typically in poorer condition to the yellow sandstone, and in addition to the measures outlined above I would carry out trials to determine the efficacy of Silex OH (solvent-based silica ester acid consolidant) and Syton X30 (aqueous silica consolidant) to stabilise the disaggregating surfaces. With the Fountain dismantled this can be applied to dry stone, which is preferable for it to be effective.

Handling

Most the stones have old Lewis holes from where they would have been lifted and set into position originally. The holes were subsequently covered up by the course above. It makes sense to reconstruct using the same method, noting that new holes may be required into the existing ones to take a modern Lewis pin arrangement.

Course D has two Lewis holes, one each on opposite sides, and must have been lifted at these two points with plenty of internal bracing.

It goes without saying that handling heavy stones has associated safety risks if not done in a controlled way. Planning, method statements and risk assessments will be needed, and the work carried out by suitably skilled operatives.

Courses C and D on P18 are at great risk of damage from careless (or even careful) handling and will need carefully bracing and strapping before any attempt is made to move them.

Notes on rebuilding

The old slate pins in the little column shafts (course D) could be replaced using 316 grade stainless steel.

The mortar for reconstruction generally needs careful consideration. I would certainly advise against the use of a Portland Cement mortar, but it will require more resilience than might be offered by a non-hydraulic lime. As such I recommend an NHL2 lime binder for all elements from course C up, and an NHL5 binder for the steps in course A and B. Sand will also need careful selection, using a well graded sharp sand to suit the joint size and also the colour of the stone. Locally sourced sands would be preferred if suitable options are available.

It is no coincidence that the upper courses retain lots of hard cement bedding mortar. They would always be more vulnerable to stresses under wind load.

Consideration should be given in the design of the new holding-down rod for an arrangement that effectively clamps them together.

Dr David Carrington
Skillington Workshop Ltd
February 2022