



Urban Geology in Hackney: An Undersong

Ruth Siddall & Joshua Bilton

This is a psychogeological walk around Hackney. It was designed with artist Josh Bilton to complement his installation at SPACE from 24 June – 17th September 2016 and takes place on 4th August 2016. In addition, Bilton has produced a self-guided walk in collaboration with Holly Corfield Carr, 'Cairn'. The guide for this can be collected from the starting point at SPACE and downloaded from their website (Bilton & Corfield Carr, 2016). The walk is accompanied by 4 'Sound Cairns' numbered, relating to Cairns 3-6. These can be listened to or downloaded from **Soundcloud** (Bilton, 2016). Those taking this walk during the duration of Bilton's installation at SPACE should watch the video installation *Undersong* first and can then collect a piece of Portland Stone from the first Cairn at SPACE and can carry this through Hackney to deposit it, finally, at a new and growing Cairn in the portico of the church of St John-at-Hackney.

Exploring the unknown and sensing the unfamiliar in an urban landscape is the preserve of psychogeographers; the ability to drift around a cityscape with no real direction, exploring the routes that one finds unfamiliar is, as Abdelhafid Khatib (1996) put it 'at the same time as being a form of action, it is a means of knowledge'. Both 'action' and 'knowledge' are essential components of this experience, a *dérive*. Psychogeography can also be about layers. Different interpretations and responses of the cityscape from the historical to the occult. Geology is also about layers and here we will introduce the building stones of the city of London and particularly Portland Stone.

Stone *and* Pitch
Echo *and* Acoustic
Chamber *and* Sound
Material *and* Weight

This walk planned by Bilton, will take a non-intuitive route through the centre of Hackney, itself the stamping ground of the great British psychogeographer Iain Sinclair (see Sinclair, 2010). The route is fixed, but the experiences of walkers will vary whether they did this walk with Josh Bilton and myself on 4th August 2016 or whether they do it alone. The experience will be different depending on the season, the weather and the time of day. The experience of the walk will be multi-sensual. Looking, listening to the Sound Cairns, reading Holly Corfield Carr's poetry, feeling the weight of your piece of Portland Stone. But

we will also be adding layers, the unseen stratigraphy of psychogeologies, for this is also a story in stone, from a tropical lagoon to a layer of rock, from a quarry to a city, to a stone and a monumental mason and a tombstone, from 145 Ma to 2016.

The aural and haptic experiences of this walk are designed to make the walker think about erasure, tactility, embodying, shaping and being shaped. A sense of things being erased, peeling back their skin. The viewer is embodying the sound from the *Undersong* video but they are also shadowed by a second figure that walks with them, mimicking, replicating and syncing with their movements. They are almost one person and then they are distinctly different. The sound will cross from something that has happened already to a feeling that the sound is present, it's someone walking by, no it's a recording of someone who has walked by. It's a voice with you, no it's the recording of a past voice. The structures chosen also reflect this sense of doubling, the same structure splitting in two. Two town halls, two bell towers, two grave stones. Structures are emphasizing their separation from the landscape and others are being consumed back into it. The longing for the body to last, for ideals to last, the longing for material to mirror those ideals beyond the material body.

This walk is about Portland Stone, its geology and its place and symbolism in London's civic architecture. As well as taking in the six Cairns, this urban geological walk deviates slightly from Bilton's locations whilst retaining the route. A number of other important, stone-built buildings are included in this walk. Architectural information, unless otherwise cited, is from Pevsner (Cherry & Pevsner, 1998).

Hackney plays a part in London's geological history. Much of London stands on a thick layer of London Clay, of Palaeogene-Eocene age. These dark grey clays, variably fossiliferous were deposited in a marine environment. They represent some of the youngest bedrock exposed in the area. In Hackney the Clay is covered by deposits dating from the Ice Ages; terraces of gravels deposited by an ancestral River Thames and its tributaries, the River Lea and the Hackney Brook. These are the Hackney Gravels (formerly classified as part of the Taplow Gravels, but now known to overlie them; Ellison et al. 2004), composed of quartz sands and crushed flints. These were deposited after the retreat of the great Anglian Ice sheet (which reached as far south as Finchley and Hornchurch) 500,000 years ago. The Hackney gravels are covered in a layer of the so-called brickearths, more properly the Langley Silt. These are fine grained silty clays, which were used for making London stock bricks. The brickearths are yellow orange coloured sediments with the odd string of flints or pebbles incorporated within them. For the most part these are wind blown sands, loess

Hackney was a small village in the Middlesex Countryside until the mid 18th Century. Mare Street appears on Joseph Roque's map of 1746. At this time the parish was rural, although a number of families had country estates in the area. It also seems that there were a number of girls boarding schools, which Samuel Pepys visited for nefarious reasons. By the early 19th Century, the area was famous for gardens and was the site of the Loddiges family of botanists and plantsmen's nursery and palm house. These had gone by the 1850s and the parish of Hackney became more urbanised. Towards the end of the 19th Century a great number of factories were built in the area, increasing the need for workers housing and subsequently the remaining farmland was built over and Hackney was absorbed into the sprawl of London. In 1965 the Borough absorbed Shoreditch and Stoke Newington.

Cairn 1: SPACE

SPACE is located at 129 – 131 Mare Street, Hackney E8 3RH and is the starting point of this walk.

What is a cairn? Scottish myth has it that the Highland Clans, before they fought in a battle, each man would place a stone in a pile. Those who survived the battle returned and removed a stone from the pile. The stones that remained were built into a cairn to honour the dead. Cairns are also way-markers to help travellers and pilgrims negotiate a safe and sure route. Mountaineers add stones to cairns as they pass them and so cairns are links to the past but also evolve in the present. Cairns also embody a presence, they loom unexpectedly (but reassuringly) out of the mountain mist on a knife-edge ridge. In German the word

for a cairn is *Steinmann*, literally a 'stone man' and it is a 'little man', *ometto*, in Italian. The Inuit of Arctic North America replicate the human figure in their *inuksuit*, solitary markers in empty, treeless landscapes.

A Cairn has been assembled in SPACE from off-cuts of Portland Stone, salvaged from the Isle of Portland's cutting works. Cut into man-made shapes, a process which has transformed them from rock to stones, and then discarded. Much of London's historic building stone has been extracted from the Isle of Portland on the Dorset coast over the last 400 years. The stone has become part of the fabric of the city.



Portland Stone is late Jurassic in age, deposited during the final stage of this period, the Tithonian (also known locally as the Portlandian; Cope, 2012; Townson, 1975). It is around 150 million years old. There are three main varieties of Portland building stone, in stratigraphic order, these are the Basebed, the Whitbed and the Roach. All are ivory white in colour. They are distinguished by a variability in fossil content. The Basebed has few fossils. It is considered the 'best bed', excellent for intricate carving with no planes of weakness and homogenous in colour. However it is the

least resistant as a load bearing stone. Whitbed is the most commonly used variety of Portland Stone. It contains oyster shells, spiny oysters, scallops, mussels and clams. Oysters fossilise perfectly and are most commonly seen. Some varieties of Whitbed also contain broken fragments of fossil algae, an endemic species called *Solenopora portlandica* which look a little like disarticulated cauliflower florets. The fossil content of Whitbed can range from sparse oyster shells, to strata packed with these fossils. The Roach is the stratigraphically highest member of the Portland limestone and it is packed with fossils ... which are conspicuous by their absence. The Roach is full of holes; cast and moulds of shell fossils that have dissolved away. These are predominantly thick-walled bivalves called *Trigonia* and the turret shaped 'Portland Screws', *Aptyxiella portlandica*.

Collect your piece of Portland stone from Cairn 1. What variety of Portland Stone do you have?

76 Mare Street

Leaving SPACE and crossing Mare Street, we turn into King Edward's Road. On the corner is Portland Stone-built office building.

Portland Stone is a generic name for three main varieties of dimension stone extracted from the Freestone Member of the Portland Limestone Formation. It was deposited in shallow seas on submerged continental crust, so-called 'epeiric seas'. The shoals and swells of the topography of north-west Europe during the Jurassic created a pattern of changing marine basins, each of a different character and some containing an endemic biota. We understand the origins of rocks and the stones that they become in an urban landscape by observing at them at all scales, from those incorporating space imagery, down to the microscopic. We interpret these observations through comparison with modern global environments. What goes around, comes around. This understanding, the theory of Uniformitarianism, was developed in the 18th Century by early geologists of the Scottish Enlightenment, primarily James Hutton (1726-1797) and John Playfair (1748-1819) and later developed by Charles Lyell (1797-1875); 'the present is the key to the past'.

76, Mare Street is built from Portland Whitbed. It is very typical of this facies and contains shells and shell fragments of oysters and spiny oysters, *Spondylus* species.

Cairn 2: Five King Edward's Road

The late 19th and early 20th Centuries saw a boom in industry in Hackney, with factories and warehouses set up, primarily, for the furniture and clothing trade. The warehouse at Five King Edward's Road was part of the rag trade and has now been converted into flats and office space. It was built in 1922 and belonged to

the tailors Horne Brothers. During most of the last century it was known as Durigo House. It closed in 1987 and was then used for storage, but it has now been restored. The building is imposing, painted ivory white, it has the grand presence of a Portland Stone building, so familiar in London's cityscape, but this is simply a simulacrum. Look closely and beneath the paintwork, the surface resembles planks of wood. This structure is built of shuttered concrete. Wooden formwork moulds were constructed into which the concrete was poured. The markings of the wood are left on the surface of the cast concrete.

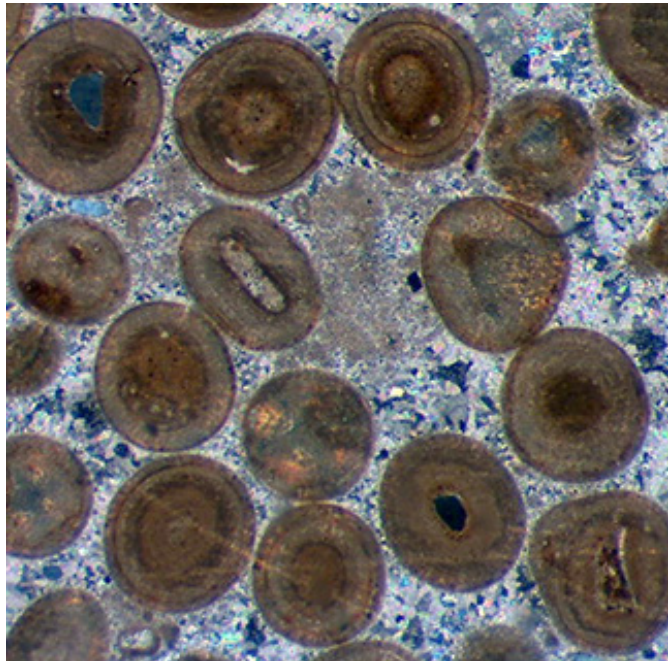
Continue along King Edward's Road before turning left into Tryon Crescent. Follow the crescent around and turn left into the footpath which connects it to Shore Road. Walk along Shore road, cross Well Street and enter the public gardens of St Thomas's Burial Ground.

Cairn 3: St Thomas's Burial Ground

Once the graveyard of a chapel of ease belonging to St John-at-Hackney Church, this space was converted into a garden in 1885. The place had been used for burials between 1810 and 1875, and although most tombs were cleared to the margins, two chest tombs and a coffin-shaped sarcophagus remain *in situ*.

Listen here to Sound Cairn 3: 'The first sound piece you hear is the sound of clicking, finger and thumb rubbing together to produce a noise and a rhythm, this sound is the presence of the body, one body making a sound external to itself. I've then worked with the acoustic of the stones themselves, tapping my hand against their surface. The sound speeds up to the point that the separate pitches almost join, and the finger and thumb clicking speed up to keep in time. As they speed up they begin to lose their spacing as individual sounds and eventually they are consumed back into this white noise.' JB

These ancient-looking stone chest tombs date from the 18th and 19th Centuries, contemporary with the beginnings of the then new science of geology and the concept of uniformitarianism. They are made of Portland Whitbed, weathered and appearing to be almost crumbling. However they are still hard and strong. The stone rings when you knock your fist against it. Look closely at the stone here; these old surfaces show the granular texture, just visible to the naked eye, easy to see with a hand lens or magnifying glass. Portland Stone is an oolitic limestone. It is composed of tiny spherical grains, each around 1 mm in diameter (left, magnified x 40). They resemble fish roe and this is how they got their name 'ooids' from French New Latin for roe, a translation of the German *Rogenstein* (roe stone). Each ooid is formed as calcium carbonate precipitates onto tiny sand grains. We know from modern environments where ooid sands form, that they are typical of tropical, tidal lagoon environment. They are known today from places such as the Bahamas and the Arabian Gulf. This tells us that the Portland Limestones formed in clear, warm, tropical seas.



Geologists hit rock outcrops with their hammers to hear them ring. We learn to recognise the noises they make and this tells us whether a rock is *in situ*, connected to the bedrock, or whether it is a loose field stone. Unwilling to brook the incommunicable as such, Nancy suggests instead that "timbre is communication of the incommunicable: provided it is understood that the incommunicable is nothing other, in a perfectly logical way, than communication itself, that thing by which a subject makes an echo—of self, of the other, it's all one—it's all one in the plural" (cited in Iddon, 2016). Communication, listening,

sense, meaning all resound inside and between bodies and, if Nancy's underlying notion that the self is constituted in this eternal returning echo, being in his terms in neither singular nor plural, neither outside nor inside. Nevertheless, it is both bodily and fundamentally intimate.

Walk north through the gardens, turning left into the small alleyway into St Thomas's Recreation Ground.

Cairn 4: St Thomas's Recreation Ground

St Thomas's Recreation Ground was once the burial ground for a nonconformist chapel at St Thomas's Square. The graveyard was laid out as a park in 1888, designed by Fanny Wilkinson, who was responsible for many municipal parks.

Listen here to Sound Cairn 4: 'We hear the sound of rain and the way this rain changes pitch as it hits a surface that could be the roof of the old chapel or an object that we can no longer see. The absence of the object producing this sound allows what we hear to attach to the architecture of the peeling burnt walls. Within these recorded sounds I've layered the sound from the video of clay cracking and breaking that is sculpted around the figure's body. I am interested in how this cracking mirrors the chapel interior and evokes a new associative narrative.' JB

Walk through the passage back onto Mare Street. Cross over and turn right until you reach the Town Hall.



Cairn 5: Hackney Town Hall

The Town Hall is a classic example of London's Art Deco civic architecture. Designed by architects Lanchester & Lodge, it was built between 1934-7.

Listen here to Sound Cairn 5: 'As we stand on the steps of Hackney Town Hall we become a part of this structure looking out. We hear the sound of the quarrymen's voices speaking about reaming the rock and hitting the stone in time to song. As they sing gradually their voices are consumed into the sound of the saws cutting. I have layered sounds of the cutting in the workshops above ground and the cutting directly into the stone beneath ground in the mines. I wanted the quarrymen's voices to suggest shaping something collaboratively in context with the Town Hall that's aim is to hold up and mirror the civic, the collective.' JB

Portland Stone is also about power. Building in Portland Stone states 'Britishness', and more. The stone was transported across the British Empire and later the Commonwealth for grand buildings, the museum in Auckland, all Commonwealth war graves and many war memorials, public buildings in New Delhi, a new

branch of Debenhams in Ørestad, Denmark and a memorial garden in New York. It is a well travelled stone, now moving around faster than it could ever have done on any tectonic plate. In fact 'Portland' has become synonymous with stone to build cities. New York's Brownstone comes from Portland, Connecticut.

Hackney's Town Hall is a reassuringly English Building. Solid, sturdy, incorruptable. If the lettering were removed from the local buildings, a stranger would immediately identify the white building as the town hall

Alderman Herbert W Butler said of the Town Hall on its opening in 1937 that it '*represented something more than mere stone and wood put together; it embodied the ideal of social living which they would have to keep going. It was not the property of the Mayor and the Corporation; it was the property of the people of Hackney.*' The civic architecture of Hackney Town Hall was created as an architecture that mirrored a sense of community; logging births, deaths and marriages, there is something here about recognition, archiving and collective memories.

The Town Hall is built of Portland Whitbed. Looking at the plinth for the brass light fitting, here the Whitbed is cross bedded, swept into shoals by tidal currents, sweeping up and depositing fragments of *Solenopora* algae and broken oyster shells (see Frontispiece). The *Solenopora* florets are layered, we now know that this represents seasonal growth of these reef-building organisms (Wright, 1985). The slightly leached-out layers are Summer growth. We are only seeing fragments of this algal growths here, which would have formed reefs structures similar to corals and they are the ancestors to modern coralline algae. Where these are preserved in the Portland Quarries *in situ*, they are carefully cut and slabbed by the quarrymen and saved until there are enough reefs rocks to clad a building. Caxton House in Victoria is such an example (Siddall, 2013).

*The plaza in front of the Town Hall is finished on the north side by Frank Matcham's **Hackney Empire** (1901), clad in architectural terracottas (but a feast of decorative marbles clad the resplendent interior). Across the road from the Town Hall is **Hackney Picturehouse**. This is also built from a shallow marine, Jurassic limestone, but this is around 15 Ma older than the Portland Stone and from a separate marine basin, that of the Lincolnshire Limestones. This is **Ancaster Oolite**, notably more honey-coloured, due to the presence of small quantities of yellow ochre (iron oxide hydroxide). This is another of England's great building stones. Its has a distinctive, brindled pattern which has led to it being colloquially called 'streaky bacon'.*

Continuing up Mare Street we pass a jumble of shops occupying and modifying Victorian and Edwardian buildings. At the Junction with Amhurst Road and Bohemia Place, Mare street becomes a shopping street. A part-Palladian building, the Old Town Hall marks the junction.

Hackney Old Town Hall

The Old Town Hall is now a bookmakers shop. It too is built from Portland Whitbed, with rusticated ashlar to enhance the appearance of solidity and weightiness. The door arch has intricately carved lion heads and floral swags, showing off the properties of Portland Basebed freestone.

Just south of the Old Town Hall is the entrance to the Walled Garden and St Augustine's Tower. Two chest tombs, escaped from the churchyard, stand here.

Chest Tombs: Walled Garden Walk

Like the chest tombs in St Thomas's Churchyard and recreation ground, these tombs, on the south side of the Old Town Hall have walls of Portland stone, grey oolitic and slightly crumbling. The lids are of interest. They are made of a fine grained, dense black limestone. There are a few fossils here, of sequined-shaped crinoid ossicles, but these are uncommon and not easy to spot. The stone is **Belgian Black** Limestone and it is of Lower Carboniferous age, around 340 million years old. It has been quarried in the vicinity of Namur since at least the Roman period and naturally has always been popular in funerary monuments. It was also used as a touchstone for assaying precious metals; the streak of silver or gold on this fine, black surface was

used to determine the quality and purity of the metal. Unlike Portland Limestone, black limestones form in anoxic marine conditions.

St Augustine's Tower

This tower, bereft of its church, probably dates from the later 15th Century. The Church was demolished in 1798. The Tower is built of **Kentish Ragstone** rubble masonry, with dressings of Portland Stone. Kentish Rag was the main building stone for London monuments during the Roman and Medieval periods. It comes from the Cretaceous Greensands of Kent and is worked from a number of quarries along its strike. This was the nearest source of building stone for London, which is built on London Clay. Ragstone only occurs in beds a few 10s of centimetres thick and this dictates the maximum size of the stone blocks available. This is a sandstone, with a few fossils, shell fragments, bryozoan *etc.* Greensands are so-called because of the presence of the clay mineral glauconite, which is green. It is the main component of the artists' pigment *terre verte* and has given a grey greenish cast to this stone, especially clear when seen in contrast to the Portland Stone dressings.

The stones are cemented by a lime mortar rich in an aggregate of crushed grey, brown and black flint. This flint was probably dug from Thames gravels and is ultimately derived from the Cretaceous Chalk which underlies the London Basin and outcrops on the Downs around its margins. Portland Whitbed is used on the quoins and has been recently restored and replaced. There are good examples here of bioturbation, the fossilised burrowings of marine animals, as well as fragments of oyster shell fossils.

St Augustine's Tower gives us a glimpse into the architectural landscape of London before the Portland Stone was introduced in the 17th Century. Monumental civic architecture, built from dressed ashlar, such as that seen on both the old and new town halls, could not have existed with London's original building stone.



Above: The River Thames seeps between the stones of St Augustine's Tower; flint-rich mortars cementing Kentish Ragstone.



Above is a fossil spiny oyster shell, 10 cm long, from the Portland Stone dressings on St Augustine's Tower.

Pyramid: Walled Garden Walk

Burials ceased in the churchyard in 1859, and the graves markers were moved in 1893 to create the public garden. A mysterious memorial stands on the north side of the Walled Garden. It is a tall and slender pyramid, its inscriptions are worn away. The plinth has deeply and intricately carved coats of arms, surmounted by helms and surrounded by flourishing foliage and the pyramid is surmounted by a flame. A curious space lies underneath the pyramid, occupied by a loaf-shaped lump of Portland Stone. Sean Gubbins (*pers. comm.*) has suggested to me that it could belong to Elizabeth, daughter of Thomas Foster d.1727, but that legend has it that it belongs to Elizabeth, daughter of King James I. She lived in Hackney but is buried in Westminster Abbey. Architecturally, the monument fits well with an early 18th Century date, but the inscriptions are too worn to decipher.



Once again, this is Portland Whitbed, exposed to the elements for 300 years. Some of the monument has been painted white, but the delicate carving has survived remarkably well and the tiny ooids are clear on the lichen encrusted surfaces.

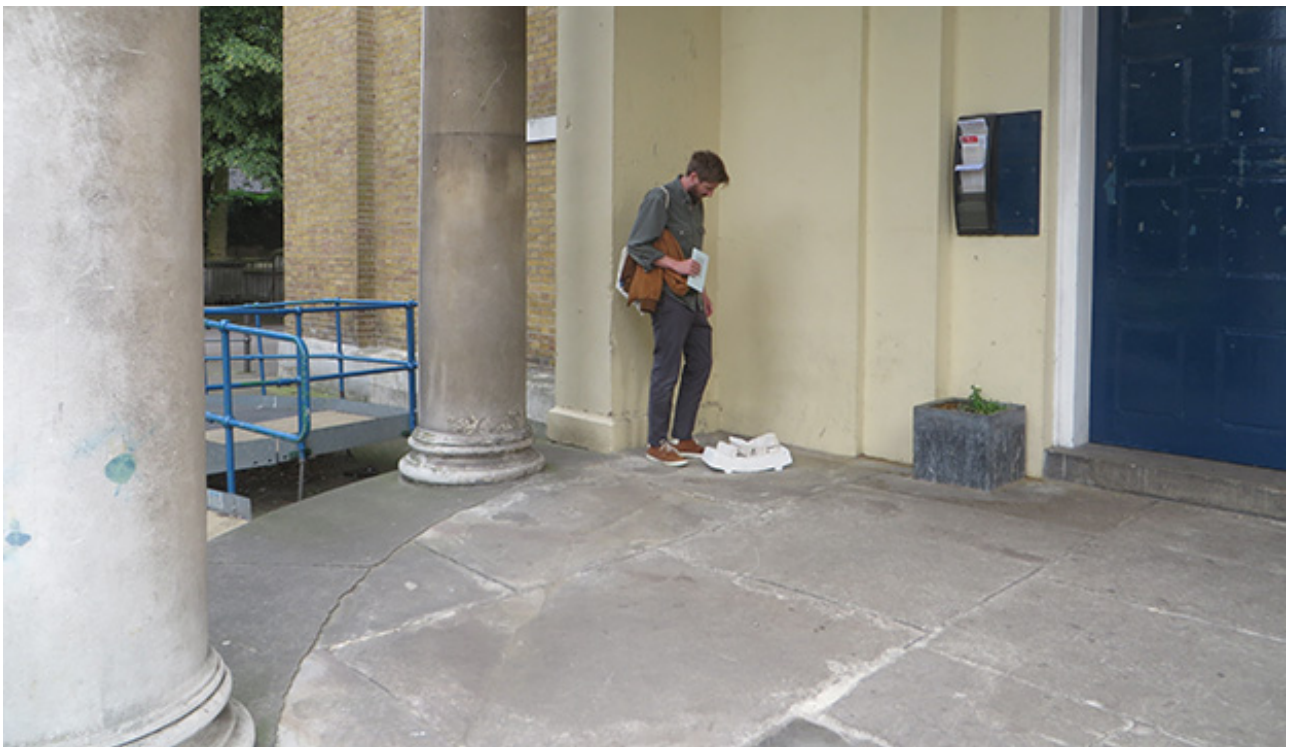
We continue around the Walled Garden, once the old churchyard. The gravestones have been collected and are stacked around the walls, many of these too are of Portland Whitbed, variably weathered and eroded. Sarcophagi of the great and the good have been cleared and line up against the east wall of the graveyard, including that of Rear Admiral Beaufort who gave us a system, the Beaufort Scale, to measure and describe the strength of the wind.

We turn left, past the café, into the precinct of the 'new' church of St John-at-Hackney.

Cairn 6: St John-at-Hackney Church

St John-at-Hackney was built during 1791-4 by architect James Spiller. It took time for Spiller's designs to be fully implemented, although the church was consecrated in 1797, the bell tower and the semicircular porch were not added until 1813-14. This church is architecturally unique in London, it is shaped as a Greek Cross, showing symmetry along both N-S and E-W axes. Pevsner describes it as '*odd: Soanian perhaps ... more in the spirit of Hawksmoor than of the architects of 1800*'.

It is built mainly of yellow London stock brick, probably from brick earths dug locally and fired on the spot in clamps, fluxed with chalk and tempered with cinders. Foundations, dressings and the spectacular tower, with its volute buttresses are of Portland Whitbed. This is best seen in the foundation blocks along the west side. The Whitbed is sometimes transitional with Roach, with cavities left by fossil shells. Other surfaces show the variable weathering of the stone's oolitic matrix and the slightly harder shell remains, leaving a fossilised late Jurassic 'pizza' on the surfaces.



Listen here to Sound Cairn 6 and leave your fragment of Portland Stone on the final Cairn in the portico. 'Standing at St John's we hear the sound of the bells ringing inside in the Portland Stone Bell Tower. This is a recording I made during Bell practice on Monday nights, where members of the community are invited to practice ringing the bells in time. I've slowed these chimes right down so that you hear a wider range of tones and hums. As these hums continue a figure begins to walk with the viewer, a very

slowed paced walk keeping in time with the hum of the bells. As the figure walks I've taken a recording of a piece of stone being removed from down the mines and slowed this right down so that its extraction produces a song that weaves into the bells and figures' footsteps. Voices enter the composition at the end in minor key and gradually find a harmony in a more uplifting major key.' JB

The walk ends here at St John-at-Hackney.

You can read more about the history of the use of Portland stone in Gill Hackman's book, 'Stone to Build London' (Hackman, 2014). The geology of the stone is described in various academic sources. Excellent introductions and field guides to Portland Bill are by Cope (2012) and West (2013, 2014). Descriptions of the geological environment can be found in Townson (1975) and the fossils and ecology are described by Delair & Wimbledon (1993), Fürsich et al. (1994) and Wimbledon & Cope (1978). The fossils that can be seen in building stones are described and illustrated in Siddall (2015).

Acknowledgements

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St Thomas's Recreation Ground; London Gardens Online

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St Thomas's Burial Ground; London Gardens Online

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Five King Edward's Road:

<http://www.fivekingedwardsroad.co.uk/#!about/csac>

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