

Building Birmingham: A tour in three parts of the building stones used in the city centre. Part 2: Centenary Square to Brindleyplace

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This area of central Birmingham has undergone significant redevelopment over the last two decades. Centenary Square, the focus of many exercises, realised and imagined, of civic centre planning is dominated by Symphony Hall and new Library of Birmingham (by Francine Houben and completed in 2013) and the areas west of Gas Street Basin are unrecognisable today from the derelict industrial remains and factories that were here in the 1970s and 80s. Now this region is a thriving cultural and business centre. This walking tour takes in the building stones used in old and new buildings and sculpture from Centenary Square, along Broad Street to Oozells Square, finishing at Brindleyplace.



Brindleyplace; steps are of Portland Stone and the paving is York Stone, a Carboniferous sandstone.

The main source on architecture, unless otherwise cited is Pevsner's Architectural Guide (Foster, 2007) and information on public artworks is largely derived from Noszlopy & Waterhouse (2007). This is the second part in a three-part series of guides to the building stones of Birmingham City Centre, produced for the Black Country Geological Society. The walk extends the work of Shilston (1994), Robinson (1999) and Schroder et al. (2015).

The walk starts at the eastern end of Centenary Square, at the Hall of Memory.

Hall of Memory

A memorial to those who lost their lives in the Great War, The Hall of Memory has a prominent position in the Gardens of Centenary Square. It is an octagonal building in the Doric order, with a pedimented entrance portico and a domed roof. It was completed in 1925 by architects S. N. Cooke and W. N. Twist. The bronze sculpture is by Albert Toft. The main building is in white **Portland Stone**. This is arguably Britain's most iconic building stone and indeed it has been the stone of choice for the construction war



The Hall of Memory, Centenary Square

memorials and commonwealth war graves throughout the world, and is therefore a fitting choice for the Hall of Memory. Portland Stone comes from the Isle of Portland, a peninsula on the Dorset Coast which is now riddled with quarries and underground mines for the stone. The Portland Limestones are late Jurassic in age, deposited around 150 Ma in the Tithonian Stage (known locally as the Portlandian). The building stones are known as the Freestone Member of the Portland Limestone Formation and are subdivided into the three main bed quarries as building stone, the Basebed, Whitbed and Roach. It is **Portland Stone Whitbed** that we see here and this is the most commonly used variety of Portland Stone. Whitbed is an oolitic limestone, and the tiny, spherical ooids are clearly visible using a hand lens. These tell us that this stone formed as a sediment in a warm, shallow tropical sea, where the tidal currents were able to roll sand grains backwards and forwards as they became coated with calcium carbonate. There is evidence of life in the seas too, in the form of shells. These can be seen as grey fossils standing slightly proud of the surface. The majority of these are species of oyster shells, mainly from *Liostrea* sp. and the spiny oyster *Spondylus* sp. Spiny oysters had barbs projecting off their shells, enabling them to anchor themselves in the sediment. Articulated shells of spiny oysters are not uncommon here.

The foundations of the Hall of Memory are in **Cornish Granite**. This is a grey, coarse-grained granite with two micas present; the black variety, biotite and silvery muscovite which sparkles in the sunshine. Also present are randomly orientated white feldspars, around 15 mm in length. This is probably the variety of Cornish Granite from Carnsew in the Carnmenellis Pluton, one of the plutons of the Cornubian Batholith, which was intruded at the end of the Variscan mountain building event in the early Permian. The majority of the Cornubian granites of Cornwall are two-mica granites and this makes them distinctive as building stones.

Turning north from the Hall of Memory is Baskerville House and a memorial to the eponymous letter setter and printer.



Cornish Granite with both muscovite and biotite mica (left) and Portland Whitbed with oyster fossils (right). This combination of stones is seen on the Hall of Memory, Baskerville House & the First Municipal Trading Bank.

Baskerville Memorial

This is a memorial to the letter founder John Baskerville (1706-1775) who lived in the vicinity of what is now Centenary Square from 1748-1775. The full title of the memorial is 'Monument to John Baskerville – Industry and Genius'. It is by David Patten and Michael P. House and represents letter punches, which spell out the word Virgil; a volume of Virgil's poetry being the first book that Baskerville printed in 1757. The letters and inscriptions are in bronze, but once again **Portland Whitbed** is used to construct the monument. This too has many broken fragments of oyster shell but also contains the floret-like heads of a reef forming algae, *Solenopora portlandia* which was endemic in the Portland seas. Fragments of *S. portlandia* observed here have broken off the reef and have accumulated in amongst the shell debris.

Baskerville House

Baskerville House, designed by T. Cecil Howitt and completed in 1940, dominates this end of Centenary Square. Like The Hall of Memory, it too is built from **Portland Whitbed** on foundations of **Cornish Granite**, again, probably Carnsew or a similar type. Indeed this was the intention, to continue the theme of the stones used in the Hall of Memory. The ashlar masonry on the ground floor has been rusticated to give the appearance of greater 'weightiness' to the Portland Stone in this portion of the building. The intricate carving on the arms and garlands above the main doorway demonstrate the versatility of **Portland Basebed** as a decorative stone. Basebed contains far fewer fossils than Whitbed and this coupled with no string partings makes it an excellent 'freestone' that can be cut and carved in any direction. Above the doorway, the upper stories are in fine, smooth ashlar masonry. The apse above the doorway is fronted by ionic columns and the half-dome has a coffered ceiling.

Statue of Edward VII

A regal statue of King Edward VII stands at the east end of Centenary Square. The spectacular plinth, adorned with bronzes is of sandstone, whereas Edward himself, sadly too high up for close examination, is in white marble. An Upper **Carboniferous sandstone** is used for the plinth; it is a medium grained, quartz-rich sandstone, an arenite. Evidence of liesegang banding, can be seen on the east-facing side of the plinth. The provenance of this stone is unknown, but many sandstones of this type are sourced from quarries in the Millstone Grit Group of the Lancashire and West Yorkshire Pennines.

It is not possible to ascertain the precise variety of marble used in the sculpture of Edward VII. Not only is it above eye-level, but all white marbles look pretty much the same. However this appears to be a pure

white, without any grey streaks. The main source of statuary marble in the early 20th Century was Carrara in Tuscany, Italy and this is by far the most likely provenance of the stone used here. Various grades of statuary marble '*statuario*' were extracted from the Tuscan quarries. One variety which was often used by the British Royal Family was called '*Campanile*'; it was a particularly tough marble which rang like a bell when hit with a hammer.

Turn now towards the southern side of Centenary Square and Broad Street.

First Municipal Savings Bank

The imposing building on the south side of the square is also built from **Portland Whitbed**. This was formerly the First Municipal Savings Bank, opened in 1933 and also designed by T. Cecil Howitt, who went on to build Baskerville House opposite. Once again we see the theme of Portland Stone and Cornish Granite being used here. This building has that impenetrable look of a bank, with few windows and weighty, rusticated masonry. The portico is supported by Ionic columns and the windows on the ground floor are heavily barred. Good examples of oyster shell lags can be observed in the columns and also weathering out on the ashlar masonry. The foundations of the bank are in a brownish **Cornish Granite**. The two micas can be seen, with the muscovite more obvious on sunny days. Very roughly aligned, brick-shaped 'small megacrysts' of feldspar are set in a matrix rich in smoky, brown quartz. Granites with these textures were obtained from the Carnmenellis and Bodmin Plutons of the Cornubian Batholith.

Another major figurative sculpture on Centenary Square stands opposite the Library of Birmingham.

'The Golden Boys'

This gilded sculpture of engineers Matthew Boulton, James Watt and William Murdoch is by William Bloye and Raymond Forbes-Kings. Originally installed in 1956, the statue was restored and re-gilded in 2006. The plinth is of **Portland Whitbed**, as described above for the Hall of Memory. Fragments of large oyster shells can be seen weathering out of the oolitic limestone matrix.

Walk now to the west end of Centenary Square and the entrance to the International Convention Centre and Symphony Hall.



Laura Hamilton & Julie Schroder at Symphony Hall; grey Sardinian Granite and red Balmoral Granite.

Symphony Hall

Symphony Hall dominates the western end of Centenary Square and is a striking building, built in the post-modern style it is part of a complex which includes the International Convention Centre and the Hyatt Regency Hotel. It was designed under a consortium by Percy Thomas Partnership and Renton Wood Howard Levin. It was built between 1987 and 1991 and was not met with universal approval. Foster (2007) describes it as 'architecturally a huge disappointment'; nevertheless it has fulfilled its use and many of the facilities are designed to a high specification. As was very much the trend at the time, the building is clad with granite, predominantly white with a red stone used for bands and for columns on the Broad Street façade.

The grey granite is **Sardinian Grey Granite**, also known as Grigio Perla (grey pearl). This is a Variscan Granite from the Buddoso Pluton on the Italian island of Sardinia, aged around 280-290 Ma. It has a distinctive texture, being slightly porphyritic with larger grey-white plagioclase feldspar in a groundmass of grey quartz, black biotite and a small amount of pink, partially kaolinised, potassic feldspar.

The red granite is from Finland is distinctive and instantly recognisable. It is called **Balmoral Granite** and it comes from Kurpi Quarry and others, near Turku in Vehmaa, SW Finland. Composed of bright red feldspar and smoky quartz, biotite and hornblende, this stone is one of the so-called rapakivi granites, a variety called pyterlite. It is an ancient stone too, over 1.5 billion years old. Industrial-scale quarrying began on the Vehmaa peninsula in 1903 and the granite is still actively quarried today and remains very popular as an ornamental stone.

Finally on the corner of Symphony Hall with Broad Street, is a small dedicatory plaque advertising an Arts Council and British Gas award for the complex in 1992. The plaque is made of dark grey slate set with a roundel of green slate. The grey slate is probably **Welsh Slate** from the Ordovician Slate Belt of North Wales, quarried from a number of quarries around Blaenau Ffestiniog. The green stone is **Cumbrian Green Slate**, also of Ordovician age, from a number of quarries working the Seathwaite Fell Formation in the Lake District.

Turn right onto Broad Street and cross over to the complex of buildings around Regency Wharf.



Sculpture: Inner Spirit

This public artwork is installed in a walkway to Regency Wharf, between the Regency Hyatt Hotel and Wetherspoon's pub. Entitled 'Inner Spirit' it is by sculptor Amanda Brisbane and was erected in 2001. The sculpture is composed of a column of blue glass roundels, flanked by monolithic slabs of **Welsh Heather Slate**. The slabs of stone are fresh from the quarry and have not been further worked following extraction. They have naturally broken along the cleavage and joint planes which form planar surfaces. The joint surfaces are distinguished by the fine, feather-like ridges on their surfaces and this sculpture will have interest to structural geologists. This feature is indeed known as *plumose structure* and forms as joints propagate through a rock. The direction of propagation goes in the direction of the feather, from its origin at the base of the 'feather' until we run out of rock to fracture at the tip of the 'feather'. On the large slab of Inner Spirit, joint propagation is from top to bottom as indicated by the arrow on the photograph (left).

The variety of slate used here is dark purple in colour and is the variety known as 'Heather Slate'. It has numerous small, pale grey-green reduction spots. This makes this instantly recognisable as slate derived from the Cambrian Slate Belt of North Wales which runs SW-NE from Nantlle, through Llanberis to Bethesda. The slate is Lower Cambrian in age and has been metamorphosed to greenschist facies, during which it was subjected to homogeneous strain which developed a strong cleavage. This has made this stone World-famous as a roofing slate. The colour is imparted by iron and titanium oxides and reduced forms of iron oxides in the spots. The only active quarry producing this slate is Penrhyn near Bethesda and this is therefore the likely origin of this stone. The quarry has been in production since the 13th Century and is currently operated by Welsh//Slate.

Next door to Inner Spirit is a rather drab-looking building, housing the local branch of the public house chain Wetherspoon's.

Wetherspoon's: The Soloman Cutler

This (typically) large hostelry is no architectural gem, with large glass frontages and ceramic cladding on the Broad Street façade. The pub stands on the site of Pearce & Cutler's Glassworks, founded by Soloman Cutler in 1854. The windowless block at the eastern end of the building is clad in what appears, at first glance, to be concrete. However it is faced with an ivory-coloured oolitic limestone. Closer inspection shows that this stone is very worthy of closer geological examination. It is rich in fossil debris, mainly sections through bivalve shells and echinoid spines and the ooids are just visible to the naked eye. This is one of the Middle Jurassic Limestones of the Portuguese Lusitanian Basin. A very large number of similar stones are quarried in the region around Santarém in Estremadura, and this is probably **Candeeiros Limestone** from Porto de Mos.



Fossil debris in Candeeiros Limestone on Wetherspoon's The Soloman Cutler pub.

The socle of this building is also of geological interest (though should be examined with caution, its cleanliness cannot be confirmed ...). It is a metamorphic rock, **Verde Candeeias**, a green gneiss-migmatite. This is the oldest rock we will encounter on this walk, being 2.75 billion years old. It is quarried from the Campo Belo Metamorphic Complex in Minas Gerais, Brazil, part of the São Francisco Craton. These rocks are orthogneisses derived from 3 billion year old protoliths. The major minerals are quartz, plagioclase and pyroxene and the green colour is imparted by chlorite and epidote.

Cross over the road to the Celebrity Restaurant.

Celebrity Restaurant

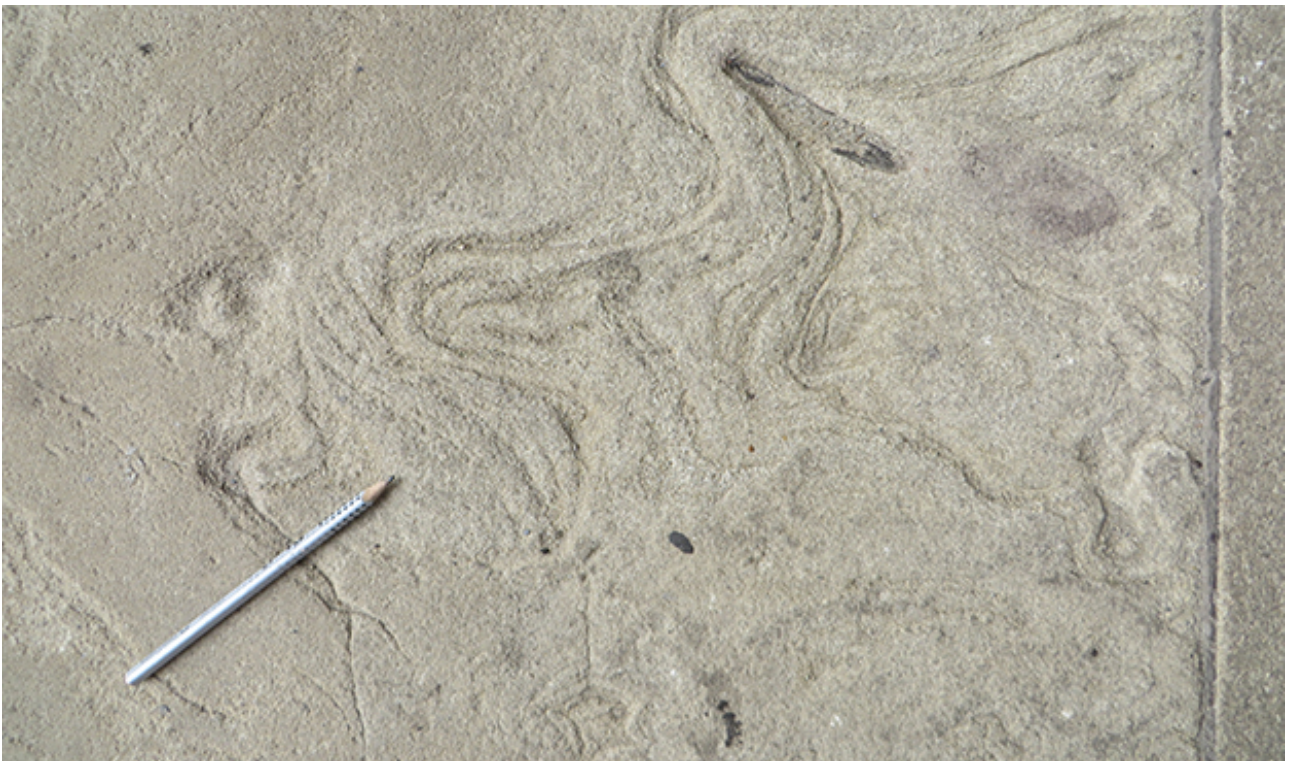
The doorway of this Indian Restaurant is the main point of geological interest here. Like many of the buildings in this area, this is brick built. However there is a grand Victorian entrance in dressed stone. The small columns are **Peterhead Granite**. These are a little weathered and are losing their high polish, however the medium-grained mosaic of grey quartz and pink feldspar, with flecks of biotite is obvious when looking closely. Also look out for the rounded enclaves of a finer grained, more mafic igneous rock, which are characteristic of this stone. Peterhead is a Caledonian, post-tectonic granite, intruded at 406 Ma. It is quarried on the coast, North of Aberdeen and was one of the most popular decorative stones of the Victorian era.

A buff-coloured, **Carboniferous sandstone** is used for the dressings around the doorway, the foundations and the delicate carving in the arch. The stone is cross-bedded and these structures can be seen in the blocks flanking the keystone of the arch. Like the stone used on the plinth of Edward VII, these stones are hard to provenance out of their geological context and without further architectural documentation. It could be Darley Dale Stone or one of the many other sandstones sourced in North Wales, the Midlands or Northern England.

Continue along Broad Street until you reach One Brindleyplace on the corner of Oozells Street.

One Brindleyplace

This building, marking the entrance to the Bridleyplace/Oozells Square development is occupied by Deutsche Bank. As a consequence it has a vigilant security team and the keen urban geologist would do well not to loiter here. It was designed by Anthony Peake Associates and constructed between 1994-5. The main geological interest is the paving under the colonnade on the ground floor. A medium-grained to gritty, pale brown sandstone has been used for flagstones. It shows good examples of current cross-bedding and there is a high carbon content, both as disseminated material and larger fragments of plant fossils.



Convolute laminations and black plant debris at One Brindleyplace.

There is also substantial iron staining. The origin of this stone is unknown, but there is a strong probability that it is from the Upper Carboniferous of the Pennines. Likely contenders are Fletcher Bank Stone from Halifax, geologically from the Millstone Grit Group and known for its drifted plant fossils, or alternatively a

variety of Rough Rock from the Coal Measures which is quarried in a number of locations around Huddersfield and Rossendale.

Follow the colonnade along Oozells Street to Oozells Square.

Oozells Square

The square has been remodelled as part of the Brindleyplace redevelopment under the direction of Townshend Landscape Architects. The centrepiece of Oozells Square is a sculptural installation by Paul de Monchaux (1998) called Water Feature. This is composed of six granite benches and a granite arch. A rill cuts diagonally across the square and this installation is surrounded by cherry trees. De Monchaux has an especial interest in stone and the materials he uses are integral to his work. The seven sculptures here are constructed from **De Lank Granite** from St Breward in Cornwall. It is a two-mica granite from the Bodmin pluton (297 Ma) and has a characteristic 'silver-grey' appearance. De Lank is the only remaining quarry in the Cornubian Batholith still extracting dimension stone.

The rill is edged in a black dolerite. This is most probably **Nero Zimbabwe** which is one of the few black stones available. It is widely used as kerb stones and polished as cladding. The stone is quarried in Mashonaland, eastern Zimbabwe, from a series of sills intruded 1.87 billion years ago. Composed predominantly of plagioclase, pyroxene and hornblende, it is also very rich in magnetite which promotes the observed black colour.



Oozells Square

The new office developments in Oozells Square and Brindleyplace are mainly brick built, reflecting the construction materials of the factories, workshops and warehouses which once stood here. One building of that time has been preserved and that is the old Oozells Street School designed in a very Birmingham version of the Victorian Gothic style by architects Martin & Chamberlain and completed in 1877. It has subsequently been restored and refurbished by the firm Levitt Bernstein and since 1997 it has been the Ikon Gallery. This phase of redevelopment reinstated the tower (designed to the original plans) which had been removed in the 1960s. Stone is used as dressings associated with the windows. Beautifully carved foliage can be seen in the gaps between the window arches on the second register. Again the stone is unknown. It is a dark brown-red in colour and could be one of the Triassic sandstones of the Midlands or the North of England.

The paving here continues to be of geological interest. Although much of the square is covered in gravel, reclaimed cobblestones have been used in patches and a good place to look for them is where the Oozells Street walkway leaves Oozells Square heading towards Brindleyplace. A wide variety of stones were used for cobbles during the 18th and 19th centuries and quarry industries were built up around the supply of cobbles and kerbstones for the growing networks of city streets. The granites of Jersey and diorites of Guernsey were primarily used for this purpose. Closer to Birmingham, igneous rocks quarried in the Black Country and the east Midlands were also commonly used. The origins of all the stones seen here are not possible to determine, especially the granites, but the characteristic features of the main stones used are described below.

Mountsorrel Granodiorite comes from Charnwood in Leicestershire, geologically from the Ordovician intrusions of the Mountsorrel Granodiorite Complex. It is a medium-grained granite, with zoned, red and white feldspar, hornblende, quartz and biotite. The quarry – one of the largest in Europe – is still worked today for aggregate.

Markfieldite also comes from the Charnwood area of Leicestershire, but is derived from the suite of Neoproterozoic South Charnwood Diorites. It is quarried at Cliffe Hill, Markfield and Groby Quarries. It has a very distinctive appearance, a medium-grained diorite, speckled red and green. It is composed of green hornblende and pink orthoclase, with minor epidote appearing as bright green patches. It is commonly seen as cobblestones along with Mountsorrel Granodiorite.



Left and centre, Mountsorrel Granodiorite, right, Markfieldite. The cobbles are ~ 10 cm square.

Whinstone is a generic name for dark grey, fine-grained igneous rocks, dolerites and basalts, which were quarried for road stone, cobbles and kerbs. The name comes from the Great Whin Sill, and the word ‘whin’ may refer to the sound the rock made when it was hit with a hammer. Whinstones were quarried from the Whin Sill as well as the contemporaneous (~ 295 Ma) sills and dykes of the Midland Valley of Scotland. The Tertiary Cleveland Dyke of north Yorkshire has also furnished particularly black, fine grained whinstone, sometimes with lath-shaped plagioclase feldspar phenocrysts.

Rowley Rag is a local whinstone that was used for cobbles. It is derived from a series of quarries, known as ‘The Quacks’ around Rowley Regis in the Black Country and comes from the Rowley Regis Microgabbro (dolerite) which is a small lopolithic intrusion which forms part of the Late Carboniferous Brierley Hill Cluster of intrusions. It is a fine-grained olivine dolerite. It is difficult to distinguish from other varieties of Whinstone, but it is dark grey with, sometimes, a brownish patina. It was widely used for cobblestones in Birmingham and surrounding areas but developed a reputation for acquiring a polish which caused horses to skid and therefore went out of use.

Trefor Granite is from North Wales. Like Mountsorrel and Markfieldite, it was mainly quarried for cobblestones, but had the added value of being one of the few stones with the perfect properties for making curling stones (it was the chosen source for the Salt Lake City Winter Olympics stones). There are two varieties of Trefor Granite, a dark grey variety and a pink-pale grey variety. Both have abundant, small, white plagioclase phenocrysts. Both stones are quarried at Trefor on the Lleyn Peninsula from separate intrusions in the 450 Ma Garnfor igneous complex.



Reclaimed cobbles in Oozells Square. Dark grey cobbles are Whinstones, and some may well be Rowley Rag. The three pale grey and pink stones at the top right are Trefor Granite. The two red stones are Mountsorrel Granodiorite.

Central Square, Brindleyplace

Planning for the development of Brindleyplace, which encompasses the large Central Square, Oozells Square and Brunswick Square began in 1987. The City Council invited developers to bid for a scheme based on commercial, leisure and cultural opportunities and to open up the canals as areas for waterside activities. However, the site changed hands a number of times and is currently owned by Hines Global REIT. Planning permission was obtained in 1992 and building began on 6th September 1993. The architects for the complex were Porphyrios Associates, Allies & Morrison, Stanton Williams and Siddell Gibson, with Townshend overseeing the landscape architecture of the open spaces. As brick dominates as the main material used for the buildings, we will focus on the square and its fountain.

The sinuous steps at the eastern end of the square are constructed from **Portland Stone Whitbed**. This facies of the stone is sparsely fossiliferous, but there are some good examples of *Trigonia* sp. bivalves (with much of the shell material preserved) on the north east end of the steps. Look carefully and you may also find the odd example of *Aptyxiella portlandica*, the gastropod known as the 'Portland Screw'.

York Stone is used to pave the square. This term is generic, referring predominantly to flaggy sandstones extracted from the Upper Carboniferous Pennine Lower Coal Measures Group. Incidentally these do not come from York, but from the South Pennines Lancashire-Yorkshire border. Again examples of **Carboniferous sandstones**, these are fluvial in nature and therefore quartz arenites, with varying amounts of mica, fossil plant material and dispersed carbon. Coarse and fine grained examples are used here to good effect. The same coarse-grained variety seen at One Brindleyplace is used here, cut in a way that it almost resembles planks of wood. These are seen in radiating strips around the glass coffee shop in the centre of the Square (see frontispiece).

A fountain is located in the eastern corner of the square. This too is walled by benches of Portland Stone. However the pool is surrounded by a polished kerb of **Emerald Pearl Larvikite**. This is a dark coloured variety of this well-known building stone, with its characteristic 'schillerescence' feldspars, which flash silver-blue. This stone comes from Larvik in Norway and is quarried from an igneous ring complex intruded into the Oslo Graben rift system at 290 Ma. The rapakivi granite **Baltic Brown** is used for paving around the edges of the fountain. This stone comes from a large number of quarries in the enormous Wiborg Batholith which is situated in Finland but straddles the border with Russia. Intruded 1.5 billion years ago, this stone is well known for its distinctive 'ovoids' of pink potassic feldspar, which are often rimmed by dark-green plagioclase and set in a matrix of smoky quartz, hornblende and biotite.

The final location is Brunswick Street, leading up to Brunswick Square.

Brunswick Street



Street furniture and paving on Brunswick Street.

Brunswick Street is mainly used for taxi access to the Central Square of Brindleyplace. It is cobbled with red, reclaimed cobblestones which are predominantly **Mountsorrel Granodiorite**, with the occasional block of **Markfieldite** and **Whinstone**, as described for Oozells Square above.

York Stone is used for the pavements, this is an example with spectacular liesegang banding, a form of iron staining produced through a series of complex chemical reactions in ground waters percolating through the rock. These flags are derived from a series of quarries in the Upper Carboniferous Pennine Lower Coal Measures Group.

Granite cubes are used for street furniture. Unfortunately the provenance of these stones is unknown but it is possible that they have come from either the Iberian Peninsula or China, these areas being the main suppliers of granite to the UK building industry. This is a grey medium to coarse-grained granite with brick shaped phenocryst of pale pink potassic feldspar, in a matrix dominated by grey quartz and white feldspar.

This walk ends here. To return to Centenary Square, it is best to retrace your steps back through Central Square and cross the canal to enter the ICC and walk through the public atrium to the Centenary Square entrance.

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