Introduction

The building stones of Greater Manchester fall into three well-defined groups, both stratigraphically and geographically. The oldest building stones in Greater Manchester are derived from the upper section of the Carboniferous Namurian Millstone Grit Group. These rocks are exposed within the denuded core of the Rossendale Anticline; the northern part of the area, and also within the core of the main Pennine Anticline; the east part of the area. Within this group, the strata tend to be gently inclined or horizontally bedded, and the sharp relief, coupled with lack of drift overburden, lent itself to large scale exploitation of the sandstones, especially in areas adjacent to turnpike roads.

Exposed on the flanks of the Rossendale and Pennine anticlines, and therefore younger in age, are the rocks of the Pennine Coal Measures Group. The outcrop of this group forms the exposed ‘Lancashire Coalfield’, which extends in a great arc from Wigan in the north-west, through Bolton, Bury, Rochdale and Oldham, then east into Manchester and Stockport. Surface exposures are limited to higher ground where the Pleistocene boulder clays are absent, in deep river valleys where erosion has cut away these later drift deposits.

The youngest rocks in the area are the Permian and Triassic sandstones and mudstones of the north Cheshire Basin. These underlie Manchester city centre, Salford and Altrincham; although surface exposures are mainly limited to river valleys due to great thickness of the overlying Quaternary deposits. Although more easily quarried due to their softer natures, the rocks of the Permo-triassic tended to be much less frequently used than the older, harder Carboniferous sandstones, because of their lower compressive strength and their tendency to weather more easily.

Manchester itself, and the ring of industrial towns which surround it, grew rapidly during the 18C and 19C, consuming prodigious quantities of local stone for buildings, pavements and roads. As a result, the area contains a fairly sharp distinction between a built environment of Carboniferous sandstone within the Pennine foothills to the north and east, and urban areas almost wholly brick-built to the south and west. Because of rapacious demand during the mid to late 19C, resulting in rapid exhaustion of local stone sources, and perhaps allied to architectural whim, stone began to be brought in by the railway and canal networks from more distant sources, such as Cumbria, Yorkshire, Derbyshire, and Staffordshire. During the late 20C and early 21C, a considerable amount of new stone construction, or conservation repair, has occurred, but a lack of active quarries has resulted in the import of dimension stone from outside the area.
Namurian
Millstone Grit Group

Hebden Formation

Upper & Lower Kinderscout Grits
The Lower and Upper Kinderscout Grits underlie much of the high moorland on the eastern margin of the area, including the impressive escarpments at Blackstone Edge (Rochdale), Saddleworth Moor (Oldham), and Hollingworthall Moor (Tameside); being of great thickness at the last two locations. It is a grey, coarse-grained, feldspar-rich pebbly sandstone, generically termed ‘gritstone’, which is still extracted for aggregate at Buckton Vale, near Stalybridge (Tameside), but was previously worked for ashlar, sills, lintels, steps and thralls, as well as for monumental stone and gravestone bases. Carr Brook at Mossley and the villages around Saddleworth have been largely constructed of these sandstones. At Blackstone Edge, the sandstone was quarried for mill engine beds; and in Stockport town centre Wellington Mill (now the Hat Works Museum) and Wellington Bridge include these sandstones in their fabric. The sandstone has also been used as a plinth material for fine Victorian buildings in Manchester city centre, to support facades of more exotic or finer-grained building stone. Coarse grained sandstones (gritstones) generally, whilst much harder to work than other sandstones, were less affected by weathering, due to the high proportion of quartz present. Within older vernacular buildings, gritstone was employed for critical detail, where greater strength was needed, such as quoins, mullions, drip-moulds, and window and door surrounds, with the walls comprising softer local sandstones. Following the development of a mechanical saw, allegedly at Haigh Hall, Wigan in c.1820, and then refined further by James and George Hunter of Arbroath during the 1840’s, the resilience of gritstone was ideal for decorative detail in large structures such as churches, and public buildings. The massive bedding and high quartz content of these gritstones resulted in considerable compressive and shear strengths, hence they were invariably sourced for mill engine beds, gearing walls, and chimneys. Gritstone setts (commonly but mistakenly described as ‘granite setts’) and kerbstones also became common in urban areas for street layouts, where horses’ iron shod hooves and iron wheel rims would have damaged softer materials.

Many Pennine villages appear to have been wholly constructed of these sandstones, which give them a distinctive and visually attractive appearance.

Marsden Formation

Readycon Dean Flags
The Readycon Dean Flags have limited exposure in the Denshaw area of Oldham, although these sandstones have been more widely used for building stone in West Yorkshire. It is characteristically fine grained and flaggy, with ganister-like layers and interbedding with layers of siltstone, with a bluish tint being seen on fresh, unweathered faces. It has been used for flagstone, and was quarried and probably used in the construction of the Readycon Dean Reservoir.

Fletcher Bank Grit
The Fletcher Bank Grit (also known as Midgley, Gorpley, Pule Hill, or Revidge Grits) has been employed extensively within the upper Irwell valley in particular. The mill towns of Ramsbottom and Bury contain a significant number of buildings of this sandstone. It is grey, medium to coarse grained, massively bedded, and cross-bedded.
The architect John Harper of York constructed a triumvirate of local churches (All Saints, St Marie’s and St Pauls), whilst the steeple & tower of St Mary’s, Bury; part of Manchester Cathedral; and the whole of Stand Church (below), were all erected in Fletcher Bank Grit. This sandstone is still extracted on a large scale from the fault-bounded inlier at Fletcher Bank Quarry, near Ramsbottom.

**Huddersfield White Rock**

The Huddersfield White Rock crops out in the northern and eastern margins of Greater Manchester, and was earlier thought to be the equivalent of the Holcombe Brook Grit so there may be some exposures where the names were used synonymously. Exposures within Greater Manchester can be more variable in their colour compared to those from its outcrops in West Yorkshire, with many sandstones being grey rather than white. It can also be variable in its character with some quarries in massive sandstone and others showing a fine grained, flaggy rock. It has been quarried for ashlar, sills, setts, kerbs and flags.

**Holcombe Brook Grit**

The Holcombe Brook Grit can also be very variable in character, ranging from massive and thickly bedded to fine grained and flaggy. There are often shale partings towards the top. It has been used as a building stone within Greater Manchester for ashlar, sills, setts and kerb stones.

**Rossendale Formation**

**Lower & Upper Haslingden Flags**

The Lower and Upper Haslingden Flags have been quarried (and occasionally mined) on the moorland plateaux to the north-west of Rochdale (i.e. at Ding Quarry), with thicknesses of 10-15m and 30m respectively. These pale buff to pale grey fine sandstones are very hard, but the presence of micaceous material allows them to be split easily, resulting in their extensive use as paving slabs and roofing slates. The latter are characterised by the diminishing flagstone courses typical of traditional Pennine farmstead roofs, with the largest slabs at the eaves, which might equal a metre in length.
These ceased to be worked locally for roofing after Welsh slate began to be imported using the canal network. Thin rectangular slabs of this material were also used as walling parpen (a through stone) at Ramsbottom Civic Hall, Ramsbottom, and at St Mary’s Church, Hawkshaw, both in Bury.

**Rough Rock**

The Rough Rock sandstone occurs in extensive exposures on the high Pennine moorlands in the north and east of the area, where it has been extensively quarried. It is coarse grained, feldspar rich, iron stained, well jointed, and often contains pebbles of quartz. Unlike many of the other sandstones in the area which can be very variable in character, the Rough Rock is fairly consistent, although there are areas, such as the Whitworth Valley, north of Rochdale, where it is not well cemented and becomes friable. The resulting porosity negates its value as a building stone, because it becomes susceptible to frost action. Where the Rough Rock is well cemented it makes a good building stone and it has been used to produce ashlar, sills, lintels and steps.

It was quarried along the steep scarp above Holcombe village, as well as at Walmersley, Baldingstone, Birtle, and Ashworth Moor, near Bury. Holcombe Stone was employed in the attractive village of that name, as well as at the prominent Christ Church, Walshaw. Birtle Stone was used for St John the Baptist Church at Birtle (1845-6), which actually stands within part of the quarry (bottom right), and also at St Thomas’ Church near Bury.

As a strong durable rock it has been used in reservoir construction, such as at Higher Ogden reservoir in Rochdale and also for road construction as setts and kerbs. It was also extensively used for drystone walling close to the rockhead outcrop, with the Enclosure Acts increasing the local demand for this stone. Settlements on Werneth Low, between Hyde and Romiley, have been built from Rough Rock sandstone. Many of the old quarries are still visible; and the Rough Rock at Werneth Low has the name ‘Old Mother Rock’.
Westphalian

Pennine Lower Coal Measures Group

Ousel Nest Grit

The lowest productive unit of this group comprises the Ousel Nest Grit, which occurs in faulted blocks within the west part of the Lancashire Coalfield. It is white-grey, medium to coarse grained sandstone, massive, and cross-bedded. During the 19C and early 20C, it was extracted on a large scale at Cox Green and Horrocks Fold (now Wilton Quarries), north of Bolton. The account book of Daniel & Thomas Anderton, dated 1880 to 1913, listed their principal products as ashlar and cuts; but also included wallstone, rubble, broken stone, ballast, copings, scapplings, sandstone, wash-sand, setts, roadstone, pitching, quarry gravel, sills, and steps. All of this was being delivered to local churches, schools, villas, terraced streets, mills, railway stations, and waterworks; with clients ranging from individuals to local corporations. In 1903, a 50 ton gritstone block, possibly the largest ever quarried in the area, was taken from Cox Green quarry to Mill Hill Bleachworks in Bolton, probably for use as an engine bed (below left). It is also still worked at Montcliffe Quarry, with many of the stone buildings in the nearby town of Horwich being constructed of this material.

Woodhead Hill Rock

This sandstone can vary greatly in its character from being coarse grained and massive to fine grained and flaggy. Numerous quarries have exploited this unit, particularly around the northern and eastern margins of Greater Manchester, and these are known to have extracted building stone such as ashlar, sills, flagstones and walling stone. A notable quarry, producing good quality flagstones, is at High Moor near Oldham. These flagstones were used for roofing slabs and paving flags, building and walling stone. The Victorian geologist Binney, who widely surveyed in the region, described Woodhead Hill Rock as one of the best building stones in the ‘Coal Series’.

In other quarries, the well developed cross-bedding may have limited its versatility as a building stone, as it could have a tendency to split on bedding planes. This tendency was exploited at Ludworth Moor near Marple, Stockport, where blocks of irregular size and shape were won for drystone walling. Where the rock has a massive character it has more potential as a freestone, which could be cut into regular blocks.
**Helpet Edge Rock**

Generally the Helpet Edge Rock is a massive and coarse grained sandstone, particularly in the north eastern part of the County, around Rochdale and Oldham. Towards the west it splits into two or more sandstone beds separated by shale. The grain size also tends to become finer grained and it can be seen as evenly bedded and flaggy. It is known to have been used in reservoir construction at Brushes Clough Reservoir near Crompton, Oldham (below); in road building as setts and aggregate; and as a building stone in settlements such as Crompton near Oldham.

**Milnrow Sandstone**

The Milnrow Sandstone was also known as Crutchman Sandstone, Doffcocker Flag Rock and Billinge Beacon Flags. There are numerous quarries, particularly around Milnrow, Rochdale where the type locality of this sandstone can be found. It varies between being coarse and massive to fine grained and flaggy. It is often mica rich and weathers brown. The rock was known as ‘Chocolate Drop’ by builders around the eastern area of Stockport, as it was often found to contain small discoloured areas, probably iron rich concretions. Settlements such as Milnrow in Rochdale and Romiley in Stockport were built from this rock, and the more fissile layers have been used for flagstones. Flags of this material were probably used to construct the walls of the great 17C houses at Bispham Hall (Wigan) and Stayley Hall (Tameside).

During the late 19C, a number of churches and chapels were constructed using a combination of Milnrow sandstone of thin yellow parpoints, along with dressings of red-brown Triassic sandstones. This visually attractive design can be seen at St John’s and St Benedict’s churches at Hindley, and at St Michael and All Angels Church, Howe Bridge, all within Wigan. The same tradition was noted within churches in the eastern parts of St Helen’s, across the border in Merseyside.
Dyneley Knoll Flags

In 1795 John Holt wrote that ‘Flaggs and grey slates are dug up at Holland, near Wigan’. He was almost certainly referring to the Dyneley Knoll Flags (also known as the Upholland Flags). Like the Haslingden Flags these sandstones can also have a greenish-grey tinge. They have been quarried over quite a wide area from Billinge in Wigan, spreading round to Horwich at Bottom o’th Moor, through to Tottington near Bury. Although they outcrop in Oldham they have been largely quarried along the flanks of the Tame valley between Hartshead and Hazelhurst, and to the south of Stalybridge. Many of the flags used on the south side of Stalybridge are thought to be Dyneley Knoll Flags.

Old Lawrence Rock

The Old Lawrence Rock has been widely exposed around the upland fringes of the area, and it has been extensively quarried. It is a fine-grained sandstone with a characteristic greenish grey tint. Wisps of carbonaceous material are also common within the rock. The character of the rock can vary as it can be massive; but at other exposures it is rippled and flaggy. It is often interbedded with sandy fissile mudstones and the main body of sandstone is often split into two sandstone layers by a persistent layer of fissile mudstone around one metre thick. The most notable quarry in the Old Lawrence Rock was at Appley Bridge near Wigan, where it was extracted for building stone. This quarry is in Lancashire, although much of the material would have been brought via canal into Greater Manchester. Where worked in the Bury and Bolton areas for walling stone, it is relatively soft and fissile, and weathers easily. It has also been used for building stone, such as ashlar and flags, for example at Knott Hill, Tameside, where the Old Lawrence Rock was also used in the construction of the nearby Knott Hill Reservoir.

Cannel Rock & Trencherbone Rock

The Cannel Rock and Trencherbone Rock have been worked since medieval times in the areas of Bury, Bolton, and Wigan. The great medieval houses at Bury Castle and Smithills Hall (right), near Bolton, contain this material, which seems to have been exploited on a small scale in river valley exposures. These medium-grained sandstones tend to be relatively soft and easily worked, are grey when fresh, and contain a significant colour variation when weathered, from purple to buff to yellow to brown. Locally, these units have a strong red colouration, probably as a consequence of staining from the overlying Permian and Triassic deposits. The Earls of Balcarres’ estates, centred upon Haigh Hall, produced Cannel Rock from School Quarry, and Trencherbone Rock from Toddington Delph, the latter was used to erect Haigh Church in 1831-3.

Blenfire Rock

Blenfire Rock forms the prominent escarpment of Oldham Edge. It has a distinctive red-pink colour when fresh, which would have made Oldham Edge a striking feature in the landscape when the numerous quarries were still working. Building stone quarried from Oldham Edge was used in Oldham town centre, on the Town House Restaurant in Greaves Street, and also part of the churchyard wall of St Mary’s church. Its distinctive red-pink colour may have made it an attractive building stone although its exposed surfaces can be prone to developing pitting and cavities as the softer clays it contains, weather out. Blenfire Rock has been mainly quarried for building stone around Oldham; but it has also been quarried near Haughton Green in the Tame Valley, where it is thought to have been used to build workers cottages.
Chamber Rock

The Chamber Rock is now best exposed in the disused quarry at Rocher Vale along the Medlock valley. The other known quarry in the Chamber Rock, closer to Oldham town centre at Chamber Hall, Coppice is no longer visible. This was possibly the source of stone for Chamber Hall, known to date back to at least 1640 and possibly back to the 13C. Some of the 18C farmsteads close to Rocher Vale have been built of stone which closely resembles the locally available Chamber Rock. The iron rich clay nodules visible in the Rocher Vale quarry can clearly be seen in some of the building stone of the farmsteads. It was also probably used by the expanding Park Bridge Iron Works which once flourished close to Rocher Vale, as records from the Ironworks mention the quarry. The exposures at Rocher Vale could also have been used to construct the stone built engine house for the nearby Nelsons India Pit.

The lower part of the Chamber Rock tends to be more massive and it is this part of the rock that has been exploited in the quarry at Rocher Vale. This would be more suitable for the engine beds used at the engine house of the nearby coal pit. The higher part of the Chamber Rock contains many lenses of sandstone and siltstone, making it much harder to work economically as building stone.

Pennine Middle Coal Measures Formation

Peel Hall Rock

In the west part of the County, the Peel Hall Rock (also equivalent to Pemberton Rock and Bardsley Rock) was won largely from a single large quarry at Little Hulton, and in appearance, is a uniform yellow to buff medium grained sandstone, with occasional iron stained pebble. The churches of St George at Tyldesley (1821-4, below); St Paul at Little Hulton (1874-6); St James at New Bury (1862-5); and St John the Baptist, Atherton (1878-9), were all prominent buildings in this stone type, within vast swathes of brick-built suburbia.
Bardsley Rock
The eastern equivalent to Peel Hall Rock, Bardsley Rock, is exposed along the Medlock valley at Bardsley Bridge and also further upstream at Park Bridge on the western flank of the river, on the high ground overlooking Park Bridge Heritage Centre, once the stables for Park Bridge Iron Works. Here it shows itself as a massive, red coloured rock. It is known to contain numerous fossils of the seed Trigonocarpus. Fossils in this locality were well recorded by the Victorian geologist George Wild who was also involved with the local coal mines. Peel Hall Rock quarried within the western part of the area also contains Trigonocarpon seeds, suggesting the two sandstone types are possible correlatives. The foundations of Bardsley Bridge rest directly on Bardsley Rock and it could have been used in the construction of the bridge and could also be the source rock for nearby Bardsley House which overlooks Bardsley Bridge.

Nob End Rock
The Nob End Rock only seems to have been exploited within the Irwell gorge to the south-west of Radcliffe (apparently derived from ‘Red-cliff’), and has similar colour variations to those noted in the Cannel and Trencherbone Rocks, i.e. purple-orange-light yellow. In its weathered state, it is a soft, fissile, medium grained rock. It is highly probable that it was the source of the cluster of late medieval/early post-medieval buildings of Radcliffe Tower (above), St Mary’s Church, the nearby tithe barn, and the old Blackford Bridge, 1km to the east. This rock type also outcrops in the Farnworth and Tyldesley areas, although it is not known whether it was worked here for building stone.

Newton Heath Sandstone
The Newton Heath Sandstone belongs to the Pennine Middle Coal Measures. Where it outcrops in the Irk valley it is known as the Smedley Grit. Old maps and descriptions by Victorian geologists Edward Binney, and later Edward Hull, show that the Smedley Grit was quarried in the Irk Valley. Like the nearby Collyhurst Stone of the Pennine Upper Coal Measures it also has a purple colour. It may be difficult therefore to distinguish between old buildings within the centre of Manchester that were made from this rock and those made of the younger Collyhurst Stone.
Pennine Upper Coal Measures Formation

Worsley Delph Rock
The Worsley Delph Rock has the distinction of providing material for some of the earliest and best known buildings in the area. It is a red-yellow, medium to coarse, cross-bedded sandstone. There were two notable sources for this rock. Firstly, Worsley Delph itself, where a small stream cut through the east end of a sandstone ridge at Worsley village. From here, rock was quarried for structures on the Bridgewater Canal by the 'Canal Duke', including the iconic aqueduct at Barton-on-Irwell, and the lesser known ones on the Mersey and the Bollin. It was also employed in Worsley village itself.

Secondly, the quarry at Collyhurst, first noted as ‘noble and famous quarries’ by the antiquary Camden in 1586. The sandstone extracted from here has been variously named Collyhurst Stone, Mr Appleton’s Collyhurst Rock, Appleton’s Grit Rock, Delf Fold Rock, and Binney Sandstone. Current geological thinking suggests that this sandstone represents an exposure of Worsley Delf Rock. This purple-brown sandstone is thought to have been extracted to build the late medieval elements of Manchester Cathedral; and the 18C St Ann’s Church (right), and Sacred Trinity Church, Salford; and probably many more buildings within the pre-industrial towns of Manchester and Salford.

In the past this rock-type has been confused with the younger Permian Collyhurst Sandstone, which also crops out at Collyhurst. Geologist Fred Broadhurst, whose paper with Morven Simpson in 2000 explored this confusion between the two sandstones, suggested calling the Coal Measure Sandstone ‘Binney Sandstone’ in honour of the Victorian geologist Edward W. Binney who did so much pioneering work in our understanding of geology in Greater Manchester.
Sherwood Sandstone Group

Chester Pebble Beds Formation

Chester Pebble Beds
The Chester Pebble Beds (formerly Bunter Sandstone) form the rockhead for much of the city of Manchester and also much of Stockport town centre. Within the area, the beds contain only sparse and sporadic rounded pebbles, about 25mm across, unlike the Bunter Pebble Beds of the Midlands, where pebbles are more abundant. This can make it harder to distinguish them from the other red Permian and Triassic sandstones, although they do tend to be more coarse-grained generally, when compared with the others.

At Stockport, the River Mersey and the Tin Brook have cut gorges into this material, leaving an elevated promontory overlooking Lancashire Bridge. The earliest elements of St Mary’s church (14C) were probably of this material, as was the plinth and foundations of the nearby gentry Staircase House, built in about 1479. It can be clearly viewed in section where the M60 motorway passes Stockport town centre, and quarries must have existed in this vicinity, although urban development has now obscured any evidence.

Wilmslow Sandstone Formation

Wilmslow Sandstone
The Wilmslow Sandstone, formerly known as Upper Mottled Sandstone, is known to have been used as a building stone just over the border in Cheshire along the Bollin Valley. It is generally a fine grained red sandstone, containing abundant ‘millet seed’ sand grains and often has a mottled appearance. It is likely that outcrops of the Wilmslow Sandstone could also be found underneath the cover of drift deposits towards the centre of Manchester.
The Helsby Sandstone Formation (formerly the Lower Keuper Sandstone) has been worked at Stockport and Timperley (Trafford), and just outside the area at Lymm and Alderley Edge, in Cheshire. This rock type is harder than the others in the Permian-Triassic succession, due to the localised presence of a silica cement matrix, hence it is a more durable building material. It is often red or pink from the coating of iron oxide over the sand grains and often contains many ‘millet seed’ grains, with a spherical shape, indicative of an aeolian origin within a desert environment. It contains white or purplish quartz pebbles up to 20mm across; and pebbles of red silt and red clay, which when weathered out leave ovoid cavities.

This material was used to construct the 16C Church of St Mary, at Cheadle, Stockport, and the 17C Church of St James, Didsbury, Manchester. The pair of quarries at Timperley, which became disused before 1900, were probably used for stone plinths for timber-framed and brick houses within the Dunham Massey estate, as well as in the striking boundary walls within the Victorian ‘villa suburbs’ of Altrincham (above).

During the later 19C and 20C, increasing amounts of building stone were imported into Greater Manchester from elsewhere, particularly for use in public and municipal buildings. Larger, well-established quarries located outside the area could guarantee both quantity and quality of dimension stone, which was a prerequisite of large construction projects. In particular, the rebuilding of Manchester city centre after the IRA bomb in 1996, has resulted in the application of cladding and surfaces sourced from a truly international geological palette.

The earliest commonplace rock-type used in the area was the metamorphic blue-grey Welsh Slate (Ordovician), which was once ubiquitous as a roof cladding in the vast swathes of terraced housing which formed the iconic industrial townscapes of Manchester’s satellite towns. Green Cumberland Slate (Ordovician), and Cornish Delabole Slate (Devonian), have also been utilised occasionally for roofing.
Within the Millstone Grit Group, Horncliffe Stone (Lower Haslingden Flags) was used as parpoints at St Thomas’ church, Bury, but the principal use of Upper Haslingden Flags was reflected in Phillipsons Flag & Stone quarry at Round Barn, Edgworth, from where 40 railway wagon loads of flags per day were despatched to pave the roads and yards of nearby mill towns.

Construction of the Leeds-Liverpool Canal in the late 18C allowed the hard Parbold Stone (Harrock Hill Grit, Westphalian Coal Measures) from West Lancashire to be shipped into the County, and until the best beds expired in the 1840’s, this was used in particular on the Wigan estates of the Scarisbrick family, and on the Haigh estates of the Earls of Balcarres.

After the railway network connected with the principal quarries, the relatively soft Longridge Stone (Carboniferous) from Lancashire was used to reconstruct the great parish churches at All Saints, Wigan (1845-50) and St Peters church, Bolton (1866-71), both by Sharpe & Paley of Lancaster; whilst All Souls church (1878-81), in north Bolton, used this stone type for detail.

Carboniferous Gaisby Rock (Elland Flags equivalent) from Spinkwell Quarries, near Bradford, was used by Alfred Waterhouse to construct Manchester Town Hall in 1868-77. ‘Golden’ Darley Dale Stone, from Stancliffe, Derbyshire, was used for the Manchester Town Hall Extension (1934-38); the Manchester Royal Exchange (1914-31); the Miners Federation Hall, Bolton (1913-14) (below), and in the body of St Mary’s Church, Bury (1872-6).

Dark red Penrith Sandstone (Permian) from Lazonby can be seen cladding the exterior of John Rylands Library (1890-99), whilst the interior is of Triassic St Bees Sandstone. Within more recent years, these stone types seem to have been superseded in use by the red Locharbriggs Sandstone (Permian) from Dumfries, which have been utilised in the Manchester Magistrates Court, and the Manchester International Convention Centre.
Probably the most prolific ‘exotic’ stone type used in the area was the red Runcorn Sandstone (Triassic, Sherwood Sandstone group). Shipped in great volumes via the Bridgewater and Manchester Ship Canals, this has been employed at the Portico Library, and Oxford Road railway viaduct, in Manchester; Bowden church, Altrincham; St George’s church, Stockport; and as detail in other buildings. The eminent philanthropist William Lever insisted on this stone type for his magnificent bequests of Bolton School (c.1920-53) and the ‘Iron Church’ (1895-8) on Blackburn Road, also Bolton.

Pale red Hollington Stone (Triassic Sandstone) from Staffordshire was used in the Lady Chapel in Manchester Cathedral; St Anne’s church, Manchester; St Mary’s, Bury; and at St Thomas church, Radcliffe.

Yellow Jurassic Limestones employed in the area include Bath Stone, in the Chapter House of Manchester Cathedral, and lining the interior of St Luke’s church at Heywood. White Portland Stone (Upper Jurassic) was employed to form the Pantheon-like shell of Manchester Central Library (1930-34) and the adjacent Cenotaph; weathering of the latter is very apparent on its west face. Painswick Stone (Middle Jurassic), from Stroud, is used at E.W. Pugin’s masterpiece church of All Saints, Barton upon Irwell (1865–8), where he alternated this material with Red Mansfield Stone (Permian) from Nottinghamshire (below).

The early Victorian geological trail through Rochdale Cemetery comprises an assemblage of 27 small stone blocks representative of many types of rock from the Cambrian to the Cretaceous. Apart from local specimens, blocks were derived from sources in Great Britain, Ireland, and Italy. This is not just a scientific curiosity, but represents an unusual educational trail which is presently being restored.

Finally, the vast architectural collage of the Trafford Centre, just off the M60, has been clad and floored in a bewildering mixture of sedimentary, metamorphic and igneous rock types, with no expense spared. These have been sourced from Italy, Spain, Germany, Norway, South Africa, Brazil and India.
Glossary

Ashlar: Stone masonry comprising blocks with carefully worked beds and joints, finely jointed (generally under 6 mm) and set in horizontal courses. Stones within each course are of the same height, though successive courses may be of different heights. ‘Ashlar’ is often wrongly used as a synonym for facing stone.

Carbonaceous: Consisting of, containing, relating to, or yielding carbon.

Cemented: The materials which bind the grains and/or fossil components together to form a rock.

Clay: Sediment of very fine-grained particles less than 2 microns in size (in reality pure clays are rare, most fine-grained sediments are muds (mudstones) which are a mixture of clay and coarser silt-grade particles).

Drip-mould: The projecting edge of a moulding, channelled, or throated beneath, so that the rain will be thrown off.

Feldspar: A commonly occurring aluminium silicate mineral of potassium, sodium and calcium.

Flaggy: A finely laminated, sedimentary rock that splits into thin sheets when exposed to weathering.

Igneous rock: Rocks formed when molten magma cools and solidifies. It includes extrusive rocks erupted from volcanoes (e.g. basalt) and intrusive rocks that cool beneath the Earth’s surface (e.g. granite, gabbro, granodiorite, dolerite).

Interbedded: Occurs when beds (layers or rock) of a particular lithology lie between or alternate with beds of a different lithology. For example, sedimentary rocks may be interbedded if there were sea level variations in their sedimentary depositional environment.

Limestone: A sedimentary rock consisting mainly of calcium carbonate (CaCO₃) grains such as ooids, shell and coral fragments and lime mud. Often highly fossiliferous.

Metamorphic: Rocks which have been subject to heat or pressure which has caused changes in their solid state e.g. mudstone to slate, limestone to marble.

Micaceous: A rock which contains a high proportion of the platey micaceous minerals muscovite and/or biotite.

Mudstone: A fine-grained sedimentary rock composed of a mixture of clay and silt-sized particles.

Mullions: A vertical, slender pier which forms the division between the lights (glass) of a window.

Porosity: The ratio of the fraction of voids to the volume of rock in which they occur.

Quartz: The crystalline form of silica (silicon dioxide, SiO₂).

Quoin: The external angle of a building. The dressed alternate header and stretcher stones at the corners of buildings.

Sandstone: A sedimentary rock composed of sand-sized grains (i.e. generally visible to the eye, but less than 2 mm in size).

Sedimentary rock: A rock that is commonly formed by the binding together (lithification) of sediment particles (e.g. sandstone, siltstone, mudstone, limestone).

Sett: A square stone used for paving.

Silica: The resistant mineral quartz (silicon dioxide) SiO₂ an essential framework constituent of many sandstones and igneous rocks, but it also occurs as a natural cement in both sandstones and limestones.

Siltstone: A sedimentary rock composed of silt-sized grains (i.e. only just visible to the eye).

Shale: An argillaceous rock with closely spaced, well-defined laminae.

Slate: A compact fine-grained metamorphic rock with a closely spaced cleavage formed by the alteration of a mudstone or siltstone by heat and pressure.

Stratigraphically: Branch of geoscience dealing with stratified rocks (generally of sedimentary origin) in terms of time and space, and their organisation into distinctive, generally mappable units.
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Further Reading


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