Historic England

Derbyshire and the Peak District

Building Stones of England

The Building Stones of England

England's rich architectural heritage owes much to the great variety of stones used in buildings and other structures. The building stones commonly reflect the local geology, imparting local distinctiveness to historic towns, villages and rural landscapes.

Historic England and the British Geological Survey (BGS), working with local geologists and historic buildings experts, have compiled the Building Stones Database for England to identify important building stones, where they came from and potential alternative sources for repairs and new construction.

Drawing on this research, plus BGS publications and fieldwork, guides like this one have been produced for each English county. The guides are aimed at mineral planners, building conservation advisers, architects and surveyors, and those assessing townscapes and countryside character. The guides will also be of interest if you want to find out more about local buildings, natural history, and landscapes.

This guide is based on original research and text by Ian Thomas (National Stone Centre).

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Front cover: St Johns Street, Wirksworth. Carboniferous limestones and sandstones © William Robinson / Alamy Stock Photo.

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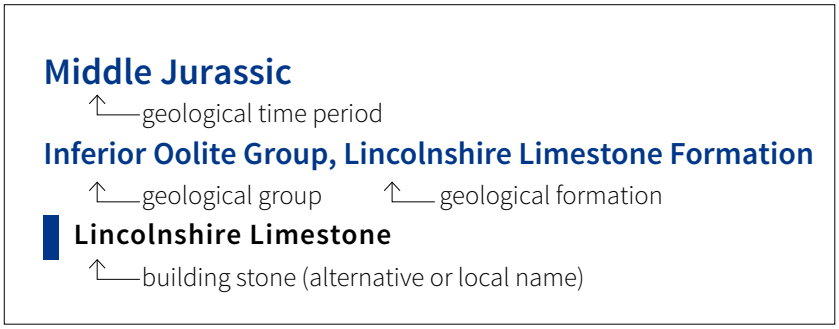
HistoricEngland.org.uk/advice/technical-advice/

How to Use this Guide

Each guide describes the local building stones in their geological timescale order, starting with the oldest layers through to the youngest. The guide ends with examples of other notable building stones from other parts of England and further afield.

Geological time periods, groups, formations and building stones

Each building stone is listed under the relevant geological timescale, group and formation. A formation may be divided into members and where relevant these are referenced in individual building stone sections.



Bedrock geology map and stratigraphic table

To help you with the geology of the area, there is a bedrock geology map and a stratigraphic table which shows the layers of rocks and the associated building stones in this geological timescale, group, formation order.

Page numbers for each building stone are included in the stratigraphic table for ease of reference. The page numbers are inverted to correspond with the geological age order.

Contents list

If you click on the page number for a building stone in the Contents list, you will go straight to the relevant section in the guide.

Building stone sources and building examples

A companion spreadsheet to this guide provides:

- More examples of buildings. Information is included on building type, date, architectural style, building stone source, and listed/ scheduled status
- A list of known (active and ceased) building stone sources such as quarries, mines, pits and delphs
- Additional information on building stones including lithology, grain size, sedimentary structures, key identification features, and notes on failure/weathering, and use.

The Building Stone GIS map allows you to search the Building Stones Database for England for:

- A building stone type in an area
- Details on individual mapped buildings or stone sources
- Potential sources of building stone sources within a given proximity of a stone building or area
- Buildings or stone sources in individual mineral planning authority area.

Further Reading, Online Resources and Contacts

The guide includes geological and building stone references for the area. A separate guide is provided on general Further Reading, Online Resources and Contacts.

Glossary

The guides include many geological terms. A separate Glossary explaining these terms is provided to be used alongside the guides.

The guides use the BGS lexicon of named rock units.

Mineral and local planning authorities

This guide covers the Derby City Council, Derbyshire County Council and Peak District National Park Authority mineral planning authority areas, and the High Peak, Derbyshire Dales, South Derbyshire, Erewash, Amber Valley,

North East Derbyshire, Chesterfield, Bolsover, Derby City and Peak District National Park planning authority areas.

The Peak District National Park boundary includes or borders with Barnsley Metropolitan Borough Council, Cheshire East Council, Derbyshire Dales District Council, High Peak Borough Council, Kirklees Borough Council, North East Derbyshire District Council, Oldham Metropolitan Borough Council, Sheffield City Council and Staffordshire Moorlands District Council.

Contents

1 Introduction

Rocks deposited during the Carboniferous period underlie almost all of the Peak District National Park and probably two-thirds of the remainder of Derbyshire. Limestones (mostly in the White Peak) and sandstones (largely in the Dark Peak) comprise the main building stones. However, there are many variants within these broad categories and a number of other minor rock types in the same area. Permian dolomitic limestones in the north-east of the county and Triassic mudstones and softer sandstones in the south account for most of the remaining areas.

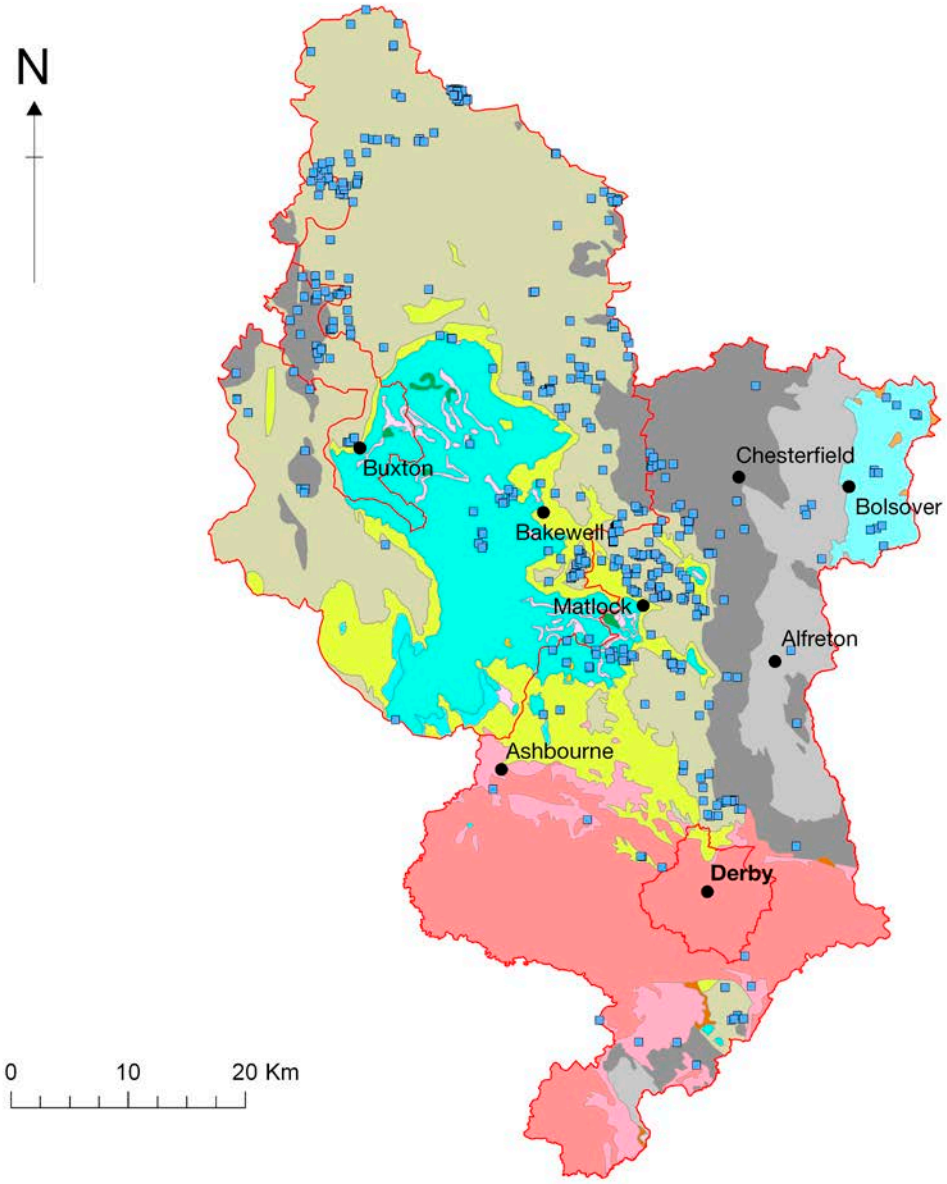
Both historically and currently, the area is seen as a major source of stone for local use and throughout the UK.

Geologically, the oldest rocks are found in the heart of the White Peak, in deep valleys in the west and central parts of the outcrop, extending into Staffordshire. Very generally, these older rocks (all limestones and dolostones) are encircled progressively by outcrops of younger rocks, rather like the layers of an onion. In the core of the area, mudstones and sandstones of Upper Carboniferous age overlie the limestones and their associated igneous rocks. The mudstones are exposed along the major valley bottoms, whereas the sandstones form the oldest limestones and associated igneous rocks, all of Lower Carboniferous age. Wrapped around these are mudstones exposed in the major valleys and sandstones (the latter often coarse), which form the bleak ‘edges’ and moors, traditionally known as the Millstone Grit. Beyond these, overlying the Namurian rocks, is the Pennine Coal Measures succession of Westphalian age.

In the north-east and south of Derbyshire, the younger dolomitic limestones, mudstones and sandstones of the Permian and Triassic crop out.

Rocks of later geological periods are almost entirely absent from the area, until the great spreads of clay, sand and gravel deposited mainly to the south by glaciers and rivers from the Pleistocene to the present. This simple model does not hold in all areas, though, and there are examples of small Carboniferous limestone and Millstone Grit outcrops south of the River Trent.

Bedrock Geology Map



Key

Building stone sources

Bedrock geology

Neogene Rocks — gravel, sand, silt and clay

Triassic Rocks — mudstone, siltstone and sandstone

Triassic Rocks — sandstone and conglomerate, interbedded

Zechstein Group — dolomitised limestone and dolomite

Permian Rocks — mudstone, siltstone and sandstone

Permian Rocks — sandstone and conglomerate, interbedded

Pennine Upper Coal Measures Formation — mudstone, siltstone, sandstone, coal, ironstone and ferricrete

Pennine Middle Coal Measures Formation and South Wales Middle Coal Measures Formation

Pennine Lower Coal Measures Formation and South Wales Lower Coal Measures Formation

Millstone Grit Group — mudstone, siltstone and sandstone

Bowland High Group and Craven Group — limestone

Bowland High Group and Craven Group — mudstone, siltstone and sandstone

Dinantian Rocks — limestone with subordinate sandstone and argillaceous rocks

Unnamed extrusive rocks, Carboniferous — mafic lava

Unnamed extrusive rocks, Carboniferous — mafic tuff

Unnamed igneous intrusion, Carboniferous to Permian — mafic igneous rock

Stratigraphic Table

Sedimentary building stones

Geological timescale	Group	Formation	Building stone	Page
Quaternary	various	various	Sands, gravels and clays Tufa	25 24
Triassic	Mercia Mudstone Group	various		
	Sherwood Sandstone Group	Helsby Sandstone Formation (Bromsgrove Sandstone Formation)	Sherwood Sandstone (Keuper Sandstones, Waterstones)	22
		Chester Formation (Polesworth Formation)		
		Moira Formation		
Permian	Zechstein Group	Edlington Formation		
		Cadeby Formation	Lower Magnesian Limestone	20
Upper Carboniferous	Pennine Coal Measures Group	Pennine Upper and Middle Coal Measures formations		
		Pennine Lower Coal Measures Formation	Coal Measures Sandstone Green Moor Rock (Brincliffe Edge Rock), Grenoside Sandstone Silkstone Rock Wingfield Flags Crawshaw Sandstone (Woodhead Rock)	 18 18 17 17
	Millstone Grit Group	Rossendale Formation	Rough Rock (Rough Rock Flags)	16
		Marsden Formation	Ashover Grit (Roaches Grit, Corbar Grit, Five Clouds Sandstone, Beacon Hill Flags, Heyden Rock, Darley Dale Stone) Chatsworth Grit (Huddersfield White Rock, Rivelin Grit)	15 14
		Hebden Formation	Kinderscout Grit	14
Lower Carboniferous	Craven Group	Bowland Shale Formation		
		Widmerpool Formation	Mixon Limestones	13
	Peak Limestone Group	Eyam Limestone Formation	Eyam Limestone	11
		Monsal Dale Limestone and Bee Low Limestone formations (including Winstermoor and Lower Matlock Lava members)	Monsal Dale Limestone Rosewood Marble, Ashford Black Marble Dukes Red Marble Bee Low Limestone Hopton Wood Stone Dunstone	10 10 9 9 8 7
		Woo Dale Limestone Formation	Woo Dale Limestone	7
		Milldale Limestone Formation	Milldale Limestone	7

Igneous and metamorphic building stones

Geological timescale	Group	Formation	Building stone	Page
Permo-Carboniferous	various	various including Bee Low Formation (Treak Cliff area)	Veinstones including Blue John, Oakstone and Calcspar (Derbyshire Spar)	19
	various	various including Bee Low Limestone Formation, Monsal Dale Limestone Formation	Igneous building stones	

Building stones in geological order from the oldest through to the youngest layers.

2 Local Building Stones

Lower Carboniferous

Peak Limestone Supergroup

In broad terms, this rock succession is dominated by grey limestones that are commonly fossiliferous and exhibit a considerable range of bedding styles. They contribute significantly to the character of the built environment of the White Peak, as they form the principal stone used in vernacular buildings and in the network of drystone field walls that criss-cross the area. To the outsider, these limestones appear at first glance to be uniform in character, but subtle differences, in colour, bedding and grain size, for example, add considerable variety. With a few notable exceptions, the building limestones of the White Peak have seldom travelled far from their quarry source. Today, only about 7,000 tonnes of limestone are produced annually in the area as building stone, compared with 12.4 million tonnes for aggregates.

The lack of reliable water supplies which is a consequence of the limestone-dominated geology of the White Peak heartland, means that there are few large villages. With the exception of Tideswell, most of the area is served by a string of market towns around the edge of the limestone/mudstone outcrop, including Castleton, Buxton, Bakewell and Wirksworth.

In buildings, a very common vernacular approach addresses the intractable nature of many of the limestones. This involves using randomly coursed grey limestone (rubblestone) as a general walling material, with local pink or buff Millstone Grit sandstones employed for door and window mouldings and for quoins. This combination can be seen in vernacular architecture in Tideswell village. Although it appears to fly in the face of some conventional views about not mixing sandstone and limestone, this style, in general, appears to suffer from no obvious weathering ill-effects. The sandstones were usually quarried from the nearest available sources outside the White Peak area.

Peak Limestone Group, Milldale Limestone Formation

Milldale Limestone

Only rarely were substantial limestone buildings constructed of ashlar or as rock-faced material trimmed back to near-ashlar plane surfaces. Sawn surfaces like Castleton Hall are even less common. Much of the limestone won in the western valleys within the Staffordshire section of the Peak District National Park tends to be more muddy in character and mid to dark grey in colour. Alstonefield is a good example of a village constructed, in part, on these beds.

Figure 1: Houses, Alstonefield. Milldale Limestone.

Peak Limestone Group, Woo Dale Limestone Formation

Woo Dale Limestone

The Woo Dale Limestone outcrops in the Derbyshire area of the National Parkalong the Via Gellia, near Hartington, at Wye Dale and at Peak Forest.

Peak Limestone Group, Monsdal Dale Limestone Formation, Bee Low Limestone Formation

Dunstone

Intrusive and extrusive igneous rocks occur at a number of locations in the White Peak area. They were used almost exclusively for roadstone in the early 1900s and very occasionally for building, but only for field walls. Examples can be seen around Bonsall, Tissington and Peak Forest.

Two areas of dolomitised limestone extend from Parsley Hay to Masson Hill (Matlock) and from Royston Grange almost to Wirksworth. They are colloquially known as Dunstone and comprise a brownish honeycombed rock, with a sugary texture. They frequently appear in stone walling and occasionally in buildings, such as All Saints' Church at Bradbourne.

Figure 2: All Saints' Church, Bradbourne. Dunstone.

Hopton Wood Stone

The paucity of villages and the narrowness of the outcrop in this, the driest, part of the White Peak mean that there are relatively few villages that consistently used this stone. Examples include parts of Chelmorton and Hartington.

A notable exception to this generally limited local application is the exploitation of the Bee Low Limestone Formation in the south-east of the outcrop to produce Hopton Wood Stone.

This is a consistent, fine-grained, fossiliferous, crystalline, pale cream-coloured limestone, perhaps the UK's most widely used decorative indigenous limestone. From the 18th century onwards, it was used predominantly in interior work (staircases, floors, door surrounds, wall cladding) in grand houses and official buildings, notably Kedleston Hall near Derby and the present Houses of Parliament in London. It was in vogue from 1850 to 1950 and is still much in demand, although it is only available in small quantities. From the late 1920s to the present day, Hopton Wood Stone has been important in the work of the Commonwealth War Graves Commission and used as grave markers in its cemeteries across the world. It was sourced at various times from up to six quarries, which, in some instances, led to High Court claims and counter claims disputing the use of the name. Hopton Wood was also a stone of choice for leading sculptors, including Jacob Epstein, Eric Gill, Henry Moore and Barbara Hepworth. The great beds of the Bee Low Limestone Formation are commonly associated

with coarsely fossiliferous reef knolls, which provide a far more rubbly rock. However, their limited outcrop and the proximity of more easily worked sandstones mean that this rock has attracted few users.

Figure 3: Cottages, Hartington. Hopton Wood Stone.

Bee Low Limestone

In the central parts of the White Peak, the limestone beds are generally much thicker and produce a light grey and off-white stone from the Bee Low Limestone. These are some of the 'cleanest' calcium carbonates in the UK and they are worked on a large scale because of their chemical purity, accounting for more than 50 per cent of national requirements for this type of stone. The limestone beds are up to 10m thick and they were not easily worked to supply the everyday building needs of local communities. Most of the building material for drystone field walls was gathered in the course of surface stone clearance, augmented from quarries from the 18th century onwards.

Dukes Red Marble

This is a blood red, iron-rich limestone. Its origins are much disputed, but documentary evidence puts its source at Newhaven in the 1830s. The entire deposit was worked out and all stocks were held at Chatsworth. It was used very sparingly, for example in St Peter's Church at Edensor and in a floor set in the House of Lords, London.

Figure 4: St Peter's Church font columns, Edensor. Dukes Red Marble.

Rosewood Marble, Ashford Black Marble

This dark-coloured facies of the Monsal Dale Limestone hosts two distinctive, decorative materials, highly popular with the Victorians: Rosewood Marble and Ashford Black Marble. Both were quarried, then mined, to the south and west of Ashford-in-the-Water until the early 1900s. The former has the appearance of ebony; the latter displays finely variegated but uneven mid/dark grey/black laminations, like wood cut on the grain. Ashford Black Marble was widely used as a setting for delicate inlaid stone ornaments, tables and mantlepieces (part of England's pietre dure crafts). A black limestone with occasional small white features (brachiopod fossils), known as Birds Eye Marble, was also produced in this area.

Monsal Dale Limestone

Higher in the limestone succession, the limestones of the Monsal Dale Limestone Formation comprise mid-grey shelly rocks in most areas, with thinner bedding than the Bee Low Limestones. They form extensive outcrops clustered around Monyash (from Elton to Litton), between Castleton, Tideswell and Wardlow, and in a smaller area around Biggin. They were

widely used for building in these areas. The same limestone interval also includes darker varieties of limestones. These are more restricted in extent but are particularly important (together with the overlying Eyam limestones) in contributing to the character of buildings in Bakewell, Ashford and the Longstones. They have also been identified in some buildings in the town of Wirksworth. These limestones tend to be much thinner bedded and sometimes flaggy. Although generally dark when freshly broken (and giving off a bituminous smell), they may weather to a lighter grey. The presence of the chert bands and bituminous character of these limestones represent a gradual deepening of the limestone shelf at this time. Chert is relatively common in these darker beds, but it is insufficient and too brittle to be used in the manner of flint nodules as a building material in its own right. However, it is commonly seen in some villages within the wallstones, as at Hognaston. This material does not lighten noticeably on weathering and so has a mottled grey/black appearance. The chert has been mined to supply glazing material to the pottery industry.

Figure 5: Houses, Wirksworth. Monsal Dale Limestone.

Peak Limestone Group, Eyam Limestone Formation

Eyam Limestone

The limestones of this formation are rather similar to the dark Monsal Dale Limestone beds. They are consistently thinly bedded, except in reef areas, and were worked down the eastern flank of the White Peak as a readily accessible source of limestone block. The stone was used in the construction of settlements such as Eyam, Youlgrave and Bakewell.

There are some other important variants within the normal bedded Eyam Limestone sequence, which formed as isolated ‘patch reefs’. These reefs form relatively horizontal structures rising only slightly above the normal bedding as shallow domes. They are densely packed with fossils, predominantly of crinoid and brachiopod, and to a lesser extent coral debris. They were significant stone sources and were worked at a number of locations, particularly around Monyash and in the Cromford–Wirksworth area. They have been cut and polished to great effect for interior decoration, in some cases since about 1600.

These decorative stones are collectively known as Derbyshire Fossil Marbles, but individual sources are often difficult to identify. Some varieties may even have been won from outside the area.

For a short period after the Second World War, Derby Dene (a variety of Derbyshire Fossil Marble) and Hadene (similar to Hopton Wood Stone) were quarried on a large scale at Cromford and used widely in post-war reconstruction in London, including for the interior of the Royal Festival Hall. Varieties of Birds Eye Marble and some ‘Black’ marbles were also extracted and polished at Matlock and near Middleton-by-Wirksworth.

Figure 6: Church Street, Youlgrave. Eyam Limestone.

Figure 7: Cottages, Bakewell. Eyam Limestone.

Craven Group, Widmerpool Formation

Mixon Limestones

At the very edge of the limestone outcrop are thin, very flaggy, dark grey, muddy limestones, locally known as the Longstone mudstones. In general, the outcrop is very narrow, except around the Bakewell–Ashford–Great Longstone area, where it was used locally, and in the south, particularly in the Staffordshire Moorlands, where there are beds of comparable age (formerly the Mixon Limestone Shales). Between Butterton and Mixon, these tend to include thin and limy calcareous sandstones. They have been used here on a small scale for building, but elsewhere other local limestones or sandstones are favoured.

The Widmerpool Formation also has an irregular outcrop in the valley floor between Turnditch and Mackworth, but it is generally far too soft and friable to be employed as a building stone. An exception is the thin flaggy limestone dug from the quarries at Flower Lilies near Turnditch. Although mainly used as a hydraulic lime, it is a natural stone that, at first glance, is not unlike concrete paving in appearance.

Upper Carboniferous

Millstone Grit Group

The term ‘Millstone Grit’ was applied geologically to this thick interbedded succession of very coarse sandstones, with mudstones and finer sandstones, first described in this area by John Whitehurst in 1778. The name reflects the significance of the moors between the Derwent Valley and the Derbyshire Coalfield as a national source of abrasive stones from medieval, if not Roman, times. There are documented references to quarrying in this respect from the 13th century onwards. Early hand querns gave way to millstones and millstones to grindstones, then to exported pulp stones to make wood pulp for the paper industry. The same physical properties also rendered

these stones particularly suited for use as building materials. Collectively, the sandstones of this group worked in this area account for almost a quarter of the sandstone building stone production in Great Britain.

Millstone Grit Group, Hebden Formation

Kinderscout Grit

The Kinderscout Grit, the oldest of the Millstone Grit sandstone beds, forms the extensive area of the Kinder Scout–Bleaklow moors and tends to be a very coarse, hard sandstone. It dies out between Baslow and Bakewell. However, its extreme hardness and the inaccessible nature of most of the outcrop mean that this sandstone was seldom exploited. It was used locally in Edale and the Upper Derwent valleys.

A finer grained variety is still produced at Shire Hill Quarry, Glossop, and at Stoke Hall Quarry, Grindleford (one of the last producers of pulp stones). It was previously worked at Tegg's Nose Quarry above Macclesfield in Cheshire. Probably its main contribution to the built environment can be seen in Glossop (from which stone slates were also produced on a large scale at Glossop Low), in the Longdendale Valley (particularly in the form of reservoir dams) and at Hayfield, as well as in the scattered hamlets of the Eyam and Abney Moors.

Millstone Grit Group, Marsden Formation

Chatsworth Grit (Huddersfield White Rock, Rivelin Grit)

The Chatsworth Grit tends to be rather coarser than the Ashover Grit. However, like many of the younger Millstone Grit sandstones, and even some of the Coal Measures (Westphalian) sandstones, it is often difficult to identify with certainty in buildings. Although exposures are usually relatively narrow, it extends along both flanks of the Pennines. In the far north, it is known as

Figure 8: Smedley's Hydro Victorian spa, Matlock. Chatsworth Grit.

the Huddersfield White Rock and its counterpart in the Sheffield area is the Rivelin Grit.

On the west, it runs as far south as the Roaches. Most of the beds form high moorland, which makes them somewhat inaccessible. For this reason, in part, Chatsworth Grit has been exploited on a more limited scale, but it was particularly important for the construction of the Victorian spas and villas in the Matlock towns. The main quarries were high above the town to the east. Like the Ashover Grit, consistent, buff, evenly grained varieties were (and still are) favoured. The Chatsworth Grit was also a significant source of abrasive stones.

Ashover Grit (Roaches Grit, Corbar Grit, Five Clouds Sandstone, Beacon Hill Flags, Heyden Rock, Darley Dale Stone)

The Ashover Grit (and its equivalents, the Roaches Grit in the west, the Corbar Grit/Five Clouds Sandstone around Buxton and the Beacon Hill Flags/ Heyden Rock in the north) has a far more sinuous and fragmented outcrop. In the Derwent Valley, it is found as far north as Calver and runs down to Little Eaton. It has some decided advantages over the more prominent Kinderscout Grit below and the Chatsworth Grit above: it is consistently fine to medium grained and often well bedded. Furthermore, in the past, it was more easily accessed by railways and canals and, more recently, by roads. In some areas, the bedding is particularly massive, notably on Stanton Moor, around Whatstandwell and at Little Eaton.

At the first of these, several hundred quarries opened up over many centuries. Here, and at Stancliffe Quarries (an isolated outcrop at Darley Dale) and Duke's Quarry (Whatstandwell), the stone has achieved a national reputation for its durability and aesthetic qualities, generally having a consistent buff, light orange or pink colouration.

Figure 9: Chatsworth House. Ashover Grit.

Between Belper and Little Eaton, there is seldom the space of a field between former quarries. Indeed, the Ashover Grit accounts for the bulk of the area's sandstone production, and it is often specified for prestigious projects throughout the UK. However, in at least two areas (Cromford and Buxworth) the Ashover Grit is a strong pink colour, even red in parts, and medium to coarse grained, giving local villages a distinctive character.

The Corbar Grit was a major contributor to 18th and 19th-century Buxton, including The Crescent and the Devonshire Royal Hospital.

Figure 10: The Crescent, Buxton. Corbar Grit.

Millstone Grit Group, Rossendale Formation

Rough Rock (Rough Rock Flags)

The uppermost sandstones of the Millstone Grit form the Rough Rock. In some areas west of Sheffield, the lower parts of this sandstone interval are differentiated as the Rough Rock Flags. The Rough Rock has a very long, noticeably faulted outcrop, which encircles the whole of the Dark Peak. It was heavily exploited at Coxbench and Belper for building stone.

The Coxbench Quarries were the main source of building sandstone for the development of Derby and also supplied stone for the construction of Kedleston Hall.

Further north, in the area between the Upper Rivelin and Loxley Valleys, and on a more concentrated area north of Winscar Reservoir, the Rough Rock sandstone beds were riven (on a particularly large scale at Magnum Bonum) for stone slates serving markets on both sides of the Pennines. The western outcrops of the Rough Rock were not widely worked.

Figure 11: Kedleston Hall. Rough Rock.

Pennine Coal Measures Group, Pennine Lower Coal Measures Formation

In most cases, the sandstones of the Pennine Coal Measures are thinner than those of the Millstone Grit and they are usually regarded as being less robust, too. None of the quarries in this area have achieved the national status of the Millstone Grit sandstone beds. However, they have been very widely exploited locally: for example, in colliery company housing and many of the smaller country houses. Many of the former mining villages have road or place names referring to quarries, long after the workings themselves disappeared. Although numerous former quarries have been filled and built over, or removed by opencast coal extraction, a trawl of documentary evidence revealed relatively few workings. Three formations within the group were particularly significant, albeit only on a local scale.

Crawshaw Sandstone (Woodhead Rock)

At the very base of the formation, the Crawshaw Sandstone (Woodhead Rock in the north and west) was quarried at Stanage and on Holymoor (both west of Chesterfield), at Buxworth and, until recently, at Ambergate, Birch Vale and New Mills.

Wingfield Flags

The Wingfield Flags have a very narrow outcrop, but they can be traced over a considerable area of the Pennine flanks and into the Derbyshire area. They form a marked scarp along the western edge of the main coalfield. The sandstones have been used locally at various locations and are often thinly bedded or flaggy, as seen at Wingfield Manor near South Wingfield. In contrast, they display a more massive form near Wingerworth, where they were once quarried as an important freestone.

Figure 12: Wingfield Manor. Wingfield Flags.

Silkstone Rock

The only other sandstone of note as a building stone source is the Silkstone Rock, underlying a series of lofty escarpments of land between Dronfield Woodhouse and Eckington.

Many small quarries in this area supplied building stone for local use, and scythe makers favoured it for sharpening stones. Marsh Lane Quarry was probably the only operation of any scale.

Green Moor Rock (Brincliffe Edge Rock), Grenoside Sandstone

The Green Moor Rock (or Brincliffe Edge Rock) and Grenoside Sandstone feature in a number of buildings in former parts of Derbyshire, almost all now absorbed into Sheffield. A notable example of a local major building is Sutton Scarsdale Hall. The stone was also used in the two Hardwick Halls at Doe Lea (sandstone below the Clowne Coal), Renishaw Hall near Eckington (sandstone above the Clay Cross Marine Band) and the medieval Codnor Castle near Ripley.

Attempts have been made to use large blocks of sandstone found during opencast coal working since 1942 for building stone, but the results have been inconsistent. This may be because of fracturing by deep mining subsidence or the lack of careful selection of stones. None of the Coal Measures sandstones found in the south Derbyshire Coalfield and in the north west were worked on any significant scale, but they were used for local building purposes.

Figure 13: Sutton Scarsdale. Grenoside Sandstone.

Figure 14: Hardwick Hall. Grenoside Sandstone.

Permo-Carboniferous

Various groups, various formations including Bee Low Formation (Treak Cliff area)

Veinstones including Blue John, Oakstone and Calcspar (Derbyshire Spar)

Vein minerals, notably barite, fluorite and calcite accompanying lead ore (galena), have been used for internal decorative work, especially inlaid work, and to line Victorian grottos and follies. They sometimes feature in rockeries and landscaping. The vein minerals formed the basis (with the marbles already mentioned) for a substantial local Victorian industry making stone souvenir ornamental baubles.

The variety of fluorite known as Blue John was especially popular, as was barite, locally termed oakstone, but to a lesser extent. Although these minerals are still being processed for industrial uses, only Blue John and Calcite (Calcspar or Derbyshire Spar) are used decoratively. The former is used for ornaments and jewellery, and Castleton is a notable centre of production. Pieces of the spar were commonly set in cement panels and external renders. These and other vein minerals also spawned a significant pigments industry in the Derwent Valley, but what remains today relies on imported raw materials.

Figure 15: Blue John mines. Blue John veins.

Permian

Zechstein Group, Cadeby Formation

Lower Magnesian Limestone

The Permian dolostones and dolomitic limestones belonging to the Cadeby Formation (previously known as the Lower Magnesian Limestone) occur in the north-east of the county, east of a line between Hardwick and Barlborough. The beds represent a small section of a long narrow outcrop,

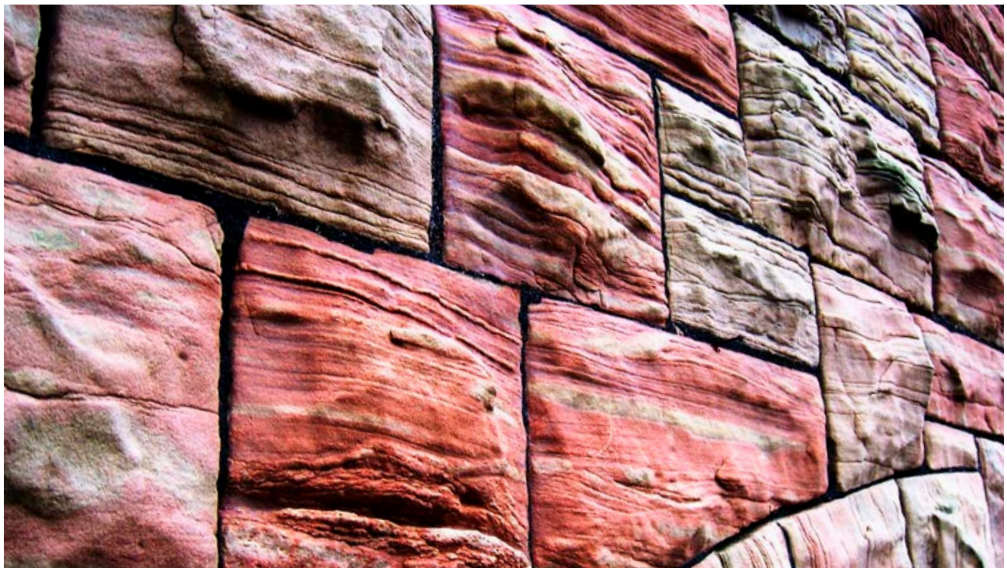


Figure 16: Pleasley Vale. Cadeby Formation Limestone.

running from the Nottingham area to the coast in County Durham. They are typified by an apparently uniform buff-coloured dolostone or magnesium-rich dolomitic limestones, which generally weather to a cream, grey or off-white colour. They were widely used within the outcrop itself and beyond, both as ashlar and as dressings for brick buildings.

In detail, the stone tends to be pink and sandy near the base and in the Pleasley Vale area, but elsewhere the stone is relatively uniform in character. The pre-1850 centres of a number of the colliery villages and towns (now largely surrounded by brick buildings), such as Bolsover, Clowne, Shirebrook, Whitwell, Langwith, Mansfield, Mansfield Woodhouse and Creswell, are of this yellowish limestone, contrasting with typical vermillion-coloured pantile roofing.

Figure 17: Bolsover Castle. Cadeby Formation Limestone.

Figure 18: Bolsover Castle. Cadeby Formation Limestone.

Triassic

Sherwood Sandstone Group, various formations

Sherwood Sandstone (Keuper Sandstones, Waterstones)

The Triassic rocks in Derbyshire all occur south of a line from Ashbourne to Stanton-by-Dale. Most of the Triassic formations seen in this area are often regarded as too soft to constitute viable building stones. However, in some places, they have been used quite extensively for building purposes. The numerous geological terms that have been applied to published maps of this and neighbouring areas are still being considered. The fluidity and complexity of the present situation in this respect precludes a detailed account here. In essence, the older sandstone-dominated beds belong to the Sherwood Sandstone Group, above which is the red mudstone-dominated succession, with thin discontinuous beds of pale-coloured dolomitic Skerry Sandstones, comprising the Mercia Mudstone Group.

The sandstones that have historically provided building stone are principally found in the Sherwood Sandstone Group, and they were formerly referred to as the Keuper Sandstones and the Waterstones. The sandstones are very fine grained and range from off-white to greenish-grey or pale pinkish-red in colour.

The occurrence of Triassic building sandstone sources is limited to the few areas where they are sufficiently well cemented (indurated) to be a reasonably durable stone. The sandstones were quarried around Mayfield to supply Ashbourne.

Figure 19: Old Grammar School, Ashbourne. Triassic Sandstone.

Nearby, but within the county, quarries at Clifton and Norbury produced stone from this group. The sandstone was also worked at Bowbridge Fields between Kirk Langley and Mackworth, and elsewhere in that area. The Bromsgrove Sandstone Formation and the Polesworth Formation of the Sherwood Sandstone Group were quarried at Weston Cliff (Weston-on-Trent)

and in the Bretby and Stapenhill area near Burton-on-Trent, as well as at Repton and Pistern Hill near Smisby.

From the records, it would appear that a relatively small group of quarry sites (mainly those noted above) provided the source for a remarkable number of significant properties, including Calke Abbey near Ticknall, Swarkestone Hall Pavilion near Chellaston and Foremarke Hall at Milton. Workings at Repton are documented in the 13th century and from archaeological evidence that long pre-dates written accounts.

Figure 20: Calke Abbey. Triassic Sandstone.

These stones were widely deployed as dressings, either with other harder stone used for walling, as at Kedleston Hall, or complementing the pervasive brick of southern Derbyshire, as at Sudbury, Elvaston and Egginton. Use in vernacular building, in the main applied as dressings, was also relatively widespread, but it was often in competition with the Millstone Grit sandstones.

Figure 21: Sudbury Hall. Triassic Sandstone dressings.

Figure 22: Elvaston Castle. Triassic Sandstone dressings.

Quaternary

Tufa

Tufa was worked for building stone from Matlock Bath, the Via Gellia and Alport.

Examples of tufa include Marl Cottage in the Via Gellia (locally known as the Hansel and Gretel House on account of its gingerbread appearance) and the tower at St Margaret's Church at Wormhill, north of Buxton. Tufa was also widely used for lining Victorian grottoes.

Figure 23: St Margaret's Church, Wormhill. Tufa.

Sands, Gravels and Clays

Quaternary deposits comprise of sands, gravels and clays, with no building stone. However, not only do these and their main source beds in the Sherwood Sandstone Group furnish large volumes of high-quality fine and coarse aggregates (in the form of selected large liver-coloured pebbles) but they are also widely used in landscaping, and occasionally for paving.

3 Further Reading

The Further Reading, Online Resources and Contacts guide provides general references on:

- Geology, building stones and mineral planning
- Historic building conservation, architecture and landscape.

There is also a separate glossary of geological terms.

Derbyshire and the Peak District references

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Figures

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