Introduction

Cornwall and the Isles of Scilly represent one of the most complex geological regions in England. Generally, the geology is dominated by Devonian and Carboniferous marine basin sediments which have been affected by major tectonic events, and intruded into and metamorphosed by large scale igneous bodies (granites) during Carboniferous to early Permian times. These rocks have been further altered in places by other later-stage igneous intrusive and volcanic events, and various hydrothermal and mineralisation processes. The Lizard Peninsula provides the best example in Britain of an ‘ophiolite complex’ - a suite of rocks originating from the oceanic crust and some of the underlying upper mantle – the Lizard rocks also have been affected by thrusting and faulting, and partial melting as well as serpentinization. Many of these varied rock types have provided vernacular building materials.

All these events have contributed to creating the wide diversity of rock types and minerals that have shaped the Cornish and Scilly landscapes, and played such an important and enduring part in the economy of the area. Not surprisingly, this geology also includes a rich variety of very hard, durable rocks of Devonian to early Permian age suitable for building purposes. These are dominated by intrusive igneous rocks, principally the granites, but their associated elvans and a range of smaller basic intrusions, greenstones and dolerites, and the rocks forming the Lizard complex, are also important. Extrusive igneous rock types are represented by late Carboniferous and early Permian volcanic lavas, although these have a limited geographical occurrence.

High quality slates suitable for roofing purposes and tough, resistant sandstones occur in many of the Cornish sedimentary and metasedimentary sequences. An unusual stone used for building, is the geologically ‘very young’ and soft, Quaternary Sandrock which is found at several locations on the north Cornwall coast. Many of these different stones are used locally and impart a strongly distinctive character to towns and villages, others have been widely exported nationally and internationally.

For the purposes of describing the building stones, this report is very broadly organised by lithological types, namely: igneous rocks (granites, elvans, greenstones and lavas), the Lizard complex (serpentinites, gneiss, gabbros and schists), sedimentary and metasedimentary rocks (slates, sandstones, limestones and sandrock). These are followed by brief summaries covering minestones and veinstones, Cornish hedges and dry stone walling.

Useful accounts of the geology and building stones of Cornwall and the Isles of Scilly are provided by Bristow (2001, 2004) and Selwood et al (1999). Cornwall County Council (2007) have produced a guide to current suppliers of Cornish stones, and an assessment of the conservation value of abandoned pits and quarries was undertaken by Spalding et al (2001).
Granites
History

Granite has been very extensively used for building in Cornwall since the late Neolithic or early Bronze age, approximately 5000 years ago, when standing stones (termed menhirs or megaliths), stone circles and chambered tombs were erected in, and around the granite uplands. The Hurler Stones on Bodmin Moor provide a classic example. Later Bronze age farmers used granite moorstone to build field boundaries and enclosures. During the Celtic Monastic/Celtic Christianity Period (approximately 500 to 1000 AD), surface stone was used for carving inscriptions and the iconic Cornish Celtic crosses. Techniques for cutting and dressing granite moorstones commenced on a large scale in medieval times, when splitting the rocks was achieved using water soaked wooden wedges; these were later replaced by iron wedges.

It was only in the 19th century that quarries opened to provide granite building stone and the early use of quarried granite primarily for churches, larger houses and bridges rapidly expanded to cover other markets. This expansion coincided with growing industrialisation, particularly the arrival of large steamships and development of the railways which not only created its own demand for the stone via railway architecture, but also supplied a means of transportation.

The height of the Cornish Granite quarrying industry was between 1840 and 1905, when the stone was in high demand, especially as a dimension stone for the construction of civic buildings, dockyards and harbours, railway engineering and lighthouses, including Eddystone and Bishop Rock. Many of the Cornish mine engine houses were also built of, or extensively dressed with granite.

The decline of the granite industry began in the early 20th century, initially as a result of competition from imported Scandinavian Granites and the impact of the First World War. The interwar years saw some minor revival for monumental work and crushed stone aggregate. Post the Second World War the advent of reinforced concrete and growing trade in other imported granites, has further reduced the quarrying of Cornish Granite other than that for aggregate and cladding. Stanier (1999) provides a detailed account of the history of the granite industry in Cornwall.
Occurrence, Composition & Classification

From west to east, the five main granite bodies (termed plutons) are the Isles of Scilly, Land’s End, Carnmenellis, St Austell and Bodmin Moor. Much smaller satellite granites crop out at several other locations in Cornwall including St Michael’s Mount, Tregonning-Godolphin, Carn Brea, Carnmarth, St Agnes Beacon, Cligga Head, Castle-an-Dinas, Belowda Beacon, Kit Hill and Hingston Down. At depth these granites are all linked to a single intrusive parent body, the Cornubian Batholith (which also includes Dartmoor). Apart from the surface exposures of the main granite plutons and satellite outcrops, the batholith is concealed under very thick sequences of Devonian and Carboniferous strata.

Cornish and Scilly Granites are typically composed of crystals of white to pale pink orthoclase and plagioclase feldspars, grey glassy quartz, and platy dark biotite mica and pale muscovite mica. Other minerals are invariably present depending on the granite type, and may include clusters or blebs of radiating or needle-shaped crystals of dark hornblende or tourmaline, or small pale yellow masses of zircon or topaz. Whatever the mineral composition, it is the texture of interlocking crystals that give granites their great durability, and the variation in colours that accounts for their decorative appeal.

Several different classification schemes have been developed for the Cornish and Scilly Granites, based mainly on detailed mineralogical composition or the form and size of large crystals (megacrysts). Further details can be found in Dangerfield & Hawkes (1981), Hawkes & Dangerfield, (1978) and Floyd et al (1993); the latter also provides a very thorough account of other igneous rocks and their locations, with site descriptions. Table 1 here is intended to provide a simplified, composite guide to the different types of Cornish and Scilly Granites used as building stones, and combines components from various classification schemes. Some generalisations about the granites can readily be made, and are helpful when considering building stones, for example, the majority of Cornish Granites are pale grey in colour. Also the most common form of granite in Cornwall and the Isles of Scilly is biotite mica granite, and this accounts for approximately 90% of all granites encountered.

In comparison, lithium-mica granites are confined to granites in the St Austell and Tregonning-Godolphin areas. Also, granite varieties are abundant with large megacrysts (those in which the granitic magma cooled slowest permitting large crystal growth) and tend to occur within the Land’s End and St Austell Granites; the Carnmenellis and Bodmin Granites tend to be more medium-grained, with relatively few megacrysts. Fine-grained granite varieties occur in all the main granite plutons, with the exception of the Isles of Scilly.

<table>
<thead>
<tr>
<th>GRANITE / PLUTON TYPES</th>
<th>MINERALOGY</th>
<th>GRAIN SIZE TYPES</th>
<th>KEY:</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cornwall &amp; Isles of Scilly Strategic Stone Study 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Isles of Scilly | B+M | Li | M>B | B=M | Land’s End: St Michael’s Mount granite=type 1. Main quarries at Lamorna, Sheffield, Castallack, Castle-an-Dinas (Land’s End), Zennor.
| Land’s End | M>B | Ba | Tregonning-Godolphin |
| Tregonning - Godolphin | B+M | Li | M>B | Boswyn |
| Carnmenellis | Ba | Tregonning-Godolphin | St Austell: Belowda Beacon granite=types 1 and 3; Castle-an-Dinas granite=type 3; Luxulyan granite=type 1; Carn Grey granite=transitional types 1-2; finer-grained Li mica granite variety called St Stephen’s Stone. Main quarries at CarnGrey and in Luxulyan area (Tregarden, Carbean, Colcerrow, Orchard).
| St Austell | Ba | St Stephen’s |
| Bodmin | B=M | | Bodmin: Main quarries at Cheesewring, DeLank, Hantergantick. |
Isles of Scilly Pluton

The Isles of Scilly consist almost entirely of granite. The available dating information indicates that these granites belong to the older group of Cornish granites including Carnmenellis and Bodmin Moor Granites.

Isles of Scilly Granite

The Isles of Scilly Granite is a coarse-grained biotite granite and is composed predominantly of pale coloured quartz and feldspar with approximately equal amounts of muscovite and biotite micas, the latter often occur as aggregates. Small feldspar megacrysts, less than 15 mm long, typically comprise 5-9% of the rock. This granite often weathers with a characteristic reddish or yellowish hue, due to the presence of iron oxide.

The Scilly Granites exhibit little variation, although a ‘central area’ of medium-grained granite (in which feldspar megacrysts are very rare) occurs on southwest Tresco and Samson and the north western isles, eg. Mincarlo.

This medium-grained granite contains more muscovite than biotite, and often weathers a pinkish colour. Elvans and fine-grained granitic dykes occur locally. The Isles of Scilly Granite is unique in that the contact with metamorphosed Palaeozoic country rocks is not exposed anywhere on the present islands, and no significant metalliferous mineralisation is associated with it. Not surprisingly, granite has been the dominant vernacular building stone on the island, although some of the 19th-century buildings also include granite imported from the Cornish mainland.

Tresco Granite

A major period of building occurred during the middle of the 19th century following the lease of land on Tresco from the Duchy of Cornwall to the Augustus Smith family in 1834. Tresco Abbey was built and extended between 1838 and 1891, using local Tresco Granite, some of which was taken from the promontory on which the house stands. The 18th-century harbourside cottages at New Grimsby, Tresco (below), are constructed mainly of local Scilly (Tresco) Granite ashlar, with roughly coarsed blocks for porch and wall.

The harbourside cottages at New Grimsby, Tresco, constructed mainly of local Scilly (Tresco) Granite ashlar.
Moorstone
Many of the smaller houses and buildings utilised local granite ‘moorstone’, these are loose boulders or erratic blocks of granites typically lying on granite moorland or tor areas and were formerly collected as a readily available source of local building stone. An unusual use of granite is seen in the Post Office in Hugh Town, St Mary’s, where large blocks of rough granite were used alternatively with finer granite. Imported Delabole Slate is used predominantly for roofing across the Scillies. As these islands are small and have a limited supply of granite building material, reuse of stone has occurred. For example, stone from the ruined castles at St Mary’s and Tresco was reused at The Garrison (Star Castle), Hugh Town and in Cromwell Castle, Tresco respectively. One other distinctive feature of the islands is the widespread use of high (often dry-laid) granite stone walls, typically built from loose weathered blocks and cobbles.

Cornish Mainland
Land’s End Pluton
Land’s End Granite
This granite pluton consists mainly of pale to medium coloured, coarse-grained megacrystic biotite granites, in which the feldspar crystals are large and conspicuous, some forms are extremely coarsely-grained and contain feldspar megacrysts up to 20 centimetres long (only the Luxulyan Granite type from the St Austell area exhibits similarly sized megacrysts). Within the Land’s End Granites, such coarse-grained varieties are characteristic of the Lamorna and Castallack areas, finer-grained granites (also megacryst-rich) occur in the Castle-an-Dinas area.
**Lamorna Granite**

The main quarries were at Lamorna, Sheffield, Castallack and Castle-an-Dinas. High quality Lamorna Granite dimension stone was formerly quarried at Lamorna Cove, on the southern edge of the Land’s End Granite pluton; the granite was used in local buildings and exported from the small harbour in the cove. This granite type was used for constructing the pier at Mousehole, the Wolf Rock lighthouse, the base of Sir Humphry Davy’s monument in Jew Street, Penzance, and further afield such as in the Embankment in London. Sheffield Quarry produced stone mainly for local buildings. The finer-grained granite quarried at Castle-an-Dinas was used mostly for aggregate. The 18th /19th century cottages at Lamorna Cove (right, probably former quarrymans cottages, are constructed of very local, large, roughly coarsed and dressed Lamorna Granite.

**St Michael’s Mount Granite**

Although not strictly part of the Land’s End Granite pluton, St Michael’s Mount is located very close to the main granite mass. St Michael’s Mount Granite is a darkish, coarse-grained biotite granite, often associated with mineralized veins. However, unlike the granites of Land’s End, it contains smaller feldspar megacrysts, less than 15 mm long.

**Tregonning - Godolphin Granites**

The Tregonning-Godolphin Granite mass is relatively small, and occurs in the Tregonning Hill – Godolphin Hill areas, extending south to the coast near Trewavas Head and Megilligar Rocks (where a spectacular very coarse-grained variety called a ‘pegmatite’ occurs). The granite mass is intruded by quartz porphyry dykes and contains mineralised tin and copper veins. Two distinct types of granite make up the Tregonning-Godolphin Granite: Godolphin Granite is a fine-grained variety of biotite granite, containing small feldspar megacrysts; Tregonning Granite is a medium-grained, non-megacrystic lithium mica granite (the only other lithium mica in Cornwall is St Stephen’s Stone, part of the St Austell Granite pluton). Lithium micas are typically pale brown or pale mauve in colour, biotite mica is usually much darker.

Both granite types are usually pale coloured, often in attractive cream hues in which the quartz and mica minerals are prominent. They are also both highly valued and used for local building and memorial stonework.

**Carnmenellis Pluton**

**Carnmenellis Granite**

Carnmenellis is a roughly circular granite pluton, which also includes the satellite granite outcrops of Carn Brea and Carn Marth on its northern edge. The main Carnmenellis Granite (including Carn Brea and Carn Marth Granites) is a coarse-grained biotite granite containing numerous small feldspar megacrysts averaging an approximate length of 20 mm; amounts of biotite and muscovite are approximately equal, the biotite mainly occurs as aggregations of platy crystals. The central area of the Carnmenellis pluton is composed of a different granite; this is a medium-grained biotite with relatively few feldspar megacrysts, in which amounts of muscovite exceed biotite.
**St Agnes Beacon & Cligga Head Granite**

Very small satellite granites outcrop on the north Cornwall coast at St Agnes Beacon and Cligga Head. Both are represented by coarse grained, megacryst-poor biotite granite varieties, a finer-grained granite also occurs at St Agnes (St Agnes Granite).

In addition, the granites at Cligga Head are renowned for their exposures of greisen veins and sheets. Both granites have been greisenized and mineralized, but only the Cligga Head Granite exhibits significant kaolinization. Both are mostly used locally.

**Boswyn Granite**

This granite is a pale coloured, fine-grained variety of the Carnmenellis Granite, poor in feldspar megacrysts. It only occurs in small outcrops at Boswyn and Praze on the western edge of the main outcrop. Carnmenellis Granite has been extensively quarried from the south-eastern part of the pluton around the parish of Mabe, notably from Carnsew quarry which provided the stone used for the exterior of Truro Cathedral. Carnmenellis Granite was also used in the construction of the 16C castles at St Mawes and Pendennis, Falmouth. Several quarries are still actively working the Carnmenellis Granite, but mainly for the production of crushed aggregate, used for general construction work.

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Truro Cathedral, built in 1880 in a gothic style, mainly of Carnmenellis Granite from Carnsew quarry, with carved Bath Stone tracery and ornament. The older (St Mary’s) part of the cathedral is built from types of elvan, including Pentewan and Newham Stones.
St Austell Pluton

St Austell Granite
The granite mass at St Austell is the most complex of all the Cornish Granite plutons, and contains the most varieties of the stone. Essentially, it consists of a central zone of coarse-grained, poorly megacrystic biotite granites, with coarse-grained, megacryst rich biotite granites on its eastern and western margins. In addition to this are central outcrops of fine-grained granite, and a western area of medium-grained, non-megacrystic lithium mica granite. Small satellite granite cusps (comprising mainly fine-grained varieties, with some coarse-grained megacryst poor granite) also occur at Belowda Beacon and Castle-an-Dinas. The main granite quarrying areas were located on the edges of the St Austell Pluton in areas free from the effects of intense kaolinization which produced huge amounts of China Clay (for which St Austell is also famous). Locally quarried ‘St Austell Granite’ can be seen in many buildings throughout St Austell and the surrounding towns and villages, such as Charlestown and Luxulyan.

Luxulyan Granite
Luxulyan Granite was quarried extensively from the Luxulyan valley, notably from Tregarden, Carbean and Colcerrow quarries. Many famous buildings and engineering structures were constructed from it, including Old London Bridge and Plymouth Breakwater. Within Cornwall, it was also used in the exterior of Porphyry Hall, in the construction of Par Harbour and was also one of the favoured building stones used in imposing Victorian railway viaducts, including the Treffry Viaduct (containing 200,000 tonnes of Luxulyan Granite) and the St Austell Viaduct (below). The viaduct is 220 metres long and crosses 35 metres above the Trenance valley. The original viaduct, built by Isambard Kingdom Brunel in the 1850s, had wood tops; its remaining granite pillars can be seen behind the present viaduct.

Luxullianite Granite
A striking and attractive variant of Luxulyan Granite is Luxullianite Granite. This rock consists of deep pink orthoclase feldspar megacrysts in a groundmass of fine black tourmaline crystals with minor biotite. It can be cut and polished and is used primarily for interior ornamental work, as for example, at Porphyry Hall, Fowey, and for the Duke of Wellington’s sarcophagus in St Paul’s Cathedral.
St Stephen’s Stone Granite

In stark contrast to Luxulyan Granite is St Stephen’s Stone Granite from the Nanpean and Hensbarrow areas in the western part of the St Austell pluton. This a non-porphyrctic, pale coloured mainly fine-grained, lithium mica granite, which is typically whitish and represents the palest coloured granite known in Cornwall.

It is also slightly softer than other Cornish granites and is typically used in the construction of church towers in the Nanpean area (such as St Stephen’s) and further afield. For example, the 15C church at Probus (left) is built mainly of St Stephen’s Stone, ashlar, with local slate and greywacke sandstone (from the Porthtowan Formation) used in some walls. The roof is Delabole slate. The stone was also used for some of the older buildings in Lemon Street, Truro.

Hensbarrow Granite

This is essentially a variety of St Stephen’s Stone which contains the accessory mineral turquoise. It was quarried from between Hensbarrow Beacon and Stenalees, and was used in the construction of St Paul’s church, Charlestown.

Carn Grey Granite

Carn Grey Granite is intermediate between Luxulyan Granite and St Stephen’s Stone; it is a pale grey, medium to coarsely-grained biotite granite and poorly megacrystic, the feldspar megacrysts reaching up to 40 mm in length. Fine, evenly-grained forms of this granite from Carn Grey Quarry were reserved for higher graded building work, and it is the predominant building stone used in St Austell. For example, the Market House was constructed in 1844 from Carn Grey Granite ashlar with vermiculated quoins and voussoirs to the ground floor (left).
Bodmin Moor Pluton

Bodmin Moor Granite
This is a distinctive pale coloured, coarse-grained biotite granite, characteristically containing some (> 5%) small feldspar megacrysts ranging from 10-20 mm in length. Occasionally megacryst-rich varieties are also found. The small megacrystic form of Bodmin Moor Granite is characteristic, and is only otherwise encountered in forms of the Cammenellis and Isle of Scilly Granites. Granites along the western margin of Bodmin Moor often exhibit slight foliation. Bodmin Moor Granite is extensively used in buildings both on the moor and surrounding areas. It is also widely exported and used outside of the county. Formerly there were 39 granite quarries on Bodmin Moor, but the main centres of production lie at the Cheesewring Quarries (on the southeast edge of the moor near Liskeard) and the De Lank Quarries (on the southwest edge of the moor near Bodmin). The quarries below the Cheesewring supplied high quality granite which was taken for shipment at Looe via the Caradon railway. Examples of use in construction include famous lighthouses (Eddystone, Bishops Rock, Beachy Head) and bridges (Tower Bridge and Blackfriars Bridge, London).

De Lank Granite
De Lank Granite is a high quality, hard, non-porphyritic, medium-grained biotite granite, often with a light foliation, which has been used in many famous constructions including the Eddystone, Bishop Rock and Beachy Head lighthouses, as well as Blackfriars and Tower bridges in London. It has also been used for producing granite setts and kerbstones. The nearby Tor Down Quarry produced stone for the Britannia Royal Naval College at Dartmouth, and Hantergantick quarry produced stone for architectural and monument work, including the London Stock Exchange and the Tate Gallery.

Kit Hill and Hingston Down
The Kit Hill and Hingston Down Granites lie between the Bodmin Moor and Dartmoor Plutons. The quarries produced a small range of various granites, of which a fine-grained biotite granite is mainly encountered. Two quarry areas occur in the Gunnislake area on the edge of the Tamat Valley.

Although relatively small, this quarry district was an important source of building stone for engineering, architectural and monument use, as well as for setts and roadstone, which were used locally and in Plymouth. Granite from Kit Hill was also used at Battersea Bridge and in the Thames Embankment in London.

Elvans
Elvans (not to be confused with the Greenstone ‘Blue Elvans’ described below) are felsitic igneous rocks similar to granites in composition, but typically much finer-grained. They occur in association with the granite intrusions usually as dykes varying from a few centimetres to tens of metres in thickness. Elvan dykes are remarkably persistent, and may be traceable along strike for many kilometres, so they may not always be related to the granite they are located closest to.

Elvans vary from light grey to light buff or pink in colour and may include large crystals (phenocrysts) of feldspar (up to 30 mm long) or crystal clusters (glomerocrysts) of quartz (up to 5 mm across) – these elvans are called quartz porphyry or feldspar porphyry depending on the composition of the main phenocrysts. The matrix usually comprises very fine grained (0.1 – 0.2 mm, occasionally up to 0.5mm) quartz and feldspar; granophyric or micrographic textures (caused by intergrowths of quartz and alkali feldspar) sometimes occur. Secondary alteration of elvans is common, for example impregnation by iron oxides can cause local variants to have an attractive reddish colour.
Tourmalinization (the replacement of feldspars and micas with tourmaline) or greisenization (altering the feldspar to a fine-grained mixture of quartz and mica) also occurs in some elvans. However, kaolinisation (the alteration of feldspar to clay minerals, including ‘China Clay’) provides the most widespread alteration to elvans, and locally this may be so pervasive that many elvans also had working claypits in close proximity. Elvans are no longer quarried, but their fine grain size enabled them to be easily worked, often in fine detail, and they are among Cornwall’s most distinctive building stones. The non-porphyritic varieties are preferred for finer carved work. The best known elvan quarries were in the Pentewan area, and in medieval times elvan was quarried from a dyke in cliffs at Polrudden Cove which can be traced inland for nearly one kilometre to a large overgrown quarry behind Pentewan village.

**Pentewan Stone**

This is a pale golden-yellow elvan freestone, often tinged pink, which is generally resistant to rainwater and weathering, although prolonged exposure leads to the surface layers of the stone developing a honeycomb texture. Examples of its use include Charlestown Methodist Chapel, the exterior of Place House at Fowey, Anthony House at Torpoint, St Mawes Castle and Pentewan Church (top right) built in 1821 of (elvan) ashlar, with rubble and Pentewan Stone dressings. Particularly fine examples also occur in the porch of St Petroc, Bodmin and the intricate carvings on the 15C tower of St Austell parish church (right).

Many buildings described as being built of Pentewan Stone are actually built of other similar elvan stones sourced from nearby locations such as Polgooth, Sticker and Penrice. These are best referred to as ‘Pentewan-type Stone’ and originate from other elvans which may differ significantly from Pentewan Stone proper, for example by exhibiting small phenocrysts of feldspar. One particular example is provided by the Georgian Penrice House, mid 18th century, near Porthpean (right). This is built of Penrice Stone, a fine-grained whitish variety of Pentewan-type elvan, the source of which has been traced to infilled quarries less than one kilometre away.
Newham Stone
Another important elvan was quarried at Newham, just south of Truro. This is a pale yellow or creamish stone extensively used in the 18th and 19th century. Many of the older buildings in Truro are constructed of Newham Stone, notably much of Lemon Street (above), the Royal Hotel and part of the early 16C St Mary’s church, now incorporated into Truro Cathedral.

Tremore Stone
A particularly attractive porphyritic elvan, with prominent phenocrysts of white feldspar and quartz set in a fine-grained red or pinkish matrix with spherulitic growths of black tourmaline, was extensively quarried at Tremore, near Withiel. Tremore Porphyry has been used as an external building stone, as in the front of the West Hill Baptist Church at St Austell, (left) built in 1899 from very distinctive reddish Tremore Porphyry (elvan) roughly coarsed and squared blocks, with vermiculated quoins and dressings of St Austell Granite (Carn Grey type).

It has also been polished as a decorative internal stone (King Arthur’s Hall in Tintagel, also Porphyry Hall, Place House, Fowey and alcoves at Osborne House on the Isle of Wight). Cornish elvan dykes have been worked at many other locations, and wherever a suitable stone occurs it has often been quarried along its outcrop, producing an elongate excavation rather like a railway cutting. Other examples of the local use of elvan occur at Warleggan, St Agnes and St Colomb Minor.
Warleggan Stone

A porphyritic elvan (Warleggan Elvan) was used extensively in that village and the local church, St Bartholemew’s. Here, most of the medieval building would have used locally derived ‘moorstone’ before a quarry was properly opened. An elvan extending from Davidstow Woods to Rock, on the Camel Estuary (a distance of approximately 24 kilometres), was extensively quarried and used for railway bridges between Camelford and Wadebridge, as well as for many other village chapels and halls along its length.

Greenstones

‘Greenstone’ is a convenient name for a variety of basic (low silica content) dark coloured, intrusive igneous rocks, that have a variety of mineralogies, and are often referred to as dolerites or diabases in the geological literature (e.g. Floyd et al, 1993). Greenstones contain significant amounts of dark ferromagnesian minerals, and consequently are often very dark green or dark blue, near blackish, in colour. Quarryworkers, especially in West Cornwall, sometimes refer to such rocks as ‘Blue Elvan’. Greenstones commonly occur as intrusive dykes or sills in the country rock, and where they cooled quickly or are affected by contact metamorphism around granites, they are finely crystalline, extremely resistant and characteristically form prominent features in the landscape. Greenstones were some of the earliest building stones used in Cornwall and have been extensively quarried.

Cataclews Stone

One of the best known examples is Cataclews (or Catacleuse) Stone which has been used as a building stone since Norman times. It is a very dark blue-green rock sourced from a dolerite dyke intruded into coastal Devonian slates at Cataclews Point, Harlyn Bay. The grain size is variable, and the medieval stonemasons seem to have preferred the finer-grained variety for carving and decorative work. Cataclews Stone has been used externally in a number of older buildings in and around Padstow, and also in local churches such as St Petroc, Padstow and St Merryn. Where the stone has been used for external carvings, it has demonstrated strong resistance to weathering.

Cataclews Stone has also been used for internal work, notably fonts, as at St Petroc’s Church, Padstow. The 15C church tower at Merryn, near Padstow, is built of local Devonian slates (from the Trevose Slate Formation) with Cataclews Stone buttresses, quoins and decorative angels. The greenstone was sourced from nearby coastal quarries at Cataclews Point, Harlyn Bay.
**Tregongeeves Stone**
A series of Greenstone (dolerite) intrusions also occur in the Pentewan valley, and were quarried at Tregongew and Tregongeeves (Tregongeeves Stone). The stone here is a very dark green, almost black rock rich in the ferromagnesian minerals hornblende and pyroxene. It was quarried mainly for aggregate, but some buildings in St Austell were constructed from the stone, including the former Public Rooms in Truro Road, and the Freemasons Hall in South Street.

**Serpentinites**
Some Cornish basic (and ultrabasic) intrusions have been affected by hydrothermal alteration (termed carbonisation) in which the original olivine minerals have been altered to complex mixtures of talc, chlorite and carbonates. Such rocks, called Serpentinites are typically quite soft and porous, and susceptible to frost action, so they are rarely employed for external building purposes.

**Polyphant Stone**
At Polyphant, near Launceston, the carbonatized intrusion has been worked since Norman times. However, as demonstrated at Launceston Priory and Castle, Polyphant Stone weather poorly in external use, but it can be polished to give a dark green shiny stone which is very well suited for carving and internal decorative work. Many Cornish churches have interior features made of Polyphant Stone, notably the Boer War memorial in Truro Cathedral and the north porch arch at St Llullwy, Menheniot. Polyphant Stone has also been extensively used outside of Cornwall, for example for the tomb of Archbishop Temple in Canterbury Cathedral and some of the columns in Exeter Cathedral.

**Duporth Stone**
Another carbonatized rock that has been used is Duporth Stone, which crops out as a sill-like feature in cliffs at Duporth Bay, near St Austell, where it has intruded into lower Devonian Slates of the Meadfoot Group. Duporth Stone is paler than Polyphant Stone, usually greenish-grey in colour, and has a coarsely speckled texture. It has been used primarily for internal work, for example, for pillars in Truro Cathedral, the Rood Wall in St Paul’s church at Charlestown, and in the north arcade in Holy Trinity church, St Austell.

**Volcanic Lavas**

*Kingsand Rhyolitic Formation*

**Kingsand Rhyolite**
Many of the older buildings in Kingsand and Cawsand (on the Cornish side of The Sound opposite Plymouth) are constructed of characteristic reddish brown, fine-grained lava (rhyolite) and conglomeratic sandstones belonging to the Kingsand Rhyolitic Formation. The Kingsand Rhyolite extends over an area of nearly one square kilometre, including along the foreshore, and gives a distinctive character to the parts of these villages where the stone is utilised. The stone is generally not very hard, and can be trimmed for use as rubble masonry; typically it is used as coarse irregular blocks and rubblestone.

The Institute and Clock Tower, 1911, (below) situated at the water front at Kingsand, provides an excellent example of this local building stone, using roughly coursed and squared blocks of distinctively red-coloured lava and sandstones (belonging to the Kingsand Rhyolite Formation). The dressings are of Devonian limestone probably sourced from the Plymouth area. Another example of its use is afforded by the sea-wall constructed from large dressed blocks and pebbles of Kingsand Rhyolite, standing partly on the natural outcrop of the Kingsand Rhyolitic Formation.
The Lizard Complex

The Lizard Peninsula provides the best example in Britain of an ‘ophiolite complex’ (a suite of rocks originating from oceanic crust and part of the underlying upper mantle) and includes ultrabasic peridotites, layered and massive basic gabbros, basaltic dykes, pillow lavas and associated cherts. On the Lizard, this sequence has been affected by thrusting and faulting, partial melting (producing the Kennack Gneiss) as well as serpentinization, in which circulating hydrothermal water replaced original minerals (such as olivine and pyroxene) by minerals of the Serpentine group. These altered rocks are known as serpentinites, and are largely composed of serpentine with chlorite, tremolite and talc.

Serpentinite

Serpentinite is a relatively soft rock, often attractively marbled and banded green and red, and can be easily carved and polished. It has been extensively used for decorative purposes and ornaments since the 19th century. The first factory opened at Poltresco in 1866 making polished serpentinite souvenirs for tourists; craftsmen still work in the area today.

Although serpentinite has been used for internal features in local churches (such as fonts, intricately carved lecterns and pulpits, as at Grade church), it also has been used locally as a building stone, particularly the massive serpentinized form (called dunite serpentinite) which is easier to work than tremolite-serpentinite which has a tendency to shatter when worked. The mainly 15th to early 16C church towers at Grade Ruan Minor and Landewadnack are mainly built of large blocks of serpentinite (sometimes with accompanying granite), or serpentinite ashlar in the case of St Melaines, Mullion. Other houses and buildings in Mullion, such as the former Wesleyan chapel, 1840 (below), are constructed of large, roughly cut and dressed blocks of dark greenish and bluish serpentinite, often in combination with granitic quoins and lintels. Another good example is the Three Tuns Pub, St Keverne.

A mixture of other building stone are frequently used in other villages on the Lizard; these take advantage of the local geology which varies within short distances. They include:

Kennack Gneiss

Kennack Gneiss is a pale greyish granitic gneiss characteristically composed of alternating bands of dark (hornblende or biotite) and light (quartz and feldspar) minerals; unlike typical Cornish Granites, the quartz and feldspar components are seldom found in association with muscovite or biotite micas. Being closely jointed, this rock does not provide large blocks for building purposes, but it is used as a general walling stone at Erisey, Gwendreath and Clahar, and was formerly dug from pits in these areas. An intensely red coloured variety occurs at Kynance.

St Keverne Gabbro

St Keverne Gabbro is a coarsely crystalline gabbro, often dark grey-green in colour composed of dark bronze pyroxene, grey feldspar and greenish actinolite. A characteristic variety at Coverack (called troctolite) contains dark red serpentinite with white feldspar spots. The gabbro is quarried at St Keverne and is a hard, durable, resistant rock. Some is used locally as a general purpose building dimension and walling stone, but is also employed as an armourstone (in gabions and sea defence works) as well as for aggregate.

Hornblende Schists

Hornblende Schists cover considerable areas of the Lizard Peninsula, especially coastal areas south of Lizard town, and around Landewednack and Traboe. Typically dark green to blackish rocks, rich in hornblende, with thin feldspar layers (folia), these schists split readily into thin, flat, parallel slabs suitable for rough walling. However, they are rarely sufficiently durable for use as a building stone.
**Devonian - Carboniferous**

**Sedimentary & Metasedimentary Rocks**
Most of the sedimentary rocks in Cornwall were originally deposited in deep marine basinal areas during the Devonian and Carboniferous periods. Subsequently, many of these rocks have become metamorphosed either by proximity to the younger granite intrusions, or by changes due to the thrusting and faulting caused by a period of intense tectonic activity called the Variscan Orogeny. The geology and stratigraphy of the sediments and metasediments is highly complex. Current evidence indicates that the sequences are related to the development of distinct basins which have been tectonically juxtaposed, and within which, a series of main thrust sequences (termed nappes) occur. Bristow (2004) provides a useful summary of the sequence and the various formation names employed; more detailed descriptions of the stratigraphy and evolutionary developments in the various basins are given by Hollick et al, (2006) and Leveridge & Hartley (2006), and references therein. However, for the purposes of describing Cornish building stones, it is simplest and most convenient to divide the relevant rocks very generally into ‘Slates’, ‘Sandstones’ and ‘Limestones and Sandrock’.

**Cornish Slates**
Slates (locally termed ‘killas’, especially in the mining districts) are extensively used in Cornwall for building, both for walls and roofing, and are the most convenient stone to use for such purposes outside of the main granite areas. Slates are produced by low grade metamorphism of former mudstones, and their quality (dependant largely on the quality of the cleavage) varies from quarry to quarry reflecting the original differences in the source basin sediments.

Typically, an older Cornish house located away from a granite moorland is constructed of slate rubblestone, possibly with granite or elvan dressings. Slate hung walls are a common feature on some cottages, particularly on west/southwest facing walls or the upper parts of walls, to protect buildings from the prevailing rain-bearing winds. The slate used in the houses in the foreground is mainly Delabole Slate, the darker slate used in houses further along the street made be from Carnglaze. Other common uses for slate include roofing, porches, memorials and wall boundaries. In St Tudy, northeast of Wadebridge, large vertical slate slabs are pinned together with iron clamps to form boundary walls between adjoining gardens. Slate is still used in modern Cornish buildings, perhaps as often for decorative facings, as for construction purposes, as can be seen in the modern vernacular apartment suite constructed at Headland Road, Newquay (below), using local Devonian slates and sandstones as facing and building stone for walls Slates used for building purposes occur through much of the Devonian and Carboniferous succession in Cornwall.
Devonian

Meadfoot Group

Bovisand Formation

Lower Devonian slates from the Bovisand Formation (Meadfoot Group) have been quarried from several locations around Newquay and the St Austell / east Cornwall areas. They are used locally although are not of high quality due to their pyrite content. Slates quarried from Holmbush, near St Blazey, have a distinctive reddish colouration (caused by iron oxides) and have been used in St Blazey church and St Blazey Gate.

Trevose Slate (St Issey Stone)

Quarries around Wadebridge, including Tedinnick and Cannalidgely, yield large quantities of Middle Devonian Trevose Slate. They also are the source for the famous St Issey Stone, a pale grey-green sandy slate that weathers to a distinctive rusty brown colour.

Many of the buildings in St Issey, including the church and former 19th-century chapel, are constructed of local Devonian Slates (Trevose Slate Formation), including St Issey Stone (below). It is also much used for constructing ‘Cornish hedges’ and alongside roads where a natural stone finish is required.

Saltash Formation

Carnglaze Slate

Mixed rusty and silver-grey coloured slates from the Saltash Formation are currently quarried at Westwood and Lantoom near Dobwalls, Liskeard. They are used locally for building and walling purposes. In the 19th century, slate from the Saltash Formation was also quarried from a series of three main underground caverns at Carnglaze, near St Neot. Carnglaze Slate has a distinctively even, deep blue-grey colouration, and was used primarily as a roofing slate over a wide area from Plymouth to Penzance.
**Tredorn Slate Formation**

**Delabole Slate**
The best known and highest quality roofing slate in Cornwall is Delabole Slate from the Upper Devonian Tredorn Slate Formation. Delabole Slate is hard, has a well developed cleavage and a distinctive silvery-grey colour with an almost silky lustre. Delabole Quarry has been the source of slate for over 600 years and is one of the largest slate quarries in England, being 130 metres deep, and more than 2 kilometres in circumference. It has been the source of exceptional quality slate for local, national and international markets, and has been worked continuously since Tudor times – a considerable export trade for the stone already existed in 1602.

**Trevillet Slate**
Trevillet Slate (also known as Tintagel Slate) has been won from several quarries including Trevillet, the Prince of Wales and Bolehill, from the 19th century. However, apart from Trevillet quarry, all are currently inactive. The slates are distinctly greyish-green in colour with brown oxide coatings on their cleavage and joint planes. Cliffside Quarries between Tintagel and Trebarwith Strand provided a source of slate back to the 17C, and good quality roofing slate was once extracted from this area. Other quarries in the Tredorn Slate Formation occur to the west of Boscastle. These yielded finer and harder greenish grey slates from quarries at the base of the sea cliff. Extracted slates were hauled by cable to the cliff tops and then exported via Boscastle Harbour, although some were used locally.

**Teign Valley Group**

**Trambley Cove Formation**
Very dark, blackish slates from the Lower Carboniferous Trambley Cove Formation were also quarried from near Boscastle and used extensively as building and roofing stone in Boscastle and the surrounding area. Many former old quarries in the Launceston area, such as Bangor Slate Quarry, yielded slates and slate slabs from the Crackington Formation. These were used as general building stone in the Launceston area, although nearly all the quarries are now abandoned.

**Cornish Sandstones**

**Devonian**

**Staddon Formation**

**Staddon Grits**
In southeast Cornwall, Lower Devonian sandstones from the Staddon Formation have been worked on a small scale from quarries at Lower Clicker and Landlooe Bridge. They are used for local building and walling purposes in the Kingsand area, south of Polbathic and near Maker.

**Portscatho Formation**

**Portscatho Sandstone**
In south Cornwall, sandstones from the Middle Devonian Portscatho and Grampound formations have also been used as local, general purpose building stones. Portscatho Sandstone is very durable, and has been used in St Gerran’s church at Portscatho, Tregony, Trewarthenick House near Tregony, and in the 16C castle at St Mawes.

**Grampound Formation**

**Treworgans Sandstone**
Most of the older buildings in the village of Grampound and adjoining areas as far north as Mitchell, have been constructed from Treworgans Sandstone (Grampound Formation). Much of this sandstone was probably quarried from Tredinnick, just north of Grampound; freshly cut surfaces are bluish-grey in colour, but over time weather buff-brown.
Gramscatho Group

Porthtowan Formation

Porthtowan Sandstone
The predominant building stones used in Mevagissey are greywacke sandstones (Porthtowan Sandstone) and slaty mudstones belonging to the Middle and Upper Devonian Porthtowan Formation. A mixture of Middle and Upper Devonian sandstones, derived Ordovician-aged quartzitic sandstones and other rock types (including igneous cobbles and slaty rubble from the Roseland Breccia has been used for older buildings in Veryan and Gorran Haven (along with Pentewan Stone in St Goran’s church).

Carboniferous

In north Cornwall, several quarries (some still active) work Upper Carboniferous sandstones from the ‘Culm Measures’ succession. Much of the stone is now used as crushed aggregate, but formerly several sandstones were employed for traditional building purposes in the local area, including Cansford Sandstone (from the Crackington Formation) and Pigsdon and Herdbury sandstones (from the Bude Formation).

Cornish Limestones & Sandrock

Limestones which can be used as building stone are almost absent from Cornwall, apart from a few very small Carboniferous aged outcrops in the Launceston area, and around Veryan and Trevone, although here the beds were mainly exploited in the 18th and 19th century to provide agricultural lime. Historically, Devonian limestones from the Plymouth area were brought into Cornwall for building purposes (especially in the coastal towns and villages on the south coast) and also for burning to make lime for agricultural purposes.

Quaternary

The deficiency of lime-bearing rocks near the north Cornish coast was overcome by using local beach sands, which are typically fine-grained and have a high bioclastic content. This type of sand forms the dunes north of Hayle, at Perranporth and many of the beaches on the north coast.

In places these Quaternary beach sands are cemented by calcium carbonate and characteristically form a raised beach, notably at Godrevy Point near Hayle, at Harlyn Bay, in the Padstow Estuary and on the north side of Fistral Bay, Newquay. This ‘Sandrock’ is just about sufficiently hard enough to be used as a building stone, and it represents one of the geologically youngest freestones (approximately 150,000 years old) to be used in Britain. Sandrock has been used in the construction of some churches in these coastal areas, notably in the 12C St Carantoc’s church at Crantock (below). The original church tower at Crantock collapsed shortly after it was built in the 14C, providing an unfortunate but apt lesson on the structural limitations of using Sandrock as a building stone, built mainly of local Devonian slate and sandstone rubblestone, with roughly dressed Quaternary sandrock blocks and quoins; roof of Delabole Slate. The golden-yellow colour of the sandrock is best seen around the main porch and internal doorways. The source of this particular Sandrock may lie behind Crantock beach, but it has subsequently become covered with blown sand since being worked in medieval times.
Minestones and Veinstones

A significant amount of stone used in older buildings and walls in the Cornish mineralized areas comes as waste from metalliferous workings. Early medieval structures often use stones that have apparently originated from former tin workings, and 18th or 19th century buildings often use stones from underground mining. For example, an old wall at Sandy Hill, near St Austell, is partly composed of veinstone from the nearby Charlestown United Mine, and of tourmalinized killas from stream tin workings in the Sandy valley. A white quartz stone is often used in buildings in Cornwall north of the Camel Estuary and southwest of Truro, around Kea. One possible source of this may be veinstone from the local area.

Cornish Hedges and Dry Stone Walling

Cornish Hedges and dry stone walls are a key part of the character and local distinctiveness of the county’s landscape. Styles vary, but essentially the traditional Cornish Hedge consists of two outer courses of stone built with a soil filled core (rab), the sides often have an inward curve for stability. Uniquely, vegetation is encouraged to grow on the top by turfing; on exposed sites, vegetation may be limited to low growing herbaceous plants and stunted shrubs such as gorse, however, in more sheltered area they can support a wider range of species including larger shrubs and small trees.

As Cornish Hedges are ubiquitous across the county, examples of all the principal stones described in this report have been used in the construction of Cornwall’s Hedges: moorstone in the granite uplands (especially Bodmin Moor), slates from the metamorphic areas (such as the Tintagel or Delabole areas), mine and veinstone from the mining areas (such as St Agnes and Botallack), and local gabbro, serpentinite and hornblende-schist on the Lizard.

Where slate or large granite boulders are available, dry stone walling is practised, and some of this dates back to prehistoric time (as at west Penwith). Large granite cobbles are extensively used in walls on Tresco, characteristically in a pattern with lower courses laid horizontally, topped with a course laid vertically. Walls constructed from flat, well cleaved slates, often have a different construction pattern to other Cornish Hedges. To counteract their tendency to bulge, an alternating ‘herringbone’ form of construction was commonly used, producing an attractive textural and visual pattern. The herringbone styles are known colloquially as ‘Jack and Jill’, ‘Darby and Joan’ or ‘Kersey Way’.

A mature Cornish hedge and wall at Angarousse Cliff, Polurrian Cove, constructed of local Devonian slates and irregular blocks of serpentinite.
Glossary

Actinolite: A bright to gray-green member of the amphibole mineral family. In addition to silica, it contains calcium, magnesium, and iron.

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.

Basaltic ‘dykes’: A dark, fine-grained, extrusive (volcanic) igneous rock with a low silica content (40% to 50%), but rich in iron, magnesium and calcium. Generally occurs in lava flows, but also as dykes. Basalt makes up most of the ocean floor and is the most abundant volcanic rock in the Earth’s crust.

Bioclastic: Term used to describe fragments of any skeletal material e.g bioclastic limestone, bioclastic sandstone.

Biotite: A common rock-forming mineral of the mica family. Biotite is a black or dark brown silicate rich in iron, magnesium, potassium, aluminum, and, of course, silica. Like other micas, it forms flat book-like crystals that peel apart into individual sheets on cleavage planes.

Buttress: A projection from a wall and bonded to the wall to create additional strength and support.

Carbonate: A general term used for sedimentary rocks consisting of 50 per cent or more of either calcite (calcium carbonate) or dolomite (magnesium carbonate).

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

Chert: Hard, resistant beds or nodules composed of cryptocrystalline silica. The use of the term flint is restricted to nodules and beds that occur only in Chalk (Upper Cretaceous) rocks.

Chlorite: Family of platy silicate minerals containing various amounts of magnesium, iron, aluminum, water, and small amounts of other elements.

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).

Cobbles: Rounded rock clasts (of any lithology) between 64 mm and 256 mm in size.

Conglomerate: A sedimentary rock made up of rounded pebbles (>2mm), cobbles and boulders of rock in a finer-grained matrix.

Diabases: An American term for Dolerite.

Dolerite: Medium grained basic igneous rock found as small to medium sized intrusions.

Elvans: A Cornish mining term for a Dyke cutting Granite.

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

Ferromagnesian: Containing iron and magnesian.

Granite: Coarsely crystalline igneous rock, composed primarily of quartz, feldspars and micas, with crystal sizes greater than 3 mm.

Foliation: Aligned layers of minerals characteristic of some metamorphic rocks. Foliation forms in metamorphic rocks when pressure squeezes flat or elongates minerals so that they become aligned. These rocks develop a platy or sheet-like structure that reflects the direction that pressure was applied.

Freestone: Term used by masons to describe a rock that can be cut and shaped in any direction without splitting or failing.

Gabbros: A black, coarse-grained intrusive igneous rock that is the compositional equivalent of basalt. Composed of calcium-rich feldspars, pyroxene and possibly olivine, but containing little if any quartz.

Gneiss: A coarse-grained, foliated metamorphic rock that commonly has alternating bands of light and dark-colored minerals.

Granophyric texture: A small-scale graphic texture.

Greenstones: A low-grade metamorphic rock that frequently contains green minerals such as chlorite, epidote and talc.

Greisenized: The process of Greisen formation.

Herringbone: When any stone, timber or brick building material is laid aslant instead of being bedded flat, and is found in paving, nogging and walling.

Hornblende: Always has aluminum and is a most common dark green to black variety of amphibole; it forms in many igneous and metamorphic rocks.

Hydrothermal: Refers to heated (thermal) water (hydro).

Igneous: 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).

Intruded: A body of igneous rock formed from molten magma that has been injected into pre-existing rock.

Lava: Magma that reaches the Earth’s surface through a volcanic eruption. When cooled and solidified, forms extrusive (volcanic) igneous rock.
**Limestone**: A sedimentary rock consisting mainly of calcium carbonate (CaCO₃) grains such as ooids, shell and coral fragments and lime mud. Often highly fossiliferous.

**Lithium-mica**: A pink or lilac, lithium-bearing Mica found in Granite rocks and Pegmatites.

**Lithology**: A basic description of the material features of a rock, generally as seen with the naked eye, but also including microscopic features. Commonly occurring sedimentary lithologies are sandstone, siltstone, mudstone and limestone; commonly occurring igneous lithologies are granite, diorite, dolerite and basalt.

**Megaliths**: An enormous stone, usually standing upright or forming part of a prehistoric structure.

**Menhirs**: A large upright standing stone.

**Metalliferous Mineralisation**: A type of geological process (see also Mineralisation) which causes the formation of metal-bearing minerals, such as copper, tin, lead or zinc ores.

**Metamorphosed**: An alteration of the minerals, textures and composition of a rock caused by exposure to heat, pressure and chemical actions.

**Metasedimentary**: A sedimentary rock that shows evidence of having been subjected to metamorphism.

**Mica**: Group of silicate minerals composed of varying amounts of aluminum, potassium, magnesium, iron and water. All micas form flat, plate-like crystals. Crystals cleave into smooth flakes. Biotite is dark, black or brown mica; muscovite is light-colored or clear mica.

**Micrographic**: As seen through a microscope.

**Mineralisation**: The formation of minerals. New minerals may be added to fractures and empty spaces in a rock or by replacing preexisting minerals with different ones.

**Minestones**: The solid residual material resulting from mining of coal. It is likely to contain varying proportions of sandstone, shale, mudstone and coal fragments.

**Muscovite**: One of the mica family of minerals. Muscovite is light-colored or clear mica, sometimes called isinglass.

**Orthoclase**: A variously coloured feldspar.

**Peridotite**: A dark-colored, coarse-grained igneous rock that is made up mainly of olivine and pyroxene, with very little quartz or feldspar. Picture of Peridotite.

**Phenocrysts**: A relatively large and usually conspicuous crystal, surrounded by smaller crystals that form the main fabric of an igneous rock.

**Plagioclase**: A member of the feldspar mineral family. Plagioclase feldspars are silicates that contain considerable sodium and calcium. Feldspar crystals are stubby prisms, generally white to gray and a glassy lustre.

**Platy**: Describes minerals that crystallize in thin sheets and tend to flake along cleavage planes.

**Porphyritic**: An igneous rock texture characterized by larger crystals (phenocrysts) in a matrix of distinctly finer crystals (groundmass).

**Quartz Porphyry**: The name given to a group of hemi-crystalline acid rocks containing porphyritic crystals of quartz in a fine-grained matrix.

**Pyrite**: Forms silvery to brassy metallic cubes or masses. Common in many rocks. Known as fool’s gold. Weathered pyrite produces limonite (iron oxide) that stains rock brown or yellow.

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

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

**Rubble**: Rough, undressed or roughly dressed building stones typically laid uncoursed (random rubble) or brought to courses at intervals. In squared rubble, the stones are dressed roughly square, and typically laid in courses (coursed squared rubble).

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

**Sandrock**: A rock made of cemented sand.

**Schists**: Metamorphic rock usually derived from fine-grained sedimentary rock such as shale. Individual minerals in schist have grown during metamorphism so that they are easily visible to the naked eye. Schists are named for their mineral constituents.

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

**Serpentinites**: A rock composed mainly of serpentine minerals with minor brucite, talc, oxide and carbonates.

**Serpentinization**: Serpentinite is a rock composed of one or more serpentine group minerals. Minerals in this group are formed by serpentinization, a hydration and metamorphic transformation of ultramafic rock from the Earth’s mantle.

**Spherulitic**: Small, rounded bodies that commonly occur in vitreous igneous rocks. They are often visible in specimens of obsidian, pitchstone and rhyolite as globules about the size of millet seed or rice grain, with a duller lustre than the surrounding glassy base of the rock.
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.


Tracery: An architectural term used primarily to describe the stonework elements that support the glass in a Gothic window. The term probably derives from the ‘tracing floors’ on which the complex patterns of late Gothic windows were laid out.

Topaz: Found in Granite and used as a gem.

Tourmaline: A hard, variously coloured crystalline borosilicate mineral.

Veinstones: Rock or mineral matter occurring in a vein.

Vermiculated: Architectural term describing the way a block of stone has been worked, having the appearance of being eaten by worms, anything with irregular wavy lines.

Voussoirs: A wedge-shaped stone or brick forming part of an arch or vault with its radiating sides coinciding with the radii of the arch.

Zircon: Mineral of zirconium, silicon, and oxygen (zirconium silicate). Generally glassy-looking, microscopic, four-sided prisms. Most commonly formed in igneous rocks.

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Further Reading


BGS Memoirs


