
The built environment

The built environment includes houses, farms, churches, graveyards, schools and other public, industrial and commercial buildings, roads and highway structures. In the context of the North Pennines AONB it embraces vernacular architecture as well as countless miles of drystone walls and, underground, many miles of stone-arched mine tunnels and shafts. Where natural materials have been employed in their construction, all may legitimately be viewed as components of the area's geodiversity.

The built environment and geodiversity

The nature and appearance of stone-built structures in any area is directly related to the physical characteristics of the available rocks and the constraints those characteristics may impose on their potential use as constructional materials. Whereas it is generally appreciated that the character of local buildings is an important element in determining the character of a landscape, it may not be so readily appreciated that those buildings, and the material they contain, must be viewed as key components of the area's geodiversity. Built structures thus provide readily accessible opportunities to demonstrate the characteristics of a variety of local rock types.

Geological materials sourced from outside an area may be regarded as offering another useful dimension to the area's geodiversity. These materials may have been employed for specific purposes for which there are no suitable materials within the area. They may have been selected for aesthetic reasons. Recognition of the exotic nature of such stones, and understanding their original sources, is important in studies of the built environment and may be of practical application in planning repair or restoration work.

All of the geological materials employed in built structures can contribute greatly to an appreciation of the importance of the Earth's resources through understanding the properties and limitations of these materials. They are thus a potentially valuable educational resource.

Materials used in the built environment of the AONB

Despite the varied geology of the AONB, the range of rock types suitable for building is rather restricted. The main rock types employed are:

Sandstone

The most commonly used stone in the North Pennines. Most of the sandstones used have been derived from the Carboniferous succession, though Permo-Triassic sandstones have been employed on the margins of the Vale of Eden, and locally elsewhere. Sandstones were mainly obtained either from quarries opened in the nearest available outcrop, or from clearance stones.

Almost any reasonably durable sandstone can be used for wall construction. Where stone was required for roofing, the choice of material, and source of supply, was rather more limited.

A feature of many North Pennine villages and farms is the use of sandstone slabs for roofing. The number of sandstones able to provide these was much more limited than those for walling stone. Although some roofing slab quarries can still be identified, the location of most of these is now lost. One small quarry, at Ladycross, just beyond the AONB boundary, continues to produce slabs suitable for roofing. This quarry is known to have been the source of roofing stone for many buildings within the AONB, notably those in Blanchland.

The builders of the many miles of drystone walls typically sought stone as close to the construction site as possible. A feature of many walls is the presence, at intervals along the course of the wall, of small pits from which stone was obtained, either from rock outcrops or from boulders within the superficial deposits.

A major use of building stone in the 18th and 19th centuries was in lining and supporting shafts and adit levels in the area's lead mines. The full scale of this commonly forgotten craft can only be appreciated underground in the many miles of adits which remain accessible, even after centuries of disuse and neglect. That so many of these stone-lined structures survive is a clear tribute both to the materials used and the highly skilled masons responsible for their construction. As the main mine shafts and adits were designed to serve for many years as the main access ways for the mines, considerable care was given to their design, construction and selection of the materials used. Waste rock from the mines was rarely, if ever suitable. Instead, specially quarried stone was taken underground for the purpose. Rather flaggy sandstone, capable of yielding parallel-sided slabs, was preferred. Quarries from which such stone was obtained can be identified close to many mines.

Sandstone setts were commonly used to pave roads in major settlements. Their use is today best seen in Alston, where Namurian sandstone from Flinty Fell Quarry at Nenthead provides an effective paving surface on the town centre's steep roads.

Limestone

Except in the Kirkby Stephen area, where it is a comparatively common building stone, limestone has not generally been widely employed for building in much of the AONB. Limestone appears to have been commonly reserved for making of mortar.

The unique coral-rich limestone, known as 'Frosterley Marble' (see Frosterley Marble, below), obtained from the Great Limestone, has been an important source of ornamental stone.

Dolerite ('Whinstone')

Although an extremely durable rock, the dolerite of the Whin Sill has never been widely employed as a building stone, except in drystone walls on or close to its outcrops. This almost certainly reflects the hard, intractable nature of the stone, making it difficult to work.

Although little used for building, Whin Sill dolerite has long been employed as a good quality roadstone. Large abandoned quarries mark its outcrop in Teesdale. Force Garth Quarry, close to High Force, is today a major producer of crushed Whin Sill dolerite for road surfacing. Most of the roads in the area are surfaced with tarmac-coated dolerite.

Clearance stones

Clearance stones from fields have locally been an abundant source of stone. Walls and buildings constructed from such stones can generally be recognised from the very varied nature of the stones and commonly the rather rounded outlines typical of boulders recovered from superficial deposits. These contrast with the angularity of freshly quarried blocks.

Imported geological materials used in the built environment of the AONB

For most purposes there were few incentives to import stone into the AONB. The area has few buildings for which design specifications may have required the costly acquisition of such materials. However, some examples of imported stone are to be found.

Whereas sandstone slabs are perhaps the most characteristic roofing material in older buildings in the AONB, a significant number of slate roofs can be seen. Most common are Welsh slates, recognisable by their distinctive dark purplish grey colour. Fine examples can be seen at Hunstanworth. Lake District 'green slate' derived from the Borrowdale Volcanic Group, is employed locally, for example on the old school at Blanchland.

Building stones from outside the area are uncommon, though some good examples of Penrith Sandstone can be seen in a bank in Alston.

A variety of exotic stones, perhaps including some from overseas, may be seen employed in gravestones, and to a limited extent as ornamental stones churches. A conspicuous example is the use of polished Shap Granite pillars in St Augustine's Church, Alston.

Pillars of polished Shap Granite, St Augustine's Parish Church, Alston. © B. Young, BGS, NERC.

Impact on the landscape

Building design, and the materials used, have had a significant impact on local landscape character. The settlement pattern in the North Pennines is basically an agricultural one, overlain by, but not always submerged by, the industrial activities and mineral workers' settlements developed mainly over the last 250 years. The pattern of rural building existing today varies through the AONB from the scattered farmsteads of the Strathmore and Raby estates in Teesdale to the more dense lead mining and subsistence smallholdings of the Nent and Allen Valleys and Weardale.

The North Pennines has listed buildings ranging from Anglo-Saxon times to the Victorian era. The greatest number belong to the 18th and early 19th Centuries, which is a reflection of the high standard of architecture and the high survival rate of buildings of those times, partly because of their relatively recent construction. This is also a note-worthy period for the variety of buildings which are listed. These include great country houses like Horsley Hall, town houses like those in Alston and Middleton-in-Teesdale and village cottages like those at Wearhead, Melmerby or Allenheads. Earlier buildings are not so common, simply because time has taken its toll. In most instances it is only the more substantial and higher status ones which have survived, such as manor houses (eg Stanhope Hall), bastles (e.g. Monk, West Allendale) and churches (e.g. Blanchland).

The composition of drystone walls typically closely mirrors the local geology. In places the drystone walls give important clues to the underlying geology where this may not be clearly visible.

Impact on biodiversity

Rocks in walls and buildings provide important substrates for a variety of lower plants, including mosses and lichen and nest sites and shelter for several bird species and small mammals.

Selected references

Forbes, Young, Crossley and Hehir, 2003; Johnson and Dunham, 1982; North Pennines AONB Partnership, 2004

Figures

(Figure 66) Croglin. Use of local sandstone including St. Bees sandstone from the village quarry. Charlie Hedley © Countryside Agency (Figure 67) Blanchland – use of locally worked sandstones as building and roofing stone' © B. Young, BGS, NERC (Figure 68) Pillars of polished Shap Granite, St Augustine's Parish Church, Alston. © B. Young, BGS, NERC.

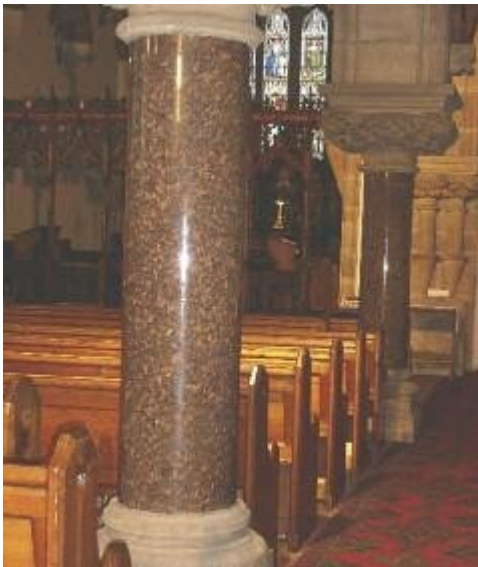
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Croglin. Use of local sandstone including St. Bees sandstone from the village quarry. Charlie Hedley © Countryside Agency.



Blanchland – use of locally worked sandstones as building and roofing stone' © B. Young, BGS, NERC.



Pillars of polished Shap Granite, St Augustine's Parish Church, Alston. © B. Young, BGS, NERC.