



Journey through the Valley of Stone

... a living history

Rapid growth and a new era of quarrying

Quick Facts

In the 1780s the development of steam engines and new railways meant that towns and industries, all needing stone, could grow quickly. Steam engines were a very important part of the Industrial Revolution, and were used in a variety of industries from mills to mining, improving productivity and technology, and crucially allowing transport of goods by rail.

In the Rossendale valley, the first railway was built in 1846, 16 years after the Liverpool-Manchester railway. As well as goods and materials for industry, rocks and stone for building could now be moved around more easily, both locally, to other parts of the country, and abroad. This meant there was a rapid expansion in hillside quarrying, with the stone being transported to build towns and cities all over Britain. At its peak from 1870–1890, stone quarrying was the third largest workforce in Rossendale, with over 3000 men employed.

Somebody's been along and rubbed out some of the words on our information sheets — can you fill in the gaps?

In order to transport stone from the quarries high on the hillsides to the railways below, many miles of ..tramways.. were constructed down steep inclines. These tramways were not steam powered, but used long ...wire ropes... attached to circular drums at the top, and the weight of ..wagons..to lower the stone down.

Stone was now needed on a much larger scale for:
(name 3 uses)

Building stone
Steam engine beds
Flagstones
Kerbstones
Road setts
Flagstones



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Changes in stone working

Early stone

Random Rubble. This method of building used stone that was put together without trying to create regular shape blocks or courses and used whatever stone was available.

Watershot stone. A way of building using shaped stones that were set at an angle so that they let water drain away from the surface of the wall. This method of building became rare after 1840 because of the time it took to shape, or dress the stone, and then build with it. Every stone had to be accurately cut in the quarry. An example of this type of stone can be seen in the Black Bull & Commercial Inns, Haslingden.

Later methods of cutting or 'dressing' stone

Changes in industry with the development of steam railways, steam driven machinery, the cotton mills and the growth of the Mill towns in the 1800s meant that a lot more stone was needed. This meant finding a tougher rock that could be easily worked with new tools in great numbers, to create what was known as rock faced or pitch building blocks, instead of building with random stone or carefully cutting even blocks. The quarrymen used a type of rock, found in Rossendale, known as Lonkey stone. We don't know why it was called Lonkey stone, but it is a very hard and fine grained sandstone, quarried around Haslingden, Grane and the southern moorland of Rossendale

Pitch-faced stone. This was also known as 'Rock-faced' stone. The stone was finished with a smooth surface on four sides of the block instead of all six sides. This meant the stones could be made more quickly and so were cheaper to make. Pitch-faced blocks had little slopes or pitches cut around the edges of the blocks. Quarrymen used a little chisel known as a pitcher to achieve this effect. This stone was used in most terraced housing between 1840 and 1900.

Ashlar Stone. There was also more need for very high-quality stone known as Ashlar. This high-quality stone was the most expensive, and was used on the front of important buildings such as banks, town halls and churches. The stone was finished with a very smooth surface and fine joints that fit together very well. It was often prepared in scrubbing mills, by rubbing the surface with other stones or sand. Examples of places built using Ashlar stone include Forest House and King George V in Bacup, and Longholme Chapel in Rawtenstall.



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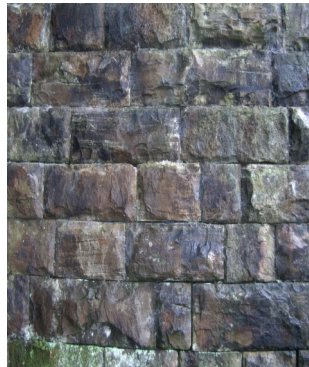
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Which type of stone?

Using these descriptions of different types of stone, can you say which type of stone has been used in these Lancashire buildings? (An example of the stone type is shown close up)











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Our time lines have become all mixed up — can you put the correct event in the right period? The timeline cards are on the next two pages.

NB. You could print the cards out and do this activity in groups. Each group could have 3 cards (one of the rows below) to organise into a timeline

	1700's	1800's	1900's
Changes in quarrying			
Changes in transport			
Changes in building			
Changes in agriculture, industry and society			



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Timeline cards

Changes in Quarrying

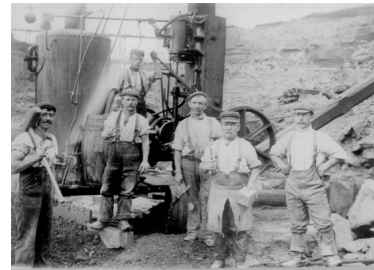
Most of the good quality stone had been taken from the ground. Engineers were now using crushed stone for motorways.



Increased small shallow quarrying on hill sides for stone used in dry stone walls.
1700s



Increase in the scale of quarrying to meet demand. Harder, tougher stone was needed. Stone was now mined from layers deep underground, and lifted out of pits by cranes. Development of tramways to the quarry face for the removal of stone and waste. Start of mechanisation of crane saws and polishing mills.
1800's



Changes in Transport

The age of the railway, improvements in road building with stone setts being used for street surfaces, pavements and bridges. Tramway systems to quarries were completed allowing transport and export of stone.

1844 building of railway in Rossendale.
1870 Rochdale Facit railway built.

1800's



The M62 motorway from Liverpool to Manchester and Leeds was built, using crushed stone. The Bacup- Bury railway closed.
1900s



Roads were in a very bad condition, and stone could not be moved on these.

1700s



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Timeline cards

Changes in building

Cheaper and lighter bricks were used to build buildings, and later modern buildings no longer needed stone .

1900s



Early buildings were built out of uneven blocks known as 'randon rubble', and later, 'watershot' stone blocks, carefully cut by hand in the quarry.

1700s



Faster building techniques needed for mills, terraced housing, bridges, and reservoirs. 'Rock-faced' pitched building stones were used and smooth polished Ashlar stone on the most expensive buildings.

1800s



Changes in agriculture, industry and society

Quarry workers refused to work in harsh conditions for very little money, and 50 years later some quarries were filled in as they were an eyesore.

1900s

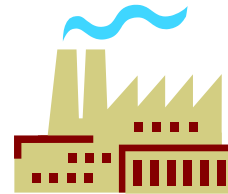
Laws were passed called the 'enclosure act' to enclose areas of land. If you could not afford to enclose your land, you lost it and if you only had common grazing or farming rights, you lost them.

1700s



Steam driven machinery was used to make cotton goods on a large scale. Lancashire towns became bigger as more mills were built. Victorians built many large and impressive buildings.

1800's





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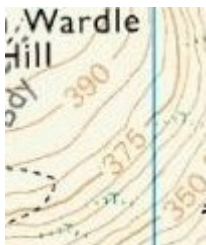
Maps

‘A map is a bird’s eye view of the features of the landscape’

Maps not only show you what you can find, but can also tell a story from the past.

Can you discover some of the symbols we use when making maps?

Here are parts of a map from a modern 1:25000 Ordnance Survey (OS) map around Rossendale. Each picture shows features in the landscape. Unfortunately we took our maps out in the rain and some of the labels became smudged. Can you put labels next to the pictures where you can see a railway and the River Irwell, the edge of part of a quarry, some footpaths, an main road (an ‘A’ road), a church next to a minor road (a ‘B’ road), some contour lines**, and a reservoir.



**NB. Contour lines join up places of the same height, so they show you where the hills or valleys are and are labelled with numbers that show the height of each line in meters, above sea level.



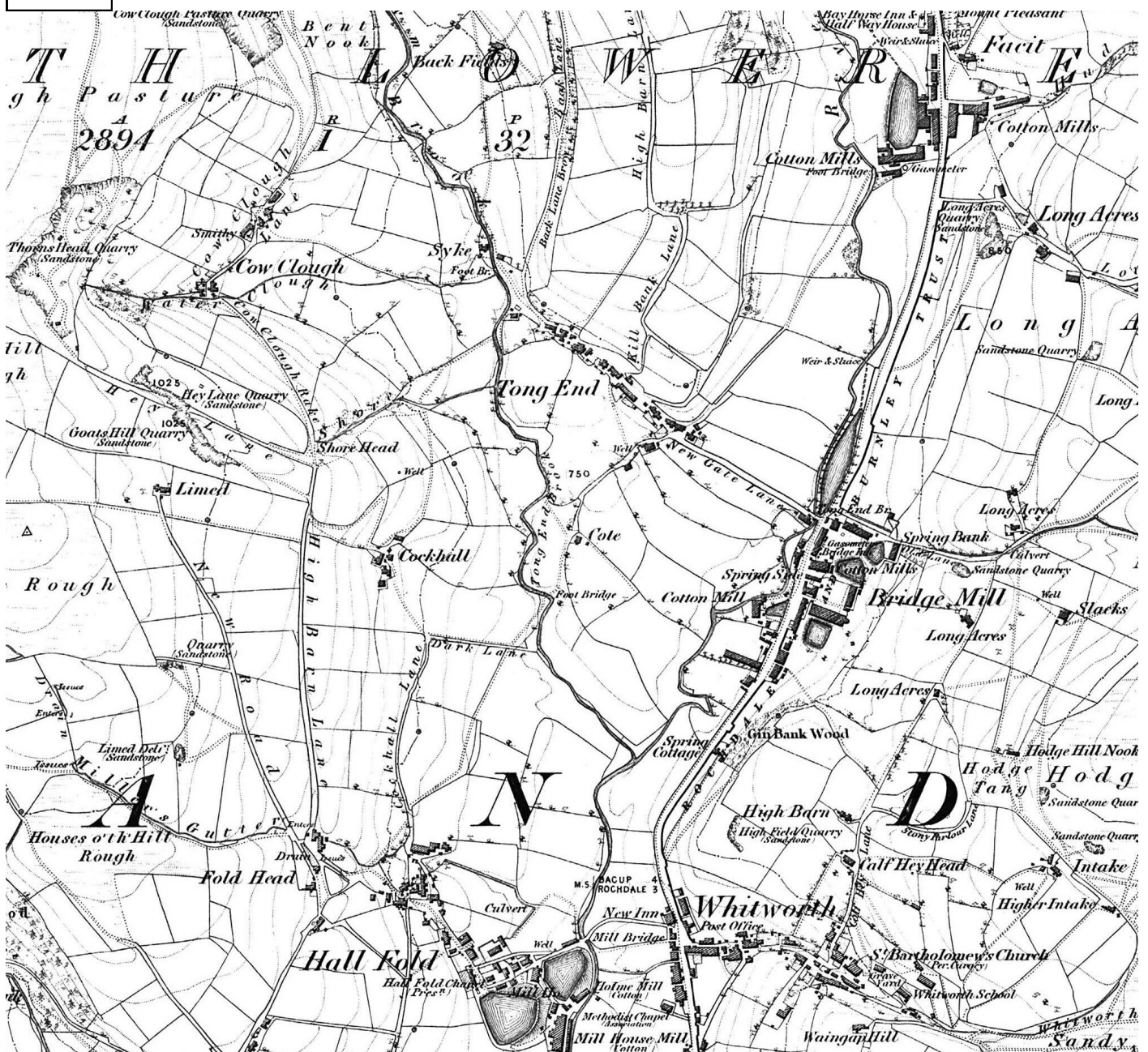
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Spot the difference!!

Compare the two maps from 1848 and 1891. Find the old Whitworth town centre and the hamlets of Hall Fold and Tong End so that you can compare the two maps. You can see that the style of maps changes over time, but the main features should still be recognisable.

1848





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There were some really big changes in the landscape between 1848 and 1891 (a period of only 43 years) with a lot more features and buildings being built. Can you work out what some of these were?

The reservoir was built flooding fields between Cow Clough and Tong End, and the hamlet of Syke disappears

L & YR railway was built

Quarries expanded and tramways built e.g. tramway from Thurns Head and Goat Hill quarry to Fold Head

More housing around Tong End and lots more housing, a school and a church associated with the mills at Facit

Bridge Mill Cotton Mill is much bigger by 1891 - it is now more than one cotton mill, and also includes Thorney Lee Mill and Bridge End Mill

The old town centre of Whitworth expands northwards with lots of new houses being built along the main road. Whitworth town centre now shown further north around Bridge Mill area.

Whitworth Cricket ground, gas works and filter beds have been built





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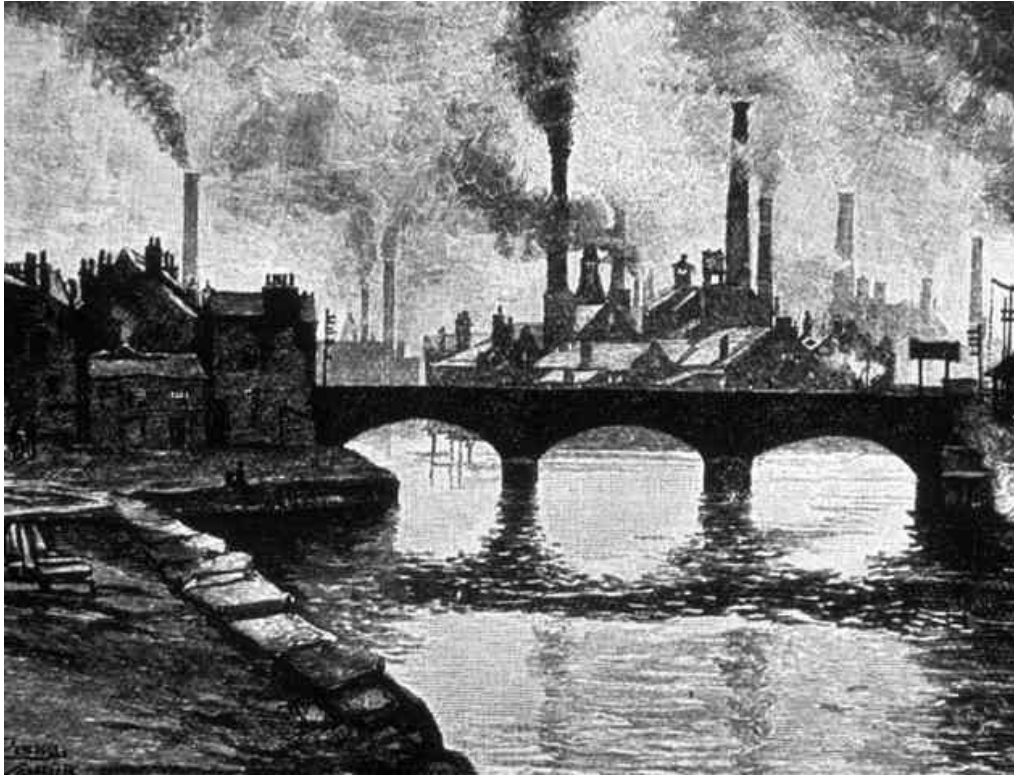
There were also some really big changes in the landscape 120 years later between 1891 and today, with a some new features, as well as some things disappearing. Can you work out what some of these were?

There is a picnic area on the site of what looked like a sewage works,
There is a water ski centre next to the reservoir, and a museum on the site of Bridge Mill
The railway has gone completely and the yellow B road follows the same line
The quarries at Cow Clough, Thorn's head and Goat's hill are now disused
There is an electricity pylon now cutting across the landscape
Hall Fold and Fold Head are now known as Fold head!!
St Bartholomews church is still there, which must therefore be at least 163 years old, and the younger Methodist chapel is still there.
Interestingly, the footpaths over Hodge hill look very similar to what they did in 1848, 163 years ago
Similarly, New Road and Cockhall lane are still there, whereas High Barn lane and Cow Clough rake are now only shown as footpaths



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This picture shows how mill towns looked over a hundred years ago, when building with stone, quarrying and the mill industries were at their peak.

What words can you use to describe it?



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Henry Heys (1815 - 1889) was a well known quarryman, and he owned quarries at Brandwood, Facit and Hambeldon by the time he died.

Although Henry could not read and signed his name with a mark, he had an amazing ability to work out by eye how much stone was needed to make a building. At India Mill, in Bacup, he correctly assessed and measured up how much stone was needed in a couple of hours. An astonished surveyor hired by the mill owner, said it would take three weeks to do that sort of measurement.

Pretend you are Henry Heys and have a go at working out the number of stone blocks needed for the front face of this building!



You need to work out the number of stones you need across the building and from top to bottom first, then work out how many are being saved by putting in windows and doors. As this is a guess, or estimate, then there is no exact answer, but it needs to be roughly the correct size of number. So the number should be either in 10s 100s or 1000s (it should be either 2,3 or 4 numbers) The way to work it out it is shown overleaf.

The whole area of the front of the building:

Multiply (times) the number of stone blocks across the width of the building by the number of blocks high

The building is about **30** stone blocks wide

The building is about **60** stone blocks high

So **30 X 60** stone blocks are needed for front face = **1800** stone blocks

But we have to subtract (or take away) the number of stone blocks that would fit into the window and door spaces

How many do we take away for the ground floor windows?

The window spaces would use about 20 blocks each. If there are 6 windows, how many stone blocks would fit into the window spaces? **6 X 20** stone blocks = **120** stone blocks

How many do we take away for the door?

The door is about 3 blocks wide and 14 blocks high, so **3 X 14** = **42** stone blocks

Windows on the first and second floors

Each group of windows would use about 30 blocks each. If there are 12 windows, how many stone blocks would fit into the window spaces?..... **12 X 30** stone blocks = **360** stone blocks

Total number of stone blocks for the door and window spaces:

Ground floor windows + door + Windows on 1st and 2nd floor = **120 + 42 + 360 = 522**

So total number of blocks needed = Front face—windows/door spaces

= 1800 — 522 = 1278

Round this up to the nearest 100 = 1300



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Wordsearch

k	w	s	t	o	n	m	y	a	l	u	l	o	n	k	y	b	e	d	s
n	l	c	e	n	o	t	s	r	a	l	h	s	a	m	e	n	s		i
i	u	l	n	n	u	a	y	a	i	k	n	r	q	t	o	u	k	p	f
p		u	i	c	j	r	s	t	s	y	e	n	o	t	s	g	a	l	f
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n	s	n	a	s	e	i	g	h	n	y	a	c	r	a	n	e	s	a	w
e	t	r	i	w	g	x	c	r	i	o	r	m	a	r	t	n	y	y	a
D	e	a	s	o	l	a	o	i	n	e	n	r	u	e	f	e	r	e	g
n	o	i	t	u	l	o	v	e	r	l	a	i	r	t	s	u	d	n	i
n	f	r	u	j	r	e	v	o	k	t	a	s	w	d	v	h	n	i	D

Find all these words above:

Steam Engine
Railways
Industrial Revolution
Tramways
Crane Saw

Ashlar Stone
Pitch face stone
Random Rubble
Watershot stone
Stone Setts

Dry stone wall
Flagstone
Polishing Mill
Lonky beds
Milltown



Extension activity

Stone in my landscape:

With your teacher or a responsible person:

Walk about your town and see if you can find examples of the type of stone and features talked about in this worksheet

Either draw the buildings and features, or if you have access to a digital or disposable camera, take some photographs of the different types of stone.

Try and find out how old the buildings are that you have photographed / drawn.