

# Age of Scotland's rocks

QUATERNARY Ice Ages	0	million years before present
NEOGENE	2.6	
PALAEOGENE	23	
CRETACEOUS	65	
JURASSIC	145	
TRIASSIC	200	
PERMIAN	250	
CARBONIFEROUS MIDLAND	299	
VALLEY DEVONIAN	359	
SILURIAN SOUTHERN	416	
UPLANDS ORDOVICIAN	444	
CAMBRIAN	488	
GRAMPIAN DALRADIAN HIGHLANDS	542	
	700	
NORTHERN MOINE HIGHLANDS	950	
	1200	
HEBRIDEAN LEWISIAN	1500	
	3000+	
NOT TO SCALE		

# What is the Canongate Wall?

Under the façade of the Canongate building is the Canongate Wall. During the construction of the Parliament buildings a blast wall was incorporated into the design of the new structure. The wall is cast in concrete, 39 metres in length and 6 metres high at the highest point.

The concrete structure is embellished by a selection of Scottish rocks, some of which have Scottish texts carved onto the face. These texts were selected by a panel of MSPs together with a literature expert and include suggestions of suitable material submitted by the Scottish people. Hundreds of proposals were submitted and twenty four were chosen for the original design.

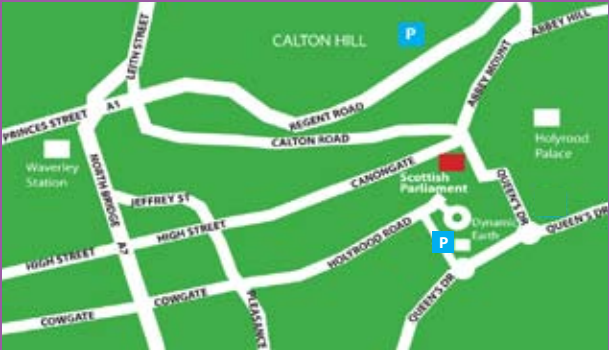
In 2010, to mark the tenth anniversary of the Scottish Parliament in 2009, two more stones were added using the same selection process as before. In total there are currently 28 panels of Scottish rocks, two of which have no inscriptions.

The overall design of the Canongate Wall was by Sora Smithson and contains a representative range of Scottish rocks carved by Gillian Forbes and Martin Reilly. Also incorporated are "Brewery Stones" recovered from the building demolished to make way for the new Parliament building. All the stone inserts are set in the large pre-cast concrete panels.

At the eastern end of the wall is a townscape based around the sketch by Enric Miralles (architect of the Scottish Parliament Buildings) of Edinburgh's Old Town as viewed from his room at the Balmoral Hotel on Princes Street in Edinburgh.



# How to find the Canongate Wall



## How to find the Canongate Wall

The Canongate Wall at the eastern end of the Royal Mile forms the northern boundary of the Scottish Parliament buildings.

By Coach: Parking in Regent Road  
By Car: Parking in Regent Road and at Our Dynamic Earth.

## Acknowledgements:

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Mapwork based on Ordnance Survey Licence number 100033582

# Canongate Wall

## Art Science and Politics



Local Geodiversity Site

Scottish Parliament Building  
Edinburgh



Lothian and  
Borders

GeoConservation



Key to Quotations

- 1 When we had a king, and a chancellor, and parliament-men o’ our ain, we could aye peeble them wi’ stanes when they werena gude bairns - But naebody’s nails can reach the length o’ Lunnon. **Sir Walter Scott (1771-1832) Mrs Howden in “Heart of Midlothian”**
- 2 Let the words of my mouth, and the meditation of my heart, be acceptable in thy sight, O Lord, my strength, and my redeemer. **Psalms 19:14**
- 3 From the lone sheiling of the misty island  
Mountains divide us, and the waste of seas -  
Yet still the blood is strong, the heart is Highland,  
And we in dreams behold the Hebrides. **Anonymous “Canadian Boat Song” First appeared 1829**
- 4 This is my country,  
The land that begat me.  
These windy spaces  
Are surely my own.  
And those who toil here  
In the sweat of their faces  
Are flesh of my flesh,  
And bone of my bone. **Sir Alexander Gray (1882-1968) “Scotland”** © John Gray
- 5 What would the world be, once bereft  
Of wet and wildness? Let them be left,  
O let them be left, wildness and wet;  
Long live the weeds and the wilderness yet. **Gerard Manley Hopkins (1844-1889) “Inversnaid”**
- 6 Then let us pray that come it may  
(As come it will for a’ that)  
That Sense and Worth, o’er a’ the earth,
- Shall bear the gree, an’ a’ that.  
For a’ that, an’ a’ that,  
It’s coming yet for a’ that,  
That Man to Man the world o’er,  
Shall brithers be for a’ that. **Robert Burns (1759-1796) “A Man’s A Man for A’ That”**
- 7 Conglomerate - no lettering
- 8 But Edinburgh is a mad god’s dream  
Fitful and dark,  
Unseizable in Leith  
And wildered by the Forth,  
But irresistibly at last  
Cleaving to sombre heights  
Of passionate imagining  
Till stonily,  
From soaring battlements,  
Earth eyes Eternity. **Hugh MacDiarmid (1892-1978)** © Carcanet Press
- 9 If a man were permitted to make all the ballads, he need not care who should make the laws of a nation. **Andrew Fletcher (1655-1716)**
- 10 So, cam’ all ye at hame wi’ freedom  
Never heed whit the hoodies croak for doom  
In your hoose a’ the bairns o’ Adam  
Can find breid, barley bree an’ painted room. **Hamish Henderson (1919-2002) “The Freedom come all ye”** © Mrs K Henderson
- 11 tell us about last night  
well, we had a wee ferintosh and we lay on the quiraing.  
it was pure strontian!  
**Edwin Morgan (1920-2010)** © Carcanet Press
- 12 Who possesses this landscape? -  
The man who bought it or  
I who am possessed by it?  
False questions, for this landscape is

- masterless and intractable in any terms that are human. **Norman MacCaig (1910 - 1996), A Man in Assynt** © Birlinn Press
- 13 There is hope in honest error;  
None in the icy perfections of the mere stylist. **Charles Rennie Mackintosh (1868-1928)**
- 14 Am fear as fheàrr a chuireas  
‘S e as fheàrr a bhuaineas. **Seannfhacal**  
He who sowest best reapest best. **Proverb**
- 15 Abair ach beagan is abair gu math e. **Seannfhacal**  
Say but little and say it well. **Proverb**
- 16 Oh, dear me, the world’s ill-divided,  
Them that work the hardest are aye wi’ least provided,  
But I maun bide contented, dark days or fine,  
But there’s no much pleasure livin’ affen ten and nine. **Mary Brooksbank (1894 - 1980), Oh Dear Me (The Jute Mill Song)**
- 17 O wad some Pow’r the giftie gie us  
To see oursels as others see us!  
It wad frae monie a blunder free us  
An’ foolish notion. **Robert Burns (1759-1796) “To a Louse”**
- 18 Is i Alba nan Gall’s nan  
Gaidheal is gàire is blàth is beatha dhomh.  
It is Scotland, Highland and Lowland that is laughter and warmth and life for me. **George Campbell Hay (1915-1984) “The Four Winds of Scotland”** © W L Lorimer Memorial Trust
- 19 Errochty sandstone - no lettering
- 20 The rose of all the world is not for me.  
I want for my part  
Only the little white rose of Scotland  
That smells sharp and sweet - and breaks the heart. **Hugh MacDiarmid (1892-1978) “The Little White Rose”** © Carcanet Press
- 21 To promise is ae thing, to keep it is anither. **Proverb**
- 22 What a lovely, lovely moon.  
And it’s in the constituency too. **Alan Jackson (1938-) “The Young Politician Looks at the Moon”** © the author
- 23 Put all your eggs into one basket -and then watch that basket. **Andrew Carnegie (1835-1919)**
- 24 Scotland small? Our multiform, our infinite Scotland *small*? **Hugh MacDiarmid (1892-1978) “Scotland Small?”** © Carcanet Press
- 25 The battle for conservation will go on endlessly. It is part of the universal battle between right and wrong. **John Muir (1838-1914)**
- 26 Bright is the ring of words. **Robert Louis Stevenson (1850-1894) “Songs of Travel”**
- 27 Work as if you live in the early days of a better nation. **Alasdair Gray (1934-)** © Canongate Press (paraphrased from Dennis Lee’s Civil Elegies. Toronto: Anansi, 1972)
- 28 Sweet ghosts in a loving band  
Roam through the houses that stand -  
For the builders are not gone. **George Macdonald (1824-1905) “Song”**

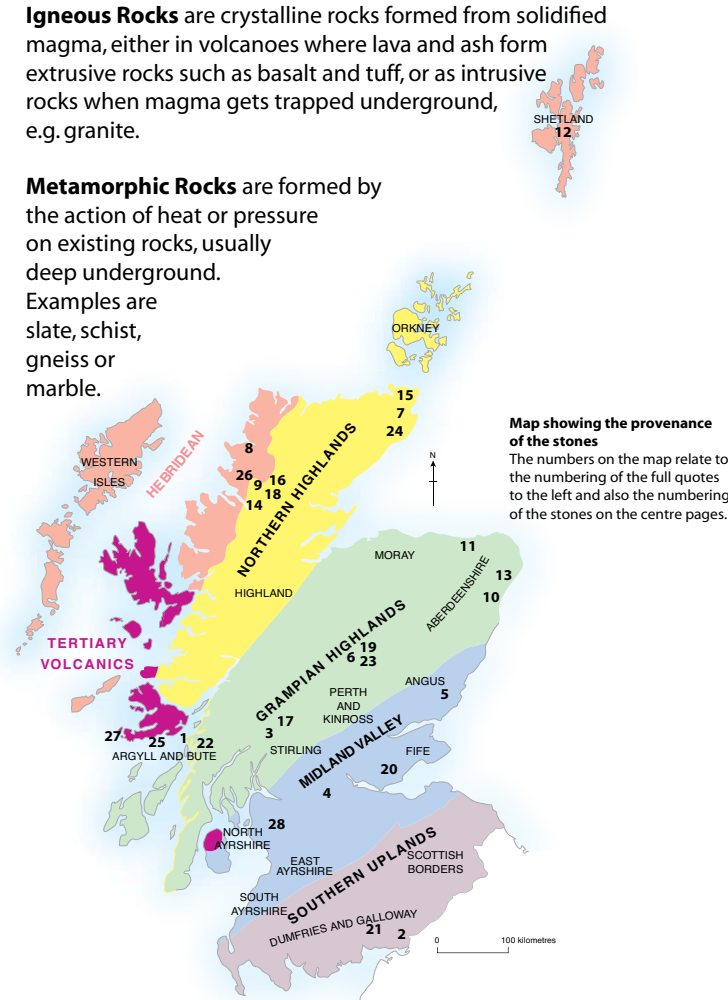
Scotland’s Geodiversity

Geologists recognize three kinds of rock.

**Sedimentary Rocks** form when sediment (e.g. sand or mud) accumulates on the Earth’s surface. This often happens under water.

**Igneous Rocks** are crystalline rocks formed from solidified magma, either in volcanoes where lava and ash form extrusive rocks such as basalt and tuff, or as intrusive rocks when magma gets trapped underground, e.g. granite.

**Metamorphic Rocks** are formed by the action of heat or pressure on existing rocks, usually deep underground. Examples are slate, schist, gneiss or marble.



The Canongate Wall displays a remarkable variety of different kinds of sedimentary, igneous and metamorphic rocks, reflecting Scotland’s long and complicated geological history. Over the past three billion years, these rocks have moved over the Earth’s surface, experiencing a range of environments and climates. Fragments of the geological units that now make up Scotland have collided, slid past each other and been torn apart by the actions of plate tectonics. The rocks are not wholly representative, as harder stones are more resistant to weathering and erosion and tend to survive longer. The map shows the six main distinctive areas of Scotland’s rocks.

Way back in the mists of time ...

**Hebridean** Scotland’s oldest rocks are found in the Outer Hebrides and the northwest of Scotland, and are from 1 to more than 3 billion years old. These tough metamorphic rocks (Lewisian Gneiss; Iona Marble) were formed deep underground in intense heat and pressure. Gradually over millions of years these deep-forged rocks have been brought to the surface, sometimes to be buried again under younger sedimentary rocks (Torridonian; Pipe Rock).

Colliding continents and a disappearing ocean - the Caledonian Orogeny

The main building blocks of modern Scotland were assembled in a series of events lasting hundreds of millions of years. The story begins almost a billion years ago with existing continental crust near the South Pole being pulled apart, creating ocean basins where sedimentary rocks piled up. As crustal stretching continued, the Iapetus Ocean was formed, with Scotland on the northern edge of the ocean and the rocks of England on the other side, hundreds of miles away. The slow but inexorable movement of tectonic plates means that oceans do not last forever. The closure of the Iapetus Ocean resulted in a mountain-building phase called the Caledonian Orogeny, which ended about 400 million years ago. The associated mountain building changed oceanic sedimentary rocks into the different kinds of metamorphic rocks now found in the Northern Highlands and the Grampian Highlands, separated by the Great Glen Fault (Easdale Slate; Ardkinglas Slate; Glen Tilt Marble).

At the same time and for millions of years afterwards, melting created magma that rose towards the surface, forming igneous rocks such as granite and associated metamorphic rocks (Corrennie Granite; grey granite; Ross of Mull Granite; Ledmore Marble).

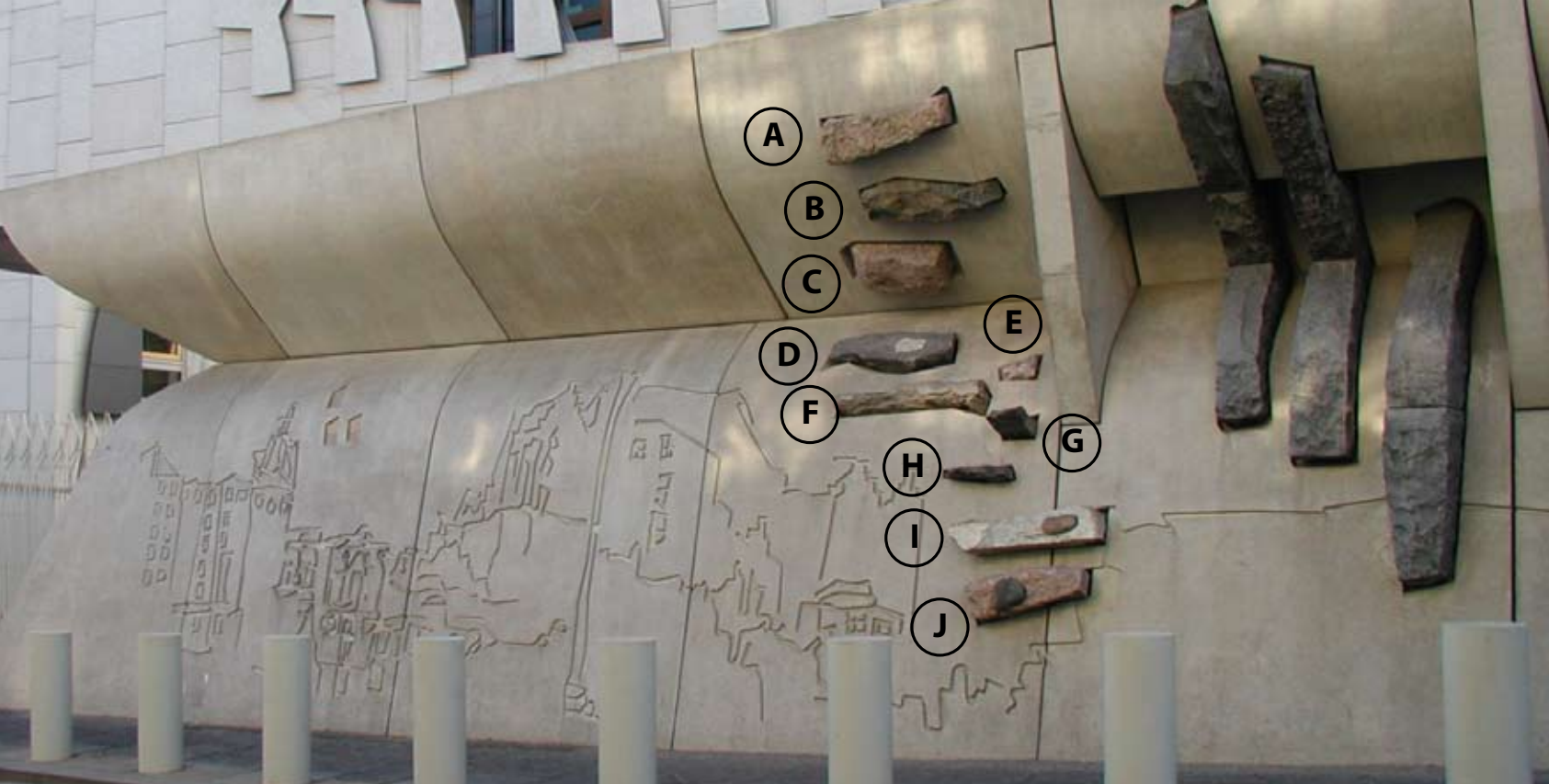
**Southern Uplands** These rolling hills south of the Southern Upland Fault are formed of folded metamorphic rocks, overlain by Permian New Red Sandstone and also intruded by granite (Cove Red Sandstone; Knowehead Sandstone).

After the orogeny - erosion and tearing of the new continent

**Midland Valley** For the next 200 million years, Scotland was a bit quieter tectonically, but still prone to occasional volcanic outbursts which have left some impressive features in the landscape (Caldercruix Dolerite). For much of this time, erosion has been the dominant geological agent at work, wearing down the mountains and depositing sedimentary rocks. As Scotland has moved northwards these sedimentary rocks have reflected changing climates, from hot desert conditions (Carmyllie Sandstone; Errochty Sandstone; conglomerate) across the equator where wet conditions dominated (Cullaloe Sandstone; Giffnock Sandstone) and back into desert conditions again (Cove Red Sandstone; Clashach Sandstone; Knowehead Sandstone).

**Tertiary Volcanics (Palaeogene Volcanoes)** Volcanic centres on Skye, Rum, Mull and Arran were associated with the start of the opening of the Atlantic Ocean about 60 million years ago [no stones].





#### Key (left)

- A Granite
- B Basalt
- C Pipe Rock
- D Dolerite with inset of marble
- E Conglomerate
- F Sandstone with inset pebble
- G Basalt
- H Slate
- I Glen Tilt Marble with inset cobble
- J Ross of Mull Granite with inset cobble

The 3 vertical strips of grey rock are Dolerite

(right) The inscription reads:

DOLERITE  
AN IGNEOUS  
ROCK FROM  
CALDERCRUIX  
THAT COOLED  
FROM MOLTEN  
MAGMA  
AROUND 300  
MILLION YEARS  
AGO etc.



- 1. Easdale Slate –**  
Easdale Island, Argyll.  
*"When we had a king..."* Walter Scott  
Mrs Howden in "Heart of Midlothian"  
**Metamorphic**



- 2. Cove Red Sandstone –** Annan, Dumfries & Galloway.  
*"Let the words..."* Psalm 19:14  
**Sedimentary**



- 3. Ardkinglas Slate –**  
Cairndow, Argyll.  
*"From the lone sheiling..."* Anon  
**Metamorphic**



- 4. Whinstone (dolerite) –**  
Caldercruix, West Lothian.  
*"This is my country..."* Sir Alexander Gray  
**Igneous**



- 5. Carmyllie Sandstone –** Angus.  
*"What would the world be..."* Gerard Manley Hopkins  
**Sedimentary**



- 6. Errochty Sandstone –** Struan, Perthshire.  
*"Then let us pray..."* Robert Burns  
**Metamorphic**



- 7. Conglomerate –**  
Dunbeath Beach, Caithness.  
No lettering  
**Sedimentary**



- 8. Lewisian (banded) Gneiss –**  
Lochinver, Sutherland.  
*"But Edinburgh..."* Hugh MacDiarmid  
**Metamorphic**



- 9. Ledmore Marble –**  
Ledmore Quarry, Highlands.  
*"If a man..."* Andrew Fletcher  
**Metamorphic**



- 10. Corrennie Granite –**  
Aberdeenshire.  
*"So, cam' all ye..."* Hamish Henderson  
**Igneous**



- 11. Clashach Sandstone –**  
Elgin, Morayshire.  
*"tell us about..."* Edwin Morgan  
**Sedimentary**



- 12. Bressay Sandstone –**  
Shetland  
*"Who possesses this landscape?"* Norman MacCaig  
**Sedimentary**



- 13. Kemnay Granite –**  
Aberdeenshire.  
*"There is hope..."* Charles Rennie Mackintosh  
**Igneous**



- 14. Torridonian Sandstone –**  
Ullapool, Highlands.  
*"Am fhearr as fhearr..."* Proverb  
**Sedimentary**



- 15. Caithness Flagstone (polished) –**  
Spittal, Caithness.  
*"Abair ach..."* Proverb  
**Sedimentary**



- 16. Ledmore Marble –**  
Ledmore Quarry, Highlands.  
*"Oh, dear me..."* Mary Brooksbank  
**Metamorphic**



- 17. Ardkinglas Slate –**  
Cairndow, Argyll.  
*"O wad some Pow'r..."* Robert Burns  
**Metamorphic**



- 18. Pipe Rock –**  
Ledmore, Highlands.  
*"Is i Alba..."* Deòrsa Mac Iain Deòrsa  
**Sedimentary**



- 19. Errochty Sandstone –**  
Struan, Perthshire.  
No lettering  
**Metamorphic**



- 20. Cullaloe Sandstone –**  
Aberdour, Fife.  
*"The rose..."* Hugh MacDiarmid  
**Sedimentary**



- 21. Knowehead Sandstone –**  
Dumfries.  
*"To promise..."* Proverb  
**Sedimentary**



- 22. Easdale Slate –**  
Easdale Island, Argyll.  
*"What a lovely..."* Alan Jackson  
**Metamorphic**



- 23. Glen Tilt Marble –**  
Blair Atholl, Perthshire.  
*"Put all your eggs..."* Andrew Carnegie  
**Metamorphic**



- 24. Grey Granite –**  
Dunbeath Beach, Caithness.  
*"Scotland small?"* Hugh MacDiarmid  
**Igneous**



- 25. Ross of Mull Granite –**  
Fionnphort, Mull, Argyll.  
*"The battle..."* John Muir  
**Igneous**



- 26. Lewisian Gneiss –**  
Lochinver, Sutherland.  
*"Bright is..."* Robert Louis Stevenson  
**Metamorphic**



- 27. Iona Marble –**  
Iona, Argyll.  
*"Work as if..."* Alasdair Gray  
**Metamorphic**



- 28. Giffnock Sandstone –**  
Glasgow.  
*"Sweet Ghosts..."* George MacDonald  
**Sedimentary**

