

LUNDY GRANITE

by Phil Stephenson



Lundy Granite exposed at Gannet Rock on the eastern side of the northern area of Lundy Island

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1. BRIEF DESCRIPTION

Lundy Granite is unique in southern Britain and is about 240 million years younger than Dartmoor Granite. This rock represents the southernmost example of igneous rocks associated with the initial formation of the North Atlantic Ocean around 60 million years ago. Igneous rock is formed by magma (molten rock from inside the earth) being cooled and becoming solid. Lundy Granite is a coarse grained rock typically with large feldspar crystals (called megacrysts).

Lundy Island is situated off the north Devon coast, about 20km north-northwest of Hartland Point. The island is about 5km long (north-south) and about 1km wide. The island is largely formed of granite but some slate can be seen, which pre-dates the granite. Also, many strips of igneous rock, called dykes, cut across the rocks.

Lundy Granite is similar to a common igneous rock of about the same age found in Scotland and Northern Ireland. The granite was formed about 60 million years ago, pushed from inside the earth into a pre-existing rock. It was initially thought that the granite was the same age as the Dartmoor Granite and others in South West England, but dating confirmed that the rocks were formed during the Tertiary geological time period.

Lundy Island has a long and rich history from prehistoric settlers to King Henry III. Marisco Castle was built in the thirteenth century from quarried Lundy Granite. The island was once owned by the Knight's Templar and has had notorious pirates responsible for wrecking many ships on the island's steep granite cliffs which are littered by sea caves once used by smugglers but now home to seal pups.

Quarrying of the granite has occurred on the island. The granite was then used to construct the island's buildings and it was also exported to the mainland.

2. GEOLOGICAL DETAIL

The Lundy Granite is the southernmost occurrence of the British Tertiary Volcanic Province which is closely associated with the formation of the North Atlantic Ocean about 60 million years ago. The majority of the igneous rocks associated with this period of crustal rifting (splitting of the earth's crust) remain in Scotland and Northern Ireland.

The Lundy intrusion is largely composed of coarse grained megacrystic granite although fine grained megacrystic granite is also found. The granite is composed of feldspar megacrysts with a groundmass of feldspar, quartz and varieties of mica. The megacrysts lengths are typically between 18mm and 30mm but have been found up to 70mm. Pegmatites - very coarse grained igneous rocks - also occur.

The granite was intruded through Devonian sediments which now form slates. The contact between the granite and slates is seen along Lundy's southern coast. Some of the contact is considered to be insitu although faulting (movement) has occurred along some of the exposed contact.

The granite and Devonian slates have been intruded by a dyke swarm (vertical or near vertical sheets of igneous material). Over 230 dykes have been recognised. The composition of the dykes is largely basic (basalt-like) and the types include: olivine dolerite, olivine-analcime dolerite, olivine-free dolerite and quartz dolerite. About 30 intermediate composition dykes have been identified and include trachytes and trachyandesites.

The derivation of the granite is complex. A basic igneous body is considered to have been intruded about 10km to the northwest of Lundy, but this remains at shallow depth in the crust. The igneous body is considered to have been intruded at about the same time as the Lundy Granite. The Lundy Granite was derived through development (fractionation) of the magma from the basic igneous body.

Weathering of the granite has produced tor-like features which are normally associated with the granite masses such as the older Dartmoor Granite. Also weathering of the granite has produced karst-like features which is a weathering structure more commonly associated with limestone.

3. USES

Quarrying of granite on Lundy occurred for centuries. Lundy Granite has been extensively used as a building stone on the island, and notable buildings include Lundy Castle built in the thirteenth century and the more recent St Helena's Church constructed in Victorian times by the former owner of the island, Reverend Hudson Heaven. The village at the southern end of the island is built from quarried granite.

A commercial quarry (The Lundy Granite Company) was established on the island in 1863 encouraged by the island's then owner William Heaven (father of Rev Heaven). The quarry company employed up to 200 workers at the height of the operation which continued for 5 years, but due to mismanagement and difficulties of transporting the granite stone to the mainland the operation ceased. The quarry and associated buildings can still be seen on the east side of the island.

4. PLACES TO VISIT

Please refer to the safety guidance about visiting geological sites on our website before visiting the places listed below.

The only exposure of Lundy Granite is on Lundy Island and hence a boat trip or helicopter ride is required. The Educational Register of Geological Sites in Devon (www.devon.gov.uk/educational_register.htm) provides further description of the geology and how to travel to the island.

Granite is exposed along the island's cliffs with numerous exposures. The former granite quarry is located above Quarry Beach on the east side of the island (SS 138 451). Pegmatite locations include: Battery Point (SS 128 449), crags above Jenny's Cove (SS 134 457) and in Gannet's Combe (SS 135473).

Dykes can be seen at the Landing Beach (SS 143 438) and Lamentry Beach (SS 142 437). The contact with the Devonian slate is seen at the Landing Beach but is faulted at this locality.

5. PHOTOGRAPHS



Granite Quarry above Quarry Beach on the eastern side of Lundy Island.

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Cliffs of Lundy Island showing large sections of Lundy Granite

© Tom Hynes



Lundy Granite used as a building stone on the island

© Tom Hynes



Rocks of Lundy Granite used to construct stone walls on the island

© Tom Hynes



The ruins of the former Lundy Granite Company's buildings on the eastern side of Lundy Island.

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Sections of Lundy Granite clearly seen from boat in the cliffs of Lundy

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