Sleat 3:

Teangue

The east coast of Sleat, or the Sleat Peninsula (Norse: smooth), around the settlement of Teangue has a distinctive scenery, consisting of low ice-sculpted hills. It is dominated by high-grade metamorphic rocks of the Lewisian Gneiss Complex within the Moine Thrust Sheet of the Moine Thrust Belt. The remains of Knock Castle sits atop granite gneiss, with excellent views across the Sound of Sleat. Nearby is the Torabhaig Distillery.

Aspects covered: the Lewisian Gneiss Complex (granite gneiss; amphibolite; serpentinite); mylonites of the Moine Thrust; Late Proterozoic Torridonian sedimentary rocks (Beinn na Seamraig Group).

Route: Knock Bay – Loch nan Dùbhrachan – Loch Barabhaig – Isle Oronsay/Aird Ghunail - Allt Duisdale.

Distance: See below.

Time: See below.

General comments: This excursion involves five disparate localities, all relatively close to Teangue on the Broadford-Armadale (A851) road. All have limited parking and involve relatively minor amounts of walking over comparatively easily traversable ground. The order set out, below, is based upon their geology, but can be undertaken in any suitable order.

1. Knock Bay (granitic gneisses) [1 kilometre; 1 hour];
2. Loch nan Dùbhrachan (granitic gneisses and amphibolites) [200m; 30 minutes];
3. Loch Barabhaig (serpentinite) [2 kilometres; 2 hours];
4. Isle Oronsay & Aird Ghunail (amphibolite / mafic gneiss) [2 kilometres; 2 hours];
5. Allt Duisdale (mylonite; granitic gneiss; Torridonian sandstones) [2 kilometres; 2 hours].

1 and **4** are coastal exposures and should be undertaken at low tide, especially **4**, which requires a very low tide, as Isle Oronsay is a tidal island.

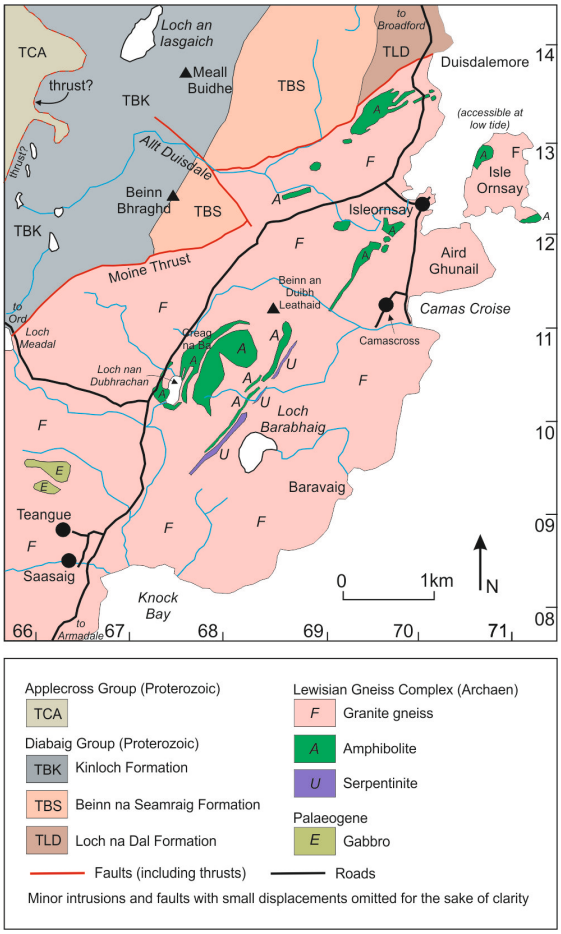

Figure Sleat 3.1: Simplified geological map of the area around Teangue.

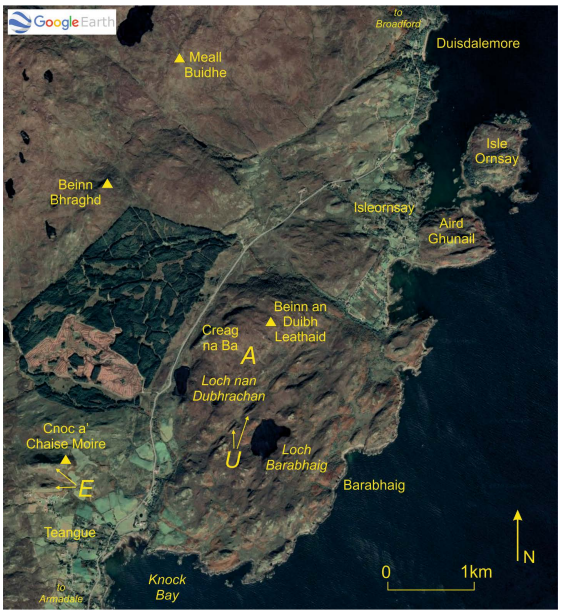

Figure Sleat 3.2: Annotated Google Earth® of the area around Teangue. A, amphibolite; E: gabbro; U: serpentinite.

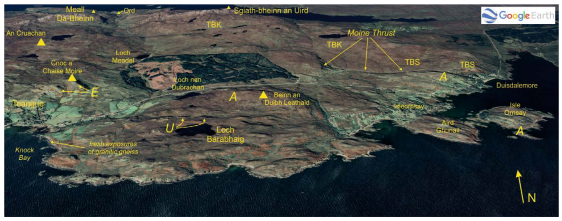

Figure Sleat 3.3: Annotated oblique Google Earth® image of the area around Teangue. Symbols as for Figure Sleat 3.1. A, amphibolite; E, gabbro; TBS, Beinn na Seamraig Formation; TBK, Kinloch Formation; U, serpentinite.

1. Knock Bay (granitic gneisses) [1 kilometre; 1 hour] [NG 6716 0868]:

In the area around Teangue on the Broadford-Armadale (A851) road there is very limited parking. The area of interest for this location is on the north side of Knock Bay, clearly visible from the main road, capped by the ruins of Knock Castle.

Using the entrance to the Torabhaig Distillery, on the SE side of the main road *c.* 500m NE of Teangue, gain access to the Allt Ghleann Thorabhaig (east of the distillery) in Gleann Thorabhaig and follow the rough path, south to the coast on the north side of Knock Bay. An obvious building (boat shed) with a rusty red roof is a useful landmark to head towards in order to reach the shore.

Knock Castle (Castle Camus), atop the high ground on the north side of the bay, was built by the MacLeod clan in an attempt to control this part of the Sleat. The castle dates from the late 13th Century and was finally abandoned in the late 17th Century. It is built on the site of an Iron Age fort, Dùn Thorabhaig.

The clean fresh exposures of the Lewisian Gneiss Complex, here part of the Moine Thrust Sheet, on the north side of Knock Bay, are dominated by granitic gneisses, with minor bands rich in amphibole and biotite. Uncommon layers of amphibolite, some intensely deformed are also present.

Figure Sleat 3.4: General view of the banded gneisses of the Lewisian Gneiss Complex within the Moine Thrust Sheet, on the north side of Knock Bay.

Figure Sleat 3.5: Banded granitic gneisses with an interval of (dark) intensely deformed amphibolite. Pole *c.* 1m long.

Figure Sleat 3.6: Detail of zone of deformation within an amphibolite layer within granitic gneisses on the north side of Knock Bay. Hammer *c.* 30cm long.

Figure Sleat 3.7: Thinly banded granitic and mafic gneisses (amphibolite) on the north side of Knock Bay. Pole *c.* 1m long.

Figure Sleat 3.8: A thick band (*c.* 15cm) of granitic gneiss within an interval of thinly banded granitic and mafic gneisses (amphibolite) on the north side of Knock Bay. Hammer *c.* 30cm long.

Return to the parking location.

2. Loch nan Dùbhrachan (granitic gneisses and amphibolites) [200m; 30 minutes] [NG 6737 1041]:

Approximately 100m NE of the Ord (road) turn-off on the NW side of the Broadford-Armadale (A851) road. Parking on SE side of road.

On the NW side of the road there is a 2m-high rock-face.

The rocks here are granitic gneisses and amphibolites of the Lewisian Gneiss Complex. The lower 1m of the exposure is a dark green, medium-grained amphibolite with a distinct foliation (strikes 060°, dips 15° SE). Although predominantly amphibolite (hornblende, plagioclase, quartz), this rock contains small patches and streaks of quartz and feldspar. The upper *c.* 1m of the exposure, not easily accessed, is a coarsely foliated, granitic gneiss containing prominent augen structures. The augen are up to 20cm long and consist of glassy grey quartz and dull white feldspar. Separating the dominant augen are thin, irregular bands rich in hornblende and biotite. These two minerals also occur as single crystals dispersed throughout the granitic gneiss.

Figure Sleat 3.9: General view of the Loch nan Dùbhrachan roadside locality, NE of the Ord (road) turn-off on the Broadford-Armadale (A851) road.

Figure Sleat 3.10: Granitic gneiss overlying amphibolite in the Loch nan Dùbhrachan exposures. Pole *c.* 1m long.

Figure Sleat 3.11: Fold within amphibolite in the lower part of the Loch nan Dùbhrachan exposure. Pole *c.* 1m long.

Figure Sleat 3.12: Detail of amphibolite, with thin layers of granitic material, in the lower part of the Loch nan Dùbhrachan exposure. Pole *c.* 1m long.

Figure Sleat 3.13: Intensely deformed interval of amphibolite in the Loch nan Dùbhrachan exposure. Pole *c.* 1m long.

Return to the parking area.

3. Loch Barabhaig (serpentinite) [2 kilometres; 2 hours] [NG 6796 0983]:

Approximately 100m NE of the Ord turn-off on the NW side of the Broadford-Armadale (A851) road. Parking on SE side of road.

Continue on foot south along the main road for *c.* 200m to a gate on the east side of the road. From the gate, the serpentinite mass lies *c.* 1km to the ESE. Go through the gate and cross a stream over steeply-dipping, foliated (E-W trending), granitic gneiss, keeping to the north side of the gated fence. Where the fence ends, continue ESE over the top of the 107m hill. This summit is composed of thinly foliated granitic gneiss containing large quartz segregations. In detail, this gneiss consists of 2–3mm-thick, dark bands rich in hornblende and biotite, together with leucocratic bands (up to 1 cm thick) rich in feldspar and quartz. Continue to the prominent ridge *c.* 200m ESE of this summit at [NG 6796 0983].

The serpentinite forms a distinct NE-SW -trending ridge with an obvious trough on its NW side and Loch Barabhaig to the SE. The ridge and trough feature can be traced to the NE for at least 1km. The serpentinite is blue-grey, with a light brown, weathered surface, and lacks an obvious foliation. Under the hand-lens the rock is medium-grained with brown specks of material which represent altered crystals of Fe-rich carbonate. Magnetite segregations, in the form of elongate (2–3cm) crystals, associated with pink-weathered dolomite and magnesite, occur as veins up to 15cm thick. These segregations are readily examined in exposures above the scree slopes on the NW side of the mass. The presence of magnetite is easily determined with a small magnet.

.

Figure Sleat 3.14: Ridge of serpentinite, NW of Loch Barabhaig.

Figure Sleat 3.15: Serpentinite exposure, NW of Loch Barabhaig. Iain Allison for scale.

Figure Sleat 3.16: Typical blue-grey serpentinite, brown on weathered surfaces. NW of Loch Barabhaig. Pole *c.* 1m long.

Figure Sleat 3.17: Typical serpentinite exposure with abundant magnetite, NW of Loch Barabhaig. Hand for scale.

Figure Sleat 3.18: Detail of serpentinite exposure, with fresh blue-grey surfaces and brown (altered) surfaces. NW of Loch Barabhaig. Coin *c.* 20mm across.

Return to the parking location.

4. Isle Oronsay & Aird Ghunail (amphibolites) [2 kilometres; 2 hours] [NG 7092 1253]: & [NG 7051 1177]

From the Camus Croise / Isle Ornsay turn-off on the Broadford-Armadale (A851) road at [NG 6976 1261], continue for *c.* 1km (0.6 miles) along the minor road to the road end. Parking is available at the pier at [NG 7029 1249]. This location should only be visited/accessed at low tide.

Walk back along the road to the junction signposting Camascross and gain the beach. Follow the indistinct path above the High-Water Line to the NE side of the Àird Ghunail at [NG 7074 1202]. Care should be exercised when walking on any of the ground between the High- and Low-Water lines as it is, in places, particularly muddy and soft underfoot.

Rocks of the Lewisian Gneiss Complex exposed on the small isthmus of land on the NE side of the Àird Ghunail are distinctly granulitic, consisting of alternating dark- and light-coloured bands. The dark bands are rich in chlorite and actinolite, imparting the rock with a green coloration. The actinolite needles commonly cross-cut the foliation of the rock and attain lengths in excess of 10mm. The pale bands are dominated by feldspar and quartz. Also present are pink, granitic pods, commonly several centimetres across and typically aligned parallel to the foliation.

Continue SE along the coast for *c.* 100m to a large, dark green mass of amphibolite that crops out on the beach. This rock is dominated by actinolite and chlorite, together with minor plagioclase. Within this amphibolite are large (at least 15cm x 45cm, but more commonly 90cm x 150cm) inweathered pods of ultrabasic rock. They are typically either spheroidal or lenticular, with their long axes parallel to the foliation of the surrounding rocks and some consist of talc-dolomite cores mantled by radiating needles of actinolite (coarsest nearest the core, finer-grained nearer the margins of the pod), all of which are encapsulated by a thin rim or zone which is rich in biotite. These zoned bodies may have formed by reaction between ultrabasic masses and the surrounding amphibolite.

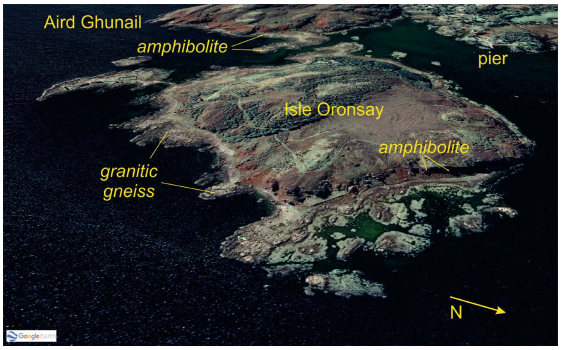

Figure Sleat 3.19: Annotated oblique Google Earth® image of Isleoronsay and Aird Ghunail, indicating locations of amphibolite exposures.

Figure Sleat 3.20: Typical amphibolite, north Isleoronsay. Pole *c.* 1m long.

Figure Sleat 3.21: Detail of typical amphibolite, north Isleoronsay. Pole *c.* 1m long.

Figure Sleat 3.22: Typical amphibolite, Aird Ghunail. Pole *c.* 1m long. View towards the east across the Sound of Sleat to the Scottish Mainland.

Return to the parking location.

5. Allt Duisdale (mylonite; granitic gneiss; Torridonian sandstones) [2 kilometres; 2 hours] [NG 6825 1276]:

Approximately 1.6km (1 mile) north from the Ord turn-off on the Broadford-Armadale (A851) road at [NG 6831 1184] there is a gated track on the west side of the road. Careful parking is available on the old (now disused) loop of the public road. Follow the track through three gates, passing sheep pens and a small cottage. From the third gate proceed NNW over open ground to a stile on the south side of the wooded Allt Duisdale at [NG 6834 1271].

Cross the stream and, *c.* 15m upstream, beneath the stream bank, phyllonitic gneisses are exposed. This rock is blue-green and thinly foliated. It contains secondary epidote and chlorite, together with sporadic porphyroblasts of hornblende, biotite and albite. Proceed upstream for a further *c.* 70m, passing more of these gneisses exposed in the SW bank, and cross onto a small, grass-covered river terrace (on the south bank of the stream). Here, Lewisian gneisses crop out, whereas on the NE bank are distinctly red Late Proterozoic (Torridonian) arkoses and sandstones of the Beinn na Seamraig Formation. Staying on the south bank of the stream, a further *c.* 50m upstream, the Moine Thrust Plane, with Lewisian gneiss overlying younger Torridonian strata, is clearly exposed in the stream bed for at least 20m along strike. The thrust plane dips to the south at a shallow angle, with the following 'sequence':

[TOP]
phyllonitic Lewisian Gneiss
- Thrust (with fault gouge) -
mylonitised Lewisian Gneiss (1m)
outweathered quartz-feldspar mylonites
inweathered micaceous mylonites
-Thrust –
Torridonian strata (Beinn na Seamraig Formation)
[BASE]

Within the mylonites, the principal mineral lineation trends E-W. The *c.* 1m-thickness of mylonitised gneiss is highly contorted and constitutes a separate, small thrust sheet. The Torridonian strata consists of rust-red, well-bedded, micaceous arkoses and sandstones. A further *c.* 30m upstream, in an area of shallow waterfalls, are exposures of Torridonian strata on both banks, and more particularly high up in the south bank. These field relationships indicate the presence of a fault trending NW-SE, with a downthrow to the NE. The steep-sided gully further upstream is eroded along the line of this fault.

Figure Sleat 3.23: Phylonitic mylonite within the Moine Thrust zone, comprising highly deformed gneisses of the Lewisian Gneiss Complex. Pole *c.* 1m long.

Figure Sleat 3.24: Detail of phylonitic mylonite within the Moine Thrust zone, comprising highly deformed gneisses of the Lewisian Gneiss Complex. Pole *c.* 1m long.

Figure Sleat 3.25: Torridonian sandstone of the Beinn na Seamraig Formation, below the Moine Thrust zone, within the Kishorn Thrust sheet. Pole *c.* 1m long.

From here, gain the north bank of the stream and return to the parking location.

End of Excursion.